

**AUGUST 3, 1994**

**OLYMPIA, WASHINGTON**

**ISSUE 94-15**



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filed not later than July 20, 1994

## CITATION

Cite all material in the Washington State Register by its issue number and sequence within that issue, preceded by the acronym WSR. Example: the 37th item in the August 5, 1981, Register would be cited as WSR 81-15-037.

## PUBLIC INSPECTION OF DOCUMENTS

A copy of each document filed with the code reviser's office, pursuant to chapter 34.05 RCW, is available for public inspection during normal office hours. The code reviser's office is located on the ground floor of the Legislative Building in Olympia. Office hours are from 8 a.m. to 5 p.m., Monday through Friday, except legal holidays. Telephone inquiries concerning material in the Register or the Washington Administrative Code (WAC) may be made by calling (206) 753-7470 (SCAN 234-7470).

## REPUBLICATION OF OFFICIAL DOCUMENTS

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## CERTIFICATE

Pursuant to RCW 34.08.040, the publication of rules or other information in this issue of the Washington State Register is hereby certified to be a true and correct copy of such rules or other information, except that headings of public meeting notices have been edited for uniformity of style.

DENNIS W. COOPER  
Code Reviser

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## STATE MAXIMUM INTEREST RATE

(Computed and filed by the State Treasurer under RCW 19.52.025)

The maximum allowable interest rate applicable for the month of August 1994 pursuant to RCW 19.52.020 is twelve point zero percent (12.00%).

NOTICE: FEDERAL LAW PERMITS FEDERALLY INSURED FINANCIAL INSTITUTIONS IN THE STATE TO CHARGE THE HIGHEST RATE OF INTEREST THAT MAY BE CHARGED BY ANY FINANCIAL INSTITUTION IN THE STATE. THE MAXIMUM ALLOWABLE RATE OF INTEREST SET FORTH ABOVE MAY NOT APPLY TO A PARTICULAR TRANSACTION.

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# WASHINGTON STATE REGISTER

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The Washington State Register is an official publication of the state of Washington. It contains proposed, emergency, and permanently adopted administrative rules, as well as other documents filed with the code reviser's office pursuant to RCW 34.08.020 and 42.30.075. Publication of any material in the Washington State Register is deemed to be official notice of such information.

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# STYLE AND FORMAT OF THE WASHINGTON STATE REGISTER

## 1. ARRANGEMENT OF THE REGISTER

The Register is arranged in the following six sections:

- (a) **PREPROPOSAL**-includes the Preproposal Statement of Intent that will be used to solicit public comments on a general area of proposed rule making before the agency files a formal notice.
- (b) **PROPOSED**-includes the full text of formal proposals, continuances, supplemental notices, and withdrawals.
- (c) **PERMANENT**-includes the full text of permanently adopted rules.
- (d) **EMERGENCY**-includes the full text of emergency rules and rescissions.
- (e) **MISCELLANEOUS**-includes notice of public meetings of state agencies, rules coordinator notifications, summaries of attorney general opinions, executive orders and emergency declarations of the governor, rules of the state Supreme Court, and other miscellaneous documents filed with the code reviser's office under RCW 34.08.020 and 42.30.075.
- (f) **TABLE**-includes a cumulative table of the WAC sections that are affected in the current year.
- (g) **INDEX**-includes a combined subject matter and agency index.

Documents are arranged within each section of the Register according to the order in which they are filed in the code reviser's office during the pertinent filing period. The three part number in the heading distinctively identifies each document, and the last part of the number indicates the filing sequence with a section's material.

## 2. PRINTING STYLE—INDICATION OF NEW OR DELETED MATERIAL

RCW 34.05.395 requires the use of certain marks to indicate amendments to existing agency rules. This style quickly and graphically portrays the current changes to existing rules as follows:

- (a) In amendatory sections—
  - (i) underlined material is new material;
  - (ii) deleted material is (~~lined out between double parentheses~~);
- (b) Complete new sections are prefaced by the heading NEW SECTION;
- (c) The repeal of an entire section is shown by listing its WAC section number and caption under the heading REPEALER.

## 3. MISCELLANEOUS MATERIAL NOT FILED UNDER THE ADMINISTRATIVE PROCEDURE ACT

Material contained in the Register other than rule-making actions taken under the APA (chapter 34.05 RCW) does not necessarily conform to the style and format conventions described above. The headings of these other types of material have been edited for uniformity of style; otherwise the items are shown as nearly as possible in the form submitted to the code reviser's office.

## 4. EFFECTIVE DATE OF RULES

- (a) Permanently adopted agency rules normally take effect thirty-one days after the rules and the agency order adopting them are filed with the code reviser's office. This effective date may be delayed or advanced and such an effective date will be noted in the promulgation statement preceding the text of the rule.
- (b) Emergency rules take effect upon filing with the code reviser's office unless a later date is provided by the agency. They remain effective for a maximum of one hundred twenty days from the date of filing.
- (c) Rules of the state Supreme Court generally contain an effective date clause in the order adopting the rules.

## 5. EDITORIAL CORRECTIONS

Material inserted by the code reviser's office for purposes of clarification or correction or to show the source or history of a document is enclosed in [brackets].

**1993 - 1994**

**DATES FOR REGISTER CLOSING, DISTRIBUTION, AND FIRST AGENCY ACTION**

Issue No.	Closing Dates <sup>1</sup>			Distribution Date	First Agency Hearing Date <sup>3</sup>
	Non-OTS & 30 p. or more	Non-OTS & 11 to 29 p.	OTS <sup>2</sup> or 10 p. max. Non-OTS		
<i>For Inclusion in--</i>	<i>File no later than--</i>			<i>Count 20 days from--</i>	<i>For hearing on or after</i>
93-16	Jul 7	Jul 21	Aug 4	Aug 18	Sep 7
93-17	Jul 21	Aug 4	Aug 18	Sep 1	Sep 21
93-18	Aug 4	Aug 18	Sep 1	Sep 15	Oct 5
93-19	Aug 25	Sep 8	Sep 22	Oct 6	Oct 26
93-20	Sep 8	Sep 22	Oct 6	Oct 20	Nov 9
93-21	Sep 22	Oct 6	Oct 20	Nov 3	Nov 23
93-22	Oct 6	Oct 20	Nov 3	Nov 17	Dec 7
93-23	Oct 20	Nov 3	Nov 17	Dec 1	Dec 21
93-24	Nov 3	Nov 17	Dec 1	Dec 15	Jan 4, 1994
94-01	Nov 24	Dec 8	Dec 22, 1993	Jan 5, 1994	Jan 25
94-02	Dec 8	Dec 22, 1993	Jan 5, 1994	Jan 19	Feb 8
94-03	Dec 22, 1993	Jan 5, 1994	Jan 19	Feb 2	Feb 22
94-04	Jan 5	Jan 19	Feb 2	Feb 16	Mar 8
94-05	Jan 19	Feb 2	Feb 16	Mar 2	Mar 22
94-06	Feb 2	Feb 16	Mar 2	Mar 16	Apr 5
94-07	Feb 23	Mar 9	Mar 23	Apr 6	Apr 26
94-08	Mar 9	Mar 23	Apr 6	Apr 20	May 10
94-09	Mar 23	Apr 6	Apr 20	May 4	May 24
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94-13	May 25	Jun 8	Jun 22	Jul 6	Jul 26
94-14	Jun 8	Jun 22	Jul 6	Jul 20	Aug 9
94-15	Jun 22	Jul 6	Jul 20	Aug 3	Aug 23
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94-19	Aug 24	Sep 7	Sep 21	Oct 5	Oct 25
94-20	Sep 7	Sep 21	Oct 5	Oct 19	Nov 8
94-21	Sep 21	Oct 5	Oct 19	Nov 2	Nov 22
94-22	Oct 5	Oct 19	Nov 2	Nov 16	Dec 6
94-23	Oct 26	Nov 9	Nov 23	Dec 7	Dec 27
94-24	Nov 9	Nov 23	Dec 7	Dec 21	Jan 10, 1995

<sup>1</sup>All documents are due at the code reviser's office by 12:00 noon on or before the applicable closing date for inclusion in a particular issue of the Register; see WAC 1-21-040.

<sup>2</sup>A filing of any length will be accepted on the closing dates of this column if it has been prepared and completed by the order typing service (OTS) of the code reviser's office; see WAC 1-21-040. Agency-typed material is subject to a ten page limit for these dates; longer agency-typed material is subject to the earlier non-OTS dates.

<sup>3</sup>At least twenty days before the rule-making hearing, the agency shall cause notice of the hearing to be published in the Register; see RCW 34.05.320(1). These dates represent the twentieth day after the distribution date of the applicable Register.



**WSR 94-15-005**

**PREPROPOSAL STATEMENT OF INTENT  
DEPARTMENT OF  
SOCIAL AND HEALTH SERVICES**

(Public Assistance)  
[Filed July 7, 1994, 9:35 a.m.]

Specific Statutory Authority for New Rule: RCW 74.08.090.

Reasons Why the New Rule is Needed: Clarification of technical language. Current language appears to be open to misinterpretation. WAC 388-513-1365 Transfer of assets.

Goals of New Rule: Clarify that only assets transferred on or after August 11, 1993, are subject to a thirty-six month "look-back" and that such look back period not cover any month prior to August 1993.

Process for Developing New Rule: Agency study; and input received from Evergreen Legal Services.

How Interested Parties can Participate in Formulation of the New Rule: Joanie Scotson, Medical Assistance Administration, Mailstop 45530, phone 753-7462 (SCAN 234), FAX 753-7315.

July 7, 1994  
Dewey Brock, Chief  
Office of Vendor Services

**WSR 94-15-006**

**PREPROPOSAL STATEMENT OF INTENT  
SUPERINTENDENT OF  
PUBLIC INSTRUCTION**

[Filed July 7, 1994, 11:00 a.m.]

Specific Statutory Authority for New Rule: RCW 28A.03.532.

Reasons Why the New Rule is Needed: To change language to reflect a recognition award amount of at least \$2,500, except for superintendents in first class districts, who will receive at least \$1,000.

Goals of New Rule: To streamline the administration of recognition award.

Process for Developing New Rule: Early solicitation of public comments and recommendations respecting new, amended or repealed rules, and consideration of the comments and recommendations in the course of drafting rules.

How Interested Parties can Participate in Formulation of the New Rule: Send written comments to Rules Coordinator, Legal Services, P.O. Box 47200, Olympia, WA 98504-7200, FAX (206) 753-4201, TDD (206) 664-3631. For telephone assistance contact Chris McElroy, (206) 753-6760.

July 6, 1994  
Judith A. Billings  
Superintendent of  
Public Instruction

**WSR 94-15-011**

**PREPROPOSAL STATEMENT OF INTENT  
WASHINGTON STATE PATROL**

[Filed July 8, 1994, 10:34 a.m.]

Specific Statutory Authority for New Rule: RCW 46.37.005.

Reasons Why the New Rule is Needed: To add clarifying information on the federal standards outlined in the RCW for motorcycle helmets.

Goals of New Rule: Clarify standards adopted for motorcycle helmets. Add additional information for persons required to wear motorcycle helmets meeting the federal standards.

Process for Developing New Rule: Negotiated rule making.

How Interested Parties can Participate in Formulation of the New Rule: Lieutenant Lonnie Brackins, Safety and Technical Section, 515 15th Avenue, Olympia, WA 98504, (206) 753-2754, FAX (206) 586-8233.

July 8, 1994  
Roger W. Bruett  
Chief

**WSR 94-15-012**

**PREPROPOSAL STATEMENT OF INTENT  
SUPERINTENDENT OF  
PUBLIC INSTRUCTION**

[Filed July 8, 1994, 3:55 p.m.]

Specific Statutory Authority for New Rule: RCW 28A.305.020 which authorizes the Superintendent of Public Instruction to adopt rules for the conduct of the election of State Board of Education members.

Reasons Why the New Rule is Needed: Statutory changes to chapter 28A.305 RCW necessitate corresponding changes in chapter 392-109 WAC.

Goals of New Rule: To assure that State Board of Education election rules are technically correct and complete.

Process for Developing New Rule: Early solicitation of public comments and recommendations respecting new, amended or repealed rules, and consideration of the comments and recommendations in the course of drafting rules.

How Interested Parties can Participate in Formulation of the New Rule: Send written comments to Rules Coordinator, Legal Services, P.O. Box 47200, Olympia, WA 98504-7200, FAX (206) 753-4201, TDD (206) 664-3631. For telephone assistance contact Richard Wilson, (206) 753-2298.

July 8, 1994  
Judith A. Billings  
Superintendent of  
Public Instruction

**WSR 94-15-014**  
**PREPROPOSAL STATEMENT OF INTENT**  
**DEPARTMENT OF ECOLOGY**  
[Filed July 8, 1994, 4:43 p.m.]

Specific Statutory Authority for New Rule: Amendment to chapter 90.76 RCW, Underground Storage Tank Act.

Reasons Why the New Rule is Needed: To respond to an opportunity to privatize the underground storage tank contractor certification program. The department intends to accomplish this by relying on a professional certification program; and to respond to a budget shortfall.

Goals of New Rule: To reduce the department's cost of administration, while continuing to require demonstration of a level of competency.

Process for Developing New Rule: Consultative rule making.

How Interested Parties can Participate in Formulation of the New Rule: Interested parties will be notified and kept informed by mail and by articles in the program newsletter. Contact person, Wendy Bolender, phone (206) 407-7211, FAX (206) 407-7154, P.O. Box 47655, Olympia, WA 98504-7655.

July 5, 1994  
Dan Silver  
Assistant Director  
Office of Waste Management

**WSR 94-15-015**  
**PREPROPOSAL STATEMENT OF INTENT**  
**DEPARTMENT OF**  
**RETIREMENT SYSTEMS**  
[Filed July 11, 1994, 1:58 p.m.]

Specific Statutory Authority for New Rule: RCW 41.50.050, chapter 41.54 RCW.

Reasons Why the New Rule is Needed: To clarify standards relating to the eligibility of persons to receive a retirement allowance from two or more retirement systems under chapter 41.54 RCW to include: Eligibility to become a dual member; termination of dual membership status; restoration of service credit in a prior system; eligibility for multiple system benefit; substitution of base salary; deferred retirement allowance; retroactive retirement allowance; maximum retirement benefit; and eligibility for lump sum retirement allowance.

Goals of New Rule: To provide guidance to members and employers concerning the department's implementation of chapter 41.54 RCW.

Process for Developing New Rule: Solicitation of comments from retirement system members and employee organizations; consideration of comments/recommendations received in the course of drafting rules.

How Interested Parties can Participate in Formulation of the New Rule: Paul Neal, Rules Coordinator, Legal/Legislative Affairs, Department of Retirement Systems, Mailstop 48380, P.O. Box 48380, Olympia, WA 98504-8380.

July 8, 1994  
Paul Neal  
Rules Coordinator

**WSR 94-15-019**  
**PREPROPOSAL STATEMENT OF INTENT**  
**STATE BOARD OF EDUCATION**  
[Filed July 11, 1994, 4:05 p.m.]

Specific Statutory Authority for New Rule: RCW 28A.410.010.

Reasons Why the New Rule is Needed: Legislative enactments and previous WAC changes in other sections necessitate further WAC amendments.

Goals of New Rule: To make technical changes to update current WACs.

Process for Developing New Rule: Early solicitation of public comments and recommendations respecting new, amended or repealed rules, and consideration of the comments and recommendations in the course of drafting rules.

How Interested Parties can Participate in Formulation of the New Rule: Send written comments to Rules Coordinator, State Board of Education, P.O. Box 47206, Olympia, WA 98504-7206, FAX (206) 586-2357, TDD (206) 664-3631. For telephone assistance contact Joanne Sorensen, (206) 753-3222.

July 11, 1994  
Larry Davis  
Executive Director

**WSR 94-15-020**  
**PREPROPOSAL STATEMENT OF INTENT**  
**STATE BOARD OF EDUCATION**  
[Filed July 11, 1994, 4:07 p.m.]

Specific Statutory Authority for New Rule: RCW 28A.150.220(6).

Reasons Why the New Rule is Needed: Current assignment rules prevent school districts from making the best use of personnel at the middle school and junior high levels.

Goals of New Rule: To allow local school districts the needed flexibility to assign teachers at the middle school and junior high levels.

Process for Developing New Rule: Early solicitation of public comments and recommendations respecting new, amended or repealed rules, and consideration of the comments and recommendations in the course of drafting rules.

How Interested Parties can Participate in Formulation of the New Rule: Send written comments to Rules Coordinator, State Board of Education, P.O. Box 47206, Olympia, WA 98504-7206, FAX (206) 586-2357, TDD (206) 664-3631. For telephone assistance contact Joanne Sorensen, (206) 753-3222.

July 11, 1994  
Larry Davis  
Executive Director

**WSR 94-15-021**  
**PREPROPOSAL STATEMENT OF INTENT**  
**STATE BOARD OF EDUCATION**  
 [Filed July 11, 1994, 4:09 p.m.]

July 11, 1994  
 Larry Davis  
 Executive Director

Specific Statutory Authority for New Rule: RCW 28A.410.010, 28A.305.130 (1), (2), and (3).

Reasons Why the New Rule is Needed: In January 1992 the State Board of Education adopted WAC 180-75-110 which called for a study of the roles, responsibilities, and professional standards for the certification of educational staff associates in order to determine if current regulations meet the emerging needs of today's students. The action of the State Board of Education was caused, in part, by a shortage of ESAs and the unavailability of approved preparation programs in some ESA roles.

Goals of New Rule: To adopt certification rules which will contribute to the availability of an adequate supply of qualified certificated support service personnel for service to public school children.

Process for Developing New Rule: Early solicitation of public comments and recommendations respecting new, amended or repealed rules, and consideration of the comments and recommendations in the course of drafting rules.

How Interested Parties can Participate in Formulation of the New Rule: Send written comments to Rules Coordinator, State Board of Education, P.O. Box 47206, Olympia, WA 98504-7206, FAX (206) 586-2357, TDD (206) 664-3631. For telephone assistance contact Joanne Sorensen, (206) 753-3222.

July 11, 1994  
 Larry Davis  
 Executive Director

**WSR 94-15-022**  
**PREPROPOSAL STATEMENT OF INTENT**  
**STATE BOARD OF EDUCATION**  
 [Filed July 11, 1994, 4:11 p.m.]

Specific Statutory Authority for New Rule: RCW 28A.410.010, 28A.305.130(3).

Reasons Why the New Rule is Needed: In 1992 the legislature passed SSB 5953 which called for a joint study by the State Board of Education and the Governor's Council on Education Reform and Funding of the current requirements for teachers and administrators. The resulting report to the legislature included a recommendation for establishing a performance-based certification model for teachers.

Goals of New Rule: To provide qualified teachers for the emerging performance-based education system.

Process for Developing New Rule: Early solicitation of public comments and recommendations respecting new, amended or repealed rules, and consideration of the comments and recommendations in the course of drafting rules.

How Interested Parties can Participate in Formulation of the New Rule: Send written comments to Rules Coordinator, State Board of Education, P.O. Box 47206, Olympia, WA 98504-7206, FAX (206) 586-2357, TDD (206) 664-3631. For telephone assistance contact Joanne Sorensen, (206) 753-3222.

**WSR 94-15-023**  
**PREPROPOSAL STATEMENT OF INTENT**  
**STATE BOARD OF EDUCATION**  
 [Filed July 11, 1994, 4:13 p.m.]

Specific Statutory Authority for New Rule: RCW 28A.410.010.

Reasons Why the New Rule is Needed: In 1992 the legislature passed SSB 5953 which called for a joint study by the State Board of Education and the Governor's Council on Education Reform and Funding of the current requirements for teachers and administrators. The resulting report to the legislature included a recommendation for changes in the preparation of principals who will need to provide leadership in a performance-based education system.

Goals of New Rule: To improve and strengthen the quality and preparation of school principals.

Process for Developing New Rule: Early solicitation of public comments and recommendations respecting new, amended or repealed rules, and consideration of the comments and recommendations in the course of drafting rules.

How Interested Parties can Participate in Formulation of the New Rule: Send written comments to Rules Coordinator, State Board of Education, P.O. Box 47206, Olympia, WA 98504-7206, FAX (206) 586-2357, TDD (206) 664-3631. For telephone assistance contact Alf Langland, (206) 753-3222.

July 11, 1994  
 Larry Davis  
 Executive Director

**WSR 94-15-026**  
**PREPROPOSAL STATEMENT OF INTENT**  
**SEATTLE COMMUNITY COLLEGES**  
 [Filed July 12, 1994, 1:50 p.m.]

Specific Statutory Authority for New Rule: RCW 34.05.310.

Reasons Why the New Rule is Needed:

**1994-95 Agenda for Significant Rules Under Development and/or Consideration**

1. Appointing Authority  
 Relocation Benefits  
 Election Rules  
 Nepotism Policy  
 Bidding Procedures-Purchasing/Contracting  
 Reason: Chapters may be repealed because they are not rules as defined by the APA
2. Model Rules of Procedure  
 Reason: New chapter of the Washington Administrative Code
3. Traffic Rules and Regulations

Reason: Changes to remove unneeded duplication and to group provisions covering same subjects into one provision.

4. Student Policies and Procedures - including General Conduct, Tuition and Fee Schedules, Scholarships, and Financial Aid

Reason: Consolidation of provisions that cover same subject; addition of provisions to complete college coverage in this area

5. Withholding Services for Outstanding Debts

Reason: Attorney General's Office has recommended that our district adopt such a policy

6. Designation of Rules Coordinator

Reason: Additional section to complete coverage

7. Policy on the Use of the College Facilities

Library Regulations

Access to Public Records

Reason: Renumber and rewrite to bring into line with suggested numbering system for community colleges

8. Tenure

Reason: Delete, no longer necessary

9. Sexual Harassment

Reason: New chapter of the Washington Administrative Code

10. State Environmental Policy Act Rules

Reason: Contains unneeded provisions. Delete in its entirety and replaced with simplified provision

11. Severability

Reason: New chapter of the Washington Administrative Code

Goals of New Rule: See above.

Process for Developing New Rule: Agency study.

How Interested Parties can Participate in Formulation of the New Rule: Dede Gonzales, Rules Coordinator, Business and Finance, 1500 Harvard Avenue, Seattle, WA 98122, per state regulations and Seattle Community College District procedures, call Ms. Dede Gonzales, Seattle Community College District Rules Coordinator, (206) 587-4160, FAX (206) 587-3894.

June 28, 1994

Dede Gonzales  
Administrative Assistant

**WSR 94-15-028**

**PREPROPOSAL STATEMENT OF INTENT  
DEPARTMENT OF HEALTH**

[Filed July 13, 1994, 1:06 p.m.]

Specific Statutory Authority for New Rule: RCW 70.98.010 declares the policy of the state to maintain a regulatory program that is compatible with the standards and regulatory program of the U.S. Nuclear Regulatory Commission. RCW 70.98.050 requires the department to develop the program with due regard for compatibility with federal programs for regulation of by-product, source and special nuclear material.

Preproposal

Reasons Why the New Rule is Needed: The U.S. Nuclear Regulatory Commission has determined that the federal rule on emergency preparedness for radioactive material licensees is a matter of compatibility between the state and federal programs and the state is, therefore, required to implement a similar rule. Two new sections are being created, WAC 246-235-077 Special requirements for emergency planning and WAC 246-235-150 Schedule C — Quantities of radioactive materials requiring consideration of the need for an emergency plan for responding to a release.

Goals of New Rule: The rule is intended to ensure that licensees with very large quantities of radioactive materials, develop and maintain emergency plans. The plans are for coping with serious accidents involving licensed radioactive materials for which off site response organizations (such as police, fire and medical organizations) might be needed.

Process for Developing New Rule: All licensees with large possession limits will be notified of this rule making and invited to participate in developing the state specific aspects of the rule prior to formally proposing the rule in the Washington State Register. However, the final rule must be compatible with the existing federal rule. A meeting may be held if there is sufficient interest among potentially affected licensees.

How Interested Parties can Participate in Formulation of the New Rule: Interested parties should contact Terry C. Frazee at the Department of Health by phone (206) 753-3461, in writing Radioactive Materials Section, P.O. Box 47827, Olympia, WA 98504-7827, or by electronic mail at TCF0303@WA-DOH.MHS.COMPU.SERVE.COM. FAX messages should be sent to (206) 753-1496.

July 11, 1994

Bruce Miyahara  
Secretary

**WSR 94-15-029**

**PREPROPOSAL STATEMENT OF INTENT  
DEPARTMENT OF  
SOCIAL AND HEALTH SERVICES  
(Public Assistance)**

[Filed July 13, 1994, 2:20 p.m.]

Specific Statutory Authority for New Rule: RCW 74.08.090. WAC 388-513-1350 Institutional—Available resources.

Reasons Why the New Rule is Needed: This rule was amended incorrectly in March 1994.

Goals of New Rule: Meet the original intent of the original version of rule. Ensure a couple applying for institutional care be allowed to exempt one vehicle regardless of value or use.

Process for Developing New Rule: Agency study; and contact from client's attorney and Evergreen Legal Services.

How Interested Parties can Participate in Formulation of the New Rule: Contact Joanie Scotson, Program Manager, Medical Assistance Administration, Mailstop 45530, phone (206) 753-7462, FAX (206) 753-7315.

July 13, 1994

Dewey Brock, Chief  
Office of Vendor Services

**WSR 94-15-030**  
**PREPROPOSAL STATEMENT OF INTENT**  
**DEPARTMENT OF**  
**SOCIAL AND HEALTH SERVICES**  
(Public Assistance)

[Filed July 13, 1994, 2:22 p.m.]

Specific Statutory Authority for New Rule: RCW 74.08.090. WAC 388-513-1365.

Reasons Why the New Rule is Needed: Clarification of technical language to meet the original intent of this rule.

Goals of New Rule: Ensure this rule is not misinterpreted and that look-back periods are applied appropriately.

Process for Developing New Rule: Agency study.

How Interested Parties can Participate in Formulation of the New Rule: Contact Joanie Scotson, Program Manager, Medical Assistance Administration, Mailstop 45530, phone (206) 753-7462, FAX (206) 753-7315.

July 13, 1994  
Dewey Brock, Chief  
Office of Vendor Services

Reasons Why the New Rule is Needed: School districts have consistently expressed difficulty understanding the meaning of the rule.

Goals of New Rule: Assist school districts in understanding when the district can place a teacher in an assignment outside the endorsements listed on a teacher's certificate and when the district must request a waiver from the State Board of Education.

Process for Developing New Rule: Early solicitation of public comments and recommendations respecting new, amended or repealed rules, and consideration of the comments and recommendations in the course of drafting rules.

How Interested Parties can Participate in Formulation of the New Rule: Send written comments to Rules Coordinator, State Board of Education, P.O. Box 47206, Olympia, WA 98504-7206, FAX (206) 586-2357, TDD (206) 664-3631. For telephone assistance contact Linda Byrnes, (206) 753-6710.

July 13, 1994  
Larry Davis  
Executive Director

**WSR 94-15-031**  
**PREPROPOSAL STATEMENT OF INTENT**  
**DEPARTMENT OF**  
**SOCIAL AND HEALTH SERVICES**  
(Public Assistance)

[Filed July 13, 1994, 2:23 p.m.]

Specific Statutory Authority for New Rule: ESSB 6244, section 206. WAC 388-21-51100 Living in the home of a relative of specified degree—Temporary absence of a child or caretaker relative.

Reasons Why the New Rule is Needed: To implement ESSB 6244, section 206, the department must amend its rule on eligibility for aid to families with dependent children (AFDC) when children are temporarily absent from the family home.

Goals of New Rule: Amending the rule to allow the department to continue AFDC when children are in temporary foster care will help prevent homelessness and facilitate family reunification.

Process for Developing New Rule: Negotiated rule making.

How Interested Parties can Participate in Formulation of the New Rule: Contact Tom Everett, Program Manager, Office of Assistance Programs, Division of Income Assistance, Mailstop 45400, Olympia, Washington 98504-5400, (206) 438-8312, SCAN 585-8312.

July 13, 1994  
Dewey Brock, Chief  
Office of Vendor Services

**WSR 94-15-035**  
**PREPROPOSAL STATEMENT OF INTENT**  
**STATE BOARD OF EDUCATION**  
[Filed July 13, 1994, 3:36 p.m.]

Specific Statutory Authority for New Rule: RCW 28A.525.020.

Reasons Why the New Rule is Needed: WAC 180-26-025 and 180-27-115 are being amended to comply with the new definition of racial imbalance as adopted by the State Board of Education at its March 1994 meeting.

Goals of New Rule: The goal of the amended rules is to provide the current definition of racial imbalance in WAC.

Process for Developing New Rule: Early solicitation of public comments and recommendations respecting new, amended or repealed rules, and consideration of the comments and recommendations in the course of drafting rules.

How Interested Parties can Participate in Formulation of the New Rule: Send written comments to Rules Coordinator, State Board of Education, P.O. Box 47206, Olympia, WA 98504-7206, FAX (206) 586-2357, TDD (206) 664-3631. For telephone assistance contact Alberta Mehring, (206) 753-6702.

July 13, 1994  
Larry Davis  
Executive Director

**WSR 94-15-034**  
**PREPROPOSAL STATEMENT OF INTENT**  
**STATE BOARD OF EDUCATION**  
[Filed July 13, 1994, 3:34 p.m.]

Specific Statutory Authority for New Rule: RCW 28A.410.010.

**WSR 94-15-037**  
**PREPROPOSAL STATEMENT OF INTENT**  
**DEPARTMENT OF LICENSING**  
[Filed July 14, 1994, 9:22 a.m.]

Specific Statutory Authority for New Rule: RCW 46.70.160, 46.70.124.

Reasons Why the New Rule is Needed: Dealers are experiencing an increased time to acquire physical title on trade-in vehicles with a paperless title from First Interstate Bank and other potential paperless title lienholder partici-

pants and from out-of-state lienholders holding the title on trade-in vehicles.

Goals of New Rule: Increase time period for dealer to make application for a certificate of title in the purchaser's name from thirty days to forty-five days; and allow dealers to sell an inventory vehicle as soon as the lien on the acquired vehicle has been paid rather than waiting to receive the title from the lienholder.

Process for Developing New Rule: Negotiated rule making; and randomly survey dealers to determine amount of time necessary for title transfers.

How Interested Parties can Participate in Formulation of the New Rule: Submit comments to Gail Saul, Dealer Services, P.O. Box 48071, Olympia, WA 98504-8071, phone (206) 586-6655, FAX (206) 586-6703.

July 14, 1994  
Heather Hamilton  
Administrator

**WSR 94-15-038**

**PREPROPOSAL STATEMENT OF INTENT  
DEPARTMENT OF ECOLOGY**

[Filed July 14, 1994, 9:54 a.m.]

Specific Statutory Authority for New Rule: Chapter 43.21C RCW, the State Environmental Policy Act, states that it shall be the duty and function of the Department of Ecology, to adopt and amend thereafter rules of interpretation and implementation of this chapter (the State Environmental Policy Act of 1971),. . . for the purpose of providing uniform rules and guidelines to all branches of government including state agencies, political subdivisions, public and municipal corporations, and counties.

Reasons Why the New Rule is Needed: New legislation, including growth management, regulatory reform (MTCA), and other legislative changes to SEPA require changes to the SEPA rules (chapter 197-11 WAC). In the case of growth management existing rules need revision to ensure the language, procedures and substance of the rules provide adequate guidance in consolidating and planning for anticipated growth and that such guidance is not duplicative and can be accomplished in a reasonable and appropriate manner.

Goals of New Rule: The primary goal of this rule amendment is to integrate growth management processes and substance with processes and substance under SEPA to expedite and further good planning in a nonduplicative manner. It is also to address several relatively minor changes required by recent legislation.

Process for Developing New Rule: Consultative: An existing SEPA/GMA work group comprised of representatives of the major stakeholders will be used as an oversight and drafting committee.

How Interested Parties can Participate in Formulation of the New Rule: Contact Marvin L. Vialle, P.O. Box 47703,

Olympia, WA 98504-7703, (206) 407-6928, FAX (206) 407-6904.

July 13, 1994  
D. J. Patin  
Assistant Director  
Central Programs and Enforcement

**WSR 94-15-039**

**PREPROPOSAL STATEMENT OF INTENT  
COMMISSION ON  
JUDICIAL CONDUCT**

[Filed July 14, 1994, 1:39 p.m.]

Specific Statutory Authority for New Rule: Washington State Constitution, Article IV, Section 31.

Reasons Why the New Rule is Needed: Experience, while generally positive, has shown the current rules can be clarified. Current rules do not separate the investigative and adjudicative functions of the commission. Although such separation is not required, comments on the viability of such a concept in Washington would assist the commission.

Goals of New Rule: New rules would clarify procedures and provide for the commission to divide itself into panels. The panels would be divided so that each member of the commission can avoid participating in both the investigative and adjudicative roles on the same case.

Process for Developing New Rule: Clarifying procedures and separating functions would require substantial changes to existing rules. These changes are evident in the attached draft rules provided for written comment. Comments received will be considered by the commission before proposed rules are published pursuant to a formal notice.

How Interested Parties can Participate in Formulation of the New Rule: Written comments must be received by September 12, 1994. These comments will be considered by the rules subcommittee of the commission at its October 6, 1994, meeting. Thereafter, the rules subcommittee will provide the written comments and the subcommittee's report and recommendations to the commission at its October 7, 1994, meeting. The commission may proceed with rule making, or may reconsider the concepts of the new rules. Contact David Akana, Commission on Judicial Conduct, P.O. Box 1817, Olympia, WA 98507, (206) 753-4585, FAX (206) 586-2918.

July 14, 1994  
David Akana  
Executive Director

**Chapter 292-06 WAC  
PROCEDURAL RULES**

NEW SECTION

**WAC 292-06-001 Preamble.** The regulation of judicial conduct is critical to preserving the integrity of the judiciary and enhancing public confidence in the judicial system. Such regulation should provide a fair and reasonable process for the handling of complaints and inquiries about members of the judiciary concerning their conduct and ability to perform judicial duties.

Judicial disciplinary cases are neither civil nor criminal in nature but are *sui generis*, i.e., of their own kind.

These rules, adopted pursuant to Washington State Constitution, Article IV, Section 31, are intended to adopt fair and efficient procedures for enforcement of the Code of Judicial Conduct. The rules represent a careful balance of a number of competing interests: The public interest that complaints against judges are given serious consideration and that judges are held to high standards of behavior; the rights of judges to fair treatment in the disposition of complaints against them; the interest of judges and complainants in the confidentiality of complaints for which the commission finds there is no probable cause to believe that misconduct occurred; the public interest in encouraging participation in the disciplinary process by protecting complainants and witnesses from retribution or harassment; and the interest of the judges and the public in having judicial disciplinary complaints resolved promptly and accurately.

All proceedings before the commission on judicial conduct involving judges as defined in these rules shall proceed exclusively under the rules set forth in this chapter.

#### NEW SECTION

**WAC 292-06-005 Terminology.** Definitions. In these rules: "Admonishment" means a written action of the commission of an advisory nature that cautions a respondent not to engage in certain proscribed behavior. An admonishment may include a requirement that the respondent follow a specified corrective course of action. Admonishment is the least severe disciplinary action the commission can issue.

"Censure" means a written action of the commission that requires a respondent to appear personally before the commission and that finds that conduct of the respondent violates a rule of judicial conduct, detrimentally affects the integrity of the judiciary, undermines public confidence in the administration of justice, and may or may not require a recommendation to the supreme court that the respondent be suspended (with or without pay) or removed. A censure shall include a requirement that the respondent follow a specified corrective course of action. Censure is the most severe disciplinary action the commission can issue.

"Chairperson" means one of the members elected by the commission to perform the duties of the chair and includes the acting chairperson.

"Commission" means the commission on judicial conduct.

"Commission counsel" means the legal advisor for the commission. See WAC 292-06-050.

"Complaint" means information in any form from any source received by the commission that alleges or from which a reasonable inference can be drawn that a judge committed misconduct or is incapacitated. If there is no written complaint from another person, the investigator's written statement of the allegations constitutes the complaint.

"Disability" means "incapacity."

"Discipline" includes admonishment, reprimand, censure, suspension, removal, and any other sanction the commission is authorized to impose.

"Disciplinary counsel" means a lawyer retained by the commission to assist an investigative panel and/or to represent the commission in designated proceedings.

"Documentary evidence" means any business record, public record, handwriting, typewriting, printing, photostating, photographing, and every other means of recording any form of communication or representation, including letters, words, pictures, sounds, or symbols, or combination thereof, and all papers, drawings, charts, maps, magnetic or paper tapes, photographic films and prints, magnetic or punched cards, discs, drums, and other documents.

"Hearing" means a public proceeding at which the issues of law and fact raised by a statement of charges and answer are tried before a review panel. See WAC 292-06-030.

"Incapacity" means any physical, mental, or emotional condition from which a respondent suffers which is permanent or likely to become permanent and which seriously interferes with the performance of judicial duties. As used in these rules, "incapacity" shall have the same meaning as "disability" in Washington State Constitution, Article IV, Section 31.

"Investigation" means an inquiry, including a search for and examination of evidence concerning allegations, divided into two stages: Preliminary investigation conducted after receipt of the complaint and initial proceedings conducted after authorization from the investigative panel.

"Investigative officer" means a person or persons employed or retained by the commission who investigates and reports the findings to the investigative panel.

"Investigative panel" means the panel of the commission that determines the extent of the investigation to be conducted and whether a statement of charges will be filed. See WAC 292-06-030.

"Judge" means those officers of a judicial system who perform judicial functions and who are subject to the Code of Judicial Conduct, such as justices of the supreme court, judges of the court of appeals, judges of the superior court, judges of any court organized under Titles 3, 35, or 35A RCW, judges pro tempore, court commissioners, and magistrates. The term includes full-time and part-time judges and judges who have been or have not been admitted to the practice of law in Washington.

"Medical privilege" shall refer to any confidential, privileged communication between respondent and any health care provider recognized by law.

"Meeting" includes a regular meeting or a special meeting. Business meetings are subject to the Open Public Meetings Act, chapter 42.30 RCW. Investigations, initial proceedings, public hearings, and executive sessions involving the discipline or retirement of a judge are governed by Article IV, Section 31, of the state Constitution.

"Member" means a member of the commission and includes alternates acting as members during a member's disqualification or inability to serve.

"Misconduct" means any conduct by a respondent constituting grounds for discipline.

"Party" means the respondent or the commission as the context suggests.

"Public member" means a member of the commission who is neither a lawyer nor a judge.

"Record" means the formal statement of charges and all documents filed thereafter in a proceeding including the verbatim report of the hearing on the statement of charges if a verbatim report has been prepared.

"Reprimand" means a written action of the commission that requires a respondent to appear personally before the commission and that finds that the conduct of the respondent is a minor violation of the Code of Judicial Conduct and does not require censure or a recommendation to the supreme court that the respondent be suspended or removed. A reprimand shall include a requirement that the respondent follow a specified corrective course of action. Reprimand is an intermediate level of disciplinary action the commission can issue.

"Respondent" means the judge or former judge who is the subject of a complaint or statement of charges.

"Review panel" means the panel of the commission that conducts hearings on the statement of charges. See WAC 292-06-030.

"Statement of charges" means the formal charges of judicial misconduct or incapacity, including any amendment thereto, filed by the investigative panel upon a determination of probable cause.

## SECTION I. ORGANIZATION AND STRUCTURE

### NEW SECTION

**WAC 292-06-010 Disciplinary authority.** The disciplinary authority of the commission extends to every judge subject to the Washington State Constitution, Article IV, Section 31, and the Code of Judicial Conduct.

### NEW SECTION

**WAC 292-06-020 The commission on judicial conduct.** (1) Purpose. The commission on judicial conduct administers the judicial discipline and incapacity provisions of the Washington State Constitution, Article IV, Section 31.

#### (2) Jurisdiction.

(a) Judges. The commission has jurisdiction over judges regarding allegations of misconduct occurring prior to or during service as a judge and regarding allegations of incapacity during service as a judge.

(b) Former judges. The commission has continuing jurisdiction over former judges regarding allegations of misconduct occurring prior to or during service as a judge.

### NEW SECTION

**WAC 292-06-030 Organization and authority of the commission.** (1) Panels and meetings. The commission shall divide itself into a review panel of seven members consisting of four public members, two judge members, and one lawyer member; and an investigative panel of four members consisting of two public members, one judge member, and one lawyer member. Membership on the panels may rotate in a manner determined by the commission provided that members shall avoid sitting on both the hearing and investigative panel for the same proceeding. Panel meetings shall be scheduled as necessary. The full commission shall meet periodically as determined by the commission to consider administrative and other matters. The chair may call meetings of the commission other than regularly scheduled meetings upon the chair's own motion; the chair shall call a meeting upon the written request of three members of the commission. Meetings and executive

sessions may be conducted by telephone conference calls. Business meetings may be conducted by telephone conference calls or other telecommunications means within the provisions of the Open Public Meetings Act, whereby each participant in the meeting can simultaneously hear the others and further, whereby at least one site, identified by proper notice, shall provide the capability for members of the public to hear the conference.

(2) Officers. The commission shall elect one of its members to serve as chair, another to serve as vice-chair, and another to serve as secretary for such terms as the commission shall determine. The vice-chair shall perform the duties of the chair whenever the chair is absent or unable to act. Each review panel and investigative panel shall be chaired by a member selected by the commission chair or the respective panel members.

(3) Quorums. Six members of the full commission, four members of a review panel, and three members of an investigative panel shall constitute the respective quorums for the transaction of business. The chairperson will arrange for an alternate member selected by the appropriate appointing authority to serve in the place of a member whenever a member is disqualified or unable to serve. The alternate member so called upon shall have all the authority of a member of the commission during the time the member is unable to serve.

#### (4) Powers and duties.

(a) The duty and authority of the commission shall include but not be limited to:

(i) Adopting rules of procedure for discipline and incapacity proceedings;

(ii) Retaining disciplinary counsel;

(iii) Appointing investigative officers;

(iv) Appointing commission counsel; and

(v) Employing an executive director and other staff.

(b) The duty and authority of an investigative panel shall include but not be limited to:

(i) Retaining disciplinary counsel;

(ii) Reviewing the recommendation of the investigative officer and/or disciplinary counsel after screening and a preliminary investigation, and either authorizing a full investigation of a complaint against a respondent in initial proceedings or dismissing the complaint; and

(iii) Reviewing the findings of the investigative officer and/or disciplinary counsel after a full investigation of a complaint against a respondent in initial proceedings and dismissing the matter, making a finding of probable cause, proposing a formal stipulation to respondent, or, after making a finding of probable cause, instructing disciplinary counsel to file a statement of charges.

(c) The duty and authority of a review panel shall include but not be limited to:

(i) Ruling on prehearing motions, conducting hearings on a statement of charges, and making findings, conclusions, and a decision;

(ii) Where appropriate, making recommendations to the supreme court for discipline pursuant to WAC 292-06-240; or

(iii) Dismissing the case.

#### (5) Recusal.

(a) A member of the commission should disqualify himself or herself if his or her impartiality might reasonably



be questioned because of a conflict of interest or personal bias or prejudice.

(b) Respondent may file an affidavit challenging for cause any member who respondent believes cannot impartially consider the statement of charges. The affidavit must be filed within seven days after service of the notice of hearing identifying those members assigned to conduct the hearing. The commission chairperson, or vice-chairperson, will decide any challenge for cause if the member does not disqualify himself or herself.

#### NEW SECTION

**WAC 292-06-040 Investigative officer and disciplinary counsel.** (1) Appointment. The commission may appoint one or more full-time or part-time investigative officers and full-time or part-time disciplinary counsel.

(2) Powers and duties. The duty and authority of the investigative officer and disciplinary counsel shall include but not be limited to:

(a) Receiving and screening complaints, referring complainants to other agencies when appropriate, conducting preliminary investigations, recommending to the investigative panel, and upon authorization, conducting full investigations, notifying complainants about the status and disposition of their complaints, and making recommendations to the investigative panel on the disposition of complaints after full investigation. Additionally, disciplinary counsel shall file a statement of charges when directed to do so by the investigative panel and shall present the case supporting the statement of charges;

(b) Maintaining permanent records of the investigative and subsequent proceedings set forth in (a) of this subsection; and

(c) Performing other duties at the direction of the commission.

#### NEW SECTION

**WAC 292-06-050 Commission counsel.** (1) Appointment. The commission may appoint commission counsel to assist the commission.

(2) Powers and duties. The commission may delegate functions to commission counsel, including but not limited to the duty and authority to:

(a) Assisting the review panel during its deliberations and draft decisions, orders, reports, and other documents on behalf of the review panel; and

(b) Performing other duties at the direction of the commission.

## SECTION II. GENERAL PROVISIONS

#### NEW SECTION

**WAC 292-06-060 Discipline.** (1) Grounds. Any conduct which violates the Code of Judicial Conduct is grounds for discipline which shall be issued or administered in open session.

(2) Discipline. The commission shall have the authority to:

- (a) Admonish;
- (b) Reprimand;

(c) Censure;

(d) Censure and recommend to the supreme court the suspension of the respondent with or without pay;

(e) Censure and recommend to the supreme court the removal of the respondent; and

(f) Impose any other sanction the commission is authorized to administer.

(3) Mitigating/aggravating factors. Whenever the commission or a review panel finds grounds for discipline, it shall consider the following nonexclusive factors in determining the appropriate discipline to be ordered:

(a) Whether the misconduct is an isolated instance or evidence of a pattern of conduct;

(b) The nature, extent, and frequency of occurrence of the acts of misconduct;

(c) Whether the misconduct occurred in or out of the courtroom;

(d) Whether the misconduct occurred in the judge's official capacity or in his private life;

(e) Whether the judge has acknowledged or recognized that the acts occurred;

(f) Whether the judge has evidenced an effort to change or modify his conduct;

(g) The judge's length of service on the bench;

(h) Whether there have been prior complaints about this judge;

(i) The effect the misconduct has upon the integrity of and respect for the judiciary;

(j) The extent to which the judge exploited his position to satisfy his personal desires; and

(k) Whether the judge cooperated with the commission investigation and proceeding.

#### NEW SECTION

**WAC 292-06-070 Proof.** Findings of violations of the Code of Judicial Conduct or incapacity shall be based upon clear, cogent, and convincing evidence.

#### NEW SECTION

**WAC 292-06-080 Civil rules applicable.** Except as otherwise provided in these rules, the rules of evidence applicable to civil proceedings and the rules of civil procedure shall apply in all public proceedings under these rules.

#### NEW SECTION

**WAC 292-06-090 Right to counsel.** Respondent may retain counsel and have assistance of counsel at his or her own expense.

#### NEW SECTION

**WAC 292-06-100 Ex parte contacts.** Members of the commission shall not engage in ex parte communications regarding a case with respondent, respondent's counsel, disciplinary counsel, or any witness, except that members of the investigative panel assigned to that case may communicate with disciplinary counsel and others as required to perform their duties in accordance with these rules.

NEW SECTION**WAC 292-06-110 Confidentiality.** (1) Proceedings.

(a) Prior to the filing of a statement of charges, all proceedings shall be confidential.

(b) After the filing of a statement of charges, all subsequent proceedings shall be public except as may be provided by protective order. The statement of charges alleging judicial misconduct or incapacity shall be available for public inspection. The record of the initial proceedings that was provided to the investigative panel and which formed the basis of a finding of probable cause shall become public on the first day of the hearing. The hearing before a review panel shall be open to the public; however, all deliberations of the panel in reaching a decision on the statement of charges shall be confidential.

## (2) Information.

(a) Prior to the filing of a statement of charges, all information relating to a complaint that has not been dismissed shall be held confidential by the commission, disciplinary counsel, and staff, except that the commission may disclose information:

(i) When the commission has determined that there is a need to notify another person or agency in order to protect the public or the administration of justice; or

(ii) Upon waiver in writing by respondent:

(A) If public statements that charges are pending before the commission are substantially unfair to respondent; or

(B) If respondent is publicly associated with violating a rule of judicial conduct or with having an incapacity, and the commission, after a preliminary investigation, has determined there is no basis for further proceedings or for a recommendation of discipline or retirement.

(b) Except as provided by these rules, all information relating to a complaint that has been dismissed without the filing of a statement of charges shall be held confidential by the commission, disciplinary counsel, and staff.

(c) Except as provided in these rules, the fact that a complaint has been made, or a statement has been given to the commission, and all papers and matters submitted to the commission together with the investigation and initial proceedings conducted pursuant to these rules, shall be confidential. However, the person filing a complaint or giving a statement to the commission is not prohibited by these rules from informing any third party, or the public generally, of the factual basis upon which a complaint is based, or a statement is given.

(d) The commission may inform a complainant or potential witness when respondent is first given notice of misconduct or incapacity allegations. After final commission action on a complaint, the commission shall disclose to the person making a complaint that after an investigation of the charges:

(i) The commission has found no basis for action by the commission against the respondent; or

(ii) The commission has admonished, reprimanded, or censured the respondent, or censured the respondent and recommended to the supreme court the suspension or removal of the respondent or has recommended to the supreme court the retirement of the respondent.

The name of the respondent, in the discretion of the commission, shall not be used in written communication to the complainant.

(e) Disciplinary counsel's work product and records of the commission's deliberations shall not be disclosed.

(f) Investigative files and records prior to the date of filing of the statement of charges shall not be disclosed unless they were provided to the investigative panel and formed the basis for probable cause.

(g) Informal action taken by the commission prior to May 5, 1989, when amended rules were adopted eliminating private informal dispositions, may, in the commission's discretion, be disclosed to the Washington State Bar Association, American Bar Association, a judicial authority, any judicial appointive, selection or confirmation authority, or to law enforcement agencies, when required in the interests of justice, or to maintain confidence in the selection of judges or administration of the judiciary. The person to whom the information relates shall be informed of any information released.

(h) Unless otherwise permitted by these rules, or from public documents, or from a public hearing, no person shall disclose information obtained by that person during commission proceedings or from papers filed with the commission. Any person violating confidentiality rules may be subject to contempt proceedings.

NEW SECTION

**WAC 292-06-130 Service.** (1) Service of papers on the commission in any matter concerning a respondent shall be given by delivering or mailing the papers to the commission's office.

(2) If service is by mail, service shall be deemed complete three days after posting with the U.S. Mail, postage prepaid.

(3) All documents may be filed with the commission via facsimile machine. However, filing will not be deemed accomplished unless the following procedures are strictly observed:

(a) A facsimile document will be stamped "filed" by the commission only between the hours of 8:00 a.m. and 5:00 p.m. excluding Saturdays, Sundays, and legal holidays. Any transmission not completed before 5:00 p.m. will be "filed" on the following business day.

(b) The original document must be filed with the commission within ten calendar days from the date of the transmission.

(c) All transmissions are sent at the risk of the sender.

(4) Service of the statement of charges in any disciplinary or incapacity proceeding shall be made by personal service upon a respondent.

NEW SECTION

**WAC 292-06-140 Subpoena power.** (1) Oaths. Oaths and affirmations may be administered by any member of the commission or any other person authorized by law.

(2) Subpoenas for investigation, deposition, or hearing. The commission or panel thereof may summon and examine witnesses or delegate the power to disciplinary counsel or an investigative officer to examine such witnesses and compel the production and examination of papers, books, accounts,

documents, records, certificates, and other evidence for the determination of any issue before, or the discharge of any duty, of the commission. All subpoenas shall be signed by a member of the commission. Following service of the statement of charges, a respondent has a right to issuance of subpoenas for the attendance of witnesses to testify or produce evidentiary matters for hearing or permitted discovery.

(3) Enforcement of subpoenas. The commission may bring action to enforce a subpoena in the superior court of any county in which the hearing or proceeding is conducted or in which the person resides or is found.

(4) Quashing subpoena. Any attack on the validity of a subpoena so issued shall be heard and determined by the investigative or review panel before which the matter is pending.

(5) Service, witnesses, fees. Subpoenas shall be served and witnesses reimbursed in the manner provided in civil cases in superior court. Expenses of witnesses shall be borne by the party calling them.

#### NEW SECTION

**WAC 292-06-160 Notification to complainant of final disposition.** The commission shall notify the complainant in writing of the final disposition of a proceeding under these rules.

### SECTION III. DISCIPLINARY PROCEEDINGS

#### NEW SECTION

**WAC 292-06-170 Screening and investigation.** (1) General. An investigative officer employed by the commission will conduct the investigation aided by disciplinary counsel if deemed appropriate by the investigative panel.

#### (2) Screening.

(a) Any named or anonymous organization, association, or person, including a member of the commission or staff, may make a complaint of judicial misconduct or incapacity to the commission. A complaint may be made orally or in writing.

(b) The investigative officer shall evaluate all complaints to determine whether:

(i) The person against whom the allegations are made is a judge subject to the disciplinary authority of the commission; and either

(ii) The facts alleged, if true, would constitute misconduct or incapacity; or

(iii) The investigative officer has grounds to believe that upon further inquiry such facts might be discovered. If not, the investigative panel shall dismiss the matter or, if appropriate, refer the complainant to another agency.

(3) Notice of complaint to respondent. With the approval of the investigative panel, the investigative officer may notify respondent that a complaint has been received and may disclose the name of the individual making the complaint.

#### (4) Preliminary investigation.

(a) Upon receipt of a complaint, the investigative officer shall make a prompt, discreet, preliminary investigation and evaluation. Failure of a person making the complaint to supply requested additional information may result in

dismissal of that complaint. The investigative officer may interview witnesses and examine evidence to determine whether grounds exist to believe the allegations of complaints. No subpoena shall be issued to obtain testimony or evidence until authorized by a member of the investigative panel. The investigative officer will assemble documentary evidence, declarations, sworn statements, and affidavits of witnesses for consideration by the investigative panel. The investigative officer shall recommend to the investigative panel assigned to the case that the panel authorize a full investigation when there is evidence supporting the allegations against a respondent. The investigative officer may recommend a full investigation when there are grounds to believe that evidence supporting the allegations could be obtained by subpoena or further investigation. Where there are no such grounds, the matter shall be dismissed. Where there is a basis to proceed, the investigative panel will forward those supporting records into the initial proceedings.

(b) If the complaint alleges that a respondent is suffering a possible physical and/or mental incapacity which may seriously impair the performance of judicial duties, the investigative panel may order a respondent to submit to physical and/or mental examinations conducted at commission expense by a practitioner or health care provider selected by the commission. The failure or refusal of a respondent to submit to physical and/or mental examinations ordered by the investigative panel may, in the discretion of the review panel, preclude respondent from presenting the results of other physical and/or mental examinations on his or her own behalf.

(c) Upon determination of the investigative panel to commence initial proceedings, it shall direct the investigative officer to file a statement of allegations setting forth the nature of the complaint with sufficient specificity to permit a response.

#### (5) Initial proceedings.

(a) The respondent who is the subject of initial proceedings will be provided with a copy of the statement of allegations and shall be given a reasonable opportunity to respond.

(b) Within fourteen days after the service of the notice to respondent, respondent may file a written response with the investigative officer. The proceedings will not be delayed if there is no response or an insufficient response.

(c) If the investigative panel determines that probable cause exists that respondent has violated a rule of judicial conduct or may be suffering from an incapacity, the investigative panel shall order the filing of a statement of charges.

(d) Disposition after initial proceedings. The investigative panel shall:

(i) Dismiss the case;

(ii) Stay the proceedings;

(iii) Propose a stipulation; or

(iv) Find that probable cause exists that respondent has violated a rule of judicial conduct or may be suffering from an incapacity that seriously interferes with the performance of judicial duties and is permanent or likely to become permanent. Upon such a finding of probable cause, the investigative panel shall identify the records of the initial proceedings that are the basis for the finding and order the service and filing of a statement of charges.

(e) If the investigative panel determines that there are insufficient grounds for further commission proceedings, the respondent and the person making the complaint will be so notified.

**NEW SECTION**

**WAC 292-06-190 Statement of charges.** (1) General. The statement of charges shall give fair and adequate notice of the nature of the alleged misconduct or incapacity. The investigative panel shall file the statement of charges with the review panel and cause a copy of the statement of charges to be served upon respondent and shall file proof of service with the commission.

(2) Amendments to statement of charges or answer. The review panel, at any time prior to its decision, may allow or require amendments to the statement of charges or the answer. The statement of charges may be amended to conform to the proof or set forth additional facts, whether occurring before or after the commencement of the hearing. Except for amendments to conform to the proof by evidence admitted without objection at a hearing, if an amendment substantially affects the nature of the charges, respondent will be given reasonable time to answer the amendment and prepare and present a defense against the new matter raised.

**NEW SECTION**

**WAC 292-06-200 Answer.** (1) Time. Respondent shall file a written answer with the review panel and serve a copy on disciplinary counsel within twenty-one days after service of the statement of charges, unless the time is extended by the review panel.

(2) Waiver of privilege. The raising of a mental or physical condition as a defense constitutes a waiver of medical privilege.

**NEW SECTION**

**WAC 292-06-210 Failure to answer/failure to appear.** (1) Failure to answer. Failure to answer the formal charges shall constitute an admission of the factual allegations. In the event respondent fails to answer within the prescribed time, the statement of charges shall be deemed admitted. The review panel shall proceed to determine the appropriate discipline.

(2) Failure to appear. If respondent should fail to appear when ordered to do so by the review panel, respondent shall be deemed to have admitted the factual allegations which were to be the subject of such appearance and to have conceded the merits of any motion or recommendations to be considered at such appearance. Absent good cause, the review panel shall not continue or delay proceedings because of respondent's failure to appear.

**NEW SECTION**

**WAC 292-06-220 Disclosure and discovery.** (1) Disclosure.

(a) Required disclosure. Within seven days after the filing of the answer, disciplinary counsel shall disclose the records identified by the investigative panel pursuant to WAC 292-06-170 (5)(d)(iv).

(b) Upon written demand after the time for filing an answer has expired, the commission and respondent will each disclose within seven days thereof, with a continuing obligation of disclosure thereafter, the following:

(i) Names and addresses of all witnesses whose testimony that party expects to offer at the hearing;

(ii) A brief summary of the expected testimony of each witness;

(iii) Copies of signed or recorded statements of anticipated witnesses; and

(iv) Copies of documentary evidence which may be offered.

(c) Witnesses or documentary evidence not disclosed may be excluded from evidence.

(2) Discovery following statement of charges.

(a) The taking of depositions, the requesting of admissions, and all other discovery procedures authorized by Rules 26 through 37 of the Superior Court Civil Rules are available only upon stipulation or prior permission of the presiding officer. Depositions shall be limited and taken only upon good cause.

(b) Absent good cause, all discovery shall be completed within sixty days of the filing of the answer.

(c) Disputes concerning discovery shall be determined by the review panel or presiding officer before whom the matter is pending. The decisions of the review panel may not be appealed before the entry of the final order.

**NEW SECTION**

**WAC 292-06-230 Stipulations.** (1) Approval. At any time prior to the final disposition of a proceeding, respondent may stipulate with the investigative panel to any or all of the allegations or charges in exchange for a stated discipline. The stipulation shall set forth all material facts relating to the proceeding and the conduct of respondent. The stipulation may impose any terms and conditions deemed appropriate by the commission, and shall be signed by respondent and the investigative panel. The agreement shall be submitted to a review panel assigned to the case, which shall either approve or reject the agreement. If the stated discipline is rejected by either the investigative or review panels, the admission shall be withdrawn and cannot be used by or against respondent in any proceedings.

(2) Order of discipline. The investigative panel shall forward the agreement to the review panel. If the review panel accepts the agreement, it shall enter the order disciplining respondent in an open session.

**NEW SECTION**

**WAC 292-06-240 Hearing.** (1) Scheduling. Upon receipt of respondent's answer or upon expiration of the time to answer, the review panel shall schedule a public hearing and notify disciplinary counsel and respondent of the date, time, and place of the hearing. Respondent will be provided at least fourteen days notice of hearing, which will also include the name or names of the review panel and the presiding officer, if any.

(2) Review panel. The hearing shall be conducted by a review panel. The presiding officer shall be selected by the review panel.

(3) Conduct of hearing.

- (a) All testimony shall be under oath.
- (b) Disciplinary counsel shall present the case in support of the statement of charges.
- (c) Disciplinary counsel may call respondent as a witness.
- (d) Both parties shall be permitted to present evidence and produce and cross-examine witnesses.
- (e) The hearing shall be recorded verbatim. Whenever a transcript is requested by respondent, disciplinary counsel, or a member of the review panel, a transcript of the hearing shall be produced at the requesting party's expense.
- (f) Respondent's compliance with an opinion by the ethics advisory committee shall be considered by the commission as evidence of good faith.
- (g) Counsel may recommend and argue for a discipline appropriate to the misconduct supported by the evidence, including argument on aggravating and mitigating factors.
- (h) Disciplinary counsel and respondent may submit their respective proposed findings, conclusions, and recommendations for discipline or order of dismissal to the review panel.
- (i) Where a member of the review panel has not heard the evidence, that member shall personally consider the whole record, or portion of the hearing from which that member was absent.
- (4) Dismissal or recommendation for discipline. The review panel shall dismiss the case, discipline respondent, or in the case of incapacity, recommend to the supreme court the retirement of respondent.
- (5) Submission of the report. After the hearing, the review panel shall file the record of the proceeding and a decision setting forth written findings of fact, conclusions of law, any minority opinions, and the order, within ninety days following the evidentiary hearing or after the filing of the transcript if one is requested, unless the review panel extends the time. A copy of the decision shall be served upon respondent.
- (6) Motion for reconsideration. The review panel decision is final fourteen days after service unless a motion for reconsideration is filed. A motion for reconsideration, if filed, shall be specific and detailed, with appropriate citations to the record and legal authority. The motion will be decided without oral argument unless requested by the review panel. If the motion for reconsideration is denied, the decision is then final. If the motion for reconsideration is granted, the reconsidered decision is final when filed in the commission's office.

#### NEW SECTION

- WAC 292-06-250 Review by supreme court.** (1) Within thirty days after the review panel admonishes, reprimands, or censures a respondent, the respondent shall have a right of appeal de novo to the supreme court.
- (2) Within fourteen days after the decision is final, a review panel decision recommending the suspension, removal, or retirement of a respondent will be filed in the supreme court and served on the respondent. The notice of the decision served on respondent shall state the date the decision was filed in the supreme court and shall specify the period during which respondent may challenge the review

panel recommendation as provided in the *Discipline Rules for Judges*.

(3) If the commission recommendation is that respondent be removed, respondent shall be suspended, with salary, from that judicial position effective upon filing the recommendation with the supreme court; such suspension with pay will remain in effect until a final determination is made by the supreme court.

(4) Commission counsel shall transmit to respondent those portions of the record required by the *Discipline Rules for Judges* or these rules, and shall certify the record of review panel proceedings to the supreme court.

(5) If the supreme court remands a case, the commission will proceed in accordance with the order on remand.

### SECTION IV. SPECIAL PROCEEDINGS

#### NEW SECTION

**WAC 292-06-270 Cases involving allegations of mental or physical incapacity.** (1) Initiation of incapacity proceeding. An incapacity proceeding can be initiated by complaint, by a claim of inability to defend in a disciplinary proceeding, or by an order of involuntary commitment or adjudication of incompetency.

(2) Proceedings to determine incapacity generally. All incapacity proceedings shall be conducted in accordance with the procedures for disciplinary proceedings, except:

(a) The purpose of the incapacity proceedings shall be to determine whether respondent suffers from an incapacity which is permanent or likely to become permanent and which seriously interferes with respondent's ability to perform judicial duties;

(b) If the review panel concludes that respondent suffers from an incapacity, it shall recommend retirement of respondent;

(c) If it appears to the review panel at any time during the proceedings that respondent is not competent to act, or if it has been previously judicially determined that respondent is not competent to act, the review panel will appoint a guardian ad litem for respondent unless respondent already has a guardian who will represent respondent's interests. In the appointment of a guardian ad litem, consideration may be given to the wishes of the members of respondent's immediate family. The guardian or guardian ad litem may claim and exercise any right and privilege, including without limit retaining counsel, and make any defense for respondent which respondent could have claimed, exercised, or made if competent. Any notice to be served on respondent will also be served on the guardian or guardian ad litem.

(3) Waiver. The raising of mental or physical condition as a defense to or in mitigation of a statement of charges constitutes a waiver of medical privilege.

(4) Stipulated disposition.

(a) The review panel shall designate one or more qualified medical, psychiatric, or psychological experts to examine respondent prior to the hearing on the matter. The expert or experts shall report to the review panel and the parties.

(b) After receipt of the examination report, disciplinary counsel and respondent may agree upon proposed findings of fact, conclusions, and order. The stipulated disposition

shall be submitted to the review panel for a recommendation to the supreme court. The final decision on the recommendation shall be made by the court.

(c) If the stipulated disposition is rejected by the court, it shall be withdrawn and cannot be used by or against respondent in any proceedings.

(5) Reinstatement from incapacity status.

(a) No respondent retired based upon an incapacity proceeding may resume active status except by order of the supreme court.

(b) Any respondent retired based upon an incapacity proceeding shall be entitled to petition for reinstatement of eligibility.

(c) Upon the filing of a petition for reinstatement of eligibility, the commission may take or direct whatever action it deems necessary or proper to determine whether the incapacity has been removed, including a direction for an examination of respondent by qualified medical or psychological experts designated by the commission.

(d) With the filing of a petition for reinstatement of eligibility, respondent shall be required to disclose the name of each psychiatrist, psychologist, physician, and hospital or other institution by whom or in which respondent has been examined or treated since the transfer to retirement status. Respondent shall furnish to the commission written consent to the release of information and records relating to the incapacity if requested by the commission or commission-appointed medical or psychological experts.

**NEW SECTION**

**WAC 292-06-280 Reinstatement of eligibility.** A respondent whose eligibility for judicial office had been removed by the supreme court, or by resignation and order of closure in a proceeding before the commission, may file with the commission a petition for reinstatement of eligibility. The petition shall set forth the age, residence and address of the petitioner, the date of removal by the supreme court, or resignation and order of closure in the proceeding before the commission, and a concise statement of facts claimed to justify reinstatement.

The commission may refer the petition to the investigative panel for investigation of the character and fitness of the respondent to be eligible for holding judicial office. The investigative panel may seek and consider any information that may relate to the issues of character and fitness or the reinstatement.

Respondent shall make an affirmative showing by clear, cogent, and convincing evidence, that reinstatement will not be detrimental to the integrity and standing of the judiciary and the administration of justice, or be contrary to the public interest.

The commission will recommend to the supreme court in writing that the respondent should or should not be reinstated to eligibility to hold judicial office as provided by these rules and the *Discipline Rules for Judges*.

**REPEALER**

The following chapter of the Washington Administrative Code is repealed:

WAC 292-08-010 Purpose.

WAC 292-08-020 Function.  
WAC 292-08-030 Definitions.  
WAC 292-08-040 Organization.  
WAC 292-08-050 Confidentiality provisions.

**REPEALER**

The following chapter of the Washington Administrative Code is repealed:

WAC 292-12-010 Preliminary investigation.  
WAC 292-12-020 Initial proceedings.  
WAC 292-12-030 Statement of charges.  
WAC 292-12-040 Fact-finding hearing.  
WAC 292-12-050 Disqualification of fact-finder.  
WAC 292-12-060 Procedural rights of judge.  
WAC 292-12-070 Guardian ad litem.  
WAC 292-12-080 Discovery procedure before fact-finding.  
WAC 292-12-090 Amendments to statement of charges or answer.  
WAC 292-12-110 Procedure at fact-finding hearing.  
WAC 292-12-120 Report of fact-finder.  
WAC 292-12-130 Commission decision.  
WAC 292-12-140 Additional evidence.  
WAC 292-12-150 Supreme court procedures.  
WAC 292-12-160 Reinstatement of eligibility.  
WAC 292-12-170 Extension of time.  
WAC 292-12-180 Service.

**WSR 94-15-043  
PREPROPOSAL STATEMENT OF INTENT  
DEPARTMENT OF  
SOCIAL AND HEALTH SERVICES**

(Public Assistance)  
[Filed July 15, 1994, 11:28 a.m.]

Specific Statutory Authority for New Rule: United States Department of Agriculture Administrative Notices 94-30 and 94-53, RCW 74.04.050.

Reasons Why the New Rule is Needed: To minimize the administrative burden for elderly or disabled household members choosing to deduct their recurrent medical expenses. Relieves these persons from the necessity of reporting subsequent changes in already anticipated and verified medical expenses. WAC 388-49-630.

Goals of New Rule: To establish policy whereby the department shall verify incurred and anticipated medical expenses and reimbursement amounts resulting in a deduction at food stamp application and recertification. Subsequent reporting of changes will not be required during the remainder of the certification period.

Process for Developing New Rule: Internal (management) and external (field staff) review process whereby draft material is distributed for review and comment. All comments are taken into consideration before final rule is issued.

How Interested Parties can Participate in Formulation of the New Rule: Contact Charles Henderson, Program Manager, Food Stamp Program Section, Division of Income Assistance, Mailstop 45400, phone (206) 438-8325 or SCAN 585, FAX 438-8258 (SCAN 585).

July 15, 1994  
Dewey Brock, Chief  
Office of Vendor Services

**WSR 94-15-044**  
**PREPROPOSAL STATEMENT OF INTENT**  
**DEPARTMENT OF**  
**SOCIAL AND HEALTH SERVICES**  
(Public Assistance)  
[Filed July 15, 1994, 11:30 a.m.]

Specific Statutory Authority for New Rule: Chapter 74.12 RCW, E2SHB 2798, 53rd Legislature, 1994 regular session.

Reasons Why the New Rule is Needed: Implement requirements of Welfare System Reform Legislation E2SHB 2798. Adding new section to chapter 388-265 WAC.

Goals of New Rule: Take an active role in preventing pregnancy in young teens and provide family planning assistance.

Process for Developing New Rule: Proposed rule is distributed to all interested parties for review. Comments are received and incorporated as appropriate.

How Interested Parties can Participate in Formulation of the New Rule: Contact Rose Mary Micheli, phone 438-8304 or (SCAN) 585-8304, FAX 438-8258.

July 15, 1994  
Dewey Brock, Chief  
Office of Vendor Services

**WSR 94-15-063**  
**PREPROPOSAL STATEMENT OF INTENT**  
**DEPARTMENT OF HEALTH**  
[Filed July 19, 1994, 8:21 a.m.]

Specific Statutory Authority for New Rule: RCW 43.70.250.

Reasons Why the New Rule is Needed: Updating fee schedule for osteopathic physicians and physician assistants, podiatry, acupuncture, and occupational therapy professions to eliminate unnecessary fees, reduce fees, or implement new fees created by the legislature. Rules to be amended: WAC 246-853-990, 246-802-990, 246-922-990, and 246-847-990.

Goals of New Rule: To reduce surplus revenues and to comply with legislative mandates.

Process for Developing New Rule: Mailing to current rules lists.

How Interested Parties can Participate in Formulation of the New Rule: Contact prior to September 1, 1994, Bob Nicoloff, Executive Director, Health Professions Quality Assurance Division, P.O. Box 47868, Olympia, WA 98504-7868.

July 18, 1994  
Mimi Fields, MD, MPH  
for Bruce Miyahara  
Secretary

**WSR 94-15-066**  
**PREPROPOSAL STATEMENT OF INTENT**  
**DEPARTMENT OF HEALTH**  
[Filed July 19, 1994, 8:30 a.m.]

Specific Statutory Authority for New Rule: RCW 43.70.050 authorizes the secretary to adopt and amend rules which describe the organization for the Department of Health and its relationship with other entities.

Reasons Why the New Rule is Needed: During the last year the Department of Health has reorganized its divisional structure and changed the names of some of its functions. Several professional licensing boards and commissions have been reorganized and/or renamed. Amendments will be made to WAC 246-01-040 and 246-01-080.

Goals of New Rule: To amend these rules to reflect the current structure of the department and its boards and commissions.

Process for Developing New Rule: Not applicable. The agency will make these housekeeping changes without public meetings and hold one hearing in Olympia to adopt the amendments.

How Interested Parties can Participate in Formulation of the New Rule: Send written comments to Ann Foster, Rules Coordinator, Department of Health, P.O. Box 47890, Olympia, WA 98504-7890.

July 15, 1994  
Bruce Miyahara  
Secretary

**WSR 94-15-075**  
**PREPROPOSAL STATEMENT OF INTENT**  
**LIQUOR CONTROL BOARD**  
[Filed July 19, 1994, 1:15 p.m.]

Specific Statutory Authority for New Rule: ESB 6356 (chapter 202, Laws of 1994) specifically states "The board shall adopt rules that allow an exception to the requirement that a device be located not less than 10 feet from all entrance or exit ways to and from a premise if it is architecturally impractical for the device to be located not less than 10 feet from all entrance and exit ways."

Reasons Why the New Rule is Needed: To permit exceptions to the 10-foot statutory requirement for the placement of cigarette vending machines if it is architecturally impractical to comply with the law.

Goals of New Rule: Take into consideration and allow for exceptions for those licensees who cannot comply with the statute's 10-foot requirement because of architectural limitations of the premises.

Process for Developing New Rule: Agency study; and input from the public will be solicited prior to the formulation of language for a rule-making hearing on the subject.

How Interested Parties can Participate in Formulation of the New Rule: Gary W. Gilbert, Chief of Enforcement, P.O. Box 43094, Olympia, WA 98504-3094, (206) 586-3052, FAX (206) 664-0501. Comments must be submitted no later than August 20, 1994.

July 19, 1994  
Joe McGavick  
Chairman

PREPROPOSAL

**WSR 94-15-076**  
**PREPROPOSAL STATEMENT OF INTENT**  
**LIQUOR CONTROL BOARD**  
[Filed July 19, 1994, 1:17 p.m.]

July 19, 1994  
Joe McGavick  
Chairman

Specific Statutory Authority for New Rule: RCW 66.08.030.

Reasons Why the New Rule is Needed: The board intends to amend WAC 314-12-170 which sets forth a minimum penalty of \$500 for violations of the Liquor Control Act. A new minimum penalty may be desired in light of current business practices and economics.

Goals of New Rule: To set forth minimum penalties for violations of the Liquor Control Act which are reasonable to apply against those licensees who have committed violations.

Process for Developing New Rule: Gather input from the public and liquor licensees as to what their recommendations are for equitable and reasonable penalties for violations. Then develop amendatory language to the existing rule to reflect that input.

How Interested Parties can Participate in Formulation of the New Rule: Gary W. Gilbert, Chief of Enforcement, Washington State Liquor Control Board, P.O. Box 43094, Olympia, WA 98504-3094, (206) 586-3052, FAX (206) 664-0501. Comments must be submitted no later than August 20, 1994.

July 19, 1994  
Joe McGavick  
Chairman

**WSR 94-15-077**  
**PREPROPOSAL STATEMENT OF INTENT**  
**LIQUOR CONTROL BOARD**  
[Filed July 19, 1994, 1:19 p.m.]

Specific Statutory Authority for New Rule: RCW 66.08.030.

Reasons Why the New Rule is Needed: The existing WAC allows for the liquor enforcement officers to seize, confiscate and destroy liquor. It is possible such seized or confiscated product could be put to useful purposes rather than being destroyed. (An example would be to give the product to local law enforcement officers for training purposes.) The amendatory language would afford the board that option.

Goals of New Rule: To provide board liquor enforcement officers with other options than destruction of liquor seized or confiscated. Provide alternative methods of disposition which could be beneficial to local law enforcement officers involved in training programs.

Process for Developing New Rule: Solicit input from the public and interested parties as to whether or not this option would be beneficial more so than destruction of the products so confiscated or seized.

How Interested Parties can Participate in Formulation of the New Rule: Gary W. Gilbert, Chief of Enforcement, Washington State Liquor Control Board, P.O. Box 43094, Olympia, WA 98504-3094, (206) 586-3052, FAX (206) 664-0501. Comments must be submitted no later than August 20, 1994.

**WSR 94-15-078**  
**PREPROPOSAL STATEMENT OF INTENT**  
**LIQUOR CONTROL BOARD**  
[Filed July 19, 1994, 1:21 p.m.]

Specific Statutory Authority for New Rule: RCW 66.08.030.

Reasons Why the New Rule is Needed: Standardize the hours of operation for banquet permits with those hours required by retail liquor licensees. Remove discrepancies in hours during which liquor may be served and consumed by liquor licensees and liquor banquet permit holders.

Goals of New Rule: The agency wishes to standardize the hours of consumption of liquor for those individuals holding banquet permits with the same hours observed by all retail liquor licensees on New Year's Day at 2:00 a.m.

Process for Developing New Rule: Agency seeking input from the public as to possible language which would enable the hours of use by the banquet permit holder to those hours of service, sales and consumption by retail liquor licensees.

How Interested Parties can Participate in Formulation of the New Rule: Gary W. Gilbert, Chief of Enforcement, Washington State Liquor Control Board, P.O. Box 43094, Olympia, WA 98504-3094, (206) 586-3052, FAX (206) 664-0501. Comments must be submitted by August 20, 1994.

July 19, 1994  
Joe McGavick  
Chairman

**WSR 94-15-079**  
**PREPROPOSAL STATEMENT OF INTENT**  
**EVERETT COMMUNITY COLLEGE**  
[Filed July 19, 1994, 2:48 p.m.]

Specific Statutory Authority for New Rule: Tobacco free workplace, children on campus, animals on campus, and permissive tuition waivers.

Reasons Why the New Rule is Needed: None currently exists.

Goals of New Rule: To provide an enhanced educational environment for students.

Process for Developing New Rule: Rules will be adopted individually through the rule-making process as necessary.

How Interested Parties can Participate in Formulation of the New Rule: Interested parties may contact the Everett Community College Agency Rules Coordinator, Juli Boyington, Everett Community College, 801 Wetmore Avenue, Everett, WA 98201, phone (206) 388-9202, SCAN 474-9202.

June 29, 1994  
Juli Boyington  
Administrative Assistant/  
Agency Rules Coordinator



**WSR 94-15-080**  
**PREPROPOSAL STATEMENT OF INTENT**  
**CENTRAL WASHINGTON UNIVERSITY**

[Filed July 19, 1994, 2:49 p.m.]

Specific Statutory Authority for New Rule: Chapter 34.05 RCW and RCW 28B.35.120(12).

Reasons Why the New Rule is Needed: Chapter 106-08 WAC, Practice and procedure, grammatical, punctuation, office location, and sexist language changes are needed to improve clarity; chapter 106-20 WAC, Organization, changes to departmental names and addresses will provide essential public information; chapter 106-50 WAC, Rules coordinator, address change of rules coordinator will facilitate contact; and chapter 106-72 WAC, Affirmative action policy/grievance procedure, grammatical and punctuation changes as well as language adjustments to comply with federal guidelines are necessary to improve readability and provide accurate public information.

Goals of New Rule: Rule changes will improve readability, remove sexist language, provide current address information, and reflect federal affirmative action language guidelines.

Process for Developing New Rule: Editorial review by agency rules coordinator and involved departments produced changes.

How Interested Parties can Participate in Formulation of the New Rule: Judy B. Miller, Rules Coordinator, President's Office, Central Washington University, 400 East 8th Avenue, Ellensburg, WA 98926-7502.

July 18, 1994  
 Ivory V. Nelson  
 President

**WSR 94-15-081**  
**PREPROPOSAL STATEMENT OF INTENT**  
**CENTRAL WASHINGTON UNIVERSITY**

[Filed July 19, 1994, 2:51 p.m.]

Specific Statutory Authority for New Rule: Chapter 34.05 RCW, RCW 28B.35.120(12).

Reasons Why the New Rule is Needed: Chapter 106-120 WAC, Student judicial code, grammatical, punctuation, sexist language, departmental name changes, and addition of rule legislatively mandated concerning hazing will improve readability and affect compliance to statute; chapter 106-124 WAC, General conduct—Rights and responsibilities of university community members, punctuation, sexist language, and clarifying language changes will improve clarity; and chapter 106-172 WAC, Student records policy, departmental and position name changes, APA and sexist language changes will improve clarity and affect compliance with statute.

Goals of New Rule: Rule additions and changes will improve clarity, remove sexist language, and reflect statutory mandates.

Process for Developing New Rule: Editorial review by agency rules coordinator and involved departments produced changes.

How Interested Parties can Participate in Formulation of the New Rule: Judy B. Miller, Rules Coordinator,

President's Office, Central Washington University, 400 East 8th Avenue, Ellensburg, WA 98926-7502.

July 18, 1994  
 Ivory V. Nelson  
 President

**WSR 94-15-082**  
**PREPROPOSAL STATEMENT OF INTENT**  
**CENTRAL WASHINGTON UNIVERSITY**

[Filed July 19, 1994, 2:52 p.m.]

Specific Statutory Authority for New Rule: Chapter 34.05 RCW, RCW 28B.35.120(12).

Reasons Why the New Rule is Needed: Chapter 106-140 WAC, Use of facilities, grammatical, punctuation, position and departmental name changes, sexist and APA language changes, and adjustments to reflect current policy and procedure will improve clarity and affect compliance; and chapter 106-276 WAC, Public records, grammatical, punctuation, position and departmental name changes, sexist and APA language changes, and adjustments to reflect current policy and procedure will improve clarity and affect compliance.

Goals of New Rule: Rule additions and changes will improve readability, remove sexist language, and reflect statutory mandates.

Process for Developing New Rule: Editorial review by agency rules coordinator and involved departments produced changes.

How Interested Parties can Participate in Formulation of the New Rule: Judy B. Miller, Rules Coordinator, President's Office, Central Washington University, 400 East 8th Avenue, Ellensburg, WA 98926-7502.

July 18, 1994  
 Ivory V. Nelson  
 President

**WSR 94-15-083**  
**PREPROPOSAL STATEMENT OF INTENT**  
**CENTRAL WASHINGTON UNIVERSITY**

[Filed July 19, 1994, 2:53 p.m.]

Specific Statutory Authority for New Rule: Chapter 34.05 RCW and RCW 28B.35.120(12).

Reasons Why the New Rule is Needed: Chapter 106-156 WAC, Housing and dining hall services, grammatical, punctuation, and sexist language changes will improve clarity; chapter 106-160 WAC, Admission and registration procedures, repeal of outdated sections and addition of sections reflecting current policies and procedures are necessary to provide current information to the public; and chapter 106-168 WAC, Library policies, updating information on smoking, borrower identification, and payment of charges will provide necessary information to the public.

Goals of New Rule: Rule additions and changes will improve clarity, remove sexist language, and reflect current university policy and procedure.

Process for Developing New Rule: Editorial review by agency rules coordinator and involved departments produced changes.

How Interested Parties can Participate in Formulation of the New Rule: Judy B. Miller, Rules Coordinator, President's Office, Central Washington University, 400 East 8th Avenue, Ellensburg, WA 98926-7502.

July 18, 1994  
Ivory V. Nelson  
President

**WSR 94-15-084**  
**PREPROPOSAL STATEMENT OF INTENT**  
**DEPARTMENT OF**  
**SOCIAL AND HEALTH SERVICES**  
(Public Assistance)

[Filed July 19, 1994, 3:49 p.m.]

Specific Statutory Authority for New Rule: Amendments related to eligibility for division of child support (DoCS) services will be adopted under RCW 26.23.045(2). Amendments to WAC 388-14-030 will be adopted under RCW 26.23.120(2). All other amendments will be adopted under RCW 74.08.090, the department's general rule making authority for programs administered under Title 74 RCW.

Reasons Why the New Rule is Needed: The 1994 legislative session enacted many minor changes to DoCS programs and collection remedies. DoCS WAC is inconsistent with those legislative changes. The following statutes affected DoCS programs, and generated the need for amendment: Chapter 146, Laws of 1994, SB 6221: Authorized genetic paternity testing in addition to traditional blood test methods. Chapter 230, Laws of 1994, SHB 2488: Required responsible parents to prove that health insurance is not available; changed the requirements of child support and mandatory wage assignment orders; changed the duration of DoCS income withholding notices; and authorized disclosure to federally recognized Indian tribes.

Goals of New Rule: DoCS is developing this rule to implement the changes enacted by the 1994 legislative session.

Process for Developing New Rule: Agency study; and DoCS invites interested parties to participate in the review and approval for issuance process. Please see below to learn how to participate in this process. This process will generate two published proposals, one to adopt necessary amendments to chapter 388-11 WAC and the other to amend chapter 388-14 WAC.

How Interested Parties can Participate in Formulation of the New Rule: Contact Bill Kellington at DoCS headquarters to be included in the review process. The address and phone number are listed below. This material will go out for review no later than August 23, 1994. You must contact Mr. Kellington prior to this date to be included in the initial review process. Bill Kellington, Division of Child Support, P.O. Box 9162, Olympia, WA 98507-9162, phone (206) 586-3162, FAX (206) 586-3274.

July 19, 1994  
Dewey Brock, Chief  
Office of Vendor Services

**WSR 94-15-089**  
**PREPROPOSAL STATEMENT OF INTENT**  
**DEPARTMENT OF**  
**LABOR AND INDUSTRIES**

[Filed July 20, 1994, 10:20 a.m.]

Specific Statutory Authority for New Rule: RCW 70.74.020 (2) and (3), 70.74.025, 49.17.040 and [49.17.]050 (1) and (2).

Reasons Why the New Rule is Needed: The agency is currently amending explosives regulations due to the following: SHB 1118 amends (substantively) chapter 70.74 RCW. The department proposes amendments to chapter 296-52 WAC to reflect the amendments in chapter 70.74 RCW; to comply with OSHA/state plan agreement obligations to adopt OSHA standards amendments and amend standards to be "at-least-as-effective-as" the OSHA standards; remove conflicts created by amendments to United States Department of Transportation (DOT) regulations: Bureau of Alcohol, Tobacco and Firearms (BATF) regulations; and Institute of Makers of Explosives (IME) standards; and existing chapter 296-52 WAC has not been substantively amended since 1982. New blasting technology now represents more than 50 percent of all commercial blasting operations. Adopt new regulations to address new blast initiation systems and explosives.

Goals of New Rule: Comply with legislative mandate; comply with state plan agreement obligations; remove conflicts with interstate/international commerce regulations; adopt consensus rules for storage, handling and use of new technology explosives and initiation systems; and housekeeping amendments mainly reflecting the Department of Labor and Industries' reorganization and publication errors.

Process for Developing New Rule: Negotiated rule making: In-state industry advisory committee conducted three days of full committee meetings (March 22 and 23, 1994, and May 18, 1994); agency study: Incident reports, accident investigations, compliance inspection reports; and other: Substantive analyses of national regulations and consensus standards. Invited direct input from national/international manufacturers and professional organizations. On-going interagency contact and/or meetings with law enforcement (state/county/city), state fire marshall's office, state Department of Commerce and Economic Development, and attorney general division.

How Interested Parties can Participate in Formulation of the New Rule: Please send comments to project engineer Merle Larson, phone (206) 956-5519, FAX (206) 956-5529, P.O. Box 44620, Olympia, WA 98504-4620.

July 20, 1994  
Mark O. Brown  
Director

**WSR 94-15-090**  
**PREPROPOSAL STATEMENT OF INTENT**  
**DEPARTMENT OF**  
**LABOR AND INDUSTRIES**

[Filed July 20, 1994, 10:21 a.m.]

Specific Statutory Authority for New Rule: RCW 51.04.020, 51.16.035, 51.16.070, 51.48.040.

**Reasons Why the New Rule is Needed:** This rule change will delete an extremely punitive rule for employers, and in its place we will adopt rules to help employers understand their industrial insurance premium reporting responsibilities.

**Goals of New Rule:** Delete punitive rule; add clarifying definitions; and add industrial insurance reporting responsibilities.

**Process for Developing New Rule:** A quality group recommendation. The group was made up of interested internal department members and members from external groups (labor and business associations).

**How Interested Parties can Participate in Formulation of the New Rule:** Contact Doug Mathers, Chief Auditor, Department of Labor and Industries, P.O. Box 44150, Olympia, WA 98504-4150, (206) 956-4750, FAX (206) 956-4853.

July 20, 1994  
Mark O. Brown  
Director

#### WSR 94-15-091

### PREPROPOSAL STATEMENT OF INTENT DEPARTMENT OF LABOR AND INDUSTRIES

[Filed July 20, 1994, 10:22 a.m.]

**Specific Statutory Authority for New Rule:** Electric Power Generation and Transmission, Electrical Protective Clothing - Federal Register Volume 59, Number 20, dated January 31, 1994, re: 29 CFR Part 1910.137 and 269, chapter 49.17 RCW.

**Reasons Why the New Rule is Needed:** Employees performing operation or maintenance work on electric power generation, transmission, or distribution installations are not adequately protected by current WISHA standards, though these workers face far greater electrical hazards than those faced by other workers. The voltages involved are generally much higher than voltages encountered in other types of work. A large part of electrical power generation, transmission and distribution work exposes employees to energized parts of the power system. The department is required to adopt rules identical or "at-least-as-effective-as" OSHA.

**Goals of New Rule:** Federal-initiated proposed amendments to chapter 296-45 WAC add requirements for training and retraining of electrical workers, transformers, testing hot sticks, and use of nonflammable clothing when there is potential for arcing. New sections are proposed for communication facilities, power generation, hazardous energy control (lockout/tagout) procedures and testing, and test facilities. These revisions will update existing WISHA standards and will prevent accidents caused by inadequate electrical protective equipment, as well as prevent injuries to employees working on electrical power systems.

**Process for Developing New Rule:** The department must adopt rules identical or "at-least-as-effective-as" OSHA rules, as required under the OSHA/WISHA state plan agreement and RCW 49.17.010.

**How Interested Parties can Participate in Formulation of the New Rule:** Please send comments to project engineer

Chuck Blocher, phone (206) 956-5523, FAX (206) 956-5529, P.O. Box 44620, Olympia, WA 98504-4620.

July 20, 1994  
Mark O. Brown  
Director

#### WSR 94-15-092

### PREPROPOSAL STATEMENT OF INTENT DEPARTMENT OF LABOR AND INDUSTRIES

[Filed July 20, 1994, 10:23 a.m.]

**Specific Statutory Authority for New Rule:** Personal Protective Equipment (PPE), Federal Register Volume 59, Number 66, dated April 6, 1994, re: 29 CFR Part 1910.132, 133, 135, 136, 138, chapter 49.17 RCW.

**Reasons Why the New Rule is Needed:** The standards for PPE are being updated to be more consistent with current consensus standards regarding good industry practices, as reflected by the latest editions of the pertinent American National Standards Institute (ANSI) standards.

**Goals of New Rule:** The revisions will provide guidance for the selection and use of PPE as well as clearer requirements that are performance-oriented, where appropriate. New requirements covering equipment selection, defective and damaged equipment, and training will be proposed. Requirements to address hazards to the hands are also proposed. Nonmandatory appendices are also proposed to provide guidance to employers and employees with regard to PPE for eye, face, head, foot and hand hazards.

**Process for Developing New Rule:** The department must adopt rules identical or "at-least-as-effective-as" OSHA rules as required by RCW 49.17.010 and the OSHA/WISHA state plan agreement.

**How Interested Parties can Participate in Formulation of the New Rule:** Please send comments to project engineer Bob Rhimer, phone (206) 956-5522, FAX (206) 956-5529, P.O. Box 44620, Olympia, WA 98504-4620.

July 20, 1994  
Mark O. Brown  
Director

#### WSR 94-15-093

### PREPROPOSAL STATEMENT OF INTENT DEPARTMENT OF LABOR AND INDUSTRIES

[Filed July 20, 1994, 10:25 a.m.]

**Specific Statutory Authority for New Rule:** Reporting of fatalities and multiple hospitalizations. Federal Register Volume 59, Number 63, dated April 1, 1994, re: 29 CFR Part 1904.8, RCW 49.17.040, [49.17.]050, [49.17.]060.

**Reasons Why the New Rule is Needed:** Modifications to rules on employer reporting of fatalities and multiple hospitalization are required due to the following: Federal-initiated proposed amendments to chapter 296-24 WAC, published in Federal Register Volume 59, Number 63, dated April 1, 1994, are to modify employer requirements for reporting of fatalities and multiple hospitalization incidents. Employers will be required to report fatalities or multiple

hospitalization within eight hours after the employers learn of it. Reporting information requirements are also specified. These amendments are made to make the standard "at-least-as-effective-as" the federal standards.

Goals of New Rule: The reduction of the reporting period and specific reporting requirements will allow the department to respond quickly and inspect for hazardous conditions that may pose a risk to others at the worksite. Information gathered will help ensure Washington workers safe and healthful workplaces.

Process for Developing New Rule: The department must adopt rules identical or "at-least-as-effective-as" OSHA rules as required by RCW 49.17.010 and the OSHA/WISHA state plan agreement.

How Interested Parties can Participate in Formulation of the New Rule: Please send comments to Marcia Holt, Standards Supervisor, phone (206) 956-5530, FAX (206) 956-5529, P.O. Box 44620, Olympia, WA 98504-4620.

July 20, 1994  
Mark O. Brown  
Director

**WSR 94-15-097**  
**PREPROPOSAL STATEMENT OF INTENT**  
**HORSE RACING COMMISSION**  
[Filed July 20, 1994, 10:41 a.m.]

Specific Statutory Authority for New Rule: RCW 67.16.040.

Reasons Why the New Rule is Needed: Trainer or designated representative must be present prior to a veterinarian administering any medication to a horse.

Goals of New Rule: Ensure that proper medication is being administered to the correct horse at the correct date and time.

Process for Developing New Rule: Agency study; and process requested at a regularly scheduled meeting of the commission to be looked into and a change made to ensure that a witness be present prior to medication being given to a horse.

How Interested Parties can Participate in Formulation of the New Rule: Bruce Batson, Executive Secretary, Washington Horse Racing Commission, 7912 Martin Way, Suite D, Olympia, WA 98506, (206) 459-6462, FAX (206) 459-6461.

July 20, 1994  
Bruce Batson  
Executive Secretary

AMENDATORY SECTION (Amending WSR 87-15-020, filed 7/8/87)

**WAC 260-70-026 Bleeder treatment.** A horse on the bleeder list must be treated at least four hours prior to post time with furosemide (i.e., Lasix®). No other medication is permitted for bleeder treatment unless or except as approved by the commission. Bleeder medication must be administered in the manner approved by the commission veterinarian, and furosemide (i.e., Lasix®) by oral administration is NOT PERMITTED for such purposes.

(1) The bleeder medication shall be administered by the horse's regular veterinarian, and may be witnessed by the commission veterinarian or his designee.

(2) The trainer of the horse to be treated as authorized by this rule, or his/her designated representative, shall witness the administration of the bleeder medication.

**WSR 94-15-099**  
**PREPROPOSAL STATEMENT OF INTENT**  
**UTILITIES AND TRANSPORTATION**  
**COMMISSION**  
[Filed July 20, 1994, 11:25 a.m.]

Subject of Possible Rule Making: Amend the commission's electric consumer rules in chapter 480-100 WAC to clarify language, strengthen disconnection notice requirements, and reflect changes in technology. Sections that may be modified are WAC 480-100-021 Glossary; 480-100-051 Deposits; 480-100-071 Discontinuance of service, and particularly the medical emergency provisions; 480-100-072 Payment arrangements and responsibilities; 480-100-096 Complaints and disputes; 480-100-141 Accuracy of watt hour meters; 480-100-176 Statement of test procedures; 480-100-211 Filing of records and reports and the preservation of records; and add a new section on business offices and payment agencies.

Specific Statutory Authority for New Rule: The authority for this rule making is RCW 80.01.040(3), which requires the commission to regulate in the public interest the rates, services, facilities, and practices of persons providing utility service including electrical companies; and RCW 80.28.140 through 80.28.170 relating to electric and gas meters.

Reasons Why the New Rule is Needed: Based upon staff investigations of customer complaints, existing rules dealing with customer deposits and discontinuance of service should be clearer. Rules relating to meters are out of date. The rule regarding retention of records requires that utility companies retain billing stubs for longer than is necessary. A new rule relating to business offices and payment agencies would provide additional guidelines regarding closure procedures. Clarification of the rules should reduce misunderstandings, rule violations, different practices from company to company, discontinuance of service to customers who have medical emergencies, and complaints to the commission.

Goals of New Rule: The overall goal of this rule making is to clarify various roles and responsibilities of consumers and companies; improve the commission's consumer affairs practice by clarifying definitions and terms; provide information about commission practice; and reduce regulatory oversight when appropriate by incorporating previous rule waivers.

Process for Developing New Rule: Agency study; and workshop-type meetings with regulated companies and consumer representatives in which information and views are exchanged in an effort to reach consensus.

How Interested Parties can Participate in Formulation of the New Rule: Interested parties may contact Roger Kouchi, Washington Utilities and Transportation Commission,

Consumer Affairs Section, P.O. Box 47250, Olympia, WA 98504-7250, phone (206) 664-9368, FAX (206) 586-1150. Interested parties may contact 1-800-622-2967 and ask to be placed on the interested person list in Docket Number UE-940084. Written comments should be filed not later than the close of business August 26, 1994. It is envisioned that there will be at least one meeting scheduled to discuss proposed rule changes and small business economic impact statement (SBEIS) on or about August 30, 1994. The commission invites comments about the costs of complying with the possible rules.

July 20, 1994  
Steve McLellan  
Secretary

**WSR 94-15-100**  
**PREPROPOSAL STATEMENT OF INTENT**  
**UTILITIES AND TRANSPORTATION**  
**COMMISSION**

[Filed July 20, 1994, 11:28 a.m.]

**Subject of Possible Rule Making:** Amend the commission's gas consumer rules in chapter 480-90 WAC to clarify language, strengthen disconnection notice requirements, and reflect changes in technology. Sections that may be modified are WAC 480-90-021 Glossary; 480-90-051 Deposits; 480-90-071 Discontinuance of service, and particularly the medical emergency provisions; 480-90-072 Payment arrangements and responsibilities; 480-90-096 Complaints and disputes; 480-90-166 Statement of test procedures; 480-90-171 Frequency of periodic meter tests; 480-90-181 Filing of records and reports and the preservation of records; and add a new section on business offices and payment agencies.

**Specific Statutory Authority for New Rule:** The authority for this rule making is RCW 80.01.040(3), which requires the commission to regulate in the public interest the rates, services, facilities, and practices of persons providing utility service including gas companies; and RCW 80.28.140 through 80.28.170 relating to electric and gas meters.

**Reasons Why the New Rule is Needed:** Based upon staff investigations of customer complaints, existing rules dealing with customer deposits and discontinuance of service should be clearer. Rules relating to meters are out of date. The rule regarding retention of records requires that utility companies retain billing stubs for longer than is necessary. A new rule relating to business offices and payment agencies would provide additional guidelines regarding closure procedures. Clarification of the rules should reduce misunderstandings, rule violations, different practices from company to company, discontinuance of service to customers who have medical emergencies, and complaints to the commission.

**Goals of New Rule:** The overall goal of this rule making is to clarify various roles and responsibilities of consumers and companies; improve the commission's consumer affairs practice by clarifying definitions and terms; provide information about commission practice; and reduce regulatory oversight when appropriate by incorporating previous rule waivers.

**Process for Developing New Rule:** Agency study; and workshop-type meetings with regulated companies and consumer representatives in which information and views are exchanged in an effort to reach consensus.

**How Interested Parties can Participate in Formulation of the New Rule:** Interested parties may contact Roger Kouchi, Washington Utilities and Transportation Commission, Consumer Affairs Section, P.O. Box 47250, Olympia, WA 98504-7250, phone (206) 664-9368, FAX (206) 586-1150. Interested parties may contact 1-800-622-2967 and ask to be placed on the interested person list in Docket Number UG-940085. Written comments should be filed not later than the close of business August 26, 1994. It is envisioned that there will be at least one meeting scheduled to discuss proposed rule changes and small business economic impact statement (SBEIS) on or about August 30, 1994. The commission invites comments about the costs of complying with the possible rules.

July 20, 1994  
Steve McLellan  
Secretary

**WSR 94-15-101**  
**PREPROPOSAL STATEMENT OF INTENT**  
**DEPARTMENT OF PERSONNEL**

[Filed July 20, 1994, 11:40 a.m.]

**Specific Statutory Authority for New Rule:** RCW 41.06.500.

**Reasons Why the New Rule is Needed:** As of July 1, 1994, the Washington management service rules, chapter 356-56 WAC, apply to all state agencies under the jurisdiction of chapter 41.06 RCW, except Department of Fish and Wildlife and the Department of Community, Trade, and Economic Development. The rules are effective for the Department of Fish and Wildlife and Department of Community, Trade, and Economic Development August 1, 1994, and September 1, 1994, respectively. As the rules are fully implemented, it is our intent to consider rule proposals which may clarify and/or adjust provisions for the Washington management service. Rule proposals may be necessary when it is determined that the current rules do not adequately or appropriately address surfacing issues related to the Washington management service.

**Goals of New Rule:** By considering and developing rule proposals, the Department of Personnel will take a proactive role in ensuring a smooth transition of the Washington management service into the civil service system and increase the overall success of the service.

**Process for Developing New Rule:** Department of Personnel Washington management service rule development process, in the development and revision of rules, the Department of Personnel encourages participation of affected agencies, institutions of higher education, employee organizations, and other interested parties. Rule proposals are discussed at rule meetings held with all interested parties. Rule proposals are submitted to the director of the Department of Personnel for adoption. Agendas and meeting notices, including notices of formal meetings for public comment, are distributed to all identified interested parties.

How Interested Parties can Participate in Formulation of the New Rule: Persons interested in rules being considered or developed by the Department of Personnel for presentation to the director, should contact the Department of Personnel, Office of Client Relations, 521 Capitol Way South, P.O. Box 47500, Olympia, WA 98504-7500 or phone the Office of Client Relations at (206) 586-1770, (206) 664-3255, or FAX (206) 586-4694.

July 20, 1994  
Dennis Karras  
Director

**WSR 94-15-102**  
**PREPROPOSAL STATEMENT OF INTENT**  
**BOARD OF ACCOUNTANCY**  
[Filed July 20, 1994, 11:46 a.m.]

Specific Statutory Authority for New Rule: RCW 18.04.055(4).

Reasons Why the New Rule is Needed: Incorporates recent board rulings and changing professional environment into rules.

Goals of New Rule: Delineate appropriate use of CPA title for CPAs employed outside CPA firms.

Process for Developing New Rule: Agency study.

How Interested Parties can Participate in Formulation of the New Rule: A "Use of CPA Title" Issues Paper is available at the board office. Please write or call for a copy. Board members plan to discuss written comments to the issues paper August 25, 1994, at 2:00 p.m. in the Bank of California Building, 5th Floor Conference Room. Carey L. Rader, Executive Director, Washington State Board of Accountancy, 210 East Union, Suite H, Mailstop 43110, P.O. Box 9131, Olympia, WA 98507-9131, (206) 753-2585, FAX (206) 664-9190.

June 20, 1994  
Carey L. Rader  
Executive Director

**WSR 94-15-007**  
**PROPOSED RULES**  
**WASHINGTON STATE PATROL**

[Filed July 7, 1994, 1:57 p.m.]

Original Notice.

Title of Rule: Chapter 204-38 WAC, Flashing amber lights.

Purpose: To amend WAC 204-38-030 adding subsection (8).

Statutory Authority for Adoption: RCW 46.37.005.

Statute Being Implemented: RCW 46.37.300.

Summary: Amendment is necessary to warn motorists of search and rescue vehicles parked on the roadways or other locations.

Name of Agency Personnel Responsible for Drafting, Implementation and Enforcement: Lt. Lonnie Brackins, 515 15th Avenue, Olympia, 753-0347.

Name of Proponent: Washington State Patrol, governmental.

Rule is not necessitated by federal law, federal or state court decision.

Explanation of Rule, its Purpose, and Anticipated Effects: Gives the guidelines for use of amber flashing lamps on vehicles. Will provide warning to the motoring public of parked vehicles responding to incidents.

Proposal Changes the Following Existing Rules: Amends the rule to add WAC 204-038-030(8), search and rescue teams, shall mean those vehicles either publicly or privately owned which are used for responding to search and rescue situations.

Has a Small Business Economic Impact Statement Been Prepared Under Chapter 19.85 RCW? No. This change is to explain and define amber lights. The change will have no economic effect.

Hearing Location: Washington State Patrol, Research and Development Section, General Administration Building, Room G-130, on August 23, 1994, at 1:30.

Assistance for Persons with Disabilities: Contact Ms. Jan Bart by August 16, 1994, (206) 753-4453.

Submit Written Comments to: Lt. Lonnie Brackins, FAX (206) 493-9417, by July 22, 1994.

Date of Intended Adoption: August 24, 1994.

July 7, 1994  
 Roger W. Bruett  
 Chief

AMENDATORY SECTION (Amending WSR 92-11-032, filed 5/15/92, effective 6/15/92)

**WAC 204-38-030 Definitions.** (1) "Flashing" lamps shall include those lamps which emit a beam of light which is broken intermittently and regularly by use of an electronic or electric switch, a rotating reflector, a rotating lamp, or a strobe lamp.

(2) "Other construction and maintenance vehicles" shall mean those vehicles owned or operated by a private company which is in the process of providing highway construction or maintenance services or is working in conjunction with any public utility.

(3) "Pilot cars" shall mean those vehicles which are used to provide escort for overlegal size loads upon the roadways of this state.

(4) "Public utilities vehicles" shall mean those vehicles used for construction, operations, and maintenance, and which are owned or operated by a public or private utility, including, but not limited to, companies providing water, electricity, natural gas, telephone, and television cable services, and railroads.

(5) "Tow trucks" shall mean those vehicle engaged in removing disabled or abandoned vehicles from the roadway and which are used primarily for that purpose.

(6) "Animal control vehicles" shall mean those vehicles, either publicly or privately owned, which are used primarily for transportation of animals to or from animal shelters, humane society facilities, or veterinary medicine facilities.

(7) "Hazardous materials response team vehicles" shall mean those vehicles either publicly or privately owned which are used for responding to hazardous materials incidents.

(8) "Search and rescue teams" shall mean those vehicles either publicly or privately owned which are used for responding to search and rescue situations.

**WSR 94-15-008**  
**PROPOSED RULES**  
**WASHINGTON STATE PATROL**

[Filed July 7, 1994, 2:00 p.m.]

Original Notice.

Title of Rule: Chapter 204-91A WAC, Towing businesses.

Purpose: Amendments to update WAC for current equipment and language for tow businesses.

Statutory Authority for Adoption: RCW 46.37.005, 46.55.050.

Statute Being Implemented: Chapter 46.55 RCW.

Summary: Will eliminate the equipment and standards review section and add patrol (designated section). Update equipment requirements in WAC 204-91A-170.

Reasons Supporting Proposal: To keep the WAC current and up-to-date.

Name of Agency Personnel Responsible for Drafting, Implementation and Enforcement: Lt. M. A. O'Brien, 4242 Martin Way, Olympia, (206) 412-8930.

Name of Proponent: Washington State Patrol, governmental.

Rule is not necessitated by federal law, federal or state court decision.

Explanation of Rule, its Purpose, and Anticipated Effects: This rule outlines the standards tow businesses must follow to become registered tow operators in the state for impounding vehicles.

Proposal Changes the Following Existing Rules: Will replace ESR or equipment and standards review section with patrol and/or designated section. Updates equipment standards for tow trucks to ensure safety on the public roadways.

Has a Small Business Economic Impact Statement Been Prepared Under Chapter 19.85 RCW? Yes. A copy of the statement may be obtained by writing to: Lt. M. A. O'Brien, Vehicle Identification Section, P.O. Box 42635, Olympia, WA 98504-2635, phone (206) 412-8930, FAX (206) 493-9417.

Hearing Location: Fleet Section Conference Room, 4242 Martin Way, Olympia, WA, on September 1, 1994, at 1:30.

Assistance for Persons with Disabilities: Contact Ms. Jan Bart by August 24, 1994, (206) 753-4453.

Submit Written Comments to: Lt. Mike O'Brien, FAX (206) 493-9417, by August 25, 1994.

Date of Intended Adoption: September 2, 1994.

July 7, 1994  
Roger W. Bruett  
Chief

AMENDATORY SECTION (Amending Order 89-04-ESR, filed 6/23/89)

**WAC 204-91A-010 Authority.** This chapter is adopted pursuant to RCW 46.37.005, 46.55.050, and 46.61.567 which require ~~((that))~~ rules, regulations~~(s)~~ and equipment standards for tow trucks be made and to provide for the removal from the highway of disabled, abandoned, or damaged motor vehicles, or the removal of vehicles when the driver is intoxicated or otherwise incompetent.

AMENDATORY SECTION (Amending WSR 89-21-044, filed 10/13/89, effective 11/13/89)

**WAC 204-91A-030 Definitions.** The following definitions shall apply throughout this chapter:

(1) "Patrol" means the Washington state patrol as defined in RCW 43.43.010.

(2) "Chief" means the chief of the Washington state patrol.

(3) "Department" means the Washington state department of licensing.

(4) "Director" means the director of the department of licensing.

(5) "Tow truck permit" means the permit issued annually by the department that has the classification of service the tow truck may provide stamped upon it.

(6) "Registered tow truck operator" or "operator" means any person who engages in the impounding, transporting, or storage of unauthorized vehicles, or in the disposal of abandoned vehicles.

(7) "Tow truck" means a motor vehicle that is equipped for and used in the business of towing or otherwise transporting other vehicles with specific equipment approved by the state patrol.

(8) "Tow truck number" means the number issued by the department to tow trucks used by a registered tow truck operator in the state of Washington.

(9) "Tow truck service" means the towing, moving, transporting, or impounding of vehicles, together with personal effects and cargo, by a registered tow truck operator utilizing equipment approved by the ~~((equipment and standards review section (ESR) of the))~~ patrol.

(10) "Highway" means the entire width between the boundary lines of every way publicly maintained when any part thereof is open to the use of the public for purposes of vehicular travel.

(11) "Place of business" means a building which the registered tow truck operator occupies, either continuously or at regular times, where tow business books and records are

kept and tow business is transacted in each assigned tow zone.

(12) "Vehicle storage area" means the approved yard/buildings (primary and secondary) where stored vehicles are kept. The storage areas and fencing will comply with the requirements as established by the department and all local zoning rules and regulations. Both primary and secondary storage areas must be physically located within tow zone assigned to the operator.

(13) "Special event" means any event which causes an unusually large number of impounded vehicles and/or tow calls in a short period of time and is so declared by the district commander or designee.

(14) "Special event storage area" means an area used for temporarily storing vehicles impounded/towed from special events. Approval for such areas shall be obtained from the department, the patrol, and appropriate city and county jurisdictions.

(15) "District commander" means the commanding officer of an area established by the Washington state patrol.

(16) "Inspector" means a commissioned officer of the Washington state patrol who has been designated as a tow truck inspector by the patrol.

(17) "Tow zone" means that specific geographical area designated by the district commander for the removal of vehicles as defined in Title 46 RCW and this chapter.

(18) ~~((ESR means the equipment and standards review section of the Washington state patrol.))~~ "Section" means the section designated by the chief of the Washington state patrol to coordinate the tow truck inspection program, maintain tow truck files, and issue letters of appointment.

(19) "Letter of appointment" means a letter issued by the ~~((ESR))~~ section that authorizes a registered tow truck operator to tow and store vehicles on a rotational or contractual basis, in a specific area, for the Washington state patrol. Effective October 15, 1989, the letter of appointment must have an attached valid contractual agreement listing the maximum rates that will be charged by the operator for services provided as a result of state patrol originated calls.

(20) "Initial tow" means services provided as a result of an original call, on a particular vehicle, that the tow operator receives from the patrol as a result of contract or rotational call list.

(21) "Secondary tow" means towing services from an operator's storage facility or place of business, to another location designated by the owner/agent of a vehicle that was initially towed as a result of call from the patrol.

(22) "Letter of contractual agreement" means the document, attached to the letter of appointment, that specifies the maximum tow rates that may be charged for services provided as a result of state patrol originated calls.

AMENDATORY SECTION (Amending Order 89-04-ESR, filed 6/23/89)

**WAC 204-91A-040 Inspections.** Upon the request of a registered tow operator or applicant, the patrol shall conduct an inspection of the applicant's place of business, facilities, and equipment to determine if the applicant meets the requirements of chapter 46.55 RCW, or Titles 308 and/or 204 WAC. Verification must be shown to the inspector that the applicant complies with all applicable local laws and



regulations as prescribed for the geographical area where the towing business will be established. If local zoning regulations are applicable, a copy of the certification of approval from the local zoning commission will be furnished to the inspector. This certification may be included in the department's application form for license. The certification will become a part of the permanent record maintained on each approved towing firm by the ((ESR)) section.

(1) Reinspections will be conducted at least once a year. Unscheduled inspections may be conducted without notice at the operator's place of business by an inspector to determine the fitness of tow trucks, facilities, and business records.

(2) If reinspection of a previously-approved tow truck reveals equipment defects, one of the following procedures shall apply:

(a) In the event of a safety-related defect which would render the tow truck a safety hazard upon the public highway, a red "out-of-service" sticker shall be affixed immediately by the inspector.

(b) In the event of missing or defective equipment that does not constitute a safety hazard but is required, the inspector shall advise the operator of the defect. If after ten days the operator fails or refuses to repair the defect, the red out-of-service sticker shall be affixed.

(c) Upon confirming the satisfactory repair of the defect or defects that caused the tow truck to be taken out of service, the inspector shall remove the red sticker. In the event that the original inspector is not available to reinspect the equipment, another patrol officer appointed by the appropriate supervisor may do so. The reinspection shall be completed as soon as possible after the operator advises the patrol that the defect has been repaired. Whenever practicable this shall be done within three days and may require the operator to bring the truck to the inspector.

(d) Upon sale or other transfer of a tow truck from the business, the operator shall so advise the inspector who will obtain the issued cab card permit and will remove any decals indicating truck class, district and/or zone. The permit will be forwarded to the department by the inspector who will also advise the ((ESR)) section of the action taken.

(e) Upon the purchase or acquisition of any additional or replacement tow truck(s) to be used pursuant to this chapter, the operator shall immediately notify the patrol and request an inspection of the new unit. The new unit shall not be used for public or private impound calls until satisfactory inspection is completed and a cab card permit and/or decals for the vehicle has been issued by the department and/or patrol.

(3) On original inspection, and subsequent reinspection, the inspector shall confirm the identities and status of driving privilege of all persons that operate the tow trucks. The inspector shall notify the operator if any person does not meet the minimum license requirements.

(a) In the event that an operator becomes aware that the driving privilege of an employee, or owner no longer meets the minimum requirements, the operator shall prohibit that person from operating any tow truck.

(b) An operator shall, within three days of employing a new driver, advise the inspector in writing of the identity, including name, address and date of birth, of the new employee. The inspector shall notify the operator if the new employee does not meet the minimum license requirements.

AMENDATORY SECTION (Amending WSR 89-21-044, filed 10/13/89, effective 11/13/89)

**WAC 204-91A-060 Application for letter of appointment.** (1) An application for a letter of appointment will not be considered or approved until the applicant is qualified as a licensed and registered tow truck operator with at least one approved "A" or "B" class tow truck. Additional trucks are optional.

Note: An exception may be made if an operator desires a letter of appointment for class "C" tows only. In such situations, only a class "C" truck is required.

Upon request, the ((ESR)) section shall advise the applicant of the contents of the department's regulations and of the standards established for the issuance of a letter of appointment.

(2) An application for a letter of appointment to provide towing service for the patrol shall be filed by the applicant with the local state patrol district office on a form prescribed by the patrol. In the case of a partnership, each partner shall apply on the form prescribed. In the case of a corporation, the patrol may require that each of the present and any subsequent officers, managers, and stockholders holding ten percent or more of the total issued and outstanding stock of the applicant corporation complete an application form. A signed "letter of contractual agreement" listing the maximum tow rates to be charged for services resulting from state patrol originated calls will be attached to the application.

(3) The district commander or designee shall complete tow zone portion of the form. He/she will enter "approved" or "disapproved" and will sign the form next to the zone designation. The application and "letter of contractual agreement" will be forwarded to the ((ESR)) section.

(4) The application form will be assigned a docket number, by the ((ESR)) section, which shall be its permanent identification number for all matters relating to appointments, granted or denied, and any other correspondence with the ((ESR)) section thereafter.

(5) The filing of an application for a letter of appointment does not in itself authorize the operator to provide towing services pursuant to this chapter until a letter of appointment has been issued by the ((ESR)) section. However, nothing herein shall prohibit the patrol from calling the towing business upon the specific request of a person responsible for a vehicle or his agent.

AMENDATORY SECTION (Amending WSR 89-21-044, filed 10/13/89, effective 11/13/89)

**WAC 204-91A-070 Issuance of a letter of appointment.** (1) No towing operator shall be called to perform a towing service at the request of the patrol unless such operator has a letter of appointment as described in this chapter. No such letter of appointment will be issued unless all qualifications set out in this chapter have either been met by the applicant, or a waiver of those qualifications not met has been granted by the ((ESR)) section.

(2) The ((ESR)) section commander shall have the authority to issue letters of appointment upon request after receiving certification from the inspector, an application for a letter of appointment endorsed by the district commander,

and notice from the department that the requestor has been licensed as a registered tow truck operator.

If the ((ESR)) section shall find the requestor does not or will not meet all requirements and is not qualified for a waiver of the requirements, then such request shall be denied. The ((ESR)) section shall notify the requestor of its decision in writing, stating the reasons. If the request is approved, the ((ESR)) section commander will issue the letter of appointment and forward it to the tow operator. The tow company will be admitted to the patrol's call list for the appropriate tow zone on the effective date of the letter.

If the district commander recommends denial of a request for a letter of appointment, the ((ESR)) section commander shall notify the applicant and provide an opportunity for applicant to have a hearing as provided in chapter 34.05 RCW.

(3) A letter of appointment will be valid for one business, in a single tow zone, assigned by the district commander. Requests for additional letters of appointment in the same or another zone must be based on a complete and separate place of business capable of independent operation within the appropriate zone.

(4) A tow operator (or a district commander) may petition the ((ESR)) section in writing for a waiver of one or more requirements. The ((ESR)) section may grant a waiver if it finds that:

- (a) The towing service available to the patrol without the waiver is inadequate to meet the needs of the public;
- (b) The request is otherwise reasonable; and
- (c) The request has the district commander's approval.

In the event a qualified tow operator meeting all requirements and qualifications receives a letter of appointment in the same zone as a tow operator that had earlier been granted a waiver, the tow operator with a waiver will have the letter of appointment rescinded by the ((ESR)) section and after notification will not be called for patrol-initiated tows.

(5) Every letter of appointment shall be issued in the name of the applicant and the holder thereof shall not allow any other person or business to use the letter of appointment.

(6) The letter of appointment will only be valid for the place of business named on the application and will not apply to any other place of business.

(7) A letter of appointment shall be valid until suspended, superseded, or revoked by the ((ESR)) section.

(8) The holder of each letter of appointment must maintain at least one tow truck meeting the minimum class "A," "B," or "C" standards as listed in WAC 204-91A-170.

(9) All storage areas, primary and secondary, for each place of business must be in the tow zone assigned to that place of business.

AMENDATORY SECTION (Amending Order 89-04-ESR, filed 6/23/89)

**WAC 204-91A-080 Suspension or revocation of letter of appointment.** Upon receiving evidence that any appointee has failed to comply or no longer complies with any requirement or provision of law or this chapter, the ((ESR)) section may deny, suspend, or revoke the letter of appointment. The appointee shall be given notice of the

action and an opportunity to be heard as prescribed in chapter 34.05 RCW.

The holder of a letter of appointment may voluntarily relinquish the letter. The ((ESR)) section and the district commander will be advised in writing of this voluntary relinquishment. After receiving written notice, the district commander will cause the inspector to physically obtain the original letter of appointment and forward it to the ((ESR)) section.

AMENDATORY SECTION (Amending Order 89-04-ESR, filed 6/23/89)

**WAC 204-91A-110 Complaints.** All law enforcement or local licensing agencies that receive complaints involving registered tow truck operators shall forward the complaints, along with supporting documents, including all results from the complaint investigation, to the department.

(1) Those complaints investigated by the patrol will be reviewed by the ((ESR)) section commander before forwarding to the department.

(2) The patrol shall investigate all complaints involving deficiencies of equipment.

(3) A complete copy of all complaints investigated by the patrol will be kept on file by the ((ESR)) section.

AMENDATORY SECTION (Amending Order 89-04-ESR, filed 6/23/89)

**WAC 204-91A-160 Tow zones.** Each district commander shall outline geographical areas within his district to be designated as tow zones. The geographical tow zones for each patrol district shall be filed with the ((ESR)) section. The boundaries established pursuant to this action may be modified as circumstances warrant. Considerations may include, but are not limited to, such factors as the frequency and severity of accidents and the frequency of DWI arrests in various areas throughout the district, the volume and pattern of traffic, the availability of tow services, and the accessibility of tow services to the areas of need within each district. Nothing herein shall prevent the patrol from amending tow zones from time to time as required by changing traffic and accident patterns and other such factors affecting the adequacy of towing service available to the patrol.

AMENDATORY SECTION (Amending Order 89-04-ESR, filed 6/23/89)

**WAC 204-91A-170 Minimum tow truck equipment standards.** All tow/recovery trucks used by a registered tow operator for public or private impounds or in response to patrol requests shall meet the minimum standards as listed in this section. ~~((All equipment used in conjunction with each truck shall be commensurate with the basic boom rating or, if the truck is not equipped with booms, the manufacturer's gross vehicle weight rating. A waiver for one or more requirements may be granted as outlined in WAC 204-91A-070(4).))~~

Note: Equipment standards will be effective one year from the date of adoption.

(1) Minimum standards:

(a) All equipment used in conjunction with the tow truck winching system shall have a working load limit at least twenty-five percent more than the working load limit of the wire rope being used. All equipment shall comply with the Washington safety and health administration (WSHA) regulation if applicable.

Note: Industry standards set the working load limit of wire rope at 1/5 of its nominal or breaking strength.

(b) Each wire rope shall be capable of being fully extended from and fully wound onto its drum.

Note: OSHA (1410.179(h)(2)(iii)) requires no less than two wraps of rope remain on drum when rope is "fully extended." This is to ensure the full load never bears on the rope to drum connection.

(c) All wire rope shall be 6 X 19 or 6 X 37 classification graded "extra improved plow steel" (XIP).

Note: Documentation from the supplier must be kept on file showing the type of wire rope installed and the date of installation for each truck.

(d) All wire rope shall be in good working order. The following industry standards for out-of-service criteria shall apply:

(i) No more than six randomly distributed broken wires in one rope lay, or more than three broken wires in one strand in one rope lay.

(ii) Excessive abrasion causing the loss of more than one-third the original diameter of an outside individual wire.

(iii) Evidence of rope deterioration from corrosion.

(iv) Kinking, crushing, or other damage that results in detrimental distortion of the rope structure.

(v) Any evidence of heat damage.

(vi) Any marked reduction in diameter either along the entire main length or in one section.

(vii) Unlaying or opening up of a tucked splice.

(viii) Core protrusion along the entire length.

(ix) End attachments that are cracked, deformed, worn, or loosened.

Note: Hooks must be replaced if the throat opening has increased beyond manufacturer recommendations, the load bearing point has been worn by ten percent, or the hook is twisted by more than ten degrees.

(x) Any indication of strand or wire slippage in end attachments.

(xi) More than one broken wire in the vicinity of fittings.

(e) Wire rope end connections shall be swaged or, if clamped, shall have a minimum of three forged clamps spaced a minimum of six rope diameters apart and attached with the base or saddle of the clamp against the longer or "live" end of the cable. The "U" bolt will be placed over the short or "dead" end of the rope and will be of the proper size for the cable being clamped.

Note: Wire rope clamps must be installed and torqued per manufacturer specifications.

(f) All wire rope related equipment, sheaves, etc., must conform to the diameter of the wire rope being used or to the original tow truck equipment manufacturer specifications.

(g) All winching equipment, snatch blocks, etc., shall have permanently affixed durable factory identification,

stating working load limit (WLL). If this identification has been removed or is no longer readable, it is criteria for placing the item out-of-service. Equipment may be reinspected by a recognized recertification company. If the equipment is acceptable, it may be reidentified with a working load limit (WLL) and a recertification company identifier.

(h) All block and tackle equipment used in the winching system which shows signs of permanent deformation, significant wear or damage is criteria for placing the item out-of-service.

(i) All "J" hook chain assemblies must only be used with a sling lift system and be grade "7" chain or better.

(j) Safety chains must only be used for the securing of vehicles to the truck. Must be minimum grade "4" chain or meet the original manufacturer's recommendations and be permanently attached to the truck.

(k) Comply with legal lighting, equipment, and license requirements.

(l) Portable tail, stop, and turn signal lights for vehicles being towed.

(m) Have department of licensing registration and truck numbers painted or permanently affixed to both sides of the truck. Have firm's name, city of address, and phone number permanently affixed to both sides of the vehicle. Letters must be a minimum of three inches high with one-half inch strokes.

(n) Have a revolving/intermittent red light with three hundred sixty degrees visibility. May also be equipped with flashing amber and/or white lights which may be used in conjunction with the red lamps. Must also be equipped with a warning light visible from the driver seat which is energized when the red revolving light or flashing amber lights are activated.

(o) Have a broom, minimum twelve inches wide, handle four feet long.

(p) Have a scoop type shovel, minimum seven inches wide, overall length minimum three feet long.

(q) Be maintained in a reasonably clean condition.

(r) Have two tempered steel pinch bars or equivalent devices, one tapered and one flattened; one at least three feet long and one at least four feet long, with a minimum diameter of three-quarters of an inch.

(s) Have a two-way radio or mobile telephone system capable of communicating with a base station. A citizen band radio does not suffice. A mobile telephone system is acceptable if:

(i) The equipment is of a recognized and established manufacture and is properly installed.

(ii) The equipment is in proper working order and functions correctly throughout the assigned tow areas.

(iii) The equipment does not utilize a siren to signal incoming calls.

(iv) The equipment is used in a correct and lawful manner.

(t) Have one 20 BC rated or two 10 BC rated fire extinguishers.

(u) Axle weight must comply with the requirements of RCW 46.37.351.

(2) Class "A" tow trucks: Trucks that are capable of towing and recovery of passenger cars, pickup trucks, small trailers, or equivalent vehicles. ((Class "A" trucks shall:

(a) Comply with legal lighting, equipment, and license requirements.

(b) Have department of licensing registration and truck numbers painted or permanently affixed to both sides of truck.

(c) Have a revolving/intermittent red light with three hundred sixty degree visibility. May also be equipped with flashing amber and/or white lights which may be used in conjunction with the red lamp(s).

(d) Have a broom, minimum twelve inches wide, handle four feet long.

(e) Have a scoop type shovel, minimum seven inches wide, overall length minimum three feet long.

(f) Be maintained in a reasonably clean condition.

(g) Have all equipment commensurate with total ton rating of booms.

(h) Have firm name, city of address, and phone number permanently affixed to both sides of the vehicle.

(i) Have two pinch bars or equivalent devices; one tapered, one flattened; one three feet and one four feet, with a minimum diameter of three quarters of an inch.

(j) Have a two way radio or mobile telephone system capable of communicating with a working base station. A citizen band radio does not suffice. A mobile telephone system is acceptable if:

(i) The equipment is of a recognized and established manufacture and is properly installed.

(ii) The equipment is in proper working order and functions correctly throughout the assigned tow areas.

(iii) The equipment does not utilize the truck horn or a siren or other sound device to signal incoming calls.

(iv) The equipment is used in a correct and lawful manner.

(k) Have a twenty BC rated fire extinguisher or equivalent.

(l) Have portable tail, stop, and turn signal lights for vehicle being towed.

(m) Have a minimum of two snatch blocks.

(n) Have a tow sling or other comparable device made of material and used in such manner so as to protect vehicles being towed or recovered.

(o) Have a portable dolly or its equivalent for hauling vehicles that are not otherwise towable.

(p) Have ten thousand pounds minimum manufacturer's gross vehicle weight rating or equivalent.

(q) Have dual tires on the rear axle or duplex type tires, referred to as "super single" with load rating that is comparable to dual tire rating.

(r) Have a minimum of one hundred feet of three-eighths inch continuous length cable or its equivalent, measured from the point of attachment to drum and hook, in safe working condition on each drum.

(i) Each cable shall be capable of being fully extended from and fully wound onto its drum.

(ii) All cables and/or wire ropes shall be in good working order and shall have:

(A) No more than six randomly distributed broken wires in one rope lay, or more than three broken wires in one strand in one rope lay.

(B) No evidence of heat damage from any cause.

(C) End attachments that are not cracked, deformed, worn, or loosened.

(iii) Cable end connections shall be swaged or, if clamped, shall have a minimum of three clamps spaced a minimum of six rope diameters apart and attached with the base or saddle of the clamp against the longer or "live" end of the cable. The "U" bolt will be placed over the short or "dead" end of the rope and will be of the proper size for the cable being clamped.

(s) Have a minimum six ton boom rating with single or dual booms. Dual winches to control a minimum of two service drums.)) Class "A" tow trucks shall meet the requirements of subsection (1)(a) through (u) of this section and in addition shall have:

(a) A ten thousand minimum manufacturer's gross vehicle weight rating.

(b) Dual tires on the rear axle.

(c) A minimum of one hundred feet of three-eighths inch continuous length XIP wire rope on each drum, measured from the point of attachment at the drum to the hook.

(d) A minimum six-ton boom rating with single or dual booms. Dual winches to control a minimum of two service drums.

(e) A minimum of two snatch blocks.

(f) A tow sling or other comparable device made of material and used in such manner so as to protect vehicles being towed or recovered.

(g) A portable dolly or its equivalent for hauling vehicles that are not otherwise towable.

(h) If equipped with a wheel lift system, it must have a fully extended working load rating of at least three thousand pounds and a seven thousand pound tow rated capacity.

(i) A minimum of one ten-foot or two five-foot recovery chains used in the winching system and must be minimum grade "7" chain with matching fittings.

((2)) (3) Class "B" tow trucks: Trucks that are capable of towing and/or recovery of medium size trucks, trailers, motor homes, or equivalent vehicles. ((Class "B" tow trucks shall meet the requirements of subsection (1)(a) through (o) of this section, and in addition, shall have:

(a) Seventeen thousand pounds minimum manufacturer's gross vehicle weight rating or equivalent.

(b) Minimum ten-ton boom rating, single or dual booms, with two independent winches and drums.

(c) A minimum of one hundred fifty feet of seven-sixteenths inch cable on each drum, measured from points of attachment. All cable shall be in safe operating condition as described for class "A" trucks.

(d) Minimum of four standard release tools (caging stud assemblies).)) Class "B" tow trucks shall meet the requirements of subsection (1)(a) through (u) of this section and in addition shall have:

(a) Seventeen thousand pounds minimum manufacturer's gross vehicle rating.

(b) Minimum ten-ton boom rating, single or dual booms, with two independent winches and drums.

(c) A minimum of one hundred fifty feet of seven-sixteenths inch continuous length XIP wire rope on each drum, measured from points of attachment at the drum to the hook.

(d) Minimum of four standard release tools (caging stud assemblies).

(e) A minimum of two snatch blocks.

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(f) A tow sling or other comparable device made of material and used in such manner so as to protect vehicles being towed or recovered.

(g) A portable dolly or its equivalent for hauling vehicles that are not otherwise towable when the class B tow truck is being used for class A tows.

(h) If equipped with a wheel lift system, it must have a fully extended working load limit of at least six thousand pounds and a twenty thousand pound tow rated capacity when operating as a class B truck. May be equipped with a three thousand pound fully extended working load wheel lift system with a seven thousand pound tow rated capacity if operating as a class A truck.

(i) A minimum of one ten-foot or two five-foot recovery chains used in the winching system and must be grade "8" chain with matching fittings.

~~((3))~~ (4) Class "C" tow trucks: Trucks that are capable of towing and/or recovery of large trucks, trailers, buses, motor homes, or similar vehicles. ~~((Class "C" tow trucks shall meet the requirements of subsection (1)(a) through (n) of this section and in addition, shall have:~~

~~(a) Tandem rear axle truck chassis (both drive axles).~~

~~(b) Twenty five ton minimum single or dual boom and winch rating.~~

~~(c) One hundred fifty feet of minimum nine sixteenths inch cable on each drum measured from points of attachment. All cable shall be in safe operating condition as described in class "A."~~

~~(d) Air brakes and system capable of supplying air to towed vehicle.~~

~~(e) Minimum of four standard release tools (caging stud assemblies).~~

~~(f) Forty thousand pounds minimum manufacturer's gross vehicle weight rating or equivalent.)~~ Class "C" trucks shall meet the requirements of subsection (1)(a) through (u) of this section and in addition shall have:

(a) A forty thousand pound manufacturer's gross vehicle weight rating or equivalent.

(b) Tandem rear axle truck chassis (both drive axles).

(c) A minimum of twenty-five-ton boom rating with single or dual booms. Dual winches to control a minimum of two service drums.

(d) A minimum of one hundred fifty feet of nine-sixteenths inch continuous length XIP wire rope on each drum measured from the point of attachment at the drum to the hook.

(e) Air brakes and a system capable of supplying air to towed vehicles.

(f) A minimum of four standard release tools (caging stud assemblies).

(g) If equipped with a wheel lift system, it must have a fully extended working load limit of at least twelve thousand pounds.

(h) A minimum of one ten-foot or two five-foot recovery chains used in the winching system and must be grade "8" chain with matching fittings.

(i) A tow sling or other comparable device used in such a manner as to protect the vehicle being towed or recovered.

(j) A minimum of two snatch blocks.

~~((4))~~ (5) Class "D" tow trucks: Trucks that are equipped for and primarily used as "wheel lift" trucks.

~~((Class "D" must meet the requirement of subsection (1)(a) through (r) of this section, and in addition, shall have:~~

~~(a) A minimum three thousand pound manufacturer's lift rated and minimum seven thousand pound tow rated wheel lift assembly.~~

~~(b) One winch and drum with one hundred feet of three-eighths inch cable meeting class "A" requirements.)~~

Class "D" trucks shall meet the requirements of subsection (1)(a) through (u) of this section and in addition shall have:

(a) A wheel lift assemble with a fully extended manufacturer's working load limit of three thousand pounds and a seven thousand pound tow rated capacity.

(b) One winch and drum with one hundred feet of three-eighths inch XIP wire rope meeting class "A" requirements.

(c) One snatch block.

(d) A minimum of one five-foot recovery chain for use in the winching system and must be a minimum of grade "7" chain with matching fittings.

~~((Note: One snatch block is sufficient.~~

(5) Class "E" tow trucks: Trucks that are primarily designed and intended to transport other vehicles by loading the vehicle entirely onto the truck. These trucks may be of a flatbed, "slide back" or "tilt bed," design or may be a "rail" type truck. Class "E" trucks must meet the requirements of subsection (1)(a) through (l) of this section, and in addition, shall have:

(a) Two securing devices with a minimum breaking strength of fifteen thousand pounds. The devices may be chain, cable, nylon strap, or steel strap. The tie downs shall be passed over the axle or frame member (one in front and one in rear) of the transported vehicle. Both ends shall be attached to the truck bed or rail in a manner that will prevent movement of the transported vehicle. Factory style "T" hook tie downs may also be used (front and rear).

(b) One snatch block.

(c) Dual tires on rear axles.

~~Note: All tires must be of sufficient size to meet the requirements of RCW 46.44.042 under all loading conditions.~~

(d) If used in a towing mode (as opposed to carrying), a sling, tow bar, and/or wheel lift assembly as appropriate for gross vehicle weight of the towed vehicle.

(e) Additional minimum requirements include:

A. Gross vehicle weight rating	14,500 lbs
B. Purchased tonnage	14,500 lbs
C. Winch rating	4 ton
D. Cable	50', 3/8 6x19 Hemp Center, I.P.S. work limit 3,500 lbs 5-1 safe working load
E. Cable hook connections	3 ton
F. Car carrier (bed)	17'
G. Body load rating (bed)	4 ton
H. Tow bar load rating	2,000 lbs

~~Note: Trucks of class "E" configuration that were inspected and approved for use prior to the adoption of these specifications and that do not meet them may continue to be used for patrol calls until January 1, 1992: Provided, That they do continue to meet the original specifications required and are otherwise in safe operating condition.)~~

(6) Class "E" tow trucks: Trucks that are primarily designed and intended to transport other vehicles by loading

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the vehicle entirely onto the truck. These vehicles may be a flatbed, slide back, tilt bed, or rail design truck. Class "E" trucks shall meet the requirements of subsection (1)(a) through (u) of this section and in addition shall have:

(a) Two securing devices with a minimum working load limit of three thousand nine hundred pounds. The devices may be chain (minimum grade "4"), wire rope, nylon strap, or steel strap. The tie downs shall be passed over the axle or frame member (one in front and one behind) of the transported vehicle. Both ends shall be attached to the truck bed or rail in a manner that will prevent movement of the transported vehicle. Factory style "T" hook tie-downs may also be used (front and rear).

(b) One snatch block.

(c) Dual tires on the rear axle.

(d) If used in a towing mode (as opposed to carrying), a sling, tow bar, and/or wheel lift assembly can be used and must have a manufacturers' rating appropriate to the vehicle being towed.

(e) Additional minimum requirements include:

<u>(i) Gross vehicle weight rating</u>	<u>14,500</u>
<u>(ii) Purchased tonnage</u>	<u>14,500</u>
<u>(iii) Winch rating</u>	<u>4 ton</u>
<u>(iv) XIP wire rope</u>	<u>50 feet 3/8 inch</u>
<u>(v) One five-foot chain use in the winching system and must be a minimum of grade "7" chain with matching fittings.</u>	
<u>(vi) Car carrier (bed)</u>	<u>17 feet</u>

Note: Bed may be shorter in a collapsed mode, but must be capable of telescoping to a minimum of seventeen feet.

(7) Class "S" tow/recovery trucks: Tow/recovery trucks that cannot meet the requirements of class "A," "B," "C," "D," or "E" and are not eligible for appropriate waiver as outlined in WAC 204-91A-070(4), may be approved as class "S" (special).

To have a truck designated as class "S" the tow operator must submit a request for approval through the district commander to the ~~((ESR))~~ section. The written request shall indicate why the truck is needed, what it will be used for, its size, purchased tonnage (if appropriate), capability, and the equipment carried or used with the truck. Gross vehicle weight rating of the class "S" truck will determine the appropriate equipment required.

If the district commander approves the request, ~~((he/she will forward))~~ the ~~((approved written))~~ request will be forwarded with recommendations for equipment and/or operation instructions or limitations to the ~~((ESR))~~ patrol for review and final approval. If approval is granted, the equipment shall be inspected as outlined in WAC 204-91A-040 with reports forwarded in the normal manner.

Note: If the provisions of this section require a change in classification for a previously approved tow truck, such change may be made upon the next annual reinspection. In any case, all tow trucks shall be correctly classified within one year of adoption of these rules.

AMENDATORY SECTION (Amending WSR 89-21-044, filed 10/13/89, effective 11/13/89)

**WAC 204-91A-180 Vehicle towing/operator qualifications, restrictions, and requirements.** In addition to the requirements contained in WAC 204-91A-170, tow truck operators appointed pursuant to this chapter shall conform to all laws and administrative rules pertaining to the tow

industry and shall observe the following practices and procedures:

(1) When called by the patrol, the tow truck operator will dispatch a tow truck, from within the assigned zone, within five minutes during normal business hours.

(2) Tow trucks dispatched at the request of the patrol after normal business hours will be on the move within the assigned zone within fifteen minutes after receiving the call.

(3) The tow truck that is dispatched will arrive at the stated location within a reasonable time considering distance, traffic, and weather conditions.

(4) If for any reason a tow operator is unable to dispatch a tow truck within the stated time or if the dispatched truck will be delayed for any reason, the operator shall so advise the patrol stating the reason and estimated time of arrival. In the event the tow truck fails to arrive at the scene within a reasonable time, the patrol will contact another tow operator to respond to the scene and will cancel the original tow.

(5) A tow operator on rotation who is unable to dispatch or arrive within the times stated in subsections (1), (2), (3), and (4) of this section will forfeit his turn and be placed at the bottom of the rotation list as if he had responded.

(6) Consistent refusal or failure of the appointee to respond to calls from the patrol for towing services and/or to provide the requested services may result in the suspension or revocation of the tow operator's letter of appointment.

(7) The tow operator shall advise the appropriate patrol office when the tow company is temporarily unavailable to respond to rotational calls with a class "A," "B," or "C" tow truck. Unavailability may occur due to conditions such as, but not limited to, other tow truck commitments, tow truck disabled and/or under repair, unforeseen driver shortage due to illness, etc. The period of unavailability may last less than an hour or much longer. The tow operator will give the reason for unavailability and approximately when the company will be available to respond to calls.

The tow company will be removed from the rotational list and will not be called until the operator advises the patrol that the company is once again able to respond to calls with an "A," "B," or "C" class truck. In all such cases, the tow company will resume its normal position on the rotational list without regard to any missed calls or its position prior to being unavailable.

(8) The tow operator will advise the patrol whenever a private call is received for a tow with circumstances that indicate that the tow is for a vehicle which has been involved in an accident, incident, or equipment breakdown on the public roadway. The tow operator also will advise the patrol of all private calls to motor vehicle accidents on private property resulting in bodily injury or death.

(9) The tow operator will notify the patrol before moving any vehicle involved in an accident on a public highway under the jurisdiction of the patrol as defined in the motor vehicle code, Title 46 RCW, or where it appears that the driver of the vehicle to be moved is under the influence of intoxicants or drugs, or is otherwise incapacitated.

(10) When the patrol is in charge of an accident scene or other such incident, a tow operator shall not respond to such scene unless his services have been specifically requested by the patrol, the driver/owner, or his agent.

(11) The tow operator shall be available, or will ensure that specific employees are available, twenty-four hours a day for the purpose of receiving calls or arranging for the release of vehicles. Business hours will be posted conspicuously at the operator's place of business so they can be seen during business hours and nonbusiness hours. A copy will also be sent to the ((ESR)) section and patrol district commander of the district in which the tow operator does business. Changes of business hours will be sent to the department, the ((ESR)) section, and the patrol district commander ten days before their effective date.

(12) The tow operator will notify the appropriate patrol office of the release of stored vehicles within five working days after the release of such vehicle. Notification to the patrol will be made in such a manner as prescribed by the ((ESR)) section commander.

(13) The operator shall post a current copy of tow and storage rates, on a form approved by the department and the patrol, in the following locations:

(a) At the entrance to the place of business, in a conspicuous location, plainly visible and readable by members of the public, whether the business is open or closed. If, in order to meet this requirement, the rate sheets must be placed in a location, exposed to the elements, they shall be protected so as to remain legible.

(b) Inside the business location, where business is commonly transacted. The rate sheets shall be posted in such manner as to be ((clearly)) clearly and plainly visible and readable at all times by customers of the business.

(c) A copy of the current rates will be sent to the department, the ((ESR)) section, and the patrol district commander of the district in which the tow operator has applied for a letter of appointment. Notice of any change(s) in service rates will be forwarded to the department, the ((ESR)) section, and the district commander of the area ten days before the effective date of the changes. Charges made for towing services arising from calls initiated by the patrol shall be consistent with current posted towing rates and shall be based only upon services listed on the prescribed form.

(d) In the event that an operator has only a class "B" truck and utilizes it for class "A" and "B" type tows, the operator shall file a rate sheet that specifies the rates charged for the different types of tows.

Whenever any operator utilizes a larger truck than the towed vehicle warrants, the operator shall charge fees based on the size of the towed vehicle not the size of the truck used.

EXAMPLE: A class "C" truck is used, at the operator's discretion, to tow a class "B" size vehicle. The fees charged shall be those for a class "B" truck NOT a class "C."

(14) Charges made for towing services arising from calls initiated by the patrol shall not exceed the maximum rates established by the chief.

(15) Unless other arrangements are made with commissioned patrol personnel at the scene, all impounded vehicles shall be taken to the tow operators nearest approved storage location.

(16) The tow operator will maintain, for three years, records on towed and released vehicles which were towed at the request of the patrol. This record will include, but not be limited to:

(a) An itemized receipt of all charges for the services provided.

(b) An inventory sheet or copy thereof made out by the trooper at the scene of the tow and signed by the operator.

(c) All other records required by the department.

Such records will be available for inspection by the patrol during normal business hours at the operator's place of business.

(17) The tow operator will sign an inventory sheet made out by the patrol officer at the scene.

(18) Tow operators will obtain and maintain current registration as a licensed tow truck operator pursuant to RCW 46.55.020.

(19) Tow operators shall perform towing tasks competently. The standard of competence shall be that quality of work which is accepted as efficient and effective within the towing industry.

(20) No tow operator, employee, or agent shall misappropriate, wrongfully convert to his/her own use, or abuse property belonging to another and entrusted to his/her care or storage.

(21) Tow truck operators will use emergency lights to warn other motorists only when at the scene of accidents, disabled vehicles, and/or recoveries. Such lighting shall not be used when traveling to or from the scene.

(22) Tow truck operators shall be responsible for cleaning accident/incident scenes of all vehicle glass and debris.

(23) Specific operating restrictions and/or requirements, by truck class, are as follows:

(a) The standard air brake release tools (caging stud assemblies) required to be carried in the class "B" and "C" trucks shall be used, whenever necessary, to preserve potential evidence involving brake equipment or adjustment settings. When an operator is attempting to move a vehicle equipped with locked spring parking brakes that cannot be released by external air supply, the caging assemblies shall be used to release the brake tension. Under no circumstances shall the towed vehicle's brake assemblies or adjustments be moved or disturbed in any way that will prevent later determination of the preaccident or incident settings.

(b) Class "B" trucks in excess of twenty-three thousand pounds gross vehicle weight rating need not carry dollies when towing or recovering heavy vehicles.

(c) Class "D," "E," and "S" trucks shall not be used to respond to initial calls unless specifically authorized by patrol personnel at the scene or by local written policy approved by the district commander.

(d) Class "E" trucks shall:

(i) Have, when used for multiple vehicle towing/recovery (one on bed, one in tow) from the same location, all invoice charges evenly divided between the vehicles so transported;

(ii) Not be operated in excess of either gross vehicle weight rating or purchased tonnage weight limits;

(iii) Be required to carry its portable lights only when used in a towing mode.

(24) Whenever a "special event or overflow" storage lot is approved by the department, the patrol and appropriate city/county jurisdictions, the operator shall maintain personnel at the lot twenty-four hours per day for security and vehicle and/or personal property release. If necessary,



reimbursement for such labor shall be part of the contract for the "special event" if appropriate or by amended storage rates with a waiver of the ten-day rate change notice requirement approved by the department and the patrol.

At the conclusion of a "special event or overflow" situation, all vehicles not reclaimed by the owner shall be towed to the operator's regular storage facility and processed in the normal fashion. No additional fee shall be charged for towing the vehicle from the overflow lot to the regular facility.

(25) All work performed by the operator and/or employee shall be in the most professional and expeditious manner. All invoices and other required forms shall be completed accurately and promptly.

(26) Tow operators shall, when required by the patrol or the department, cause to be displayed on each approved truck, decals indicating truck class, patrol district, and/or assigned tow zone.

**WSR 94-15-024**  
**PROPOSED RULES**  
**FOREST PRACTICES BOARD**  
[Filed July 12, 1994, 10:37 a.m.]

Continuance of WSR 94-09-029.

Title of Rule: Amendment to forest practices rules, Title 222 WAC.

Date of Intended Adoption: August 4, 1994.

July 12, 1994

Jennifer M. Belcher  
Commissioner of Public Lands

**WSR 94-15-032**  
**PROPOSED RULES**  
**DEPARTMENT OF**  
**SOCIAL AND HEALTH SERVICES**  
(Public Assistance)  
[Filed July 13, 1994, 2:25 p.m.]

Original Notice.

Title of Rule: WAC 388-49-110 Verification.

Purpose: Administrative Notice 94-53 provides a simplified means for eligible food stamp households to claim the excess medical expense deduction. At food stamp certifications, the department shall verify incurred and anticipated medical expenses and the reimbursement amounts resulting in a deduction. Medical expense verification will no longer be required for monthly reporting households. Updates cross-reference to WAC 388-49-500 Medical care expenses. Deletes requirement to verify change in citizenship for monthly reporting households.

Statutory Authority for Adoption: RCW 74.04.050.

Statute Being Implemented: RCW 74.04.050, CFR 273.21(i).

Summary: At food stamp certifications (applications and recertifications), the department shall verify incurred and anticipated medical expenses and the reimbursement amounts resulting in a deduction. Medical expense verification will no longer be required for monthly reporting households.

Updates cross reference to WAC 388-49-500 Medical care expenses.

Reasons Supporting Proposal: Administrative Notice 94-53 provides a simplified means for eligible food stamp households to claim the excess medical expense deduction. CFR 273.21(i) allows the state agency to designate items to be verified for monthly reporting households.

Name of Agency Personnel Responsible for Drafting, Implementation and Enforcement: Diana Arnaud, Division of Income Assistance, 438-8318.

Name of Proponent: Department of Social and Health Services, governmental.

Rule is necessary because of federal law, CFR 273.21(i), Administrative Notices 94-53 and 94-30.

Explanation of Rule, its Purpose, and Anticipated Effects: Same as above.

Proposal Changes the Following Existing Rules: See above.

Has a Small Business Economic Impact Statement Been Prepared Under Chapter 19.85 RCW? No. This revision does not affect small businesses, only affects the food stamp program.

Hearing Location: OB-2 Auditorium, 14th and Franklin, Olympia, Washington, on August 23, 1994, at 10:00 a.m.

Assistance for Persons with Disabilities: Contact Office of Vendor Services by August 9, 1994, TDD (206) 753-4595, or SCAN 234-4595.

Submit Written Comments to: Dewey Brock, Chief, Office of Vendor Services, Mailstop 45811, Department of Social and Health Services, 14th Avenue and Franklin Street, Olympia, Washington 98504, Identify WAC Numbers, FAX (206) 586-8487, by August 16, 1994.

Date of Intended Adoption: August 24, 1994.

July 13, 1994

Dewey Brock, Chief  
Office of Vendor Services

AMENDATORY SECTION (Amending Order 3368, filed 4/7/92, effective 5/8/92)

**WAC 388-49-110 Verification.** (1) The department shall verify household eligibility from the following sources:

- (a) Documentary evidence;
- (b) Collateral contacts; and
- (c) Scheduled home visits.

(2) The household has primary responsibility for providing documentary evidence. The department shall offer to assist in obtaining documentary evidence if it would be difficult or impossible for the household to obtain in a timely manner.

(3) At initial application, the department shall verify:

- (a) Identity of:
  - (i) The person making the application; or
  - (ii) The authorized representative and the head of household.

- (b) Immigration status of all alien household members;
- (c) Residency;

(d) Gross nonexempt income;

(e) Actual utility expenses in excess of the standard utility allowance as specified in WAC 388-49-505;

(f) Medical care expenses as specified under WAC 388-49-500 (6)((b)) and (7);



- (g) Dependent care expenses as specified under WAC 388-49-500 (6)(a);
- (h) Disability;
- (i) Resources of an alien's sponsor; and
- (j) Actual shelter costs for households where all members are homeless as specified under WAC 388-49-020(36), if the shelter costs exceed the shelter amount as specified under WAC 388-49-500.

(4) At recertification, the department shall verify:

(a) A change in income(~~(, medical expenses,))~~ or actual utility expenses claimed by a household if the source has changed or the amount has changed by more than twenty-five dollars since the verification was completed; and

(b) Medical care expenses as specified under WAC 388-49-500(6) and (7).

(5) The department shall verify for monthly reporting households the following factors on a monthly basis:

(a) Gross nonexempt income;

(b) Utility expenses unless the standard utility allowance is used;

(c) (~~(Medical expenses per WAC 388-49-500(6);~~

~~(d))~~ Alien status, Social Security number, and residency, (~~and citizenship~~)) if changed;

~~((e))~~ (d) All other questionable information.

(6) The department shall verify questionable information.

Summary: Students shall be granted eligible student status who are parents of a child at least six, but under twelve, years of age for whom adequate child care is not available to enable the student to attend class and satisfy the twenty-hour work requirement or participate in a state or federally financed work study program.

Reasons Supporting Proposal: Public Law 102-237, Section 1727 clarifies that eligible student status shall be granted to students who are parents of a child above age five, but under age twelve for whom adequate child care is not available to enable the student to attend class and satisfy the twenty-hour work requirement of section 6 (c)(4) of the Food Stamp Act, or participate in a state or federally financed work study program during the regular school year.

Name of Agency Personnel Responsible for Drafting, Implementation and Enforcement: Diana Arnaud, Division of Income Assistance, 438-8318.

Name of Proponent: Department of Social and Health Services, governmental.

Rule is necessary because of federal law, Public Law 102-237, Section 1727.

Explanation of Rule, its Purpose, and Anticipated Effects: Same as above.

Proposal Changes the Following Existing Rules: See above.

Has a Small Business Economic Impact Statement Been Prepared Under Chapter 19.85 RCW? No. This change does not affect small businesses, it only affects food stamp recipients.

Hearing Location: OB-2 Auditorium, 14th and Franklin, Olympia, Washington, on August 23, 1994, at 10:00 a.m.

Assistance for Persons with Disabilities: Contact Office of Vendor Services by August 9, 1994, TDD (206) 753-4595, or SCAN 234-4595.

Submit Written Comments to: Dewey Brock, Chief, Office of Vendor Services, Mailstop 45811, Department of Social and Health Services, 14th Avenue and Franklin Street, Olympia, Washington 98504, Identify WAC Numbers, FAX (206) 586-8487, by August 16, 1994.

Date of Intended Adoption: August 24, 1994.

July 15, 1994

Dewey Brock, Chief  
Office of Vendor Services

**WSR 94-15-033**  
**PROPOSED RULES**  
**HIGHER EDUCATION**  
**COORDINATING BOARD**  
[Filed July 13, 1994, 3:13 p.m.]

Continuance of WSR 94-10-001.

Title of Rule: Amendments modifying regulations for the administration of the displaced homemaker program, chapter 250-44 WAC.

Date of Intended Adoption: October 21, 1994.

July 12, 1994

Elson S. Floyd  
Executive Director

**WSR 94-15-047**  
**PROPOSED RULES**  
**DEPARTMENT OF**  
**SOCIAL AND HEALTH SERVICES**  
(Public Assistance)  
[Filed July 15, 1994, 11:36 a.m.]

Original Notice.

Title of Rule: WAC 388-49-330 Student.

Purpose: Eligible student status shall be granted to students who are parents of a child at least six, but under twelve, years of age for whom adequate child care is not available to enable the student to attend class and satisfy the twenty-hour work requirement or participate in a state or federally financed work study program.

Statutory Authority for Adoption: RCW 74.04.050.

Statute Being Implemented: RCW 74.04.050.

AMENDATORY SECTION (Amending Order 3387, filed 5/19/92, effective 6/19/92)

**WAC 388-49-330 Student.** (1) A student, as defined under WAC 388-49-020, shall meet one of the following criteria to receive food stamps:

(a) Work and receive payment for a minimum of twenty hours per week. A self-employed student's minimum weekly earnings shall at least be equal to the federal minimum hourly wage multiplied by twenty hours;

(b) Work and receive money from a federal or state work study program;

(c) Be responsible for the care of a dependent household member under six years of age;

(d) Participate in the Job Opportunities and Basic Skill Training (JOBS) program;

(e) Be responsible for the care of a dependent household member at least six years of age, but under twelve years of

age, and the department has determined adequate child care is not available((+)) during the regular school year to allow the student to:

(i) Attend class and satisfy the twenty hour work requirement; or

(ii) Participate in a state or federally financed work study program.

(f) Be a single parent responsible for the care of a dependent child twelve years of age or under regardless of the availability of adequate child care;

(g) Receive benefits from the aid to families with dependent children program; or

(h) Attend an institution of higher education through:

(i) The Job Training Partnership Act (JTPA);

(ii) A food stamp act employment and training program;

(iii) Section 236 of the Trade Act of 1974; or

(iv) An approved employment and training program operated by state or local government.

(2) Student status begins the first day of the school term.

(3) Student status continues through normal periods of class attendance, vacation, and recess.

(4) Student status is lost when a student:

(a) Graduates;

(b) Is suspended;

(c) Is expelled;

(d) Drops out; or

(e) Does not intend to register for the next normal school term excluding summer school.

**WSR 94-15-048**  
**PROPOSED RULES**  
**DEPARTMENT OF**  
**SOCIAL AND HEALTH SERVICES**

(Public Assistance)

[Filed July 15, 1994, 11:38 a.m.]

Original Notice.

Title of Rule: WAC 388-49-505 Utility allowances.

Purpose: Updates standard utility allowance (SUA) and telephone allowance to reflect current costs. These allowances are income deductions used to determine eligibility and calculate food stamp benefits.

Statutory Authority for Adoption: RCW 74.04.050.

Statute Being Implemented: RCW 74.04.050.

Summary: Updates SUA and telephone allowance to reflect current costs. These allowances are income deductions used to determine eligibility and calculate food stamp benefits.

Reasons Supporting Proposal: 7 CFR 273.9 (d)(6)(v) and (vi) require establishment and annual review and adjustment of a standard utility allowance (SUA) and a telephone allowance.

Name of Agency Personnel Responsible for Drafting, Implementation and Enforcement: Joan Wirth, Division of Income Assistance, 438-8324.

Name of Proponent: Department of Social and Health Services, governmental.

Rule is necessary because of federal law, 7 CFR 273.9 (d)(6)(v) and (vi).

Explanation of Rule, its Purpose, and Anticipated Effects: Same as above.

Proposal Changes the Following Existing Rules: See above.

Has a Small Business Economic Impact Statement Been Prepared Under Chapter 19.85 RCW? No. This change does not affect small businesses; it only affects food stamp recipients.

Hearing Location: OB-2 Auditorium, 14th and Franklin, Olympia, Washington, on August 23, 1994, at 10:00 a.m.

Assistance for Persons with Disabilities: Contact Office of Vendor Services by August 9, 1994, TDD (206) 753-4595, or SCAN 234-4595.

Submit Written Comments to: Dewey Brock, Chief, Office of Vendor Services, Mailstop 45811, Department of Social and Health Services, 14th Avenue and Franklin Street, Olympia, Washington 98504, Identify WAC Numbers, FAX (206) 586-8487, by August 16, 1994.

Date of Intended Adoption: August 24, 1994.

July 15, 1994

Dewey Brock, Chief

Office of Vendor Services

AMENDATORY SECTION (Amending Order 3626, filed 8/25/93, effective 10/1/93)

**WAC 388-49-505 Utility allowances.** (1) The department shall:

(a) Establish an annualized standard utility allowance for use in calculating shelter costs;

(b) Obtain FNS approval of the methodology used to establish the standard utility allowance;

(c) Establish a separate annualized telephone allowance;

(d) Obtain FNS approval of the methodology used to establish the telephone allowance.

(2) The annual standard utility allowance shall be two hundred (~~seven~~) twelve dollars.

(3) The monthly telephone standard shall be (~~twenty-seven~~) twenty-eight dollars.

**WSR 94-15-056**  
**PROPOSED RULES**  
**DEPARTMENT OF AGRICULTURE**

[Filed July 18, 1994, 10:37 a.m.]

Original Notice.

Title of Rule: Milk processing assessments and collections.

Purpose: To establish expiration/renewal dates for new milk processing plant license as required under RCW 15.32.110 as recodified by chapter 143, Laws of 1994.

Statutory Authority for Adoption: RCW 15.32.110 as recodified by chapter 143, Laws of 1994.

Statute Being Implemented: Chapter 15.32 RCW.

Summary: Sets expiration/renewal dates for annual milk processing plant license.

Reasons Supporting Proposal: Needed for enforcement activities to protect the public from possible harm.

Name of Agency Personnel Responsible for Drafting, Implementation and Enforcement: Verne Hedlund, 1111 Washington Street, Olympia, 902-1860.

Name of Proponent: Washington Department of Agriculture, governmental.

Rule is not necessitated by federal law, federal or state court decision.

Explanation of Rule, its Purpose, and Anticipated Effects: Revision of dairy statutes established milk processing plant license required for plants which process milk into dairy products for human consumption. Provides for enforcement actions against license when necessary to protect the public health from dairy products which contain harmful or deleterious substances or do not conform to grade standards.

Proposal does not change existing rules.

Has a Small Business Economic Impact Statement Been Prepared Under Chapter 19.85 RCW? No. Cost to business is negligible - less than \$50.00. License fee = \$25.00/year. Replaces \$10.00/year license under RCW 15.32.110.

Hearing Location: Washington Department of Agriculture, 1111 Washington Street, Natural Resources Building, Room 271, Olympia, WA 98504, on August 24, 1994, at 9:00 a.m.

Assistance for Persons with Disabilities: Contact Julie Carlson by August 17, 1994, TDD (206) 902-1996.

Submit Written Comments to: Verne Hedlund, FAX (206) 902-2087, by August 24, 1994.

Date of Intended Adoption: September 7, 1994.

July 18, 1994  
John Daly  
Assistant Director

NEW SECTION

**WAC 16-103-010 Purpose.** These rules are promulgated under the authority of RCW 15.32.110 as recodified by chapter 143, Laws of 1994. The purpose of these rules is to establish a renewal date for the annual milk processing plant license.

NEW SECTION

**WAC 16-103-020 Milk processing plant license.** The licensing period for milk processing plants shall begin on July 1 and run through the following June 30. All annual milk processing plant licenses shall expire on June 30 of each year.

**WSR 94-15-057  
PROPOSED RULES  
DEPARTMENT OF  
SOCIAL AND HEALTH SERVICES**

(Public Assistance)  
[Filed July 18, 1994, 11:52 a.m.]

Original Notice.

Title of Rule: WAC 388-49-630 Changes—Reporting requirements.

Purpose: Conform to federal Administrative Notices 94-30 and 94-53 and Section 5(e) of the Food Stamp Act of 1977, as amended. Deletes subsection (3) which previously required elderly or disabled food stamp recipients to report changes in medical expenses of \$25 or more. According to Administrative Notice 94-53, after the household has

anticipated and verified medical expenses for the certification period, no further reporting of medical expenses is required.

Statutory Authority for Adoption: RCW 74.04.510.

Statute Being Implemented: RCW 74.04.510.

Summary: Relieves elderly or disabled food stamp recipients from the responsibility of reporting changes in medical expenses during a certification period if those changes have already been anticipated.

Reasons Supporting Proposal: Conforms to Federal Administrative Notices 94-30 and 94-53, and Section 5(e) of the Food Stamp Act of 1977, as amended.

Name of Agency Personnel Responsible for Drafting, Implementation and Enforcement: Charles Henderson, Division on Income Assistance, 438-8325.

Name of Proponent: Department of Social and Health Services, governmental.

Rule is necessary because of federal law, Administrative Notices 94-30 and 94-53, Section 5(e) of the Food Stamp Act of 1977.

Explanation of Rule, its Purpose, and Anticipated Effects: Same as above.

Proposal Changes the Following Existing Rules: See above.

Has a Small Business Economic Impact Statement Been Prepared Under Chapter 19.85 RCW? No.

Hearing Location: OB-2 Auditorium, 14th and Franklin, Olympia, Washington, on August 23, 1994, at 10:00 a.m.

Assistance for Persons with Disabilities: Contact Office of Vendor Services by August 9, 1994, TDD (206) 753-4595, or SCAN 234-4595.

Submit Written Comments to: Dewey Brock, Chief, Office of Vendor Services, Mailstop 45811, Department of Social and Health Services, 14th Avenue and Franklin Street, Olympia, Washington 98504, Identify WAC Numbers, FAX (206) 586-8487, by August 16, 1994.

Date of Intended Adoption: August 24, 1994.

July 18, 1994  
Dewey Brock, Chief  
Office of Vendor Services

AMENDATORY SECTION (Amending Order 3427, filed 7/23/92, effective 9/1/92)

**WAC 388-49-630 Changes—Reporting requirements.** The department shall require a household certified for more than one month and not subject to mandatory monthly reporting to report the following changes within ten days of the date the change becomes known to the household:

- (1) Change in the source of income;
- (2) Change in the amount of gross monthly income of more than twenty-five dollars, except for public assistance income;
- ~~(3) ((Change in medical expenses of more than twenty-five dollars;~~
- ~~(4))~~ Change in the household composition, such as the addition or loss of a household member;
- ~~((5))~~ (4) Change in residence and resulting change in shelter cost;
- ~~((6))~~ (5) The acquisition of licensed vehicles;

~~((7))~~ (6) The end of a temporary disability when the temporary disability is the reason for exempting the value of a vehicle; and

~~((8))~~ (7) When nonexempt liquid resources exceed two thousand dollars or three thousand dollars for households with one or more members sixty years of age or older.

July 15, 1994

Kelle Vigeland

Environmental Engineer

## ARTICLE V

## NOTICE OF CONSTRUCTION

ADOPTED: June 9, 1969

REVISED: ~~May 2, 1991~~NEW SECTIONSECTION 5.01 DEFINITIONS

In addition to the definitions provided in Article I of this regulation and unless a different meaning is clearly required by context, words and phrases used in this Article shall have the following meaning:

A. Modification means any physical change in, or change in the method of operation of, an air contaminant source that increases the amount of any air contaminant emitted by such a source or that results in the emissions of any air contaminant not previously emitted. The term modification shall be construed consistent with the definition of modification in Section 7411, Title 42, United States Code, and with the rules implementing that section.

B. New Air Contaminant Source means the construction or modification of an air contaminant source that increases the amount of any air contaminant emitted by such a source or that results in the emission of any air contaminant not previously emitted; and any other project that constitutes a new source under the Federal Clean Air Act.

C. Air Contaminant Source means any building, structure, facility, or installation, including any emission unit as defined in Section 1.04 of this regulation, that emits or may emit any air contaminant.

AMENDATORY SECTIONSECTION 5.01 5.02 NOTICE OF CONSTRUCTION - WHEN REQUIRED

A. No person shall construct, install, or establish or modify a new air contaminant source, except as provided for in 5.02.E and 5.02.F of this section those sources that are excluded in Section 5.05 and Section 6.09 of this regulation unless a "Notice of Construction and Application for Approval;" has been filed and approved by the Authority or using forms prepared and furnished by the Agency Authority. New source review of a modification shall be limited to the emission unit or units proposed to be modified and the air contaminants whose emissions would increase as a result of the modification.

B. For the purpose of this Article, alterations or modifications shall be construed as construction, installation or establishment of a new air contaminant source. No person shall replace or substantially alter the emissions control equipment installed on an existing air contaminant source except as provided for in 5.02.D and 5.02.E of this section unless a Notice of Construction and Application for Approval has been filed and approved by the Authority using forms prepared and furnished by the Authority.

**WSR 94-15-061****PROPOSED RULES****SPOKANE COUNTY AIR POLLUTION CONTROL AUTHORITY**

[Filed July 18, 1994, 4:09 p.m.]

## Original Notice.

Title of Rule: Regulation I, Article V, Notice of Construction.

Purpose: To amend the existing Notice of Construction program.

Statutory Authority for Adoption: RCW 70.94.141, [70.94.]152, and [70.94.]153.

Statute Being Implemented: Chapter 70.94 RCW.

Summary: Amends existing Notice of Construction regulation to reflect recent changes in RCW 70.94.152 and [70.94.]153. Also adds new provisions to the program to increase consistency and improve effectiveness.

Reasons Supporting Proposal: Changes are necessary to maintain consistency with state law.

Name of Agency Personnel Responsible for Drafting and Implementation: Kelle Vigeland, West 1101 College, #403, Spokane, (509) 456-4727 x. 106; and Enforcement: Mabel Caine, West 1101 College, #403, Spokane, (509) 456-4727 x. 120.

Name of Proponent: Spokane County Air Pollution Control Authority, governmental.

Rule is not necessitated by federal law, federal or state court decision.

Explanation of Rule, its Purpose, and Anticipated Effects: The rule establishes when a Notice of Construction is required and details the Notice of Construction application and review process. The effect of the rule is to ensure that new, modified, and altered air pollution sources comply with air pollution control laws and regulations.

Proposal Changes the Following Existing Rules: The changes incorporate recent changes to RCW 70.94.152 and [70.94.]153 and provide more detail to improve program effectiveness.

Has a Small Business Economic Impact Statement Been Prepared Under Chapter 19.85 RCW? No. Chapter 19.85 RCW applies to agencies, departments, and instrumentalities of the state government. The Spokane County Air Pollution Control Authority is a municipal corporation pursuant to RCW 70.94.081.

Hearing Location: Spokane County Public Works Building, Hearing Room, Lower Level, West 1026 Broadway, Spokane, WA 99201, on September 1, 1994, at 9:30 a.m.

Submit Written Comments to: Kelle Vigeland, Spokane County Air Pollution Control Authority, West 1101 College, Suite 403, Spokane, 99201, FAX (509) 459-6828, by August 26, 1994.

Date of Intended Adoption: September 1, 1994.

C. A separate Notice of Construction and Application for Approval shall be filed for each air contaminant source or emissions control system unless identical units are to be constructed, installed, or established and operated in an identical manner at the same facility; provided that, the owner has the option to file one application for an entire facility with a detailed inventory of contaminant sources and emissions related to that facility.

D. A Notice of Construction and Application for Approval shall not be required to commence an alteration, which would normally require a Notice of Construction and Application for Approval pursuant to 5.02.B of this section, in the event of a breakdown or if delaying the alteration may endanger life or have other serious consequences. The Authority shall be notified in writing of the alteration on the first working day after the alteration is commenced and a Notice of Construction and Application for Approval shall be filed within 14 days after the day that the alteration is commenced. For purposes of compliance with Section 5.02, the Control Officer shall determine whether an alteration, commenced before issuance of an order of approval, meets the requirements of this subsection.

E. Construction, installation, establishment, modification, or alteration of air contaminant sources comprised of equipment utilized exclusively in connection with any structure which is designed for and used exclusively as a residence with not more than four dwelling units shall not require a Notice of Construction and Application for Approval.

F. Construction, installation, establishment, or operation of a temporary portable air contaminant source which has met the requirements of Section 5.08 shall not require a Notice of Construction and Application for Approval.

G. A person seeking approval to construct, install, or modify an air contaminant source that requires an operating permit may elect to integrate review of the operating permit application or amendment required under RCW 70.94.161 and the Notice of Construction and Application for Approval required by this Article. A Notice of Construction and Application for Approval designated for integrated review shall be processed in accordance with operating permit program procedures and deadlines as found in Chapter 173-401 WAC.

## NEW SECTION

### SECTION 5.03 FEES

A. The person filing the Notice of Construction and Application for Approval shall pay a filing fee and plan review and approval fee according to Article X, Fees and Charges, of this regulation.

B. Fees shall be paid without regard to whether a Notice of Construction and Application for Approval is approved or denied.

## AMENDATORY SECTION

### SECTION 5.02 5.04 INFORMATION REQUIRED

~~Within thirty (30) days of the receipt of such notice, the Board or Control Officer may require, as a condition precedent to the construction, installation, or establishment~~

~~of the air contaminant source or sources covered thereby, the submission of plans, specifications and such other information as it deems necessary in order to determine whether the proposed construction, installation or establishment will be in accord with applicable rules and regulations in force pursuant to this Article.~~

A. Each Notice of Construction and Application for Approval shall be accompanied by appropriate documentation that provides a detailed description of the following:

1. The air contaminant source, equipment and control apparatus subject to the Notice of Construction;

2. Any equipment connected to, serving, or served by the air contaminant source, equipment, and control apparatus subject to the Notice of Construction;

3. A plot plan, including the distance and height of buildings within a 200 feet or other distance specified by the Control Officer from the place where the air contaminant source is or will be installed;

4. The proposed means for the prevention or control of the emissions of air contaminants;

5. Estimated emissions resulting from the proposal and the basis for the estimates, or sufficient information for the authority to calculate the expected emissions;

6. Any additional information required by the Control Officer to show that the proposed air contaminant source will meet the applicable emissions standards.

B. Each Notice of Construction and Application for Approval shall be signed by the owner or operator of the air contaminant source.

## AMENDATORY SECTION

### SECTION 5.03 5.05 PUBLIC NOTICE MAY BE REQUIRED

~~A. Within fifteen (15) days of the receipt of the information required by Section 5.02, the Board or Control Officer shall make a preliminary determination and shall publish notice to the public of the opportunity to submit written comment during a thirty (30) day period under any of the following conditions:~~

A. The Control Officer shall publish or cause to be published a notice to the public of the opportunity to submit written comments on a preliminary determination for an application during a thirty (30) day period under any of the following conditions:

1. If otherwise required by the state or federal laws, or regulations; or

2. If the proposed source would cause an annual increase of ten (10) tons or more of any air contaminant or precursor for which ambient air quality standards have been established or toxic air pollutant as defined in Article X, Section 10.01 of this regulation; or

3. If the Board or Control Officer determines that such public opportunity for comment would be appropriate is in the public interest.

B. The cost of publishing any public notice required by Section 5.03 5.05 shall be paid by the owner or applicant to the Agency.

C. Such public notice shall be published in a newspaper of general circulation in the area of the proposal and shall contain the following information:

1. Name and address of the ~~owner source~~, and the owner or operator of the source, if different.

2. Brief description of proposed construction.

3. The location at which a copy of the preliminary determination and a summary of information considered in making such preliminary determination are available to the public.

4. Announcement of a thirty day period for submitting written comment to the Authority stating the ending date of the comment period.

5. Announcement that a public hearing may be held if the Authority determines within a thirty day period that significant public interest exists.

6. Any other information required under state or federal laws or regulations.

D. A copy of the notice shall be sent to the Environmental Protection Agency regional administrator.

## NEW SECTION

### SECTION 5.06 APPLICATION COMPLETENESS DETERMINATION

Within 30 days of receipt of a Notice of Construction and Application for Approval, the Authority shall notify the applicant in writing that the application is complete or notify the applicant in writing of any additional information necessary, based on review of information already supplied, to complete the application. Determination of completeness shall be evaluated on the basis that the application contains all information required to determine that the proposal shall be in accord with Chapter 70.94 RCW, the rules adopted thereunder, and the Federal Clean Air Act (42 USC 7401 et seq). As a condition of completeness determination, the Control Officer may require payment of applicable fees or a portion thereof pursuant to Article X of this regulation.

## AMENDATORY SECTION

### SECTION ~~5.04~~ 5.07 ISSUANCE OF APPROVAL OR ORDER

~~A. Within fifteen (15) days after the public comment period if Section 5.03 is applicable, otherwise within thirty (30) days of receipt of the information required by Section 5.02 the Board or Control Officer shall issue an Approval of Construction, or an Order that the construction, installation or establishment of a new air contaminant source will not be in accord with the applicable provisions of this Regulation as are in effect at the time of filing the Notice of Construction and Application for Approval.~~

~~B. No approval will be issued unless the information supplied as required by Section 5.02 evidences to the Board or the Control Officer that:~~

~~1. The equipment is designed and will be installed to operate without causing a violation of the emissions standard.~~

~~2. The equipment incorporates all known available and reasonable methods of emission control and will meet the requirements of all applicable Standards of Performance promulgated by the United States Environmental Protection Agency.~~

~~3. Operation of the source will not result in an ambient air standard being exceeded.~~

~~C. Failure of such order to issue within the time prescribed herein shall be deemed a determination that the construction, installation or establishment may proceed: PROVIDED THAT, it is in accordance with the plans, specifications or other information, if any, required to be submitted.~~

~~D. Nothing in this Article shall be construed to authorize the Board or Control Officer to require the use of emission control equipment or other equipment, machinery, or devices of any particular type from any particular supplier, or produced by any particular manufacturer.~~

A. For new sources as defined in Chapter 173-400 WAC:

1. Within 60 days of the completeness determination made pursuant to Section 5.06, the Authority shall either issue a final determination on the application or, for those proposals subject to public notice requirements, initiate notice and comment procedures under Section 5.05. If notice is required by state or federal regulations, the public notice shall occur in a manner that shall meet both Section 5.05 and those sections of the state or federal regulations that are applicable. As promptly as possible after the close of the comment period a final determination shall be issued by the Control Officer.

2. The final determination may include

a. an order of denial if it is found that the proposal is not in accord with Chapter 70.94 RCW, the rules adopted thereunder, and the Federal Clean Air Act (42 USC 7401 et seq); or

b. an order of approval which may provide conditions as are reasonably necessary to assure maintenance of compliance with Chapter 70.94 RCW, the rules adopted thereunder, and the Federal Clean Air Act (42 USC 7401 et seq).

3. Prior to issuance, the final determination shall be reviewed and signed by a professional engineer or staff under the direct supervision of a professional engineer in the employ of the Authority.

4. If the new air contaminant source is a major stationary source as defined in Chapter 173-400 WAC or the change is a major modification as defined in Chapter 173-400 WAC, the Authority shall submit any control technology determination included in a final determination to the RACT/BACT/LAER clearinghouse maintained by the United States Environmental Protection Agency.

5. Construction shall not commence until the application is approved by the Authority.

B. For replacement or substantial alteration of emission control equipment:

1. Within 30 days of the completeness determination made pursuant to Section 5.06, the Authority shall either issue an order of approval or a proposed RACT determination pursuant to Chapter 173-400 WAC.

2. The order of approval may prescribe reasonable operation and maintenance conditions for the control equipment.

3. Prior to issuance, the order of approval shall be reviewed and signed by a professional engineer or staff under the direct supervision of a professional engineer in the employ of the Authority.

4. Replacement or substantial alteration shall not commence until the application is approved by the Authority. However, any Notice of Construction and Application for Approval filed under Subsection 5.02.B. shall be deemed to be approved without conditions if the Authority takes no action within thirty days of receipt of a complete Notice of Construction and Application for Approval.

#### AMENDATORY SECTION

#### SECTION 5.05 5.08 TEMPORARY PORTABLE SOURCES

A. For portable air contaminant sources which locate temporarily at particular specific sites, the owner or operator shall be allowed to operate at the temporary location without filing a Notice of Construction and Application for Approval, provided that the owner or operator files a "Notice of Intent to Install and Operate a Temporary Source," on forms prepared and furnished by the Authority, notifies the Agency Authority of intent to operate at the new location at least 15 days prior to starting the operation and obtains permission to operate from the Agency Authority. Sufficient information must shall be supplied by the owner or operator to enable the Agency Authority to determine that the operation will be in accord with Chapter 70.94 RCW, the rules adopted thereunder, and the federal Clean Air Act (42 USC 7401 et seq) comply with the emission standards for a new source, will not cause a violation of applicable ambient air quality standards and, if in a nonattainment area, will not interfere with scheduled attainment of ambient standards. The owner or operator must shall also provide proof that operating the temporary source at the proposed location complies with WAC the requirements of Chapter 197-11 WAC (State Environmental Policy Act) have been met.

B. The Permission to operate shall be may be granted, subject to conditions as are reasonably necessary to assure compliance with Chapter 70.94, the rules adopted thereunder, and the Federal Clean Air Act (42 USC 7401 et seq). If any conditions listed in Subsection 5.05.A. are applicable to the proposal, a public comment period shall be held pursuant to Section 5.05.

C. Permission to operate may be granted for a limited time, but in no case longer than 180 consecutive days, and the Agency may set specific conditions for operation during said period. A temporary source shall comply with all applicable emission standards.

D. The person filing a Notice of Intent to Install and Operate a Temporary Source shall pay a filing fee and plan review and approval fee according to Article X, Fees and Charges, of this regulation. Fees shall be paid without regard to whether permission is granted or denied.

E. The Authority may revoke, or suspend permission to operate if the Control Officer determines that the source is not constructed or operated as described in the Notice of Intent to Install and Operate a Temporary Source including plan, specification, or other information submitted therewith.

F. Permission to operate shall be invalid if:

1. Construction, installation, or operation does not begin within 180 days of receipt of permission;

2. Construction, installation, or operation is discontinued for a period of 180 days or more;

3. Construction, installation, or operation is not completed within a reasonable time as determined by the Control Officer.

H. Permission to operate, conditions of permission to operate, or denial of installation and operation of a temporary source may be appealed to the Pollution Control Hearings Board of Washington as provided in Chapter 43.21B RCW.

#### AMENDATORY SECTION

#### SECTION 5.06 5.09 OPERATING REQUIREMENTS

A. Any features All equipment, machines, and devices, and other contrivance constituting parts of or called for by plans, specifications or other information submitted pursuant to Section 5.042 and Section 5.05, 5.04, and 5.08 hereof shall be maintained in good working order and operated at all times that air contaminant emissions may occur unless otherwise specified by the Authority.

B. All conditions of approval, established pursuant to Sections 5.07 and 5.08, shall be complied with.

#### NEW SECTION

#### SECTION 5.10 CHANGES TO AN ORDER OF APPROVAL

A. The Authority may revoke or suspend the order of approval if the Control Officer determines that the source is not constructed or operated as described in the Notice of Construction and Application for Approval including the plans, specifications, or other information submitted therewith.

B. The applicant may request, at any time, a change in conditions and the Control Officer may approve such a request provided the Control Officer finds that:

1. The change in conditions will not cause the air contaminant source to exceed an emissions standard; and

2. No ambient air quality standard will be exceeded as a result of the change; and

3. The change will not adversely impact the ability of the Authority to determine compliance with an emissions standard.

C. A fee as established in Section 10.07 of this regulation shall be assessed to and paid by the applicant for requests pursuant to Subsection 5.10.B.

#### NEW SECTION

#### SECTION 5.11 NOTICE OF COMPLETION

Within 7 days, or a shorter time if approved by the Authority, of the expected start-up date of the source, the owner or operator shall notify the Authority of the date upon which operation is expected to commence.

#### NEW SECTION

#### SECTION 5.12 WORK DONE WITHOUT AN APPROVAL

Where construction, installation, or operation, for which a Notice of Construction and Application for Approval is

required, is commenced or performed prior to making application and receiving an order of approval except as provided for in Subsection 5.02.D, the Control Officer may conduct a compliance investigation as part of the Notice of Construction review. In such case, a compliance investigation fee as established in Section 10.07 of this regulation shall be assessed to and paid by the applicant in addition to the fees required in Section 5.03 of this regulation. Payment of the fees does not relieve any person from the requirement to comply with the regulations nor from any penalties for failure to comply.

#### NEW SECTION

##### **SECTION 5.13 TIME LIMITS**

A. An order of approval issued pursuant to Section 5.07 shall become invalid if:

1. Construction is not commenced within eighteen months after the receipt of the approval
2. Construction is discontinued for a period of eighteen months or more, or
3. Construction is not completed within a reasonable time as determined by the Control Officer.

B. The Authority may extend the 18 month period upon a satisfactory showing to the Control Officer that an extension is justified. The Control Officer may approve such a request provided that:

1. No new requirements, such as New Source Performance Standards (Title 40, Code of Federal Regulations, Part 60), National Emissions Standards for Hazardous Air Pollutants (Title 40, Code of Federal Regulations, Parts 61 and 63), or state and local regulations, have been adopted pursuant to Chapter 70.94 RCW or the Federal Clean Air Act (42 USC 7401 et seq) which would change the order of approval had it been issued at the time of the extension;
2. If there is a control technology requirement pursuant to sections WAC 173-400-112, WAC 173-400-113, or WAC 173-400-114 of Chapter 173-400 WAC, no technologies have been subsequently identified which would change the order of approval had it been issued at the time of the extension;

3. The information presented in the Notice of Construction and Application for Approval and associated documents and the assumptions that were made by the Authority during review of the application continue to accurately represent the design, configuration, equipment, and emissions of the proposed air contaminant source; and

4. The applicant certifies that the source will comply with all applicable requirements of Chapter 70.94 RCW, the rules adopted thereunder, and the Federal Clean Air Act (42 USC 7401 et seq).

C. Subsection 5.13.A. does not apply to the time period between construction of the approved phases of a phased construction project. Each phase must commence construction within 18 months of the projected and approved commencement date.

#### NEW SECTION

##### **SECTION 5.14 APPEALS**

An order of approval, conditions of an order of approval, or an order of denial of a Notice of Construction and Application for Approval may be appealed to the Pollution Control Hearings Board of Washington as provided in Chapter 43.21B RCW.

#### AMENDATORY SECTION

##### **SECTION ~~5.07~~ 5.15**

The absence of an ordinance, resolution, rule or regulation, or the failure to issue an order pursuant to this Article shall not relieve any person from ~~his~~ the obligation to comply with this Regulation or with any other provision of law. (~~RCW 70.94.152~~)

**Reviser's note:** The typographical errors in the above section occurred in the copy filed by the agency and appear in the Register pursuant to the requirements of RCW 34.08.040.

**Reviser's note:** The unnecessary underscoring in the above section occurred in the copy filed by the agency and appears in the Register pursuant to the requirements of RCW 34.08.040.

**WSR 94-15-062  
PROPOSED RULES  
SPOKANE COUNTY AIR  
POLLUTION CONTROL AUTHORITY  
[Filed July 18, 1994, 4:12 p.m.]**

Original Notice.

Title of Rule: Regulation I, Article X, Fees and Charges.

Purpose: To amend existing fee schedules for registered air pollution sources, operating permit sources, and notices of construction. To add new fee waiver provisions and new definitions. To amend existing definitions and fee requirements.

Statutory Authority for Adoption: RCW 70.94.141, [70.94.]151, [70.94.]152, and [70.94.]162.

Statute Being Implemented: Chapter 70.94 RCW.

Summary: Amendment of existing fees to more accurately recover costs. Establishment of partial fee waiver program for certain categories of air pollution sources.

Reasons Supporting Proposal: Federal and state laws require full cost recovery of operating permit program. Fee waiver program is intended to lower fees from some sources while maintaining an adequate registration program.

Name of Agency Personnel Responsible for Drafting: Eric Skelton, West 1101 College, #403, Spokane, (509) 456-4727 x. 121; Implementation: Barbara Nelson, West 1101 College, #403, Spokane, (509) 456-4727 x. 116; and Enforcement: Mabel Caine, West 1101 College, #403, Spokane, (509) 456-4727 x. 120.

Name of Proponent: Spokane County Air Pollution Control Authority, governmental.

Rule is necessary because of federal law, 42 USC; Title V, Section 502.



Explanation of Rule, its Purpose, and Anticipated Effects: This rule authorizes Spokane County Air Pollution Control Authority to assess fees for registrations, permits, notices of construction, and other activities. The purpose and effect is to fully recover costs of operating permit program and to partially recover costs of registration, notice of construction, and other Spokane County Air Pollution Control Authority programs.

Proposal Changes the Following Existing Rules: The proposal is an amendment to adjust fees to fully recover costs, without overcollecting, for operating permit program and to adjust fees for other programs.

Has a Small Business Economic Impact Statement Been Prepared Under Chapter 19.85 RCW? No. Chapter 19.85 RCW applies to agencies, departments, and instrumentalities of the state government. The Spokane County Air Pollution Control Authority is a municipal corporation pursuant to RCW 70.94.081.

Hearing Location: Spokane County Public Works Building, Hearing Room, Lower Level, West 1026 Broadway, Spokane, WA 99201, on September 1, 1994, at 9:30 a.m.

Submit Written Comments to: Eric Skelton, Spokane County Air Pollution Control Authority, West 1101 College, Suite 403, Spokane, 99201, FAX (509) 459-6828, by August 26, 1994.

Date of Intended Adoption: September 1, 1994.

July 15, 1994

Eric Skelton

Director

ARTICLE X

FEES AND CHARGES

ADOPTED: September 12, 1991  
REVISION: ~~September 2, 1993~~  
EFFECTIVE: ~~October 9, 1993~~

AMENDATORY SECTION

SECTION 10.01 DEFINITIONS

When used in Regulation I of the Spokane County Air Pollution Control Authority:

A. Criteria Pollutant means any one of the following: fine particulate matter (PM10), volatile organic compounds (VOC), nitrogen oxides, sulfur oxides, ozone, lead, or carbon monoxide.

B. Emission Fee means the component of a registration fee or operating permit fee which is based on actual emissions of criteria and toxic air pollutants. In the case of a new or modified source or a source being registered initially, the emission fee is based on projected emissions as presented in an approved Notice of Construction or registration form.

C. Emission Reduction Credit means a credit granted to a source for a voluntary reduction in actual emissions per 173-400-131 WAC.

D. Fiscal Year has the same meaning as the term in RCW 70.94.161.

E. Source means all of the emissions unit(s) including quantifiable fugitive emissions, that are located on one or

more contiguous properties, and are under the control of the same person or persons under common control, whose activities are ancillary to the production of a single product or functionally related groups of products. Activities shall be considered ancillary to the production of a single product or functionally related group of products if they belong to the same major group (i.e., which have the same two digit code) as described in the Standard Industrial Classification Manual, 1972, as amended by the 1977 Supplement.

F. Significant Emissions means, in reference to a net emissions increase or the potential of a source to emit any of the following pollutants, at a rate of emissions equal to or greater than any one of the following rates:

- increased emissions of 10 tons per year of any one toxic air pollutant; or,
- increased emissions of 25 tons per year of two or more toxic air pollutants; or,

Pollutant	Tons/Year
Carbon monoxide	100
Nitrogen oxides	40
Sulfur dioxide	40
Particulate Matter (PM)	25
Fine particulate matter (PM10)	15
Volatile organic compounds	40
Lead	0.6
Fluorides	3
Sulfuric Acid Mist	7
Hydrogen sulfide (H <sub>2</sub> S)	10
Total reduced sulfur (including H <sub>2</sub> S)	10
Reduced sulfur compounds (including (H <sub>2</sub> S)	10
Municipal waste combustor organics (measured as total tetra-through-octa-chlorinated dibenzo-p-dioxins and dibenzofurans)	0.0000035
Municipal waste combustor metals (measured as PM)15	
Municipal waste combustor acid gases (measured as SO <sub>2</sub> and hydrogen chloride)	40

F. Stage I Vapor Recovery means the capture of gasoline vapors at gasoline dispensing facilities during the transfer of gasoline from a transport tank into a stationary storage tank.

G. Stage II Vapor Recovery means the capture of gasoline vapors at gasoline dispensing facilities during the transfer of gasoline from a stationary storage tank into a motor vehicle fuel tank.

FH. Toxic Air Pollutant means any toxic air pollutant (TAP) listed in WAC 173-460-150 and 173-460-160. Toxic air pollutant does not include particulate matter and volatile organic compounds as generic classes of substances.

AMENDATORY SECTION

SECTION 10.02 FEES AND CHARGES REQUIRED

Any fee assessed pursuant to Article X shall be paid within ~~60~~ 30 days of assessment. Any person who is more than 90 days late with such payment shall pay a penalty equal to three times the amount of the ~~emissions fee component~~ original fee owed.

Revenues collected pursuant to RCW 70.94.161 shall be deposited in the operating permit program dedicated account and shall be used exclusively for the program.

AMENDATORY SECTION

**SECTION 10.04 FEE WAIVER, ~~INDIGENCY~~**

A. Except for sources subject to the operating permit program, pursuant to RCW 70.94.161, the Control Officer may waive payment of any fee or service charge required by this Article to be paid upon a showing deemed sufficient by the Control Officer that payment of the fee would cause financial hardship upon the applicant.

B. The Control Officer may identify categories of sources, or groups of sources within a category, in Section 10.04.C. with similar emissions units and processes where the Control Officer determines that any of the following conditions exist:

1. Facility-wide emission rates are less than 1 ton per year of air contaminants; or
2. There are no specific regulations on the control of air contaminants; or
3. Compliance with control requirements is readily accomplished through nontechnical self-inspection techniques; or
4. The primary purpose for registration, pursuant to Article IV, is to inventory air contaminant emissions.

As categories are so identified, the Control Officer may waive one-half of the annual registration fee for owners or operators of individual facilities who provide emission inventory data, and other required information relative to compliance with applicable regulations, within 30 days of the request by the Authority, in a format acceptable to the Authority. In so doing, the owner or operator shall certify to the best of his/her knowledge, on forms provided by the Authority, that the emission inventory data is accurate and the facility is in compliance with applicable regulations. Owners or operators who fail to return the information within 30 days of the request will not qualify for a fee waiver under this Section. Notwithstanding the provision of required data by the owner or operator, the Authority reserves the right to conduct inspections of the facility.

C. The following categories of sources are eligible for the fee waiver specified in Section 10.04.B. However individual sources are not eligible if one or more Notices of Violation have been issued by the Authority, pursuant to Section 2.04 of Regulation I, to the facility in the previous 36 month period:

<u>Source Category</u>	<u>Rating</u>
<u>Surface Coating Operations</u>	<u>&lt;1 ton/yr VOC emitted</u>
<u>Gasoline Dispensing Facilities</u>	<u>Exempt from stage II vapor recovery requirements</u>
<u>Boilers &amp; Other Fuel Burning Equipment, With Air Contaminant Emissions Exclusively From Natural Gas Combustion</u>	<u>&lt;10<sup>7</sup> BTU/hr heat input</u>
<u>Boilers &amp; Other Fuel Burning Equipment, With Air Contaminant Emissions Exclusively From Other Fossil Fuel Combustion</u>	<u>&lt;10<sup>6</sup> BTU/hr heat input</u>
<u>Dry Cleaning Plants</u>	<u>&lt;140 gal/yr solvent consumption</u>
<u>Waste Oil Burners</u>	<u>&lt;500,000 BTU/hr heat input</u>
<u>Tire Recapping Facilities</u>	<u>All units in the category</u>
<u>Grain Elevators</u>	<u>All units with no on-site processing capability</u>

AMENDATORY SECTION

**SECTION 10.06 REGISTRATION AND OPERATING PERMIT FEES FOR AIR CONTAMINANT SOURCES**

A. All sources required by Article IV, Section 4.01 to be registered, all sources subject to the operating permit program pursuant to RCW 70.94.161, and all sources required by Article V, Section 5.0+2 to obtain an approved Notice of Construction and Application for Approval shall pay an annual fee for each year, or portion of each year, during which it operates. Fees received pursuant to the registration program or the operating permit program shall not exceed the actual costs of program administration.

B. The annual fee for each source shall be determined as follows:

- (1) For sources that are not subject to Section 10.06.B.(3), (4), (5) or (6) of this regulation and which emit less than 5 tons per year of criteria and toxic air pollutants:
  - (a) a flat fee of \$125; and
  - (b) a \$30 fee for each stack and other emission point, not to exceed \$600; and
  - (c) an emission fee of \$10 per ton of each criteria and toxic air pollutant.

- (2) For sources that are not subject to Section 10.06.B.(3), (4), (5) or (6) of this regulation and which emit 5 tons or more per year of criteria and toxic air pollutants, but less than 100 tons per year of any one criteria pollutant, excluding carbon monoxide:
  - (a) a flat fee of \$125; and
  - (b) an emission fee of \$15 per ton of each criteria and toxic air pollutant, including carbon monoxide.

- (3) For sources that are not subject to Section 10.06.B.(4), or (5), and which emit 100 tons or more per year of criteria and toxic air pollutants, excluding carbon monoxide, or 10 tons or more per year of a hazardous air pollutant or 25 tons or more per year of any combination of hazardous air pollutants listed pursuant to Section 112(b) of the Federal Clean Air Act (42 USC 7401 et seq):
  - (a) an emission fee of \$30 \$20 per ton, including carbon monoxide, half of which shall be applied in Fiscal Year 1994 to development of the operating permit program, pursuant to RCW 70.94.161; and
  - (b) an interim share of the assessment, as determined by the Department of Ecology, pursuant to RCW 70.94.164(3), which shall be remitted by the Authority to the Department of Ecology. Individual shares of the assessment shall be determined pursuant to Section 10.06.E of this regulation.

- (4) Effective the latter of either July 1, 1994, or 90 days after receiving approval of delegation of the operating permit program from the U.S. Environmental Protection Agency, for sources subject to the operating permit program pursuant to RCW 70.94.161 for sources listed:

a. Name Of Source      WEDS Number      a fee of:

<u>Kaiser Trentwood</u>	<u>K-063-0023</u>	<u>\$15600</u>
<u>Waste-To-Energy</u>	<u>K-063-0097</u>	<u>\$15100</u>
<u>Fairchild AFB</u>	<u>K-063-0025</u>	<u>\$13200</u>
<u>Tosco Corporation</u>	<u>K-063-0006</u>	<u>\$ 8500</u>
<u>Exxon-Spokane Term</u>	<u>K-063-0002</u>	<u>\$ 8500</u>
<u>Columbia Lighting</u>	<u>K-063-0105</u>	<u>\$ 2700</u>
<u>Huntwood Industries</u>	<u>K-063-0106</u>	<u>\$ 2700</u>
<u>Crown Pacific</u>	<u>K-063-0019</u>	<u>\$ 1600</u>

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<u>Pacific Gas Trans</u>	<u>K-063-0093</u>	<u>\$ 1600</u>
<u>Inland Empire Paper</u>	<u>K-063-0092</u>	<u>\$ 1600</u>
<u>Eastern Wash. Univ.</u>	<u>K-063-0065</u>	<u>\$ 1600</u>
<u>Wash. Water Power</u>	<u>K-063-0086</u>	<u>\$ 1600</u>
<u>U.S. Marine</u>	<u>K-063-0083</u>	<u>\$ 1500</u>
<u>Johnson Matthey Elc</u>	<u>K-063-0072</u>	<u>\$ 1000</u>
<u>Fiber-Tech Industries</u>	<u>K-063-0087</u>	<u>\$ 1000</u>
<u>Boeing</u>	<u>K-063-0095</u>	<u>\$ 1000</u>
<u>Alloy Trailers</u>	<u>K-063-0104</u>	<u>\$ 1000; and</u>

b. a share of the assessment by the Department of Ecology, pursuant to RCW 70.94.162(3), which shall be remitted by the Authority to the Department of Ecology. Individual shares of the assessment shall be determined pursuant to Section 10.06.E of this regulation.

(a) except for affected units under Section 404 of the Federal Clean Air Act (42 USC 7401 et seq), an emission fee of \$44 per ton, including carbon monoxide. Any source subject to the fee schedule in Section 10.06.B.(4) is exempt from the fee schedules in Section 10.06.B.(1),(2), & (3). In the event the fee schedule in Section 10.06.B.(4) becomes effective after July 1, 1994, the source shall pay a prorated Fiscal Year 1994 fee, based on the respective portions of the fiscal year during which the source was subject to the two different fee schedules.

(5) ~~(b) f~~For affected units under Section 404 of the Federal Clean Air Act (42 USC 7401 et seq);

(a) a fee of \$50 per hour of time expended in carrying out the fee eligible activities specified in RCW 70.94.; and

(b) ~~(e) an~~ share of the assessment, as determined by the Department of Ecology, pursuant to RCW 70.94.161(2)(3), which shall be remitted by the Authority to the Department of Ecology. Individual shares of the assessment shall be determined pursuant to Section 10.06.E of this regulation.

(6) ~~(5) For~~ Gasoline dispensing facilities which are not subject to Section 10.06.B.(3) of this regulation, which are not subject to RCW 70.94.161 shall not be assessed the emission fee component of a registration fee a flat fee of \$150.

(6) After December 31, 1999, Section 10.06.B.(4)(b) of this regulation shall no longer be in effect, and affected units under Section 404 of the Federal Clean Air Act (42 USC 7401 et seq) shall be subject to the fee schedule in Section 10.06.B.(4)(a) of this regulation.

C. On or before April 7, 1994, and annually thereafter, the Board of Directors shall review the fee schedule established in Section 10.06.B.(4). for sources subject to the operating permit program pursuant to RCW 70.94.161 and projected costs to implement the requirements of RCW 70.94.161 and determine if the total projected fee revenue to be collected pursuant to this Section is sufficient to recover program costs. Such review shall include opportunity for public review and comment on the projected costs and any changes to the operating permit fee schedule. Accordingly, the Authority shall account for program costs, including employee costs and overhead. If the Board of Directors determines that the total projected fee revenue is either significantly excessive or deficient for this purpose, then the Board of Directors shall amend the fee schedule to more accurately recover program costs.

D. After June 30, 1995, Sections 10.06.B.(3) and (4) of this regulation shall no longer be in effect and the Board

shall adopt an amended fee schedule pursuant to Section 10.06.C. of this regulation. In the event that an amended fee schedule is not adopted by July 6, 1995, then the fee for sources subject to the operating permit program pursuant to RCW 70.94.161 shall be \$50 per hour of time expended in carrying out the fee eligible activities specified in RCW 70.94.162 until such time as a new fee schedule is adopted. When a new fee schedule is adopted, the source shall pay a prorated fee for the year, based on the respective portions of the year during which the source was subject to the two different fee schedules.

E. Individual shares of the assessment pursuant to RCW 70.94.162(3) shall be determined by the following formula:

$$I = \frac{F_I}{E_T} \times A_E$$

Where,

I is the individual share of the assessment, and  
 F<sub>I</sub> is the individual fee assessed pursuant to Section 10.06.B.(3), (4), or (5) of this regulation, and

A<sub>E</sub> is the total assessment pursuant to RCW 70.94.162(3), and

E<sub>T</sub> is the sum of all the individual fees assessed pursuant to Sections 10.06.B.(3), (4), and (5) of this regulation.

F. In the event that the Authority receives delegation of the operating permit program, pursuant to RCW 70.94.161 in Fiscal Year 1995, then half of the fees collected pursuant to Sections 10.06.B.(3), (4), and (5) of this regulation shall be applied to development and implementation of the operating permit program for Fiscal Year 1995.

AMENDATORY SECTION

**SECTION 10.07 APPLICATION AND PERMIT FEES FOR NOTICE OF CONSTRUCTION AND APPLICATION FOR APPROVAL AND FOR NOTICE OF INTENT TO INSTALL AND OPERATE A TEMPORARY SOURCE**

A. For all construction required by Article V to file a Notice of Construction and Application for Approval (NOC), a filing fee of \$125 shall be paid at the time of filing the NOC.

B. IN ADDITION to the filing fee provided in "A" above, a plan review and approval fee shall be paid according to one of the following:

(1) Fuel Burning Equipment With or Without Air Pollution Control Equipment:

<u>Design Input Size (Mbtu/hr)</u>	<u>Install Fee</u>	<u>Fuel Change Fee</u>
.4 < 5	\$ 100	\$ 20
5 < 10	\$ 150	\$ 40
10 < 20	\$ 200	\$ 60
20 < 50	\$ 250	\$ 80
50 < 100	\$ 350	\$ 100
100 < 250	\$ 500	\$ 150
250 < 500	\$ 650	\$ 200
500 < UP	\$ 850	\$ 250

(2) Refuse Burning Equipment Including Air Pollution Control Equipment:

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Washington State Register

Capacity (ton/day)	Fee
0 < 12	\$ 500
12 < 250	\$1,000
250 < UP	\$2,500

(3) Process Equipment and/or Air Pollution Control Equipment or Uncontrolled Process Equipment:

Actual ft <sup>3</sup> /min	Fee
0 < 5,000	\$ 100
5,000 < 20,000	\$ 200
20,000 < 50,000	\$ 300
50,000 < 100,000	\$ 400
100,000 < 250,000	\$ 500
250,000 < 500,000	\$ 650
500,000 < UP	\$ 800

(4) Gasoline dispensing facilities: \$50

Equipment Being Installed	Fee
Stage I Vapor Recovery	\$ 50
Stage II Vapor Recovery	\$ 125
Stage I and Stage II	\$ 125

(5) For sources not included in (1), (2), (3), or (4) above, an hourly fee of \$50.00 per hour of time expended in plan review and approval.

C. For temporary portable sources required by Article V to notify the Agency of intent to operate at a new location, the filing fee shall be \$125 and the plan review and approval fee shall be one half (1/2) of the current fee for a Notice of Construction and Application for Approval.

D. For sources seeking a change in conditions of an order of approval pursuant to Section 5.10.B. of this regulation, the fee shall be one half the current fee for a Notice of Construction and Application for Approval for that type of source or \$250 which ever is less.

E. Where a compliance investigation is conducted pursuant to Section 5.12 of this regulation, the compliance investigation fee shall be equal to 2 times the fee required in Section 5.03 of this regulation.

DF. IN ADDITION to the other fees and costs herein above required any new source of air pollution to be constructed and anticipated to produce SIGNIFICANT EMISSIONS shall pay an additional fee of \$250.

Reviser's note: The typographical errors in the above section occurred in the copy filed by the agency and appear in the Register pursuant to the requirements of RCW 34.08.040.

**WSR 94-15-069**  
**WITHDRAWAL OF PROPOSED RULES**  
**DEPARTMENT OF HEALTH**  
(By the Code Reviser's Office)  
[Filed July 19, 1994, 8:40 a.m.]

WAC 246-824-200 and 246-824-210, proposed by the Department of Health in WSR 94-02-057, appearing in issue 94-02 of the State Register, which was distributed on January 19, 1994, is withdrawn by the code reviser's office under RCW 34.05.335(3), since the proposal was not adopted within the one hundred eighty day period allowed by the statute.

**WSR 94-15-070**  
**WITHDRAWAL OF PROPOSED RULES**  
**DEPARTMENT OF ECOLOGY**  
(By the Code Reviser's Office)  
[Filed July 19, 1994, 8:41 a.m.]

WAC 173-224-070 and 173-224-120, proposed by the Department of Ecology in WSR 94-02-080, appearing in issue 94-02 of the State Register, which was distributed on January 19, 1994, is withdrawn by the code reviser's office under RCW 34.05.335(3), since the proposal was not adopted within the one hundred eighty day period allowed by the statute.

Kerry S. Radcliff, Editor  
Washington State Register

**WSR 94-15-071**  
**PROPOSED RULES**  
**PUGET SOUND AIR**  
**POLLUTION CONTROL AGENCY**  
[Filed July 19, 1994, 11:25 a.m.]

Original Notice.

Title of Rule: Amend Appendix A of Regulation III.

Purpose: Amend Regulation III, Appendix A, Acceptable Source Impact Levels (ASILs) to make consistent with chapter 173-460 WAC amendments of January 14, 1994.

Other Identifying Information: Appendix A pertains to the Acceptable Source Impact Levels.

Statutory Authority for Adoption: Chapter 70.94 RCW.

Statute Being Implemented: RCW 70.94.141.

Summary: Amend ASILs to make consistent with chapter 173-460 WAC.

Reasons Supporting Proposal: Chapter 173-460 WAC was amended on January 14, 1994. Puget Sound Air Pollution Control Agency ASILs should be consistent with the Washington State Department of Ecology.

Name of Agency Personnel Responsible for Drafting: Maggie Corbin, 110 Union Street, #500, Seattle, 98101, 689-4057; Implementation: Dave Kircher, 110 Union Street, #500, Seattle, 98101, 689-4050; and Enforcement: Jim Nolan, 110 Union Street, #500, Seattle, 98101, 689-4053.

Name of Proponent: Puget Sound Air Pollution Control Agency, governmental.

Agency Comments or Recommendations, if any, as to Statutory Language, Implementation, Enforcement, and Fiscal Matters: The state implementation plan will be updated to reflect these amendments.

Rule is not necessitated by federal law, federal or state court decision.

Explanation of Rule, its Purpose, and Anticipated Effects: This proposal would amend the Acceptable Source Impact Levels to be consistent with chapter 173-460 WAC.

Proposal Changes the Following Existing Rules: The ASILs would be updated to be consistent with Washington

PROPOSED

State Department of Ecology changes as of January 14, 1994.

Has a Small Business Economic Impact Statement Been Prepared Under Chapter 19.85 RCW? No. This agency is not subject to the small business economic impact provision of the Administrative Procedure Act.

Hearing Location: Puget Sound Air Pollution Control Agency Offices, 110 Union Street, #500, Seattle, WA 98101, on September 8, 1994, at 9:00 a.m.

Assistance for Persons with Disabilities: Contact Agency Receptionist, 689-4010 by September 5, 1994, TDD (800) 833-6388, or (800) 833-6385 (braille).

Submit Written Comments to: Dennis McLerran, Puget Sound Air Pollution Control Agency, 110 Union Street, #500, Seattle, WA 98101, FAX (206) 343-7522, by August 29, 1994.

Date of Intended Adoption: September 8, 1994.

July 18, 1994

Margaret L. Corbin  
Air Pollution Engineer

PROPOSED

**AMENDATORY SECTION**

**REGULATION III APPENDIX A: ACCEPTABLE SOURCE IMPACT LEVELS**

PROPOSED

COMPOUND NAME	CAS CODE	ASIL $\mu\text{g}/\text{m}^3$	TYPE
ANTU	86-88-4	1.0	B
Acctaldchdc	75-07-0	45	A
Acctamide	60-35-5	TBD	((D)) B
((ANTU	86-88-4	1.0	B))
Acctic acid	64-19-7	((83.3)) 83	B
Acctic anhydride	108-24-7	((66.6)) 67	B
Acctone	67-64-1	((5927.4)) 5900	B
Acctonitrile	75-05-8	((233.1)) 220	B
Acctophenonc	98-86-2	TBD	((D)) B
2-Acctylaminofluorenc	53-96-3	TBD	((D)) A
Acctylenc tetrabromide	79-27-6	((50.0)) 47	B
Acrolcin	107-02-8	((0.8)) 0.02	B
Acrylamide	79-06-1	((0.1)) 0.0077	((B)) A
Acrylic acid	79-10-7	((99.9)) 0.30	B
Acrylonitrile	107-13-1	0.015	A
Aldrin	309-00-2	0.0002	A
Allyl alcohol	107-18-6	((16.7)) 17	B
Allyl chloride	107-05-1	((FBD)) 1.0	((D)) B
Allyl glycidyl ether (AGE)	106-92-3	((73.3)) 77	B
Allyl propyl disulfide	2179-59-1	40.0	B
Aluminum, Al alkyls	7429-90-5	6.7	B
Aluminum, as Al metal dusts	7429-90-5	((33.3)) 33	B
Aluminum, as Al pyro powders	7429-90-5	((16.7)) 17	B
Aluminum, as Al soluble salts	7429-90-5	6.7	B
Aluminum, as Al welding fumes	7429-90-5	((16.7)) 17	B
2-Aminoanthraquinonc	117-79-3	TBD	A
o-Aminoazotoluenc	97-56-3	TBD	A
4-Aminobiphenyl	92-67-1	TBD	A
2-Aminopyridinc	504-29-0	((6.7)) 6.3	B
Amitrolc	61-82-5	((0.6)) 0.06	C
Ammonia	7664-41-7	((59.9)) 100	B
Ammonium chloride fumes	12125-02-9	((33.3)) 33	B
Ammonium perfluorooctanoate	3825-26-1	((0.3)) 0.33	B
Ammonium sulfamate	7773-06-0	((33.3)) 33	B
n-Amyl acetate	628-63-7	((1764.9)) 1800	B
sec-Amyl acetate	626-38-0	((2214.5)) 2200	B
Aniline	62-53-3	6.3	A
Anilinc and homologues	62-53-3	((33.3)) 1.0	B
Anisidine (o-,p- isomers)	29191-52-4	1.7	B
o-Anisidine	90-04-0	1.7	C
Antimony & compounds, as Sb	7440-36-0	1.7	B
Antimony trioxide, as Sb	1309-64-4	1.7	B
Arsenic and inorganic arsenic compounds	7440-38-2	0.0023	A
Arsinc	7784-42-1	((0.7)) 0.53	B
Asbestos (Note: fibers/ml)	1332-21-4((0.000042))	0.000044	A
Asphalt (petroleum) fumes	8052-42-4	((16.7)) 17	B
Atrazine	1912-24-9	((16.7)) 17	B
Auramine (technical grade)	2465-27-2	TBD	A
Azinphos-methyl	86-50-0	((0.7)) 0.67	B
Aziridine (Ethylenc iminc)	151-56-4	2.9	B
Barium, soluble compounds Ba	7440-39-3	1.7	B
Bcnomyl	17804-35-2	((33.3)) 33	B
((Benz(a)anthraceno	56-55-3	TBD	A))
Benzenc	71-43-2	0.12	A
Benzidine and its salts	92-87-5	0.000015	A
((Benzotrichloride	98-07-7	TBD	D))
((Benzoyl peroxide	94-36-0	16.7	B))
Bcnzo(a)anthracenc	56-55-3	TBD	A
Bcnzo(a)pyrcnc	50-32-8	((0.006)) 0.0048	A

COMPOUND NAME	CAS CODE	ASIL $\mu\text{g}/\text{m}^3$	TYPE
Benzo(b)fluoranthenc.....	((204))205-99-2.....	TBD	A
Benzo(j)fluoranthenc.....	205-82-3.....	TBD	A
Benzo(k)fluoranthenc.....	((205))207-08-9.....	TBD	A
Benzo(trichloride).....	98-07-7.....	TBD	B
Benzoyl peroxide.....	94-36-0.....	17	B
Benzyl chloride.....	100-44-7.....	((16.7)) 17	B
Benzyl violet 4b.....	1694-09-3.....	TBD	A
Beryllium and its compounds.....	7440-41-7.....	0.00042	A
Biphenyl.....	92-52-4.....	((5.0)) 4.3	B
Bis(2-chlorooctyl)ether (Dichlorooctyl ether).....	111-44-4.....	0.003	A
((Bis(2-chlorooctyl)ether-(Dichlorooctyl-ether).....	111-44-4.....	99.9	B))
Bis(chloromethyl)ether.....	542-88-1.....	0.000016	A
Bis(2-ethylhexyl)phthalate (DEHP; Di(2-ethylhexyl)phthalate).....	117-81-7.....	((FBD)) 2.5	A
((Bis(2-ethylhexyl)phthalate (DEHP; Di(2-ethylhexyl)phthalate).....	117-81-7.....	16.7	B))
((Bis(chloromethyl)ether and tech. grade chloromethyl-methyl ether.....	542-88-1.....	0.000016	A))
Bismuth telluride.....	1304-82-1.....	((33.3)) 33	B
Bismuth telluride Se doped.....	1304-82-1.....	((16.7)) 17	B
Borates, anhydrous.....	1303-96-4.....	3.3	B
Borates, decahydrate.....	1303-96-4.....	((16.7)) 17	B
Borates, pentahydrate.....	1303-96-4.....	3.3	B
Boron oxide.....	1303-86-2.....	((33.3)) 33	B
Boron tribromide.....	10294-33-4.....	((33.3)) 33	B
Boron trifluoride.....	((7637)) 76737-07-2.....	((10.0)) 9.3	B
Bromacil.....	314-40-9.....	((33.3)) 33	B
Bromine.....	7726-95-6.....	((2.3)) 2.2	B
Bromine pentafluoride.....	7789-30-2.....	((2.3)) 2.4	B
Bromoform.....	75-25-2.....	((16.7)) 0.21	((B)) A
Bromomethane (Methyl bromide).....	74-83-9.....	5.0	B
1,3-Butadiene.....	106-99-0.....	((73.3)) 0.0036	((C)) A
Butane.....	106-97-8.....	((6327.0)) 6300.0	B
2-Butanone (Methyl ethyl ketone).....	78-93-3.....	((1964.7)) 1000	B
2-Butoxyethanol (Butyl cellosolve).....	111-76-2.....	((399.6)) 400	B
n-Butyl acetate.....	123-86-4.....	((2364.3)) 2400	B
sec-Butyl acetate.....	105-46-4.....	((3163.5)) 3200	B
tert-Butyl acetate.....	540-88-5.....	((3163.5)) 3200	B
Butyl acrylate.....	141-32-2.....	((183.2)) 170	B
n-Butyl alcohol.....	71-36-3.....	((499.5)) 500	B
sec-Butyl alcohol.....	78-92-2.....	((1015.7)) 1000	B
tert-Butyl alcohol.....	75-65-0.....	((999.0)) 1000	B
tert-Butyl chromate, as CrO <sub>3</sub> .....	1189-85-1.....	((0.3)) 0.33	B
n-Butyl glycidyl ether (BGE).....	2426-08-6.....	((449.6)) 440	B
n-Butyl lactate.....	138-22-7.....	((83.3)) 83	B
n-Butyl mercaptan.....	109-79-5.....	((5.0)) 6.0	B
n-Butylamine.....	109-73-9.....	50.0	B
1,2-Butylene oxide (1,2-Epoxybutane).....	106-88-7.....	20	B
o-sec-Butylphenol.....	89-72-5.....	((99.9)) 100	B
p-tert-Butyltoluene.....	98-51-1.....	((199.8)) 200	B
((B-)) $\beta$ -Butyrolactone.....	3068-88-0.....	TBD	A
Cadmium and compounds.....	7440-43-9.....	0.00056	A
Calcium cyanamide.....	156-62-7.....	1.7	B
Calcium hydroxide.....	1305-62-0.....	((16.7)) 17	B
Calcium oxide.....	1305-78-8.....	6.7	B
Camphor, synthetic.....	76-22-2.....	((40.0)) 40	B
Caprolactam, dusts.....	105-60-2.....	3.3	B
((Caprolactam)) Caprolactam, vapors.....	105-60-2.....	((66.6)) 67	B
Captan.....	2425-06-1.....	((0.3)) 0.33	B
Captan.....	133-06-2.....	((16.7)) 17	B
Carbaryl.....	63-25-2.....	((16.7)) 17	B
Carbofuran.....	1563-66-2.....	((0.3)) 0.33	B
Carbon black.....	1333-86-4.....	((11.7)) 12	B
Carbon disulfide.....	75-15-0.....	((99.9)) 100	B
Carbon tetrabromide.....	558-13-4.....	4.7	B
Carbon tetrachloride.....	56-23-5.....	0.067	A

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COMPOUND NAME	CAS CODE	ASIL $\mu\text{g}/\text{m}^3$	TYPE
Carbonyl fluoride.....	353-50-4.....	((16.7)) 18	B
Carbonyl sulfide.....	463-58-1.....	TBD	((D)) B
Catechol.....	120-80-9.....	((66.6)) 77	B
Cellosolve (2-Ethoxyethanol).....	110-80-5.....	200	B
Cesium hydroxide.....	21351-79-1.....	6.7	B
Chloramben.....	133-90-4.....	TBD	((D)) B
Chlordane.....	57-74-9.....	0.0027	A
((Chlorinated camphene (Toxaphene)).....	8001-35-2.....	0.003	A))
Chlorinated camphene (Toxaphene).....	8001-35-2.....	((1.7)) 0.0031	((B)) A
Chlorinated diphenyl oxide (hexachlorophenyl ether).....	55720-99-5.....	1.7	B
Chlorine.....	7782-50-5.....	((10.0)) 5.0	B
Chlorine dioxide.....	10049-04-4.....	((1.0)) 0.2	B
Chlorine trifluoride.....	7790-91-2.....	1.3	B
1-Chloro-1-nitropropane.....	600-25-9.....	((33.3)) 33	B
Chloroacetaldehyde.....	107-20-0.....	((10.0)) 11	B
Chloroacetic acid.....	79-11-8.....	TBD	((D)) B
a-Chloroacetophenone.....	532-27-4.....	((1.0)) 1.1	B
Chloroacetyl chloride.....	79-04-9.....	((0.7)) 0.67	B
o-((Chlorobenzylidene)) Chlorobenzylidene malononitrile.....	2698-41-1.....	1.3	B
Chlorobenzene.....	108-90-7.....	((1165.5)) 150	B
Chlorobenzilate.....	510-15-6.....	((TBD)) 0.2	((D)) A
Chlorobromomethane.....	74-97-5.....	((3496.5)) 3500	B
((Chlorodibromomethane).....	74-87-3.....	TBD	A))
Chlorodifluoromethane.....	75-45-6.....	((11655.0)) 12000	B
Chloroethane (Ethyl chloride).....	75-00-3.....	((8658.0)) 10000	B
Chloroform.....	67-66-3.....	0.043	A
Chloromethane (Methyl chloride).....	74-87-3.....	((349.7)) 340	B
Chloromethyl methyl ether (technical grade).....	107-30-2.....	TBD	A
Chloropentafluoroethane.....	76-15-3.....	((21045.6)) 21000	B
Chlorophenols.....	108-43-0.....	0.18	A
Chloropicrin.....	76-06-2.....	((2.3)) 2.2	B
$\beta$ -Chloroprene.....	126-99-8.....	((116.6)) 120.0	C
o-Chlorostyrene.....	((1331-28-8)) 2039-87-4.....	((949.1)) 240	B
o-Chlorotoluene.....	95-49-8.....	((832.5)) 860	B
Chlorpyrifos.....	2921-88-2.....	((0.7)) 0.67	B
Chromium (II) compounds, as Cr.....	7440-47-3.....	1.7	B
Chromium (III) compounds, as Cr.....	7440-47-3.....	1.7	B
Chromium (VI) compounds.....	7440-47-3.....	0.000083	A
Chromium (metal).....	7440-47-3.....	1.7	B
Chromyl chloride.....	14977-61-8.....	((0.5)) 0.53	B
Clopidol.....	2971-90-6.....	((33.3)) 33	B
Cobalt as Co, metals, dusts and fumes.....	7440-48-4.....	((0.2)) 0.17	B
Cobalt carbonyl as Co.....	10210-68-1.....	((0.3)) 0.33	B
Cobalt hydrocarbonyl.....	16842-03-8.....	((0.3)) 0.33	B
Coke oven emissions.....	81103*.....	0.0016	A
Copper as Cu, dusts and mists.....	7440-50-8.....	3.3	B
Copper, fumes.....	7440-50-8.....	((0.7)) 0.67	B
Cotton dust, raw.....	81106*.....	((0.7)) 0.67	B
Cresote.....	8001-58-9.....	TBD	A
Cresol, all isomers.....	1319-77-3.....	((73.3)) 73	B
Crotonaldehyde.....	4170-30-3.....	20.0	B
Cruformate.....	299-86-5.....	((16.7)) 17	B
Cumene (Isopropylbenzene).....	98-82-8.....	((815.9)) 820	B
Cupferron.....	135-20-6.....	TBD	A
Cyanamide.....	420-04-2.....	6.7	B
Cyanides, as CN.....	((151-50-8)) 51-12-5.....	((16.7)) 17	B
Cyanogen.....	460-19-5.....	((66.6)) 67	B
Cyanogen chloride.....	506-77-4.....	((2.0)) 2.5	B
1,4-Cyclohexadienedione (Quinone).....	106-51-4.....	1.5	B
Cyclohexane.....	110-82-7.....	((3496.5)) 3400	B
Cyclohexanol.....	108-93-0.....	((666.0)) 690	B
Cyclohexanone.....	108-94-1.....	((333.0)) 330	B
Cyclohexene.....	110-83-8.....	((3380.0)) 3400	B
Cyclohexylamine.....	108-91-8.....	((133.2)) 140	B



COMPOUND NAME	CAS CODE	ASIL $\mu\text{g}/\text{m}^3$	TYPE
Cyclonite	121-82-4	5.0	B
Cyclopentadiene	542-92-7	((666.0)) 680	B
Cyclopentane	287-92-3	((5727.6)) 5700	B
Cyhexatin	13121-70-5	((46.7)) 17	B
2,4-D salts and esters (2,4-Dichlorophenoxy acetic acid)	94-75-7	((33.3)) 33.0	((B)) C
DDE (p,p'-Dichlorodiphenyldichloroethylene)	3547-04-4	((FBD)) 0.1	((D)) A
DDT (1,1,1-Trichloro-2,2-bis(p-chlorophenyl)ethane)	50-29-3	0.1	A
Dccaborane	17702-41-9	((1.0)) 0.83	B
Demeton	8065-48-3	((0.3)) 0.37	B
Di(2-ethylhexyl)phthalate (Bis(2-ethylhexyl)phthalate; DEHP)	117-81-7	((FBD)) 2.5	A
((Di(2-ethylhexyl)phthalate (Bis(2-ethylhexyl)phthalate; DEHP)	117-81-7	16.7	B))
Diacetone alcohol	123-42-2	((799.2)) 790	B
N,N-Diacetylbenzidine	613-35-4	TBD	A
4,4'-Diaminodiphenyl ether	101-80-4	TBD	A
Diazinon	333-41-5	((0.3)) 0.33	B
Diazomethane	334-88-3	((1.3)) 1.1	B
Dibenz(a,h)acridine	226-36-8	TBD	A
Dibenz(a,h)anthracene	53-70-3	TBD	A
Dibenz(a,j)acridine	224-42-0	TBD	A
Dibenzo(a,c)pyrene	192-65-4	TBD	A
Dibenzo(a,h)pyrene	189-64-0	TBD	A
Dibenzo(a,l)pyrene	191-30-0	TBD	A
Dibenzofurans	132-64-9	TBD	((D)) A
1,2(1,2),7,8-Dibenzopyrene (Dibenzo(a,i)pyrene)	189-55-9	TBD	A
Diborane	19287-45-7	((0.3)) 0.37	B
1,2-Dibromo-3-chloropropane	96-12-8	((FBD)) 0.20	((D)) B
Dibutyl phosphate	107-66-4	((46.7)) 29	B
Dibutyl phthalate	84-74-2	((46.7)) 17	B
2-N-Dibutylaminoethanol	102-81-8	((46.6)) 47	B
((1,1-Dichloro-1-nitroethane	594-72-9	33.3	B))
((1,3-Dichloro-5,5-dimethylhydantoin	118-52-5	0.7	B))
((Dichloroacetylene	7572-29-4	1.3	B))
((1,4-Dichloro-2-butene	764-41-0	0.00038	A))
((3,3'-Dichloro-4,4'-diaminodiphenyl ether	28434-86-8	TBD	A))
((1,4-Dichlorobenzene (p-Dichlorobenzene)	106-46-7	1500.0	C))
((1,4-Dichlorobenzene (p-Dichlorobenzene)	106-46-7	1498.5	B))
((o-Dichlorobenzene	95-50-1	999.0	B))
((3,3'-Dichlorobenzidine	91-94-1	TBD	A))
((Dichlorodifluoromethane	75-71-8	16483.5	B))
((1,1-Dichloroethane	75-34-3	2697.3	B))
((1,2-Dichloroethane (Ethylene chloride)	107-06-2	0.04	A))
((Dichloroethyl ether (Bis(2-chloroethyl) ether)	111-44-4	0.003	A))
((Dichloroethyl ether (Bis(2-chloroethyl) ether)	111-44-4	99.9	B))
((1,1-Dichloroethylene (Vinylidene chloride)	75-35-4	66.6	B))
((1,2-Dichloroethylene	540-59-0	2630.7	B))
((Dichlorofluoromethane	75-43-4	133.2	B))
((Dichloromethane (Methylene chloride)	75-09-2	2.0	A))
((Dichlorophenylarsine (arsenic group)	696-28-6	TBD	A))
((1,2-Dichloropropane (Propylene dichloride)	78-87-5	1165.5	B))
((1,2-Dichloropropane (Propylene dichloride)	78-87-5	1166.6	C))
((1,3-Dichloropropene	542-75-6	16.7	B))
((2,2-Dichloropropionic acid	75-99-0	20.0	B))
((Dichlorotetrafluoroethane	76-14-2	23310.0	B))
Dichloroacetylene	7572-29-4	1.3	B
1,4-Dichlorobenzene (p-Dichlorobenzene)	106-46-7	1.5	A
o-Dichlorobenzene (1,2-Dichlorobenzene)	95-50-1	1000	B
3,3'-Dichlorobenzidine	91-94-1	0.077	A
1,4-Dichloro-2-butene	764-41-0	0.00038	A
3,3'-Dichloro-4,4'-diaminodiphenyl ether	28434-86-8	TBD	A
Dichlorodifluoromethane	75-71-8	16000	B
1,3-Dichloro-5,5-dimethylhydantoin	118-52-5	0.67	B
p,p'-Dichlorodiphenyldichloroethylene (DDE)	3547-04-4	0.1	A
1,1-Dichloroethane	75-34-3	2700	B

PROPOSED

PROPOSED

COMPOUND NAME	CAS CODE	ASIL $\mu\text{g}/\text{m}^3$	TYPE
1,2-Dichloroethane (Ethylene chloride)	107-06-2	0.038	A
Dichloroethyl ether (Bis (2-chloroethyl) ether)	111-44-4	0.003	A
1,1-Dichloroethylene (Vinylidene chloride)	75-35-4	67	B
1,2-Dichloroethylene	540-59-0	2600	B
Dichlorofluoromethane	75-43-4	130	B
Dichloromethane (Methylene chloride)	75-09-2	0.56	A
1,1-Dichloro-1-nitroethane	594-72-9	40	B
Dichlorophenylarsine (arsenic group)	696-28-6	TBD	A
1,2-Dichloropropane (Propylene dichloride)	78-87-5	4.0	C
Dichloropropene	542-75-6	20	B
2,2-Dichloropropionic acid	75-99-0	19	B
Dichlorotetrafluoroethane	76-14-2	23000	B
Dichlorvas	62-73-7	3.3	B
Dicrotophos	141-66-2	((0.8)) 0.83	B
Dicyclopentadiene	77-73-6	((99.9)) 100	B
Dicyclopentadienyl iron	102-54-5	((33.3)) 33	B
Dieldrin	60-57-1	((0.0002)) 0.00022	A
((Dieldrin	60-57-1	0.8	B))
Dichanolamine	111-42-2	((50.0)) 43	B
Diethyl ketone	96-22-0	((2347.7)) 2300	B
Diethyl nitrosamine (DEN; N-Nitrosodimethylamine)	55-18-5	TBD	A
Diethyl phthalate	84-66-2	((16.7)) 17	B
Diethyl sulfate	64-67-5	TBD	((D)) B
Diethylamine	109-89-7	((99.9)) 100	B
Diethylaminoethanol	100-37-8	((166.5)) 170	B
Diethylene triamine	111-40-0	((13.3)) 14	B
1,2-Diethylhydrazine	1615-80-1	TBD	A
Diiododibromomethane	75-61-6	((2863.8)) 2900	B
Diglycidyl ether	2238-07-5	1.7	B
Diglycidyl resorcinol ether	101-90-6	TBD	A
Diisobutyl ketone	108-83-8	((499.5)) 480	B
Diisopropylamine	108-18-9	((66.6)) 67	B
3,3'-Dimethoxybenzidine (ortol-dianisidine)	119-90-4	TBD	A
((Dimethylacetamide	127-19-5	116.6	B))
((Dimethylamine	124-40-3	59.9	B))
((Dimethyl aminoazobenzene	60-11-7	TBD	D))
((N,N-Dimethylaniline (N,N-Diethyl aniline)	121-69-7	83.3	B))
((3,3'-Dimethyl benzidine	119-93-7	TBD	D))
((Dimethyl carbamoyl chloride	79-44-7	TBD	D))
((Dimethylformamide	68-12-2	99.9	B))
((1,1-Dimethylhydrazine	57-14-7	3.3	B))
((1,2-Dimethylhydrazine	540-73-8	3.3	B,C))
((Dimethylnitrosoamine (N-Nitrosodimethylamine)	62-75-9	TBD	A))
((Dimethyl phthalate	131-11-3	16.7	B))
((Dimethyl sulfate	77-78-1	1.6	C))
Dimethyl aminoazobenzene	60-11-7	TBD	B
3,3'-Dimethyl benzidine	119-93-7	0.0038	A
Dimethyl carbamoyl chloride	79-44-7	TBD	B
Dimethyl phthalate	131-11-3	17	B
Dimethyl sulfate	77-78-1	1.7	C
Dimethylacetamide	127-19-5	120	B
Dimethylamine	124-40-3	60	B
Dimethylaniline (Diethyl aniline)	121-69-7	83	B
Dimethylformamide	68-12-2	30	B
1,1-Dimethylhydrazine	57-14-7	4.0	B
1,2-Dimethylhydrazine	540-73-8	4.0	C
Dimethylnitrosoamine (N-Nitrosodimethylamine)	62-75-9	TBD	A
Dinitolmide	148-01-6	((16.7)) 17	B
((4,6-)Dinitro-o-cresol ((and salts))	534-52-1	((9.7)) 0.67	B
Dinitrobenzene, all isomers	528-29-0	3.3	B
2,4-Dinitrophenol	51-28-5	TBD	((D)) B
((Dinitrotoluenes (mixed)	25321-14-6	TBD	A))
2,4-Dinitrotoluene	121-14-2	((TBD)) 5.0	((D)) B
1,4-Dioxane (1,4-Dichylene oxide)	123-91-1	((300)) 0.032	((C)) A

COMPOUND NAME	CAS CODE	ASIL $\mu\text{g}/\text{m}^3$	TYPE
Dioxathion	78-34-2	((0.7)) 0.67	B
Dioxins and furans	43110*	TBD	A
Diphenylamine	122-39-4	((33.3)) 33	B
1,2-Diphenyl hydrazine	122-66-7	0.0045	A
Dipropyl ketone	123-19-3	((782.6)) 780	B
Dipropylene glycol methyl ether	34590-94-8	((1998.0)) 2000	B
Diquat	85-00-7	1.7	B
Disulfiram	97-77-8	6.7	B
Disulfuton	298-04-4	((0.3)) 0.33	B
2,6-Ditert. butyl-p-cresol	128-37-0	((33.3)) 33	B
Diuron	330-54-1	((33.3)) 33	B
Divinyl benzene	((408-57-6)) 1321-74-0	((466.5)) 180	B
EPN	2104-64-5	1.7	B
Endosulfan	115-29-7	((0.3)) 0.33	B
Endrin	72-20-8	((0.3)) 0.33	B
Enflurane	13838-16-9	((1914.8)) 1900	B
Epichlorohydrin (1-Chloro-2, 3-epoxypropane)	106-89-8	((FBD)) 0.83	((D)) A
1,2-Epoxybutane (1,2-Butylene oxide)	106-88-7	((FBD)) 20	((D)) B
Ethanolamine	141-43-5	((26.6)) 25	B
Ethion	563-12-2	1.3	B
2-Ethoxyethanol (Cellosolve)	110-80-5	((63.3)) 200	B
2-Ethoxyethyl acetate	111-15-9	((89.9)) 90	B
Ethyl acetate	141-78-6	((4662.0)) 4800	B
Ethyl acrylate	140-88-5	((66.6)) 66	B
Ethyl alcohol	64-17-5	((6327.0)) 6300	B
Ethyl amyl ketone	541-85-5	((432.9)) 440	B
Ethyl benzene	100-41-4	((1448.6)) 1000	B
Ethyl bromide	74-96-4	((2963.7)) 3000	B
Ethyl butyl ketone	106-35-4	((765.9)) 780	B
Ethyl carbamate ((Urethane)) (Urethan)	51-79-6	TBD	((D)) B
Ethyl chloride (Chloroethane)	75-00-3	((8658.0)) 10000	B
Ethyl ((E)) ether	60-29-7	((3996.0)) 4000	B
Ethyl formate	109-94-4	((999.0)) 1000	B
Ethyl mercaptan	75-08-1	((3.3)) 4.3	B
Ethyl silicate	78-10-4	((283.4)) 280	B
Ethylamine	75-04-7	((59.9)) 60	B
Ethylene chloride (1,2-Dichloroethane)	107-06-2	0.038	A
Ethylene chlorohydrin	107-07-3	((10.0)) 11	B
Ethylene diamine	107-15-3	83	B
Ethylene ((Dibromide (1,2-Dibromoethane)) dibromide (dibromethane))	106-93-4	0.0045	A
((Ethylene-Dichloride (1,2-Dichloroethane))	107-06-2	0.04	A))
Ethylene glycol	107-21-1	((416.3)) 420	B
Ethylene glycol dinitrate	628-96-6	1.0	B
Ethylene imine (Aziridine)	151-56-4	2.9	B
Ethylene oxide	75-21-8	0.010	A
Ethylene thiourea	96-45-7	((FBD)) 1.0	((D)) A
((Ethylenediamine	107-15-3	83.3	B))
((Ethylene-imine (Aziridine))	151-56-4	3.3	B))
Ethylidene norbornene	16219-75-3	((83.3)) 83	B
N-Ethylmorpholine	100-74-3	((76.6)) 77	B
Fenamiphos	22224-92-6	((0.3)) 0.33	B
Fensulfothion	115-90-2	((0.3)) 0.33	B
Fenthion	55-38-9	((0.7)) 0.67	B
Ferbam	14484-64-1	((33.3)) 33	B
Ferrovandium dust	12604-58-9	3.3	B
Fibrous glass dust	81111*	((33.3)) 33	B
Fine mineral fibers	81104*	((FBD)) 33	((D)) B
Fluorides, as F	((81112*)) 16984-48-8	8.3	B
Fluorine	7782-41-4	((6.7)) 5.3	B
Fonofos	944-22-9	((0.3)) 0.33	B
Formaldehyde	50-00-0	0.077	A
Formamide	75-12-7	((50.0)) 60	B

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COMPOUND NAME	CAS CODE	ASIL $\mu\text{g}/\text{m}^3$	TYPE
Formic acid.....	64-18-6.....	((30.0)) 31	B
Furazolidone.....	67-45-8.....	TBD	A
Furfural.....	98-01-1.....	((26.6)) 26	B
Furfuryl alcohol.....	98-00-(0)1.....	((133.2)) 130	B
Furium (nitrofuran group).....	43111*.....	TBD	A
Germanium tetrahydride.....	7782-65-2.....	((2.0)) 2.1	B
Glutaraldehyde.....	111-30-8.....	((2.3)) 2.5	B
Glyciadialdehyde.....	765-34-4.....	TBD	A
Glycidol.....	556-52-5.....	((249.8)) 250	B
Glycol ethers.....	43107*.....	TBD	((D)) B
Hafnium.....	7440-58-6.....	1.7	B
Halothane.....	151-67-7.....	((1332.0)) 1300	B
Heptachlor.....	76-44-8.....	0.00077	A
Heptane (n-Heptane).....	142-82-5.....	((5328.0)) 5500	B
Hexachlorobenzene.....	118-74-1.....	((0.0020)) 0.0022	A
Hexachlorobutadiene.....	87-68-3.....	((.8)) 0.70	B
Hexachlorocyclohexane (Lindane) Alpha (BHC).....	319-84-6.....	((TBD)) 1.7	((A)) C
Hexachlorocyclohexane (Lindane) Beta (BHC).....	319-85-7.....	((TBD)) 1.7	((A)) C
Hexachlorocyclohexane (Lindane) Gamma (BHC).....	58(0)-89-9.....	((TBD)) 0.0026	A
Hexachlorocyclopentadiene.....	77-47-4.....	((0.3)) 0.33	B
1,2,3,6,7,8-Hexachloro-dibenzo-o-dioxin (1:2 mixture).....	34465-46-8.....	TBD	A
1,2,3,7,8,9-Hexachloro-dibenzo-o-dioxin (1:2 mixture).....	19408-74-3.....	TBD	A
Hexachloroethane.....	67-72-1.....	((0.25)) 32.0	((A)) B
Hexachloronaphthalene.....	1335-87-1.....	((0.7)) 0.67	B
Hexachlorophenyl ether (Chlorinated diphenyl oxide).....	55720-99-5.....	1.7	B
Hexafluoroacetone.....	684-16-2.....	2.3	B
Hexamethylene((-1,6-)) diisocyanate.....	822-06-0.....	((0.1)) 0.11	B
Hexamethylphosphoramide.....	680-31-9.....	TBD	((D)) A
Hexane (n-Hexane).....	((110))100-54-3.....	((599.4)) 200	B
Hexane, ((0)) other isomers.....	43103*.....	((5994.0)) 5900	B
2-Hexanone (Methyl butyl ketone).....	591-78-6.....	((66.6)) 67	B
Hexone (Methyl isobutyl ketone (MIBK)).....	108-10-1.....	680	B
sec-Hexyl acetate.....	108-84-9.....	((999.0)) 980	B
Hexylene glycol.....	107-41-5.....	((416.3)) 400	B
Hydrazine.....	302-01-2.....	((TBD)) 0.002	((D)) A
Hydrogen bromide.....	10035-10-6.....	((33.3)) 33	B
Hydrogen chloride (Hydrochloric acid).....	7647-01-0.....	((23.3)) 7.0	B
Hydrogen cyanide.....	74-90-8.....	((33.3)) 37	B
Hydrogen fluoride, as F (Hydrofluoric acid).....	7664-39-3.....	((8.3)) 8.7	B
Hydrogen peroxide.....	7722-84-1.....	((5.0)) 4.7	B
Hydrogen selenide, as Se.....	7783-07-5.....	((0.7)) 0.53	B
Hydrogen sulfide.....	7783-06-4.....	((46.6)) 0.9	B
Hydroquinone.....	123-31-9.....	6.7	B
2-Hydroxypropyl acrylate.....	999-61-1.....	((10.0)) 9.3	B
Indene.....	95-13-6.....	((149.9)) 160	B
Indeno(1,2,3-cd)pyrene.....	193-39-5.....	TBD	A
Indium, & compounds as In.....	7440-74-6.....	((0.3)) 0.33	B
Iodine.....	7553-56-2.....	3.3	B
Iodoform.....	75-47-8.....	((33.3)) 33	B
Iodomethane (Methyl iodide).....	74-88-4.....	40	B
Iron oxide fumes, Fe <sub>2</sub> O <sub>3</sub> as Fe.....	1309-37-1.....	((16.7)) 17	B
Iron pentacarbonyl, as Fe.....	13463-40-6.....	((2.7)) 0.83	B
Iron salts, soluble as Fe.....	81101*.....	3.3	B
Isoamyl acetate.....	123-92-2.....	((1748.3)) 1700	B
Isoamyl alcohol.....	123-51-3.....	((1198.8)) 1200	B
Isobutyl acetate.....	110-19-0.....	((2331.0)) 2400	B
Isobutyl alcohol.....	78-83-1.....	((499.5)) 510	B
Isocetyl alcohol.....	26952-21-6.....	((899.1)) 890	B
Isophorone.....	78-59-1.....	((83.3)) 93	B
Isophorone diisocyanate.....	4098-71-9.....	((0.1)) 0.15	B
Isopropoxyethanol.....	109-59-1.....	((349.7)) 350	B

COMPOUND NAME	CAS CODE	ASIL $\mu\text{g}/\text{m}^3$	TYPE
Isopropyl acetate.....	108-21-4.....	((3163.5)) 3500	B
Isopropyl alcohol.....	67-63-0.....	((3263.4)) 3300	B
Isopropyl ether.....	108-20-3.....	((3496.5)) 3500	B
Isopropyl glycidyl ether (IGE).....	4016-14-2.....	((799.2)) 790	B
Isopropyl oils.....	43112*.....	TBD	A
Isopropylamine.....	75-31-0.....	((40.0)) 40	B
N-Isopropylaniline.....	768-52-5.....	((33.3)) 37	B
Isopropylbenzene (Cumene).....	98-82-8.....	820	B
((Isopropyl oils.....	43112*.....	TBD	A))
Ketene.....	463-51-4.....	((3.0)) 2.9	B
Lead acetate.....	301-04-2.....	TBD	A
Lead arsenate, as $\text{Pb}_3(\text{AsO}_4)_2$ .....	3687-31-8.....	((0.5)) 0.50	B
Lead chromate, as Cr.....	7758-97-6.....	((0.2)) 0.040	B
Lead compounds.....	7439-92-1.....	((TBD)) 0.5	((D)) C
Lead phosphate.....	7446-27-7.....	TBD	A
((Lindane (all isomers).....	58-89-9.....	1.6	C))
Liquified petroleum gas.....	68476-85-7.....	((5994.0)) 6000	B
Lithium hydride.....	7580-67-8.....	((0.1)) 0.080	B
Magnesium oxide fumes.....	1309-48-4.....	((33.3)) 33	B
Malathion.....	121-75-5.....	((33.3)) 33	B
Maleic anhydride.....	108-31-6.....	3.3	B
Manganese, dusts and compounds.....	7439-96-5.....	((16.7)) 0.40	B
Manganese, fumes.....	7439-96-5.....	3.3	B
Manganese cyclopentadienyl tricarbonyl.....	12079-65-1.....	((0.3)) 0.33	B
((Mercury.....	7439-97-6))		
((as Hg, Alkyl compounds.....		0.03	B))
((as Aryl & inorganic compounds.....		0.3	B))
((as vapors except alkyl.....		0.2	B))
Mercury, Aryl & inorganic compounds.....	7439-97-6.....	0.33	B
Mercury, as Hg Alkyl compounds.....	7439-97-6.....	0.33	B
Mercury, vapors except alkyl.....	7439-97-6.....	0.17	B
Mesityl oxide.....	141-79-7.....	((199.8)) 200	B
Methacrylic acid.....	79-41-4.....	((233.1)) 230	B
Methomyl.....	16752-77-5.....	8.3	B
Methoxychlor.....	72-43-5.....	((33.3)) 33	B
2-Methoxyethanol (methyl cellosolve).....	109-86-4.....	((53.3)) 20	B
2-Methoxyethyl acetate.....	110-49-6.....	((79.9)) 80	B
4-Methoxyphenol.....	150-76-5.....	((16.7)) 17	B
2-Methyl-1-nitroanthraquinone.....	129-15-7.....	TBD	A
Methyl 2-cyanoacrylate.....	137-05-3.....	((26.6)) 30	B
Methyl acetate.....	79-20-9.....	((2031.3)) 2000	B
Methyl acetylene.....	74-99-7.....	((5494.5)) 5500	B
Methyl acetylene-propadiene mixture (MAPP).....	((43113 <sup>2</sup> )) 59355-75-8.....	((5994.0)) 5500	B
Methyl acrylate.....	96-33-3.....	((116.6)) 120	B
Methyl alcohol (Methanol).....	67-56-1.....	((865.8)) 870	B
N-Methyl aniline.....	100-61-8.....	((6.7)) 7.3	B
2-Methyl aziridine (1,2-Propylene imine).....	75-55-8.....	16	B
((Methylazoxymethanol & acetate) Methyl azoxymethyl acetate.....	592-62-1.....	TBD	A
Methyl bromide (Bromomethane).....	74-83-9.....	((66.6)) 5.0	B
Methyl cellosolve (2-Methoxyethanol).....	109-86-4.....	((53.3)) 20	B
Methyl chloride (Chloromethane).....	74-87-3.....	((349.7)) 340	B
Methyl chloroform (1,1,1-Trichloroethane).....	71-55-6.....	((6327.0)) 6400	B
Methyl demeton.....	8022-00-2.....	1.7	B
Methyl ethyl ketone (MEK; 2-Butanone).....	78-93-3.....	((1964.7)) 1000	B
Methyl ethyl ketone peroxide.....	1338-23-4.....	5.0	B
Methyl formate.....	107-31-3.....	((832.5)) 820	B
Methyl hydrazine.....	60-34-4.....	1.2	B
Methyl iodide (Iodomethane).....	74-88-4.....	((33.3)) 40	B
Methyl isoamyl ketone.....	110-12-3.....	((799.2)) 780	B
Methyl isobutyl carbinol.....	108-11-2.....	((333.0)) 350	B
Methyl isobutyl ketone (MIBK; Hexone).....	108-10-1.....	((682.7)) 680	B

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COMPOUND NAME	CAS CODE	ASIL $\mu\text{g}/\text{m}^3$	TYPE
Methyl isocyanate.....	624-83-9.....	((0.2)) 0.16	B
Methyl isopropyl ketone.....	563-80-4.....((2347.7))	2300	B
Methyl mercaptan.....	74-93-1.....	3.3	B
Methyl methacrylate.....	80-62-6.....((1365.3))	1400	B
Methyl n-amyl ketone.....	110-43-0.....((782.6))	780	B
Methyl n-butyl ketone.....	591-78-6.....((66.6))	67	B
Methyl parathion.....	298-00-0.....((0.7))	0.67	B
Methyl propyl ketone.....	107-87-9.....((2331.0))	2300	B
Methyl silicate.....	681-84-5.....((20.0))	20	B
a-Methyl styrene.....	98-83-9.....((799.2))	810	B
Methyl tert-butyl ether.....	1634-04-4.....((TBD))	500	((D)) B
Methylacrylonitrile.....	126-98-7.....((10.0))	9.0	B
Methylal.....	109-87-5.....((10323.0))	10000	B
Methylamine.....	74-89-5.....((40.0))	43	B
5-Methylchrysene.....	3697-24-3.....	TBD	A
Methylcyclohexane.....	108-87-2.....((5328.0))	5400	B
Methylcyclohexanol.....	25639-42-3.....((782.6))	780	B
o-Methylcyclohexanone.....	583-60-8.....((765.9))	760	B
Methylcyclopentadienyl manganese tricarbonyl.....	12108-13-3.....((0.7))	0.67	B
Methylcne bis(4-cyclo-hexylisocyanate).....	5124-30-1.....((0.2))	0.18	B
4,4'-Methylcne bis(2-methylaniline).....	838-88-0.....	TBD	A
4,4'-Methylcne bis(2-chloroaniline).....	101-14-4.....	0.7	C
((Methylene diphenyl diisocyanate (MDI); Methylene bisphenyl isocyanate).....	101-68-8.....	0.2	B))
Methylcne bis(phenyl isocyanate) (Methylene diphenyl diisocyanate, MDI).....	101-68-8.....	0.2	B
Methylcne ((C))chloride (Dichloromethane).....	75-09-2.....((2.0))	0.56	A
4,4-Methylcne dianiline.....	101-77-9.....	2.7	C
4,4-Methylcne dianiline dihydrochloride.....	13552-44-8.....	TBD	A
((4,4-Methylene dianiline.....	101-77-9.....	2.7	B))
((4,4-Methylene dianiline.....	101-77-9.....	2.6	C))
4-(Methylnitrosamino)-1-(3-pyridyl)-1-butanone.....	64091-91-4.....	TBD	A
Metribuzin.....	21087-64-9.....((16.7))	17	B
Mevinphos.....	7786-34-7.....((0.3))	0.33	B
Mirex.....	2385-85-5.....	TBD	A
((Molybdenum, as Mo.....	7439-98-7.....	17	B))
((soluble compounds.....		16.7	B))
((insoluble compounds.....		33.3)	B))
Molybdenum, as Mo soluble compounds.....	7439-98-7.....	17	B
Molybdenum, insoluble compounds.....	7439-98-7.....	33	B
Monocrotophos.....	6923-22-4.....((0.8))	0.83	B
Morpholine.....	((1109-10-8)) 110-91-8.....((233.1))	240	B
5-(Morpholinomethyl)-3-(((5-nitrofurfurylidene)))amino)-2-oxazolidinone (furaltudone).....	139-91-3.....	TBD	A
Naled.....	300-76-5.....((10.0))	10	B
Naphtha (Rubber solvent((s))).....	((8030-30-6)) 43102*.....((5328.0))	5300	B
Naphthalene.....	91-20-3.....((166.5))	170	B
1-Naphthylamine.....	134-32-7.....	TBD	A
Nickel and compounds (as nickel subsulfide or nickel refinery dust).....	7440-02-2.....((3.3))	0.021	((C)) A
Nicotine.....	54-11-5.....	1.7	B
Nitrapyrin.....	1929-82-4.....((33.3))	33	B
Nitric acid.....	7697-37-2.....((16.7))	17	B
Nitric oxide.....	10102-43-9.....((99.9))	100	B
5-Nitroacenaphthene.....	602-87-9.....	TBD	A
p-Nitroaniline.....	100-01-6.....((10.0))	10	B
Nitrobenzene.....	98-95-3.....((16.7))	1.7	B
4-Nitrobiphenyl.....	92-93-3.....	TBD	((D)) B
p-Nitrochlorobenzene.....	100-00-5.....	2.0	B
Nitroethane.....	79-24-3.....((1032.3))	1000	B
Nitrofen.....	1836-75-5.....	TBD	A
Nitrofurans Furazolidone.....	43114*.....	TBD	A
Nitrofurazone.....	59-87-0.....	TBD	A
1-(5-Nitrofurfurylidene)amino)-2-imidazolidinone.....	555-84-9.....	TBD	A
Nitrogen mustard N-oxide.....	126-85-2.....	TBD	A
Nitrogen mustard n-oxide hydro-chloride.....	302-70-5.....	TBD	A
Nitrogen trifluoride.....	7783-54-2.....((99.9))	97	B

COMPOUND NAME	CAS CODE	ASIL $\mu\text{g}/\text{m}^3$	TYPE
Nitroglycerin.....	55-63-0.....	((1.7)) 1.5	B
((4-Nitrophenol.....	100-02-7.....	TBD	(D))
Nitromethane.....	75-52-5.....	((832.5)) 830	B
4-Nitrophenol.....	100-02-7.....	TBD	B
1-Nitropropane.....	108-03-2.....	((299.7)) 20	B
2-Nitropropane.....	79-46-9.....	((116.1)) 0.00037	((C)) A
N-Nitrosodichethylamine ((Diethyl nitrosoamine)) dichethylnitrosoamine (DEN).....	55-18-5.....	((TBD)) 0.000023	A
N-Nitrosodimethylamine.....	62-75-9.....	((TBD)) 0.000071	A
N-Nitrosodi-n-butylamine.....	924-16-3.....	((TBD)) 0.00063	A
N-Nitrosodi-n-propylamine.....	621-64-(7) 1.....	TBD	A
N-Nitrosodiphenylamine.....	86-30-6.....	TBD	A
N-Nitrosomethylcethylamine.....	10595-95-6.....	TBD	A
N-Nitrosomorpholine.....	59-89-2.....	TBD	A
N-Nitroso-n-cethylurca (NEU).....	759-73-9.....	TBD	A
N-Nitroso-N-methylurca (NMU).....	684-93-5.....	TBD	((D)) B
N-Nitroso-n-methylurcthane.....	615-53-2.....	TBD	A
Nitrotoluene.....	88-72-2.....	((36.6)) 37	B
N-(4-(5-Nitro-2-furyl)-2-thiazolyl)acetamide.....	531-82-8.....	TBD	A
Nonane.....	111-84-2.....	((3496.5)) 3500	B
Octachloronaphthalene.....	2234-13-1.....	((0.3)) 0.33	B
Octane.....	111-65-9.....	((4828.5)) 4700	B
Oil mist, mineral.....	8012-95-1.....	((16.7)) 17	B
Oil orange SS.....	2646-17-5.....	TBD	A
Osmium tetroxide as Os.....	20816-12-0.....	((0.007)) 0.0053	B
Oxalic acid.....	144-62-7.....	3.3	B
Oxygen difluoride.....	7783-41-7.....	((0.3)) 0.37	B
Panfuran S (dihydroxymethyl-furatrizine).....	794-93-4.....	TBD	A
Parafin wax fumes.....	8002-74-2.....	6.7	B
Paraquat.....	4685-14-7.....	((0.3)) 4.5	B
Parathion.....	56-38-2.....	((0.3)) 0.33	B
Pentaborane.....	19624-22-7.....	((0.03)) 0.043	B
Pentachloronaphthalene.....	1321-64-8.....	1.7	B
Pentachloronitrobenzene ((Q)quintobenzene).....	82-68-8.....	((TBD)) 1.7	((D)) B
Pentachlorophenol.....	87-86-5.....	((1.7)) 0.33	((B)) A
Pentane.....	109-66-0.....	((5994.0)) 6000	B
Perchloroethylene (Tetrachloroethylene).....	127-18-4.....	1.1	A
Perchloromethyl mercaptan.....	594-42-3.....	((2.7)) 2.5	B
Perchloryl fluoride.....	7616-94-6.....	((46.6)) 43	B
Phenol.....	108-95-2.....	((63.3)) 63	B
Phenothiazine.....	92-84-2.....	((16.7)) 1.7	B
Phenoxybenzamine hydrochloride.....	63-92-3.....	TBD	A
Phenyl ether.....	101-84-8.....	((23.3)) 23	B
Phenyl glycidyl ether.....	122-60-1.....	((20.0)) 2000	B
Phenyl mercaptan.....	108-98-5.....	((6.7)) 7.7	B
p-Phenylenediamine.....	106-50-3.....	((0.3)) 0.33	B
Phenylhydrazine.....	100-63-0.....	((66.6)) 1.5	B
Phenylphosphine.....	638-21-1.....	((0.8)) 0.77	B
N-Phenyl-2-naphthylamine.....	135-88-6.....	TBD	A
Phorate.....	298-02-2.....	((0.2)) 0.17	B
Phosgene.....	75-44-5.....	1.3	B
Phosphine.....	7803-51-2.....	1.3	B
Phosphoric acid.....	7664-38-2.....	3.3	B
Phosphorus.....	7723-14-0.....	((0.3)) 0.33	B
Phosphorus oxychloride.....	10025-87-3.....	((2.0)) 2.1	B
Phosphorus pentachloride.....	10026-13-8.....	((3.3)) 2.8	B
Phosphorus pentasulfide.....	1314-80-3.....	3.3	B
Phosphorus trichloride.....	7719-12-2.....	((5.0)) 3.7	B
Phthalic anhydride.....	85-44-9.....	((20.0)) 20	B
m-Phthalodinitrile.....	626-17-5.....	((16.7)) 17	B
Picloram.....	1918-02-1.....	((33.3)) 33	B
Picric acid.....	88-89-1.....	((0.3)) 0.33	B
Pindone.....	83-26-1.....	((0.3)) 0.033	B

PROPOSED



PROPOSED

COMPOUND NAME	CAS CODE	ASIL $\mu\text{g}/\text{m}^3$	TYPE
Piperazine dihydrochloride	142-64-3	((16.7)) 17	B
((Platinum	7440-06-4)		
((Metals		3.3	(B))
((Soluble salts as Pt		0.007	(B))
Platinum, metals	7440-06-4	3.3	B
Platinum, soluble salts as Pt	7440-06-4	0.0067	B
Polyaromatic ((H))hydrocarbons (PAH)	43116*	((0.0006)) 0.00048	A
Polychlorinated Biphenyls (PCB(s))	1336-36-3	((TBD)) 0.0045	A
Polycyclic Organic Matter	43108*	TBD	((D)) A
Ponccau MX	3761-53-3	TBD	A
Potassium hydroxide	1310-58-3	6.7	B
Primary Aluminum Smelter uncontrolled roof vent PAH emissions	81113*	0.0013	A
1,3-Propane sultone	1120-71-4	TBD	((D)) A
Propargyl alcohol	107-19-7	((6.7)) 7.7	B
((beta)) $\beta$ -Propiolactone	57-57-8	5.0	B
((Propoxur (Baygon)	114-26-1	1.7	(B))
Propionaldehyde	123-38-6	TBD	((D)) B
Propoxur	114-26-1	1.7	B
Propionic acid	79-09-4	((99.9)) 100	B
n-Propyl acetate	109-60-4	((2797.2)) 2800	B
n-Propyl alcohol	71-23-8	((1665.0)) 1600	B
n-Propyl nitrate	627-13-4	((349.7)) 360	B
Propylene dichloride (1,2-Dichloropropane)	78-87-5	((1165.5)) 4.0	((B)) C
Propylene glycol dinitrate	6423-43-4	((1.0)) 1.1	B
Propylene glycol mono-methyl ether	107-98-2	((1198.9)) 2000	B
Propylene oxide	75-56-9	((TBD)) 0.27	((D)) A
1,2-Propylene imine (2-Methyl aziridine)	75-55-8	((16.7)) 16	B
Pyrethrum	8003-34-7	((16.7)) 1.7	B
Pyridine	110-86-1	((50.0)) 53	B
Quinoline	91-22-5	TBD	((D)) B
Quinone(1,4-Cyclohexadienedione)	106-51-4	((1.3)) 1.5	B
Quintobenzene (Pentachloronitrobenzene)	82-68-8	((TBD)) 1.7	((D)) B
Radionuclides (including radon)	81105*		
Resorcinol	108-46-3	((149.9)) 150	B
((Rhodium	7440-16-6)		
((Metal		3.3	(B))
((Insoluble compounds		3.3	(B))
((Soluble compounds		0.03	(B))
Rhodium, insoluble compounds	7440-16-6	3.3	B
Rhodium, metals	7440-16-6	3.3	B
Rhodium, soluble compounds	7440-16-6	0.033	B
Ronnel	299-84-3	((33.3)) 33	B
Rotenone	83-79-4	((16.7)) 17	B
Rubber solvent (Naphtha)	((8030-30-6)) 43102*	((5328.0)) 5300	B
Selenium compounds, as Se	7782-49-2	((0.7)) 0.67	B
Selenium hexafluoride, as Se	7783-79-1	((0.7)) 0.53	B
Sesone	136-78-7	((33.3)) 33	B
Silicon tetrahydride	7803-62-5	((23.3)) 22	B
((Silver	7440-22-4)		
((Metal		0.3	(B))
((Soluble compounds, as Ag		0.03	(B))
Silver, metals	7440-22-4	0.33	B
Silver, soluble compounds, as Ag	7440-22-4	0.033	B
Sodium azide	26628-22-8	1.0	B
Sodium bisulfite	7631-90-5	((16.7)) 17	B
Sodium fluoroacetate	62-74-8	((0.2)) 0.17	B
Sodium hydroxide	1310-73-2	6.7	B
Sodium metabisulfite	7681-57-4	((16.7)) 17	B
Stibine	7803-52-3	1.7	B
Strychnine	57-24-9	0.5	B
Styrene	100-42-5	((716.0)) 1000	B



COMPOUND NAME	CAS CODE	ASIL $\mu\text{g}/\text{m}^3$	TYPE
Styrene oxide	96-09-3	TBD	((D)) B
Subtilisins	1395-21-7	0.0002	B
Sulfotep	3689-24-5	((0.7)) 0.67	B
Sulfur hexafluoride	2551-62-4 ((19980.0))	20000	B
Sulfur monochloride	10025-67-9	((20.0)) 18	B
Sulfur pentafluoride	5714-22-7	((0.3)) 0.33	B
Sulfur tetrafluoride	7783-60-0	((1.3)) 1.5	B
Sulfuric acid	7664-93-9	3.3	B
Sulfuryl fluoride	2699-79-8	((66.6)) 67	B
Sulprofos	35400-43-2	3.3	B
2,4,5-T	93-76-5	((33.3)) 33	B
TEPP	107-49-3	((0.2)) 0.16	B
Tantalum, metals & oxide dusts	7440-25-7	((16.7)) 17	B
Tellurium & compounds as Te	13494-80-9	((0.3)) 0.33	B
Tellurium hexafluoride, as Te	7783-80-4	((0.7)) 0.33	B
Temephos	3383-96-8	((33.3)) 33	B
Terphenyls	26140-60-3	((16.7)) 16	B
P(p)((alpha, alpha, alpha) $\alpha\alpha\alpha$ ) Tetra-chlorotoluene	5216-25-1	TBD	A
2,3,7,8-Tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD)	1746-01-6	0.00000003	A
1,1,2,2-Tetrachloro-1,2-difluoroethane	76-12-0 ((13886.1))	14000	B
1,1,((2))1,2-Tetrachloro-2,2-difluoroethane	76-11-9 ((13886.1))	14000	B
1,1,2,2-Tetrachloroethane	79-34-5	((23.3)) 23	B
Tetrachloroethylene (Perchloroethylene)	127-18-4	1.1	A
Tetrachloronaphthalene	1335-88-2	6.7	B
Tetraethyl lead, as Pb	78-00-2	((0.3)) 0.33	B
Tetrahydrofuran	109-99-9 ((1964.7))	2000	B
Tetramethyl lead, as Pb	75-74-1	0.5	B
Tetramethyl succinonitrile	3333-52-6	((10.0)) 9.3	B
Tetranitromethane	509-14-8	((26.6)) 27	B
Tetrasodium pyrophosphate	7722-88-5	((16.7)) 17	B
Tetryl	479-45-8	5.0	B
Thallium, soluble compounds, ((F)) Tl	7440-28-0	((0.3)) 0.33	B
4,4-Thiobis(6-tert, butyl-m-cresol)	96-69-5	((33.3)) 33	B
4,4'-Thiodianiline	139-65-1	TBD	A
Thioglycolic acid	68-11-1	((13.3)) 13	B
Thionyl chloride	7719-09-7	((16.7)) 16	B
Thiuram	137-26-8	((16.7)) 3.3	B
Thorium dioxide	1314-20-1	TBD	A
((Fin	7440-31-5)		
((Metal		6.7	B))
((Organic compounds, as Sn		0.3	B))
((Oxide & inorganic except SnH <sub>4</sub>		6.7	B))
Tin, metals	7440-31-5	6.7	B
Tin, organic compounds, as Sn	7440-31-5	0.33	B
Tin, oxide & inorganic except SnH <sub>4</sub>	7440-31-5	6.7	B
Titanium tetrachloride	7550-45-0	TBD	((D)) B
Toluene	108-88-3	((1248.8)) 400	B
2,4-Toluene diamine (2,4-Diamino toluene)	95-80-7	((FBD)) 0.011	((D)) A
2,4-Toluene diisocyanate (TDI)	584-84-9	((0.1)) 0.12	((B)) C
m-Toluidine	108-44-1	((30.0)) 29	B
o-Toluidine ((and its hydrochlorides))	95-53-4	((30.0)) 0.14	((C)) A
o-Toluidine hydrochloride	636-21-5	0.14	A
p-Toluidine	106-49-0	((30.0)) 29	B
Toxaphene (Chlorinated camphene)	8001-35-2	((0.003)) 0.0031	A
((Toxaphene (Chlorinated camphene)	8001-35-2	1.7	B))
Trans-2((Dimethylamino)methylimino)-5-(2-(5-nitro-2-furyl)) vinyl-1,3,4-oxadiazole	55738-54-0	TBD	A
Tributyl phosphate	126-73-8	((8.3)) 7.3	B
1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1 ((25308.0))	27000	B
Trichloroacetic acid	76-03-9	((23.3)) 22	B
1,2,4-Trichlorobenzene	120-82-1	((133.2)) 120	B
1,1,1-Trichloroethane (Methyl chloroform)	71-55-6	((6327.0)) 6400	B
1,1,2-Trichloroethane	79-00-5	((149.9)) 180	B
Trichloroethylene	79-01-6	((0.8)) 0.59	A

PROPOSED

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COMPOUND NAME	CAS CODE	ASIL $\mu\text{g}/\text{m}^3$	TYPE
Trichlorofluoromethane	75-69-4..((18648.0))	19000	B
Trichloronaphthalene	1321-65-9.....((16.7))	17	B
((Trichlorophenol (mixed))	25167-82-2.....	0.18	A))
2,4,5-Trichlorophenol	95-95-4.....	TBD	B
2,4,6-Trichlorophenol	88-06-2.....	0.32	A
1,2,3-Trichloropropane	96-18-4.....((199.8))	200	B
Trichethylamine	121-44-8.....((133.2))	7.0	B
Trifluorobromomethane	75-63-8..((20313.0))	20000	B
Trifluralin	1582-09-8.....	TBD	((D)) B
Trimellitic anhydride	552-30-7.....((0.4))	0.13	B
Trimethyl benzene	((25551))2551-13-7.....((416.3))	420	B
Trimethyl phosphite	121-45-9.....((33.3))	33	B
Trimethylamine	75-50-3.....((79.9))	80	B
2,2,4-Trimethylpentane	540-84-1.....	TBD	((D)) B
2,4,6-Trinitrotoluene	118-96-7.....	1.7	B
Triorthocresyl phosphate	78-30-8.....((0.3))	0.33	B
Triphenyl amine	603-34-9.....((16.7))	17	B
Triphenyl phosphate	115-86-6.....((10.0))	10	B
Tungsten, insoluble compounds	7440-33-7.....((16.7))	17	B
Tungsten, soluble compounds	7440-33-7.....	3.3	B
Turpentine	8006-64-2..((1864.8))	1900	B
Uranium, insoluble & soluble	7440-61-1.....((0.7))	0.67	B
Urthan((o-monomer)) (Ethyl carbamate)	51-79-6.....	TBD	((D)) B
VM & P Naphtha	8032-32-4.....((4495.5))	4600	B
n-Valeraldehyde	110-62-3.....((582.8))	590	B
Vanadium, as V <sub>2</sub> O <sub>5</sub>	1314-62-1.....((0.2))	0.17	B
Vinyl acetate	108-05-4.....((99.9))	200	B
Vinyl bromide	593-60-2.....((66.6))	73	B
Vinyl chloride	75-01-4.....((0.023))	0.012	A
Vinyl cyclohexene dioxide	106-87-6.....((199.8))	200	B
Vinyl toluene	25013-15-4.....((799.2))	800	B
Vinylidene ((C))chloride (1,1-Dichloroethylene)	75-35-4.....((66.6))	67	B
Warfarin	81-81-2.....((0.3))	0.33	B
Welding fumes	81108*.....((16.7))	17	B
m-Xylene a,a'-diamine	1477-55-0.....((0.3))	0.33	B
Xylenes (m-,o-,p-isomers)	1330-20-7.....((1448.6))	1500	B
((m-Xylenes	108-38-3))		
((o-Xylenes	95-47-6))		
((p-Xylene	106-42-3))		
Xylidine	1300-73-8.....((33.3))	8.3	B
Yttrium, metals and ((eps)) compounds as Y	7440-65-5.....	3.3	B
Zinc chloride fumes	7646-85-7.....	3.3	B
Zinc chromates	13530-65-9.....((0.03))	0.033	B
Zinc oxide, fumes	1314-13-2.....((16.7))	17	B
Zirconium compounds, as Zr	7440-67-7.....((16.7))	17	B

Type A toxics are carcinogens. The averaging time for Type A ASILs is an annual arithmetic mean.

Type B toxics are noncarcinogens. The averaging time for Type B ASILs is a 24-hour arithmetic mean.

Type C toxics are carcinogens. The averaging time for Type C ASILs is a 24-hour arithmetic mean.

((Type D toxics are listed in the federal Clean Air Act, but not included in WAC 173-460-150 and WAC 173-460-160.))

TBD = To Be Determined

\* PSAPCA assigned numbers

**WSR 94-15-072**  
**PROPOSED RULES**  
**SECRETARY OF STATE**

(Division of Archives and Records Management)  
 [Filed July 19, 1994, 11:41 a.m.]

Date of Intended Adoption: September 14, 1994.  
 July 19, 1994  
 Sidney F. McAlpin  
 State Archivist

**Original Notice.**

Title of Rule: WAC 434-615-030 Transfer and preservation of public records.

Purpose: To insure that state records appraised as being of historical value are properly preserved by transfer to the state archives within fifty years of their creation. Insures historical records of local agencies are properly preserved by transfer to the state archives or stored locally in conditions that meet archival standards.

Statutory Authority for Adoption: RCW 40.14.020.

Statute Being Implemented: RCW 40.14.070.

Summary: Requires proper storage for local government historical records otherwise scheduled for transfer to the state archives. Requires that historical records of state government are transferred to the state archives for preservation and access.

Reasons Supporting Proposal: Presently many historical records are endangered by poor storage conditions. Left unprotected, they will continue to deteriorate. This rule establishes policy for the preservation of historical records under archival conditions.

Name of Agency Personnel Responsible for Drafting: Sid McAlpin, 1120 Washington Street S.E., (206) 753-5485; Implementation and Enforcement: David Owens, 1120 Washington Street S.E., (206) 753-5485.

Name of Proponent: Washington State Division of Archives, Office of Secretary of State, governmental.

Rule is not necessitated by federal law, federal or state court decision.

Explanation of Rule, its Purpose, and Anticipated Effects: Requires historical records of state government to be transferred to the state archives for proper care and preservation within fifty years of their creation to reduce deterioration and provide access to the public. Requires local government to provide proper care of historical records not transferred to the state archives. Will reduce losses of historical records due to deterioration through improper storage.

Proposal Changes the Following Existing Rules: Adds language which requires proper storage of historically valuable local government records. Requires storage under standards issued by the state archivist. Adds language requiring state government records to be transferred to the custody of the state archivist within fifty years of creation.

Has a Small Business Economic Impact Statement Been Prepared Under Chapter 19.85 RCW? No. Affects only public agencies, not private business.

Hearing Location: State Archives Building, 1120 Washington Street S.E., Olympia, WA, on September 9, 1994, at 9:00 a.m.

Assistance for Persons with Disabilities: Contact David Owens by September 5, 1994, (206) 753-5485.

Submit Written Comments to: David Owens, 1120 Washington Street S.E., P.O. Box 40238, Olympia, WA 98504-0238, FAX (206) 664-8814, by September 1, 1994.

**AMENDATORY SECTION** (Amending WSR 93-04-001, filed 1/21/93, effective 2/21/93)

**WAC 434-615-030 Authority to transfer records.** ~~((In lieu of office retention,))~~ All state agency records not required in the current operation of the office where they are made or kept, and all records of every state agency, commission, committee, or any other activity of state or local government which may be abolished or discontinued, shall be transferred to the state archives ~~((and records center until eligible for disposition))~~ in accord with approved records retention schedules.

State records designated by the state archivist as being archival or potentially archival shall be transferred to the legal and physical custody of the state archives ~~((or to a repository designated by the state archivist))~~ so that the valuable historical records of the state may be centralized, made more widely available for research, and insured permanent preservation.

Transfer of archival records to the state archives must take place within fifty years of the creation of the records so that they may be preserved for posterity in archival-quality conditions. Records which the state is required to keep permanently will be maintained intact by the state archivist, who will assume all responsibility for the access, care and preservation of such records.

Local government agency records designated by the state archivist as of primarily historical interest may be transferred to the state archives, or one of its designated regional depositories, in order to relieve local offices of the burden of housing them, to insure their preservation, and to make them available for reference or study. Officials of local agencies are authorized to transfer records in their custody which are no longer in current use to the Washington state archives. The state archives is not under obligation to acquire such records and will accept only records deemed valuable as a historical source. Any transfer must be by concurrent agreement, excepting wherein records are selected for preservation as historical sources from records retention schedules submitted to the local records committee for disposition authorization.

Records designated as archival on records retention schedules must be either transferred to the state archives system or retained by the originating agency in accord with standards for the maintenance of and access to archival records issued by the state archivist.

**WSR 94-15-073**  
**PROPOSED RULES**  
**DEPARTMENT OF ECOLOGY**

[Filed July 19, 1994, 12:22 p.m.]

Continuance of WSR 94-14-085.

Title of Rule: Chapter 173-563 WAC, Instream resources protection program for the main stem Columbia

River in Washington state; and chapter 173-564 WAC, Instream resources protection program for the main stem Snake River in Washington state.

Purpose: To add hearing dates.

Hearing Location: Mid-Columbia Public Library, 1320 West Hopkins, Pasco, on August 23, 1994, at 7:30 p.m.; at the Delany Building, 111 South Third, Dayton, on August 24, 1994, at 12:00 noon; at the City Hall, Council Chambers, 80 Seventh Street, Pomeroy, on August 24, 1994, at 7:30 p.m.; at the City Hall, Youth Center, S.E. 325 Paradise, Pullman, on August 25, 1994, at 12:00 noon; at the Asotin County Library, 417 Sycamore, Clarkston, on August 25, 1994, at 7:30 p.m.; at the Public Library, 238 East Alder, Walla Walla, on August 26, 1994, at 12:00 noon; at the City Hall, Commission Chambers, 129 South Chelan, Wenatchee, on August 29, 1994, at 7:30 p.m.; at the Hal Holmes Community Center, Second and Ruby Streets, Ellensburg, on August 30, 1994, at 12:00 noon; at the Yakima Valley Regional Library Auditorium, 102 North 3rd Street, Yakima, on August 30, 1994, at 6:30 p.m.; at the Public Library Conference Room, 955 Northgate, Richland, on August 31, 1994, at 12:00 noon; at the Community Library, Complan Room, 131 West Burgen, Goldendale, on August 31, 1994, at 7:30 p.m.; and at the Skamania County P.U.D., Milepost 1.55 R, Wind River Highway, on September 1, 1994, at 12:00 noon.

Assistance for Persons with Disabilities: Contact Thom Lufkin by July 29, 1994, TDD (206) 407-6006, or (206) 407-6631.

Date of Intended Adoption: October 5, 1994.

July 18, 1994  
Mary Riveland  
Director

**WSR 94-15-086**  
**PROPOSED RULES**  
**YAKIMA COUNTY**  
**CLEAN AIR AUTHORITY**  
[Filed July 20, 1994, 9:50 a.m.]

Original Notice.

Title of Rule: Amendments to Sections 2.01, 12.01, 12.02, 6.01, and 6.09 and the repeal of Sections 6.02 through 6.08 of Restated Regulation I of the Yakima County Clean Air Authority.

Purpose: Clarify Sections 2.01, 12.01, and 12.02 and clarify the requirements (through repeal of Sections 6.02 through 6.08) of Air Operating Permit program as outlined in Article VI of Restated Regulation I.

Statutory Authority for Adoption: Chapter 70.94 RCW.

Statute Being Implemented: Chapter 70.94 RCW.

Summary: Amendment to Section 2.01 deletes the word "knowingly." Amendments to Sections 12.01 and 12.02 clarify that the state and federal regulations (adopted by reference in 12.01 and 12.02 respectively) supersede the Restate Regulation I, except that under Section 12.01, the Restated Regulation I supersedes the state regulation where it is more stringent.

Reasons Supporting Proposal: Clarification of Restated Regulation I in sections as noted above.

Name of Agency Personnel Responsible for Drafting: Robert Godwin; Implementation and Enforcement: Tom T. Silva.

Name of Proponent: Yakima County Clean Air Authority, governmental.

Rule is not necessitated by federal law, federal or state court decision.

Explanation of Rule, its Purpose, and Anticipated Effects: The amendments to Sections 2.01, 12.01, 12.03, 6.01, and 6.09 are as follows: 2.01, the word "knowingly" is deleted in both places where it occurs. The causing or permitting of air pollution is unlawful whether the person causing or permitting it knew they were doing so; 12.01, the wording has been changed from "Except as the same may be inconsistent" to "except as the same may be less stringent." As a result, those state regulations adopted by reference in this section will supersede the Restated Regulation I where there is any inconsistency, except where the Restated Regulation I is more stringent; 12.02, the wording "Except as the same may be inconsistent with the provisions of this regulation of the Yakima County Clean Air Authority as now adopted or hereafter amended" has been deleted. As a result, those federal regulations adopted by reference in this section will supersede the Restated Regulation I where there is any inconsistency; 6.01, the wording "section 6.02" is deleted and replaced with "Chapter 173-401-300 WAC"; 6.09, numbering of section is changed from 6.09 to 6.02 to reflect deletion of previous seven sections; and the repeal of Sections 6.02, 6.03, 6.04, 6.05, 6.06, 6.07, and 6.08 will eliminate any ambiguity between the requirements of the Air Operating Permit program as currently summarized in those sections and the requirements of the program as detailed in chapter 173-401 WAC. This chapter of the WAC is currently adopted by reference in Section 12.01 of the Restated Regulation I.

Proposal Changes the Following Existing Rules: See above.

Has a Small Business Economic Impact Statement been Prepared Under Chapter 19.85 RCW? No. The Yakima County Clean Air Authority is not subject to RCW 34.05.320 (1)(k) of the Administrative Procedure Act.

Hearing Location: Yakima County Courthouse, 128 North 2nd Street, Room 420, Yakima, WA, on September 14, 1994, at 2:30 p.m.

Assistance for Persons with Disabilities: Contact Tom Silva, Director APCO, (509) 575-4116, ext. 11.

Submit Written Comments to: Robert Godwin, Yakima County Clean Air Authority, County Courthouse, Yakima, Washington 98901, FAX (509) 454-6954, by August 31, 1994.

Date of Intended Adoption: September 14, 1994.

July 18, 1994

Tom T. Silva, Director  
Air Pollution Control Officer

## ARTICLE VI

### OPERATING PERMITS

#### SECTION 6.01 - POLICY

The Yakima County Clean Air Authority shall administer an air operating permit program upon approval of its delegation request, pursuant to Chapter 173-401 WAC.

Under this program any air contaminant source subject to section 6.02 Chapter 173-401-300 WAC shall be required to have an air operating permit.

#### ~~SECTION 6.02 - APPLICABILITY~~

~~Operating permits shall be required for all sources where:~~

~~A. Required by the Federal Clean Air Act, and~~

~~B. For any source that may cause or contribute to air pollution in such quantity as to create a threat to public health and welfare. This subsection shall not apply to small businesses except when both of the following limitations are satisfied:~~

- ~~1. That source is in an area exceeding or threatening to exceed federal or state air quality standards, and~~
- ~~2. The Authority provides reasonable justification that requiring a source to have a permit is necessary in order to meet federal or state air quality standards.~~

#### ~~SECTION 6.03 - PROGRAM DELEGATION~~

~~The delegation order authorizing the Yakima County Clean Air Authority to administer its Air Operating Permit Program shall become effective ninety (90) days after approval by the United States Environmental Protection Agency (EPA).~~

#### ~~SECTION 6.04 - PERMIT APPLICATION~~

~~Within one hundred eighty (180) days after EPA approval of the Authority's permitting program any source required to have a permit shall submit to the Authority a compliance plan and a permit application, signed by a responsible official, certifying the accuracy of the information submitted. Until permits are issued, existing sources shall be allowed to operate under presently applicable standards and conditions provided such sources submit complete and timely permit applications.~~

~~New Sources which commence operation after EPA approval of the Authority's permitting program and which are required to have a permit shall file a complete permit application within twelve (12) months after commencing operation.~~

~~Unless the Authority determines that an application is not complete within sixty (60) days of receipt of the application, such application shall be deemed to be complete.~~

#### ~~SECTION 6.05 - PERMIT CONTENT~~

~~Each air operating permit shall state the origin of and the specific legal authority for each requirement included therein. Every requirement in an operating permit shall be based upon the most stringent of the following requirements:~~

- ~~A. The Federal Clean Air Act and rules implementing that act, including provisions of the approved SIP; and~~
- ~~B. Chapter 70.94 RCW and Chapter 173-401 WAC; and~~
- ~~C. The requirements of any order or regulation adopted by the Authority; and~~
- ~~D. Chapter 70.98 RCW and rules adopted thereunder; and~~
- ~~E. Chapter 80.50 RCW and rules adopted thereunder.~~

~~The Authority shall issue permits for a fixed term of five years.~~

#### ~~SECTION 6.06 - PERMIT ISSUANCE, RENEWAL, REOPENINGS, AND REVISIONS~~

~~A proposed permit must be reviewed prior to issuance by a professional engineer or staff under the direct supervision of a professional engineer in the employ of the Yakima County Clean Air Authority or the Department of Ecology.~~

~~The Authority shall take final action on each permit application within eighteen months of receiving a complete application except during a transition period (not to exceed three years) that will begin the effective date of the permit program. During the transition period the Authority shall take final action on at least one-third of all operating permit applications annually.~~

~~A source shall submit an application for permit renewal no later than six (6) months prior to the expiration date of the permit.~~

~~A permit may be modified or amended during its term at the request of the permittee, or for any reason allowed by the Federal Clean Air Act.~~

#### ~~SECTION 6.07 - PUBLIC INVOLVEMENT~~

~~All proposed permits shall be subject to public notice and comment. The Authority shall respond to comments received from interested parties prior to the time that the proposed permit is submitted to the EPA for review pursuant to section 505(a) of the Federal Clean Air Act. In the event that the EPA objects to a proposed permit pursuant to section 505(b) of the Federal Clean Air Act, the Authority shall not issue the permit, unless the permittee consents to the changes required by the EPA.~~

#### ~~SECTION 6.08 - VIOLATION~~

~~After the effective date of the permit program, it shall be unlawful for any person to operate a permitted source in violation of any requirement of a permit issued under this article or fail to submit a permit application as outlined in Section 6.04.~~

#### ~~SECTION 6.09 6.02 - FEE ASSESSMENT~~

~~Pursuant to RCW 70.94.161(14), the Authority shall allocate its fiscal 1994 air operating permit program development costs among the sources under its jurisdiction emitting one hundred tons or more per year of a regulated pollutant during calendar year 1992 and shall collect interim fees from these sources. Interim air operating permit fees collected by the Authority on behalf of the Department of Ecology shall be remitted to the Department by March 1, 1994.~~

~~Pursuant to RCW 70.94, (Bill 1089), the Authority shall determine, assess, and collect annual fees sufficient to cover the Authority's direct and indirect costs of implementing its air operating permit program.~~

~~Upon receiving delegation authority per Section 6.03 of this article, air operating permit fees collected by the Authority on behalf of the Department of Ecology shall be collected from each source in two equal payments and shall be remitted to the Department by March 1 and June 30, respectively, of each year.~~

~~All air operating permit fees collected by the Authority on its own behalf shall be deposited into an air operating permit account dedicated exclusively to the support of its Air Operating Permit Program. The payment schedule for all air~~

operating permit fees collected by the Authority on its own behalf shall be four equal payments with each payment due at the beginning of the respective fiscal quarter. The fiscal year for the Authority begins July First.

All air operating permit fees collected by the Authority on behalf of itself shall be calculated according to Article XIII, Section 13.05 of this regulation.

## ARTICLE XII

### ADOPTION OF STATE AND FEDERAL REGULATIONS

#### SECTION 12.01 - STATE REGULATIONS

~~Except as the same may be inconsistent with the provisions of this Regulation of the Yakima County Clean Air Authority as now adopted or hereafter amended, t~~The Yakima County Clean Air Authority ~~does~~ hereby adopts by reference and incorporates herein, as if specifically set forth herein, all of the terms and provisions of the Washington State Administrative Code as identified below, except as the same may be less stringent than the provisions of this Regulation of the Yakima County Clean Air Authority:

WAC 173-400	General Regulations for Air Pollution Sources;
WAC 173-401	Operating Permit Regulation;
WAC 173-425	Open Burning;
WAC 173-430	Burning of Field and Turf Grasses Grown for Seed;
WAC 173-433	Solid Fuel Burning Device Standards;
WAC 173-434	Solid Waste Incineration Facilities;
WAC 173-435	Emergency Episode Plans;
WAC 173-470	Suspended Particulate (Ambient Standards);
WAC 173-474	Sulphur Oxide Standards;
WAC 173-475	Photochemical Oxidant, Hydrocarbons, Nitrogen Dioxide (Ambient Standards);
WAC 173-460	Controls for New Sources of Toxic Air Pollutants;
WAC 173-490	Emission Standards and Controls for Sources Emitting Volatile Organic Compounds (VOC);
WAC 173-491	Emission Standards and Controls for Sources Emitting Gasoline Vapors.

#### SECTION 12.02 - FEDERAL REGULATIONS

~~Except as the same may be inconsistent with the provisions of this Regulation of the Yakima County Clean Air Authority as now adopted or hereafter amended, t~~The Yakima County Clean Air Authority ~~does~~ hereby adopts by reference and incorporates herein, as if specifically set forth herein, all of the terms and provisions of the Code of Federal Regulations as identified below:

Title 40 CFR Part 60, New Source Performance Standards (NSPS);

Title 40 CFR Part 61, National Emissions Standards for Hazardous Air Pollutants (NESHAPS).

#### SECTION 2.01 - CAUSING OR PERMITTING AIR POLLUTION UNLAWFUL—EXCEPTION

Except where specified in a variance permit, as provided herein, it shall be unlawful for any person ~~knowingly~~ to cause air pollution or ~~knowingly~~ permit it to be caused in violation of these rules and Regulations.

Reviser's note: The spelling errors in the above section occurred in the copy filed by the agency and appear in the Register pursuant to the requirements of RCW 34.08.040.

Reviser's note: The typographical errors in the above section occurred in the copy filed by the agency and appear in the Register pursuant to the requirements of RCW 34.08.040.

**WSR 94-15-094**  
**PROPOSED RULES**  
**DEPARTMENT OF**  
**LABOR AND INDUSTRIES**  
[Filed July 20, 1994, 10:26 a.m.]

Original Notice.

Title of Rule: See Purpose below.

Purpose: Chapter 296-62 WAC, General occupational health standards and chapter 296-155 WAC, Safety standards for construction work, state-initiated proposed amendments to chapters 296-62 and 296-155 WAC are made to add requirements addressing medical surveillance, medical removal protection, and employer response to results of medical monitoring. The proposed amendment would establish the requirement that all lead-exposed workers performing specified tasks would receive biological monitoring, in the form of blood lead sampling and analysis, until the absence of a lead-exposure problem was documented. In addition, the proposed amendments would require employers take corrective action if necessary in response to the results of medical surveillance. The proposed amendments provide that the medical removal protection requirements would be updated in a phased-in manner to be consistent with current scientific knowledge. Beginning in the second year of the requirement, the level for medical removal protection be lowered by 5 µg/dl each year through the fifth year of the standard. In the fifth year and thereafter, the level for medical removal protection would be 30 µg/dl; and chapter 296-62 WAC, General occupational health standards, in addition to the state-initiated changes to chapter 296-62 WAC indicated above, proposed amendments are made to delete references to expired standard effective dates, to change the agency authorized to approve labs from the CDC to OSHA, to update WAC references, to correct references to specific gender, and to correct spelling. Other wording changes are made for clarification.

Statutory Authority for Adoption: Chapter 49.17 RCW.

Statute Being Implemented: RCW 49.17.040, [49.17].050, [49.17].060.

Summary: See Purpose above.

Name of Agency Personnel Responsible for Drafting: Marcia Holt, 7273 Linderson Way, Tumwater, WA, (206) 956-5530; Implementation and Enforcement: Suzanne Mager, 7273 Linderson Way, Tumwater, WA, (206) 956-5495.

Name of Proponent: Department of Labor and Industries, governmental.

Rule is not necessitated by federal law, federal or state court decision.

Explanation of Rule, its Purpose, and Anticipated Effects: See Purpose above.

Proposal Changes the Following Existing Rules: See Purpose above.

Has a Small Business Economic Impact Statement Been Prepared Under Chapter 19.85 RCW? Yes. A copy of the statement may be obtained by writing to: Department of Labor and Industries, Division of Consultation and Compliance, P.O. Box 44620, Olympia, WA 98504-4620, phone (206) 956-4615, or FAX (206) 956-5529.

Hearing Location: Department of Labor and Industries Building, Auditorium, 7273 Linderson Way, Tumwater, WA, on August 23, 1994, at 9:30 a.m.

Assistance for Persons with Disabilities: Contact Linda Dausener by August 10, 1994, TDD (206) 956-4615, or (206) 956-5527.

Submit Written Comments to: Suzanne L. Mager, Assistant Director, Division of Consultation and Compliance, P.O. Box 44620, Olympia, WA 98507-4620, by August 30, 1994. In addition to written comments, the department will accept comments submitted to the following voice mail number and telefacsimile machine number: Voice mail (206) 956-5525; and FAX (206) 956-5529. Comments submitted by FAX must be ten pages or less.

Date of Intended Adoption: November 10, 1994.

July 20, 1994

Dorette M. Markham  
for Mark O. Brown  
Director

**AMENDATORY SECTION** (Amending Order 91-07, filed 11/22/91, effective 12/24/91)

**WAC 296-62-07521 Lead.** (1) Scope and application.

(a) This section applies to all occupational exposure to lead, except as provided in subdivision (1)(b).

(b) This section does not apply to the construction industry, chapter 296-155 WAC or to agricultural operations covered by chapter 296-306 WAC.

(2) Definitions as applicable to this part.

(a) "Action level" - employee exposure, without regard to the use of respirators, to an airborne concentration of lead of thirty micrograms per cubic meter of air (30  $\mu\text{g}/\text{m}^3$ ) averaged over an eight-hour period.

(b) "Director" - the director of the department of labor and industries.

(c) "Lead" - metallic lead, all inorganic lead compounds, and organic lead soaps. Excluded from this definition are all other organic lead compounds.

(3) General requirements.

(a) Employers will assess the hazards of lead in the work place and provide information to the employees about the hazards of the lead exposures to which they may be exposed.

(b) Information provided shall include:

(i) Exposure monitoring (including employee notification);

(ii) Written compliance programs;

(iii) Respiratory protection programs;

(iv) Personnel protective equipment and housekeeping;

(v) Medical surveillance and examinations;

(vi) Training requirements;

(vii) Recordkeeping requirements.

(4) Permissible exposure limit (PEL).

(a) The employer shall assure that no employee is exposed to lead at concentrations greater than fifty micrograms per cubic meter of air (50  $\mu\text{g}/\text{m}^3$ ) averaged over an eight-hour period.

(b) If an employee is exposed to lead for more than eight hours in any work day, the permissible exposure limit, as a time weighted average (TWA) for that day, shall be reduced according to the following formula:

$$\text{Maximum permissible limit (in } \mu\text{g}/\text{m}^3) = 400 \div \text{hours worked in the day.}$$

(c) When respirators are used to supplement engineering and work practice controls to comply with the PEL and all the requirements of subsection (7) have been met, employee exposure, for the purpose of determining whether the employer has complied with the PEL, may be considered to be at the level provided by the protection factor of the respirator for those periods the respirator is worn. Those periods may be averaged with exposure levels during periods when respirators are not worn to determine the employee's daily TWA exposure.

(5) Exposure monitoring.

(a) General.

(i) For the purposes of subsection (5), employee exposure is that exposure which would occur if the employee were not using a respirator.

(ii) With the exception of monitoring under subdivision (5)(c), the employer shall collect full shift (for at least seven continuous hours) personal samples including at least one sample for each shift for each job classification in each work area.

(iii) Full shift personal samples shall be representative of the monitored employee's regular, daily exposure to lead.

(b) Initial determination. Each employer who has a workplace or work operation covered by this standard shall determine if any employee may be exposed to lead at or above the action level.

(c) Basis of initial determination.

(i) The employer shall monitor employee exposures and shall base initial determinations on the employee exposure monitoring results and any of the following, relevant considerations:

(A) Any information, observations, or calculations which would indicate employee exposure to lead;

(B) Any previous measurements of airborne lead; and

(C) Any employee complaints of symptoms which may be attributable to exposure to lead.

(ii) Monitoring for the initial determination may be limited to a representative sample of the exposed employees who the employer reasonably believes are exposed to the greatest airborne concentrations of lead in the workplace.

(iii) Measurements of airborne lead made in the preceding twelve months may be used to satisfy the requirement to monitor under item (5)(c)(i) if the sampling and analytical methods used meet the accuracy and confidence levels of subdivision (5)(i) of this section.

(d) Positive initial determination and initial monitoring.



PROPOSED

(i) Where a determination conducted under subdivision (5)(b) and (5)(c) of this section shows the possibility of any employee exposure at or above the action level, the employer shall conduct monitoring which is representative of the exposure for each employee in the workplace who is exposed to lead.

(ii) Measurements of airborne lead made in the preceding twelve months may be used to satisfy this requirement if the sampling and analytical methods used meet the accuracy and confidence levels of subdivision (5)(i) of this section.

(e) Negative initial determination. Where a determination, conducted under subdivisions (5)(b) and (5)(c) of this section is made that no employee is exposed to airborne concentrations of lead at or above the action level, the employer shall make a written record of such determination. The record shall include at least the information specified in subdivision (5)(c) of this section and shall also include the date of determination, location within the worksite, and the name and social security number of each employee monitored.

(f) Frequency.

(i) If the initial monitoring reveals employee exposure to be below the action level the measurements need not be repeated except as otherwise provided in subdivision (5)(g) of this section.

(ii) If the initial determination or subsequent monitoring reveals employee exposure to be at or above the action level but below the permissible exposure limit the employer shall repeat monitoring in accordance with this subsection at least every six months. The employer shall continue monitoring at the required frequency until at least two consecutive measurements, taken at least seven days apart, are below the action level at which time the employer may discontinue monitoring for that employee except as otherwise provided in subdivision (5)(g) of this section.

(iii) If the initial monitoring reveals that employee exposure is above the permissible exposure limit the employer shall repeat monitoring quarterly. The employer shall continue monitoring at the required frequency until at least two consecutive measurements, taken at least seven days apart, are below the PEL but at or above the action level at which time the employer shall repeat monitoring for that employee at the frequency specified in item (5)(f)(ii), except as otherwise provided in subdivision (5)(g) of this section.

(g) Additional monitoring. Whenever there has been a production, process, control or personnel change which may result in new or additional exposure to lead, or whenever the employer has any other reason to suspect a change which may result in new or additional exposures to lead, additional monitoring in accordance with this subsection shall be conducted.

(h) Employee notification.

(i) Within five working days after the receipt of monitoring results, the employer shall notify each employee in writing of the results which represent that employee's exposure.

(ii) Whenever the results indicate that the representative employee exposure, without regard to respirators, exceeds the permissible exposure limit, the employer shall include in the written notice a statement that the permissible exposure limit was exceeded and a description of the corrective action

taken or to be taken to reduce exposure to or below the permissible exposure limit.

(i) Accuracy of measurement. The employer shall use a method of monitoring and analysis which has an accuracy (to a confidence level of ninety-five percent) of not less than plus or minus twenty percent for airborne concentrations of lead equal to or greater than 30  $\mu\text{g}/\text{m}^3$ .

(6) Methods of compliance.

(a) Engineering and work practice controls.

(i) Where any employee is exposed to lead above the permissible exposure limit for more than thirty days per year, the employer shall implement engineering and work practice controls (including administrative controls) to reduce and maintain employee exposure (~~to lead in accordance with the implementation schedule in Table I below~~) at or below 50  $\mu\text{g}/\text{m}^3$ , except to the extent that the employer can demonstrate that such controls are not feasible. Wherever the engineering and work practice controls which can be instituted are not sufficient to reduce employee exposure to or below the permissible exposure limit, the employer shall nonetheless use them to reduce exposures to the lowest feasible level and shall supplement them by the use of respiratory protection which complies with the requirements of subsection (7) of this section.

(ii) Where any employee is exposed to lead above the permissible exposure limit, but for thirty days or less per year, the employer shall implement engineering controls to reduce exposures to 200  $\mu\text{g}/\text{m}^3$ , but thereafter may implement any combination of engineering, work practice (including administrative controls), and respiratory controls to reduce and maintain employee exposure to lead to or below 50  $\mu\text{g}/\text{m}^3$ .

((TABLE I  
IMPLEMENTATION SCHEDULE

Industry <sup>†</sup>	Compliance Dates <sup>‡</sup>		
	200 $\mu\text{g}/\text{m}^3$	100 $\mu\text{g}/\text{m}^3$	50 $\mu\text{g}/\text{m}^3$
Primary lead production	( <sup>2</sup> )	<sup>2</sup> June 29, 1984	<sup>2</sup> June 29, 1991
Secondary lead production	( <sup>2</sup> )	<sup>2</sup> June 29, 1984	<sup>2</sup> June 29, 1986
Lead-acid battery manufacturing	( <sup>2</sup> )	<sup>2</sup> June 29, 1982	<sup>2</sup> June 29, 1986
Automobile manufacture/ solder grinding	( <sup>2</sup> )	N/A	<sup>2</sup> June 29, 1986
Electronics, gray iron foundries, ink manufacture, paints and coatings manufacture, wall paper manufacture, can manufacture, and printing	( <sup>2</sup> )	N/A	<sup>2</sup> June 29, 1982
Brass and bronze ingot manufacture, lead chemical manufacture, and secondary copper smelting	( <sup>2</sup> )	N/A	4 1/2 years
Nonferrous foundries	( <sup>2</sup> )	N/A	4 1/2 years
All other industries	( <sup>2</sup> )	N/A	4 1/2 years

Note: <sup>†</sup> Includes ancillary activities located on the same worksite.  
<sup>‡</sup> This date is calculated by counting, from June 29, 1981, (the date when the United States Supreme Court denied certiorari and lifted the stay on the implementation of paragraph (6)(a)), the number of years specified for the particular industry in the original lead standard for compliance with the given airborne exposure level. The denial of certiorari followed a decision of the United States Court of Appeals for the District of Columbia



~~Circuit finding compliance with paragraph (6)(e) to be feasible for the relevant industries.~~

~~<sup>3</sup> On effective date. This continues an obligation from WAC 296-62-07515 Table I which had been in effect since 1973.~~

~~<sup>4</sup> Expressed as the number of years from the date on which the court lifts the stay on the implementation of paragraph (6)(a) for the particular industry.~~

~~<sup>5</sup> Large nonferrous foundries (20 or more employees) are required to achieve 50  $\mu\text{g}/\text{m}^3$  by means of engineering and work practice controls. Small nonferrous foundries (fewer than 20 employees), however, are only required to achieve 75  $\mu\text{g}/\text{m}^3$  by such controls. All foundries are required to comply within five years.)~~

(b) Respiratory protection. Where engineering and work practice controls do not reduce employee exposure to or below the 50  $\mu\text{g}/\text{m}^3$  permissible exposure limit, the employer shall supplement these controls with respirators in accordance with subsection (7).

(c) Compliance program.

(i) Each employer shall establish and implement a written compliance program to reduce exposures to or below the permissible exposure limit, ~~((and interim levels if applicable.))~~ solely by means of engineering and work practice controls in accordance with the implementation schedule in subdivision (6)(a).

(ii) Written plans for these compliance programs shall include at least the following:

(A) A description of each operation in which lead is emitted; e.g., machinery used, material processed, controls in place, crew size, employee job responsibilities, operating procedures and maintenance practices;

(B) A description of the specific means that will be employed to achieve compliance, including engineering plans and studies used to determine methods selected for controlling exposure to lead;

(C) A report of the technology considered in meeting the permissible exposure limit;

(D) Air monitoring data which documents the source of lead emissions;

(E) A detailed schedule for implementation of the program, including documentation such as copies of purchase orders for equipment, construction contracts, etc.;

(F) A work practice program which includes items required under subsections (8), (9) and (10) of this regulation;

(G) An administrative control schedule required by subdivision (6)~~((F))~~ (e), if applicable; and

(H) Other relevant information.

(iii) Written programs shall be submitted upon request to the director, and shall be available at the worksite for examination and copying by the director, any affected employee or authorized employee representatives.

(iv) Written programs shall be revised and updated at least every six months to reflect the current status of the program.

~~(d) ((Bypass of interim level. Where an employer's compliance plan provides for a reduction of employee exposures to or below the PEL solely by means of engineering and work practice controls in accordance with the implementation schedule in Table I, and the employer has determined that compliance with the 100  $\mu\text{g}/\text{m}^3$  interim level would divert resources to the extent that it clearly precludes compliance, otherwise attainable, with the PEL by the required time, the employer may proceed with the plan to~~

~~comply with the PEL in lieu of compliance with the interim level if:~~

~~(i) The compliance plan clearly documents the basis of the determination;~~

~~(ii) The employer takes all feasible steps to provide maximum protection for employees until the PEL is met; and~~

~~(iii) The employer notifies the director in writing within ten working days of the completion or revision of the compliance plan reflecting the determination.~~

~~(e)) Mechanical ventilation.~~

(i) When ventilation is used to control exposure, measurements which demonstrate the effectiveness of the system in controlling exposure, such as capture velocity, duct velocity, or static pressure shall be made at least every three months. Measurements of the system's effectiveness in controlling exposure shall be made within five days of any change in production, process, or control which might result in a change in employee exposure to lead.

(ii) Recirculation of air. If air from exhaust ventilation is recirculated into the workplace, the employer shall assure that (A) the system has a high efficiency filter with reliable back-up filter; and (B) controls to monitor the concentration of lead in the return air and to bypass the recirculation system automatically if it fails are installed, operating, and maintained.

~~((F))~~ (e) Administrative controls. If administrative controls are used as a means of reducing employees TWA exposure to lead, the employer shall establish and implement a job rotation schedule which includes:

(i) Name or identification number of each affected employee;

(ii) Duration and exposure levels at each job or work station where each affected employee is located; and

(iii) Any other information which may be useful in assessing the reliability of administrative controls to reduce exposure to lead.

(7) Respiratory protection.

(a) General. Where the use of respirators is required under this section, the employer shall provide, at no cost to the employee, and assure the use of respirators which comply with the requirements of this subsection. Respirators shall be used in the following circumstances:

(i) During the time period necessary to install or implement engineering or work practice controls, ~~((except that after the dates for compliance with the interim levels in Table I,))~~ no employer shall require an employee to wear a negative pressure respirator longer than 4.4 hours per day;

(ii) In work situations in which engineering and work practice controls are not sufficient to reduce exposures to or below the permissible exposure limit; and

(iii) Whenever an employee requests a respirator.

(b) Respirator selection.

(i) Where respirators are required under this section the employer shall select the appropriate respirator or combination of respirators from Table ~~((H))~~ I.

TABLE ((H)) I  
RESPIRATORY PROTECTION FOR LEAD AEROSOLS

Airborne Concentration of Lead or Condition of Use	Required Respirator <sup>1</sup>
Not in excess of 0.5 mg/m <sup>3</sup> (10X PEL).	Half-mask, air-purifying respirator equipped with high efficiency filters. <sup>2,3</sup>
Not in excess of 2.5 mg/m <sup>3</sup> (50X PEL).	Full facepiece, air-purifying respirator with high efficiency filters. <sup>3</sup>
Not in excess of 50 mg/m <sup>3</sup> (1000X PEL).	(1) Any powered, air-purifying respirator with high efficiency filters <sup>3</sup> ; or (2) Half-mask supplied air respirator operated in positive-pressure mode. <sup>2</sup>
Not in excess of 100 mg/m <sup>3</sup> (2000X PEL).	Supplied-air respirators with full facepiece, hood, helmet, or suit, operated in positive pressure mode.
Greater than 100 mg/m <sup>3</sup> , unknown concentration or fire fighting.	Full facepiece, self-contained breathing apparatus operated in positive-pressure mode.

Note: <sup>1</sup> Respirators specified for high concentrations can be used at lower concentrations of lead.  
<sup>2</sup> Full facepiece is required if the lead aerosols cause eye or skin irritation at the use concentrations.  
<sup>3</sup> A high efficiency particulate filter means 99.97 percent efficient against 0.3 micron size particles.

(ii) The employer shall provide a powered, air-purifying respirator in lieu of the respirator specified, in Table ((H)) I whenever:

(A) An employee chooses to use this type of respirator; and

(B) This respirator will provide adequate protection to the employee.

(iii) The employer shall select respirators from among those approved for protection against lead dust, fume, and mist by the Mine Safety and Health Administration and the National Institute for Occupational Safety and Health (NIOSH) under the provisions of 30 CFR Part 11.

(c) Respirator usage.

(i) The employer shall assure that the respirator issued to the employee exhibits minimum facepiece leakage and that the respirator is fitted properly.

(ii) Employers shall perform either quantitative or qualitative face fit tests at the time of initial fitting and at least every six months thereafter for each employee wearing negative pressure respirators. The qualitative fit tests may be used only for testing the fit of half-mask respirators where they are permitted to be worn, and shall be conducted in accordance with Appendix D. The tests shall be used to select facepieces that provide the required protection as prescribed in Table ((H)) I.

(iii) If an employee exhibits difficulty in breathing during the fitting test or during use, the employer shall make available to the employee an examination in accordance with subitem (11)(c)(i)(C) of this section to determine whether the employee can wear a respirator while performing the required duty.

(d) Respirator program.

(i) The employer shall institute a respiratory protection program in accordance with WAC 296-62-071.

(ii) The employer shall permit each employee who uses a filter respirator to change the filter elements whenever an increase in breathing resistance is detected and shall maintain an adequate supply of filter elements for this purpose.

(iii) Employees who wear respirators shall be permitted to leave work areas to wash their face and respirator facepiece whenever necessary to prevent skin irritation associated with respirator use.

(8) Protective work clothing and equipment.

(a) Provision and use. If an employee is exposed to lead above the PEL, without regard to the use of respirators or where the possibility of skin or eye irritation exists, the employer shall provide at no cost to the employee and assure that the employee uses appropriate protective work clothing and equipment such as, but not limited to:

(i) Coveralls or similar full-body work clothing;

(ii) Gloves, hats, and shoes or disposable shoe coverlets; and

(iii) Face shields, vented goggles, or other appropriate protective equipment which complies with WAC 296-24-078.

(b) Cleaning and replacement.

(i) The employer shall provide the protective clothing required in subdivision (8)(a) of this section in a clean and dry condition at least weekly, and daily to employees whose exposure levels without regard to a respirator are over 200 µg/m<sup>3</sup> of lead as an eight-hour TWA.

(ii) The employer shall provide for the cleaning, laundering, or disposal of protective clothing and equipment required by subdivision (8)(a) of this section.

(iii) The employer shall repair or replace required protective clothing and equipment as needed to maintain their effectiveness.

(iv) The employer shall assure that all protective clothing is removed at the completion of a work shift only in change rooms provided for that purpose as prescribed in subdivision (10)(b) of this section.

(v) The employer shall assure that contaminated protective clothing which is to be cleaned, laundered, or disposed of, is placed in a closed container in the change-room which prevents dispersion of lead outside the container.

(vi) The employer shall inform in writing any person who cleans or launders protective clothing or equipment of the potentially harmful effects of exposure to lead.

(vii) The employer shall assure that the containers of contaminated protective clothing and equipment required by subdivision (8)(b)(v) are labeled as follows:

CAUTION: CLOTHING CONTAMINATED WITH LEAD. DO NOT REMOVE DUST BY BLOWING OR SHAKING. DISPOSE OF LEAD CONTAMINATED WASH WATER IN ACCORDANCE WITH APPLICABLE LOCAL, STATE, OR FEDERAL REGULATIONS.

(viii) The employer shall prohibit the removal of lead from protective clothing or equipment by blowing, shaking, or any other means which disperses lead into the air.

(9) Housekeeping.

(a) Surfaces. All surfaces shall be maintained as free as practicable of accumulations of lead.

(b) Cleaning floors.

(i) Floors and other surfaces where lead accumulates may not be cleaned by the use of compressed air.

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(ii) Shoveling, dry or wet sweeping, and brushing may be used only where vacuuming or other equally effective methods have been tried and found not to be effective.

(c) Vacuuming. Where vacuuming methods are selected, the vacuums shall be used and emptied in a manner which minimizes the reentry of lead into the workplace.

(10) Hygiene facilities and practices.

(a) The employer shall assure that in areas where employees are exposed to lead above the PEL, without regard to the use of respirators, food or beverage is not present or consumed, tobacco products are not present or used, and cosmetics are not applied, except in change rooms, lunchrooms, and showers required under subdivision (10)(b) through (10)(d) of this section.

(b) Change rooms.

(i) The employer shall provide clean change rooms for employees who work in areas where their airborne exposure to lead is above the PEL, without regard to the use of respirators.

(ii) The employer shall assure that change rooms are equipped with separate storage facilities for protective work clothing and equipment and for street clothes which prevent cross-contamination.

(c) Showers.

(i) The employer shall assure that employees who work in areas where their airborne exposure to lead is above the PEL, without regard to the use of respirators, shower at the end of the work shift.

(ii) The employer shall provide shower facilities in accordance with WAC 296-24-12009.

(iii) The employer shall assure that employees who are required to shower pursuant to item (10)(c)(i) do not leave the workplace wearing any clothing or equipment worn during the work shift.

(d) Lunchrooms.

(i) The employer shall provide lunchroom facilities for employees who work in areas where their airborne exposure to lead is above the PEL, without regard to the use of respirators.

(ii) The employer shall assure that lunchroom facilities have a temperature controlled, positive pressure, filtered air supply, and are readily accessible to employees.

(iii) The employer shall assure that employees who work in areas where their airborne exposure to lead is above the PEL without regard to the use of a respirator wash their hands and face prior to eating, drinking, smoking or applying cosmetics.

(iv) The employer shall assure that employees do not enter lunchroom facilities with protective work clothing or equipment unless surface lead dust has been removed by vacuuming, downdraft booth, or other cleaning method.

(e) Lavatories. The employer shall provide an adequate number of lavatory facilities which comply with WAC 296-24-12009 (1) and (2).

(11) Medical surveillance.

(a) General.

(i) The employer shall institute a medical surveillance program for all employees who are or may be exposed above the action level for more than thirty days per year.

(ii) Any employer whose lead-exposed employees would not be required to be in a medical surveillance program according to item (i) of this subdivision, but who employs at

least one person to perform any of the following tasks more than 30 days in any consecutive twelve months, must offer blood lead level determination to all potentially lead-exposed employees according to the schedule and provisions in subdivision (b)(i)(D) of this subsection:

(A) Any open flame operation involving lead-containing solder in a manner producing molten solder or airborne particulate solder, including manufacture or repair of motor vehicle radiators or sanding, cutting, or grinding lead-containing solder; or

(B) Applying or heating lead-containing glazing of ceramics; or

(C) Breaking, recycling or manufacture of lead-containing batteries; or

(D) Casting objects using lead, brass, or lead-containing alloys; or

(E) Where lead containing coatings or paint are present: Abrasive blasting, welding, cutting, torch burning, manual demolition of structures (e.g., dry wall), manual scraping, manual sanding, heat gun applications, power tool cleaning, rivet busting, cleanup activities where dry expendable abrasives are used, abrasive blasting enclosure movement and removal; or

(F) Spray painting with lead-containing paint; or

(G) Using lead-containing mortar; or

(H) Lead burning; or

(I) Operation or cleaning of shooting facilities where lead bullets are used; or

(J) Formulation or processing of lead-containing pigments or paints; or

(K) Cutting, burning, or melting of lead-containing materials; or

(L) Other operations for which the employer has reason to believe employees have exposures to lead which may result in whole blood lead levels greater than 25 µg/dl.

(iii) The employer shall assure that all medical examinations and procedures are performed by or under the supervision of a licensed physician.

~~((+))~~ (iv) The employer shall provide the required medical surveillance including multiple physician review under item (11)(c)(iii) without cost to employees and at a reasonable time and place.

(b) Biological monitoring.

(i) Blood lead and ZPP level sampling and analysis. The employer shall make available biological monitoring in the form of blood sampling and analysis for lead and zinc protoporphyrin levels to each employee covered under item (11)(a)(i) and (ii) of this section on the following schedule:

(A) At least every six months to each employee covered under item (11)(a)(i) of this section;

(B) At least every two months for each employee whose last blood sampling and analysis indicated a blood lead level at or above 40 (~~(µg/100-g))~~ µg/dl of whole blood. This frequency shall continue until two consecutive blood samples and analyses indicate a blood lead level below 40 (~~(µg/100-g))~~ µg/dl of whole blood; and

(C) At least monthly during the removal period of each employee removed from exposure to lead due to an elevated blood lead level.

(D) For each potentially lead-exposed employee covered under subdivision (a)(ii) of this subsection at least every twelve months. If the employer has reason to believe that

lead exposures vary during the year, then biological monitoring must be conducted during a period expected to have the greatest exposure. If an employer finds all employees' blood lead levels are less than 25 µg/dl whole blood for two consecutive years, the testing may be reduced to at least once every twenty-four months, during a period of peak lead exposure. If an employer finds all employees' blood lead levels are less than 15 µg/dl whole blood for two consecutive years, the biological monitoring program may be suspended. Whenever there has been a change of equipment, control, personnel, or a new task has been initiated that may result in employees being overexposed to lead, the employer shall reinstate annual biological monitoring as specified in this paragraph.

(E) Where the employer has previously conducted biological monitoring and the data were obtained within the past twenty-four months during work operations conducted under workplace conditions closely resembling the processes, type of material, control methods, work practices, and environmental conditions used and prevailing in the employer's current operations, the employer may rely on such earlier monitoring results to satisfy the requirements of this subitem and subitem (D) of this item if the sampling and analytical methods meet the accuracy and confidence levels of item (iii) of this subdivision.

(ii) Follow-up blood sampling tests: Whenever the results of a blood lead level test indicate that an employee's blood lead level exceeds the numerical criterion for medical removal under item (12)(a)(i), the employer shall provide a second (follow-up) blood sampling test within two weeks after the employer receives the results of the first blood sampling test.

(iii) Accuracy of blood lead level sampling and analysis. Blood lead level sampling and analysis provided pursuant to this section shall have an accuracy (to a confidence level of ninety-five percent) within plus or minus fifteen percent or 6 (~~(µg/100 ml)~~) µg/dl, whichever is greater, and shall be conducted by a laboratory licensed by the Center for Disease Control and Prevention (CDC), United States Department of Health (~~(, Education and Welfare)~~) and Human Services or which has received a satisfactory grade in blood lead proficiency testing from CDC in the prior twelve months.

(iv) Employee notification. Within five working days after the receipt of biological monitoring results, the employer shall notify in writing each employee whose blood lead level exceeds (~~(40 µg/100 g)~~) 25 µg/dl: (A) of that employee's blood lead level and (B) that the standard requires temporary medical removal with medical removal protection benefits when an employee's blood lead level exceeds the numerical criterion for medical removal under item (12)(a)(i) of this section.

(c) Medical examinations and consultations.

(i) Frequency. The employer shall make available medical examinations and consultations to each employee covered under item (11)(a)(i) of this section on the following schedule:

(A) At least annually for each employee for whom a blood sampling test conducted at any time during the preceding twelve months indicated a blood lead level at or above 40 (~~(µg/100 g)~~) µg/dl;

(B) Prior to assignment for each employee being assigned for the first time to an area in which airborne concentrations of lead are at or above the action level;

(C) As soon as possible, upon notification by an employee either that the employee has developed signs or symptoms commonly associated with lead intoxication, that the employee desires medical advice concerning the effects of current or past exposure to lead on the employee's ability to procreate a healthy child, or that the employee has demonstrated difficulty in breathing during a respirator fitting test or during use; and

(D) As medically appropriate for each employee either removed from exposure to lead due to a risk of sustaining material impairment to health, or otherwise limited pursuant to a final medical determination.

(ii) Content. Medical examinations made available pursuant to subitems (11)(c)(i)(A) through (B) of this section shall include the following elements:

(A) A detailed work history and a medical history, with particular attention to past lead exposure (occupational and nonoccupational), personal habits (smoking, hygiene), and past gastrointestinal, hematologic, renal, cardiovascular, reproductive and neurological problems;

(B) A thorough physical examination, with particular attention to teeth, gums, hematologic, gastrointestinal, renal, cardiovascular, and neurological systems. Pulmonary status should be evaluated if respiratory protection will be used;

(C) A blood pressure measurement;

(D) A blood sample and analysis which determines:

(I) Blood lead level;

(II) Hemoglobin and hematocrit determinations, red cell indices, and examination of peripheral smear morphology;

(III) Zinc protoporphyrin;

(IV) Blood urea nitrogen; and

(V) Serum creatinine;

(E) A routine urinalysis with microscopic examination; and

(F) Any laboratory or other test which the examining physician deems necessary by sound medical practice.

The content of medical examinations made available pursuant to subitems (11)(c)(i)(C) through (D) of this section shall be determined by an examining physician and, if requested by an employee, shall include pregnancy testing or laboratory evaluation of male fertility.

(iii) Multiple physician review mechanism.

(A) If the employer selects the initial physician who conducts any medical examination or consultation provided to an employee under this section, the employee may designate a second physician:

(I) To review any findings, determinations or recommendations of the initial physician; and

(II) To conduct such examinations, consultations, and laboratory tests as the second physician deems necessary to facilitate this review.

(B) The employer shall promptly notify an employee of the right to seek a second medical opinion after each occasion that an initial physician conducts a medical examination or consultation pursuant to this section. The employer may condition its participation in, and payment for, the multiple physician review mechanism upon the employee doing the following within fifteen days after receipt of the

foregoing notification, or receipt of the initial physician's written opinion, whichever is later:

(I) The employee informing the employer that he or she intends to seek a second medical opinion, and

(II) The employee initiating steps to make an appointment with a second physician.

(C) If the findings, determinations or recommendations of the second physician differ from those of the initial physician, then the employer and the employee shall assure that efforts are made for the two physicians to resolve any disagreement.

(D) If the two physicians have been unable to quickly resolve their disagreement, then the employer and the employee through their respective physicians shall designate a third physician:

(I) To review any findings, determinations or recommendations of the prior physicians; and

(II) To conduct such examinations, consultations, laboratory tests and discussions with the prior physicians as the third physician deems necessary to resolve the disagreement of the prior physicians.

(E) The employer shall act consistent with the findings, determinations and recommendations of the third physician, unless the employer and the employee reach an agreement which is otherwise consistent with the recommendations of at least one of the three physicians.

(iv) Information provided to examining and consulting physicians.

(A) The employer shall provide an initial physician conducting a medical examination or consultation under this section with the following information:

(I) A copy of this regulation for lead including all appendices;

(II) A description of the affected employee's duties as they relate to the employee's exposure;

(III) The employee's exposure level or anticipated exposure level to lead and to any other toxic substance (if applicable);

(IV) A description of any personal protective equipment used or to be used;

(V) Prior blood lead determinations; and

(VI) All prior written medical opinions concerning the employee in the employer's possession or control.

(B) The employer shall provide the foregoing information to a second or third physician conducting a medical examination or consultation under this section upon request either by the second or third physician, or by the employee.

(v) Written medical opinions.

(A) The employer shall obtain and furnish the employee with a copy of a written medical opinion from each examining or consulting physician which contains the following information:

(I) The physician's opinion as to whether the employee has any detected medical condition which would place the employee at increased risk of material impairment of the employee's health from exposure to lead;

(II) Any recommended special protective measures to be provided to the employee, or limitations to be placed upon the employee's exposure to lead;

(III) Any recommended limitation upon the employee's use of respirators, including a determination of whether the employee can wear a powered air purifying respirator if a

physician determines that the employee cannot wear a negative pressure respirator; and

(IV) The results of the blood lead determinations.

(B) The employer shall instruct each examining and consulting physician to:

(I) Not reveal either in the written opinion, or in any other means of communication with the employer, findings, including laboratory results, or diagnoses unrelated to an employee's occupational exposure to lead; and

(II) Advise the employee of any medical condition, occupational or nonoccupational, which dictates further medical examination or treatment.

(vi) Alternate physician determination mechanisms. The employer and an employee or authorized employee representative may agree upon the use of any expeditious alternate physician determination mechanism in lieu of the multiple physician review mechanism provided by this subsection so long as the alternate mechanism otherwise satisfies the requirements contained in this subsection.

(d) Chelation.

(i) The employer shall assure that any person whom ~~(he)~~ they retain~~(s)~~, employ~~(s)~~, supervise~~(s)~~ or control~~(s)~~ does not engage in prophylactic chelation of any employee at any time.

(ii) If therapeutic or diagnostic chelation is to be performed by any person in item (11)(d)(i), the employer shall assure that it be done under the supervision of a licensed physician in a clinical setting with thorough and appropriate medical monitoring and that the employee is notified in writing prior to its occurrence.

(e) Actions triggered by medical examinations and biological monitoring.

(i) The employer shall take the corrective actions specified in item (ii) of this subdivision whenever any of the following conditions occur:

(A) The results of biological monitoring carried out in accordance with this section indicate a blood lead level requiring temporary medical removal; or

(B) The physician's written opinion indicates a detected medical condition which would place the employee at increased risk of material impairment of the employee's health from exposure to lead or which indicates any recommended special protective measures to be provided to the employee or limitations to be placed upon the employee's exposure to lead; or

(C) The results of a medical examination carried out in accordance with this section indicate any laboratory or clinical finding consistent with lead toxicity.

(ii) The employer shall take the following corrective actions:

(A) The employer, within thirty days, shall assess the maintenance and effectiveness of the relevant engineering controls; the hygiene facilities; the respiratory protection program; the employee's work practices and personal hygiene; and the employee's respirator use, if any; and

(B) Within thirty days of the assessment, the employer shall take all reasonable steps to correct the deficiencies found in the assessment that may be responsible for the employee's medical examination and test results.

(12) Medical removal protection.

(a) Temporary medical removal and return of an employee.

(i) Temporary removal due to elevated blood lead levels.

(A) First year of the standard (12/10/94 through 12/10/95). During the first year following the effective date of the standard, the employer shall remove an employee from work having ~~((a daily eight hour TWA))~~ an exposure to lead ~~((at))~~ or ~~((above 100 µg/m<sup>3</sup>))~~ as specified in subsection (11)(a)(ii) of this section on each occasion that a periodic and a follow-up blood sampling test conducted pursuant to this section indicate that the employee's blood lead level is at or above ~~((80))~~ 50 µg/((100-g)) dl of whole blood;

(B) Second year of the standard (12/11/95 through 12/10/96). During the second year following the effective date of the standard, the employer shall remove an employee from work having ~~((a daily eight hour TWA))~~ an exposure to lead ~~((at))~~ or ~~((above 50 µg/m<sup>3</sup>))~~ as specified in subsection (11)(a)(ii) of this section on each occasion that a periodic and a follow-up blood sampling test conducted pursuant to this section indicate that the employee's blood lead level is at or above ~~((70))~~ 45 µg/((100-g)) dl of whole blood;

(C) Third year of the standard ~~((, and thereafter))~~ (12/11/96 through 12/10/97). ~~((Beginning with))~~ During the third year following the effective date of the standard, the employer shall remove an employee from work having an exposure to lead ~~((at))~~ or ~~((above the action level))~~ as specified in subsection (11)(a)(ii) of this section on each occasion that a periodic and a follow-up blood sampling test conducted pursuant to this section indicate that the employee's blood lead level is at or above ~~((60))~~ 40 µg/((100-g)) dl of whole blood; and

(D) ~~((Fifth))~~ Fourth year of the standard ~~((, and thereafter))~~ (12/11/97 through 12/10/98). ~~((Beginning with))~~ During the ~~((fifth))~~ fourth year following the effective date of the standard, the employer shall remove an employee from work having an exposure to lead ~~((at))~~ or ~~((above the action level))~~ as specified in subsection (11)(a)(ii) of this section on each occasion that ~~((the average of the last three))~~ a periodic and a follow-up blood sampling tests conducted pursuant to this section ~~((or the average of all blood sampling tests conducted over the previous six months, whichever is longer))~~ indicate ~~((s))~~ that the employee's blood lead level is at or above ~~((50))~~ 35 µg/((100-g)) dl of whole blood; ~~((provided, however, that an employee need not be removed if the last blood sampling test indicates a blood lead level at or below 40 µg/100-g of whole blood))~~

(E) Fifth year of standard (12/11/98) and thereafter. During the fifth year following the effective date of the standard, the employer shall remove an employee from work having an exposure to lead or as specified in subsection (11)(a)(ii) of this section on each occasion that a periodic and a follow-up blood sampling test conducted pursuant to this section indicate that the employee's blood lead is at or above 30 µg/dl whole blood.

(ii) Temporary removal due to a final medical determination.

(A) The employer shall remove an employee from work having an exposure to lead at or above the action level on each occasion that a final medical determination results in a medical finding, determination, or opinion that the employee has a detected medical condition which places the employee at increased risk of material impairment to health from exposure to lead.

(B) For the purposes of this section, the phrase "final medical determination" ~~((shall))~~ means the written medical opinion on the employees' health status by the examining physician or, where relevant, the outcome of the multiple physician review mechanism or alternate medical determination mechanism used pursuant to the medical surveillance provisions of this section.

(C) Where a final medical determination results in any recommended special protective measures for an employee, or limitations on an employee's exposure to lead, the employer shall implement and act consistent with the recommendation.

(iii) Return of the employee to former job status.

(A) The employer shall return an employee to his or her former job status:

(I) For an employee removed due to a blood lead level at or above ~~((80 µg/100-g))~~ 50 µg/dl, when two consecutive blood sampling tests indicate that the employee's blood lead level is at or below ~~((60 µg/100-g))~~ 40 µg/dl of whole blood;

(II) For an employee removed due to a blood lead level at or above ~~((70 µg/100-g))~~ 45 µg/dl, when two consecutive blood sampling tests indicate that the employee's blood lead level is at or below ~~((50 µg/100-g))~~ 35 µg/dl of whole blood;

(III) For an employee removed due to a blood lead level at or above ~~((60 µg/100-g, or due to an average blood lead level at or above 50 µg/100-g))~~ 40 µg/dl, when two consecutive blood sampling tests indicate that the employee's blood lead level is at or below ~~((40 µg/100-g))~~ 30 µg/dl of whole blood;

(IV) For an employee removed due to a blood lead level at or above 35 µg/dl, when two consecutive blood sampling tests indicate that the employee's blood lead level is at or below 25 µg/dl whole blood;

(V) For an employee removed due to a blood lead level at or above 30 µg/dl, when two consecutive blood sampling tests indicate that the employee's blood lead level is at or below 25 µg/dl whole blood;

(VI) For an employee removed due to a final medical determination, when a subsequent final medical determination results in a medical finding, determination, or opinion that the employee no longer has a detected medical condition which places the employee at increased risk of material impairment to health from exposure to lead.

(B) For the purposes of this section, the requirement that an employer return an employee to his or her former job status is not intended to expand upon or restrict any rights an employee has or would have had, absent temporary medical removal, to a specific job classification or position under the terms of a collective bargaining agreement.

(iv) Removal of other employee special protective measure or limitations. The employer shall remove any limitations placed on an employee or end any special protective measures provided to an employee pursuant to a final medical determination when a subsequent final medical determination indicates that the limitations or special protective measures are no longer necessary.

(v) Employer options pending a final medical determination. Where the multiple physician review mechanism, or alternate medical determination mechanism used pursuant to the medical surveillance provisions of this section, has not yet resulted in a final medical determination with respect to an employee, the employer shall act as follows:

(A) Removal. The employer may remove the employee from exposure to lead, provide special protective measures to the employee, or place limitations upon the employee, consistent with the medical findings, determinations, or recommendations of any of the physicians who have reviewed the employee's health status.

(B) Return. The employer may return the employee to his or her former job status, end any special protective measures provided to the employee, and remove any limitations placed upon the employee, consistent with the medical findings, determinations, or recommendations of any of the physicians who have reviewed the employee's health status, with two exceptions. If:

(I) The initial removal, special protection, or limitation of the employee resulted from a final medical determination which differed from the findings, determinations, or recommendations of the initial physician; or

(II) The employee has been on removal status for the preceding eighteen months due to an elevated blood lead level, then the employer shall await a final medical determination.

(b) Medical removal protection benefits.

(i) Provision of medical removal protection benefits. The employer shall provide to an employee up to eighteen months of medical removal protection benefits on each occasion that an employee is removed from exposure to lead or otherwise limited pursuant to this section.

(ii) Definition of medical removal protection benefits. For the purposes of this section, the requirement that an employer provide medical removal protection benefits means that the employer shall maintain the earnings, seniority and other employment rights and benefits of an employee as though the employee had not been removed from normal exposure to lead or otherwise limited.

(iii) Follow-up medical surveillance during the period of employee removal or limitation. During the period of time that an employee is removed from normal exposure to lead or otherwise limited, the employer may condition the provision of medical removal protection benefits upon the employee's participation in follow-up medical surveillance made available pursuant to this section.

(iv) Workers' compensation claims. If a removed employee files a claim for workers' compensation payments for a lead-related disability, then the employer shall continue to provide medical removal protection benefits pending disposition of the claim. To the extent that an award is made to the employee for earnings lost during the period of removal, the employer's medical removal protection obligation shall be reduced by such amount. The employer shall receive no credit for workers' compensation payments received by the employee for treatment related expenses.

(v) Other credits. The employer's obligation to provide medical removal protection benefits to a removed employee shall be reduced to the extent that the employee receives compensation for earnings lost during the period of removal either from a publicly or employer-funded compensation program, or receives income from employment with another employer made possible by virtue of the employee's removal.

(vi) Employees whose blood lead levels do not adequately decline within eighteen months of removal. The employer shall take the following measures with respect to

any employee removed from exposure to lead due to an elevated blood lead level whose blood lead level has not declined within the past eighteen months of removal so that the employee has been returned to his or her former job status:

(A) The employer shall make available to the employee a medical examination pursuant to this section to obtain a final medical determination with respect to the employee;

(B) The employer shall assure that the final medical determination obtained indicates whether or not the employee may be returned to his or her former job status, and if not, what steps should be taken to protect the employee's health;

(C) Where the final medical determination has not yet been obtained, or once obtained indicates that the employee may not yet be returned to his or her former job status, the employer shall continue to provide medical removal protection benefits to the employee until either the employee is returned to former job status, or a final medical determination is made that the employee is incapable of ever safely returning to his or her former job status.

(D) Where the employer acts pursuant to a final medical determination which permits the return of the employee to his or her former job status despite what would otherwise be an unacceptable blood lead level, later questions concerning removing the employee again shall be decided by a final medical determination. The employer need not automatically remove such an employee pursuant to the blood lead level removal criteria provided by this section.

(vii) Voluntary removal or restriction of an employee. Where an employer, although not required by this section to do so, removes an employee from exposure to lead or otherwise places limitations on an employee due to the effects of lead exposure on the employee's medical condition, the employer shall provide medical removal protection benefits to the employee equal to that required by item (12)(b)(i) of this section.

(13) Employee information and training.

(a) Training program.

(i) Each employer who has a workplace in which there is a potential exposure to airborne lead at any level shall inform employees of the content of Appendices A and B of this regulation.

(ii) The employer shall institute a training program for and assure the participation of all employees who are subject to exposure to lead at or above the action level or for whom the possibility of skin or eye irritation exists.

(iii) The employer shall provide initial training by one hundred eighty days from the effective date for those employees covered by item (13)(a)(ii) on the standard's effective date and prior to the time of initial job assignment for those employees subsequently covered by this subsection.

(iv) The training program shall be repeated at least annually for each employee.

(v) The employer shall assure that each employee is informed of the following:

(A) The content of this standard and its appendices;

(B) The specific nature of the operations which could result in exposure to lead above the action level;

(C) The purpose, proper selection, fitting, use, and limitations of respirators;



(D) The purpose and a description of the medical surveillance program, and the medical removal protection program including information concerning the adverse health effects associated with excessive exposure to lead (with particular attention to the adverse reproductive effects on both males and females);

(E) The engineering controls and work practices associated with the employee's job assignment;

(F) The contents of any compliance plan in effect; and

(G) Instructions to employees that chelating agents should not routinely be used to remove lead from their bodies and should not be used at all except under the direction of a licensed physician.

(b) Access to information and training materials.

(i) The employer shall make readily available to all affected employees a copy of this standard and its appendices.

(ii) The employer shall provide, upon request, all materials relating to the employee information and training program to the director.

(iii) In addition to the information required by item (13)(a)(v), the employer shall include as part of the training program, and shall distribute to employees, any materials pertaining to the Occupational Safety and Health Act, the regulations issued pursuant to the act, and this lead standard, which are made available to the employer by the director.

(14) Signs.

(a) General.

(i) The employer may use signs required by other statutes, regulations or ordinances in addition to, or in combination with, signs required by this subsection.

(ii) The employer shall assure that no statement appears on or near any sign required by this subsection which contradicts or detracts from the meaning of the required sign.

(b) Signs.

(i) The employer shall post the following warning signs in each work area where the PEL is exceeded:

WARNING  
LEAD WORK AREA  
POISON  
NO SMOKING OR EATING

(ii) The employer shall assure that signs required by this subsection are illuminated and cleaned as necessary so that the legend is readily visible.

(15) Recordkeeping.

(a) Exposure monitoring.

(i) The employer shall establish and maintain an accurate record of all monitoring required in subsection (5) of this section.

(ii) This record shall include:

(A) The date(s), number, duration, location and results of each of the samples taken, including a description of the sampling procedure used to determine representative employee exposure where applicable;

(B) A description of the sampling and analytical methods used and evidence of their accuracy;

(C) The type of respiratory protective devices worn, if any;

(D) Name, social security number, and job classification of the employee monitored and of all other employees whose exposure the measurement is intended to represent; and

(E) the environmental variables that could affect the measurement of employee exposure.

(iii) The employer shall maintain these monitoring records for at least forty years or for the duration of employment plus twenty years, whichever is longer.

(b) Medical surveillance.

(i) The employer shall establish and maintain an accurate record for each employee subject to medical surveillance as required by subsection (11) of this section.

(ii) This record shall include:

(A) The name, social security number, and description of the duties of the employee;

(B) A copy of the physician's written opinions;

(C) Results of any airborne exposure monitoring done for that employee and the representative exposure levels supplied to the physician; and

(D) Any employee medical complaints related to exposure to lead.

(iii) The employer shall keep, or assure that the examining physician keeps, the following medical records:

(A) A copy of the medical examination results including medical and work history required under subsection (11) of this section;

(B) A description of the laboratory procedures and a copy of any standards or guidelines used to interpret the test results or references to that information; and

(C) A copy of the results of biological monitoring.

(iv) The employer shall maintain or assure that the physician maintains those medical records for at least forty years, or for the duration of employment plus twenty years, whichever is longer.

(c) Medical removals.

(i) The employer shall establish and maintain an accurate record for each employee removed from current exposure to lead pursuant to subsection (12) of this section.

(ii) Each record shall include:

(A) The name and social security number of the employee;

(B) The date on each occasion that the employee was removed from current exposure to lead as well as the corresponding date on which the employee was returned to his or her former job status;

(C) A brief explanation of how each removal was or is being accomplished; and

(D) A statement with respect to each removal indicating whether or not the reason for the removal was an elevated blood lead level.

(iii) The employer shall maintain each medical removal record for at least the duration of an employee's employment.

(d) Availability.

(i) The employer shall make available upon request all records required to be maintained by subsection (15) of this section to the director for examination and copying.

(ii) Environmental monitoring, medical removal, and medical records required by this subsection shall be provided upon request to employees, designated representatives, and the ((assistant)) director in accordance with WAC 296-62-05201 through 296-62-05209 and 296-62-05213 through 296-62-05217. Medical removal records shall be provided in the same manner as environmental monitoring records.



(iii) Upon request, the employer shall make an employee's medical records required to be maintained by this section available to the affected employee or former employee or to a physician or other individual designated by such affected employee or former employees for examination and copying.

(e) Transfer of records.

(i) Whenever the employer ceases to do business, the successor employer shall receive and retain all records required to be maintained by subsection (15) of this section.

(ii) Whenever the employer ceases to do business and there is no successor employer to receive and retain the records required to be maintained by this section for the prescribed period, these records shall be transmitted to the director.

(iii) At the expiration of the retention period for the records required to be maintained by this section, the employer shall notify the director at least three months prior to the disposal of such records and shall transmit those records to the director if requested within the period.

(iv) The employer shall also comply with any additional requirements involving transfer of records set forth in WAC 296-62-05215.

(16) Observation of monitoring.

(a) Employee observation. The employer shall provide affected employees or their designated representatives an opportunity to observe any monitoring of employee exposure to lead conducted pursuant to subsection (5) of this section.

(b) Observation procedures.

(i) Whenever observation of the monitoring of employee exposure to lead requires entry into an area where the use of respirators, protective clothing or equipment is required, the employer shall provide the observer with and assure the use of such respirators, clothing and such equipment, and shall require the observer to comply with all other applicable safety and health procedures.

(ii) Without interfering with the monitoring, observers shall be entitled to:

(A) Receive an explanation of the measurement procedures;

(B) Observe all steps related to the monitoring of lead performed at the place of exposure; and

(C) Record the results obtained or receive copies of the results when returned by the laboratory.

(17) ~~(Effective date. The effective date of this standard is September 6, 1980.~~

(18) ~~Startup dates. All obligations of this standard commence on the effective date except as follows:~~

~~(a) The initial determination under subdivision (5)(b) shall be made as soon as possible but no later than thirty days from the effective date.~~

~~(b) Initial monitoring under subdivision (5)(d) shall be completed as soon as possible but no later than ninety days from the effective date.~~

~~(c) Initial biological monitoring and medical examinations under subsection (11) shall be completed as soon as possible but no later than one hundred eighty days from the effective date. Priority for biological monitoring and medical examinations shall be given to employees whom the employer believes to be at greatest risk from continued exposure.~~

~~(d) Initial training and education shall be completed as soon as possible but no later than one hundred eighty days from the effective date.~~

~~(e) Hygiene and lunchroom facilities under subsection (10) shall be in operation as soon as possible but no later than one year from the effective year.~~

~~(f) Respiratory protection required by subsection (7) shall be provided as soon as possible but no later than the following schedule:~~

~~(i) Employees whose eight-hour TWA exposure exceeds 200  $\mu\text{g}/\text{m}^3$  on the effective date.~~

~~(ii) Employees whose eight-hour TWA exposure exceeds the PEL but is less than 200  $\mu\text{g}/\text{m}^3$  one hundred fifty days from the effective date.~~

~~(iii) Powered, air-purifying respirators provided under (7)(b)(ii) two hundred ten days from the effective date.~~

~~(iv) Quantitative fit testing required under item (7)(e)(ii) one year from effective date. Qualitative fit testing is required in the interim.~~

~~(g) Written compliance plans required by subdivision (6)(e) shall be completed and available for inspection and copying as soon as possible but no later than the following schedule:~~

~~(i) Employers for whom compliance with the PEL or interim level is required within one year from the effective date six months from the effective date.~~

~~(ii) Employers in secondary lead smelting and refining and in lead storage battery manufacturing one year from the effective date.~~

~~(iii) Employers in primary smelting and refining industry one year from the effective date from the interim level; five years from the effective date for PEL.~~

~~(iv) Plans for construction of hygiene facilities, if required six months from the effective date.~~

~~(v) All other industries one year from the date on which the court lifts the stay on the implementation of paragraph (6)(a) for the particular industry.~~

~~(h) The permissible exposure limit in subsection (4) shall become effective one hundred fifty days from the effective date.~~

~~(19)) Appendices. The information contained in the appendices to this section is not intended by itself, to create any additional obligations not otherwise imposed by this standard nor detract from any existing obligation.~~

(a) Appendix A. Substance Data Sheet for Occupational Exposure to Lead.

(i) Substance identification.

(A) Substance. Pure lead (Pb) is a heavy metal at room temperature and pressure and is a basic chemical element. It can combine with various other substances to form numerous lead compounds.

(B) Compounds covered by the standard. The word "lead" when used in this standard means elemental lead, all inorganic lead compounds (except those which are not biologically available due to either solubility or specific chemical interaction), and a class of organic lead compounds called lead soaps. This standard does not apply to other organic lead compounds.

(C) Uses. Exposure to lead occurs in at least 120 different occupations, including primary and secondary lead smelting, lead storage battery manufacturing, lead pigment manufacturing and use, solder manufacturing and use,

shipbuilding and ship repairing, auto manufacturing, and printing.

(D) Permissible exposure. The Permissible Exposure Limit (PEL) set by the standard is 50 micrograms of lead per cubic meter of air ( $50 \mu\text{g}/\text{m}^3$ ), averaged over an eight-hour work day.

(E) Action level. The standard establishes an action level of 30 micrograms per cubic meter of air ( $30 \mu\text{g}/\text{m}^3$ ) time weighted average, based on an eight-hour work day. The action level initiates several requirements of the standard, such as exposure monitoring, medical surveillance, and training and education.

(ii) Health hazard data.

(A) Ways in which lead enters your body.

(I) When absorbed into your body in certain doses lead is a toxic substance. The object of the lead standard is to prevent absorption of harmful quantities of lead. The standard is intended to protect you not only from the immediate toxic effects of lead, but also from the serious toxic effects that may not become apparent until years of exposure have passed.

(II) Lead can be absorbed into your body by inhalation (breathing) and ingestion (eating). Lead (except for certain organic lead compounds not covered by the standard, such as tetraethyl lead) is not absorbed through your skin. When lead is scattered in the air as a dust, fume or mist, it can be inhaled and absorbed through your lungs and upper respiratory tract. Inhalation of airborne lead is generally the most important source of occupational lead absorption. You can also absorb lead through your digestive system if lead gets into your mouth and is swallowed. If you handle food, cigarettes, chewing tobacco, or make-up which have lead on them or handle them with hands contaminated with lead, this will contribute to ingestion.

(III) A significant portion of the lead that you inhale or ingest gets into your blood stream. Once in your blood stream lead is circulated throughout your body and stored in various organs and body tissues. Some of this lead is quickly filtered out of your body and excreted, but some remains in your blood and other tissue. As exposure to lead continues, the amount stored in your body will increase if you are absorbing more lead than your body is excreting. Even though you may not be aware of any immediate symptoms of disease, this lead stored in your tissues can be slowly causing irreversible damage, first to individual cells, then to your organs and whole body systems.

(B) Effects of overexposure to lead.

(I) Short-term (acute) overexposure. Lead is a potent, systemic poison that serves no known useful function once absorbed by your body. Taken in large enough doses, lead can kill you in a matter of days. A condition affecting the brain called acute encephalopathy may arise which develops quickly to seizures, coma, and death from cardiorespiratory arrest. A short-term dose of lead can lead to acute encephalopathy. Short-term occupational exposures of this magnitude are highly unusual, but not impossible. Similar forms of encephalopathy may, however arise from extended, chronic exposure to lower doses of lead. There is no sharp dividing line between rapidly developing acute effects of lead, and chronic effects which take longer to acquire. Lead adversely affects numerous body systems, and causes forms

of health impairment and disease which arise after periods of exposure as short as days or as long as several years.

(II) Long-term (chronic) overexposure.

a) Chronic overexposure to lead may result in severe damage to your blood-forming, nervous, urinary and reproductive systems. Some common symptoms of chronic overexposure include loss of appetite, metallic taste in the mouth, anxiety, constipation, nausea, pallor, excessive tiredness, weakness, insomnia, headache, nervous irritability, muscle and joint pain or soreness, fine tremors, numbness, dizziness, hyperactivity and colic. In lead colic there may be severe abdominal pain.

b) Damage to the central nervous system in general and the brain (encephalopathy) in particular is one of the most severe forms of lead poisoning. The most severe, often fatal, form of encephalopathy may be preceded by vomiting, a feeling of dullness progressing to drowsiness and stupor, poor memory, restlessness, irritability, tremor, and convulsions. It may arise suddenly with the onset of seizures, followed by coma, and death. There is a tendency for muscular weakness to develop at the same time. This weakness may progress to paralysis often observed as a characteristic "wrist drop" or "foot drop" and is a manifestation of a disease to the nervous system called peripheral neuropathy.

c) Chronic overexposure to lead also results in kidney disease with few, if any, symptoms appearing until extensive and most likely permanent kidney damage has occurred. Routine laboratory tests reveal the presence of this kidney disease only after about two-thirds of kidney function is lost. When overt symptoms of urinary dysfunction arise, it is often too late to correct or prevent worsening conditions, and progression of kidney dialysis or death is possible.

d) Chronic overexposure to lead impairs the reproductive systems of both men and women. Overexposure to lead may result in decreased sex drive, impotence and sterility in men. Lead can alter the structure of sperm cells raising the risk of birth defects. There is evidence of miscarriage and stillbirth in women whose husbands were exposed to lead or who were exposed to lead themselves. Lead exposure also may result in decreased fertility, and abnormal menstrual cycles in women. The course of pregnancy may be adversely affected by exposure to lead since lead crosses the placental barrier and poses risks to developing fetuses. Children born of parents either one of whom were exposed to excess lead levels are more likely to have birth defects, mental retardation, behavioral disorders or die during the first year of childhood.

e) Overexposure to lead also disrupts the blood-forming system resulting in decreased hemoglobin (the substance in the blood that carries oxygen to the cells) and ultimately anemia. Anemia is characterized by weakness, pallor and fatigability as a result of decreased oxygen carrying capacity in the blood.

(III) Health protection goals of the standard.

a) Prevention of adverse health effects for most workers from exposure to lead throughout a working lifetime requires that worker blood lead (PbB) levels be maintained at or below forty micrograms per one hundred grams of whole blood (~~((40  $\mu\text{g}/100\text{g}$ ))~~ 25  $\mu\text{g}/\text{dl}$ ). The blood lead levels of workers (both male and female workers) who intend to have children should be maintained below (~~(30  $\mu\text{g}/100\text{g}$ ))~~ 25  $\mu\text{g}/\text{dl}$

to minimize adverse reproductive health effects to the parents and to the developing fetus.

b) The measurement of your blood lead level is the most useful indicator of the amount of lead absorbed by your body. Blood lead levels (PbB) are most often reported in units of milligrams (mg) or micrograms ( $\mu\text{g}$ ) of lead (1 mg=1000  $\mu\text{g}$ ) per 100 grams (100g), 100 milliliters (100 ml) or deciliter (dl) of blood. These three units are essentially the same. Sometimes PbB's are expressed in the form of mg% or  $\mu\text{g}\%$ . This is a shorthand notation for 100g, 100ml, or dl.

c) PbB measurements show the amount of lead circulating in your blood stream, but do not give any information about the amount of lead stored in your various tissues. PbB measurements merely show current absorption of lead, not the effect that lead is having on your body or the effects that past lead exposure may have already caused. Past research into lead-related diseases, however, has focused heavily on associations between PbBs and various diseases. As a result, your PbB is an important indicator of the likelihood that you will gradually acquire a lead-related health impairment or disease.

d) Once your blood lead level climbs above ((40  $\mu\text{g}/100\text{g}$ )) 25  $\mu\text{g}/\text{dl}$ , your risk of disease increases. There is a wide variability of individual response to lead, thus it is difficult to say that a particular PbB in a given person will cause a particular effect. Studies have associated fatal encephalopathy with PbBs as low as 150 (( $\mu\text{g}/100\text{g}$ ))  $\mu\text{g}/\text{dl}$ . Other studies have shown other forms of disease in some workers with PbBs well below 80 (( $\mu\text{g}/100\text{g}$ ))  $\mu\text{g}/\text{dl}$ . Your PbB is a crucial indicator of the risks to your health, but one other factor is extremely important. This factor is the length of time you have had elevated PbBs. The longer you have an elevated PbB, the greater the risk that large quantities of lead are being gradually stored in your organs and tissues (body burden). The greater your overall body burden, the greater the chances of substantial permanent damage.

e) The best way to prevent all forms of lead-related impairments and diseases—both short-term and long-term—is to maintain your PbB below ((40  $\mu\text{g}/100\text{g}$ )) 25  $\mu\text{g}/\text{dl}$ . The provisions of the standard are designed with this end in mind. Your employer has prime responsibility to assure that the provisions of the standard are complied with both by the company and by individual workers. You as a worker, however, also have a responsibility to assist your employer in complying with the standard. You can play a key role in protecting your own health by learning about the lead hazards and their control, learning what the standard requires, following the standard where it governs your own action, and seeing that your employer complies with the provisions governing ((his)) their actions.

(IV) Reporting signs and symptoms of health problems. You should immediately notify your employer if you develop signs or symptoms associated with lead poisoning or if you desire medical advice concerning the effects of current or past exposure to lead on your ability to have a healthy child. You should also notify your employer if you have difficulty breathing during a respirator fit test or while wearing a respirator. In each of these cases your employer must make available to you appropriate medical examinations or consultations. These must be provided at no cost to you and at a reasonable time and place.

(b) Appendix B. Employee Standard Summary. This appendix summarizes key provisions of the standard that you as a worker should become familiar with. The appendix discusses the entire standard.

(i) Permissible exposure limit (PEL). The standard sets a permissible exposure limit (PEL) of fifty micrograms of lead per cubic meter of air (50  $\mu\text{g}/\text{m}^3$ ), averaged over and eight-hour workday. This is the highest level of lead in air to which you may be permissibly exposed over an eight-hour workday. Since it is an eight-hour average it permits short exposures above the PEL so long as for each eight-hour workday your average exposure does not exceed the PEL.

(ii) Exposure monitoring.

(A) If lead is present in the work place where you work in any quantity, your employer is required to make an initial determination of whether the action level is exceeded for any employee. The initial determination must include instrument monitoring of the air for the presence of lead and must cover the exposure of a representative number of employees who are reasonably believed to have the highest exposure levels. If your employer has conducted appropriate air sampling for lead in the past year ((he)) they may use these results. If there have been any employee complaints of symptoms which may be attributable to exposure to lead or if there is any other information or observations which would indicate employee exposure to lead, this must also be considered as part of the initial determination. If this initial determination shows that a reasonable possibility exists that any employee may be exposed, without regard to respirators, over the action level (30  $\mu\text{g}/\text{m}^3$ ) your employer must set up an air monitoring program to determine the exposure level of every employee exposed to lead at your work place.

(B) In carrying out this air monitoring program, your employer is not required to monitor the exposure of every employee, but he or she must monitor a representative number of employees and job types. Enough sampling must be done to enable each employee's exposure level to be reasonably represented by at least one full shift (at least seven hours) air sample. In addition, these air samples must be taken under conditions which represent each employee's regular, daily exposure to lead.

(C) If you are exposed to lead and air sampling is performed, your employer is required to quickly notify you in writing of air monitoring results which represent your exposure. If the results indicate your exposure exceeds the PEL (without regard to your use of respirators), then your employer must also notify you of this in writing, and provide you with a description of the corrective action that will be taken to reduce your exposure.

(D) Your exposure must be rechecked by monitoring every six months if your exposure is over the action level but below the PEL. Air monitoring must be repeated every three months if you are exposed over the PEL. Your employer may discontinue monitoring for you if two consecutive measurements, taken at least two weeks apart, are below the action level. However, whenever there is a production, process, control, or personnel change at your work place which may result in new or additional exposure to lead, or whenever there is any other reason to suspect a change which may result in new or additional exposure to lead, your employer must perform additional monitoring.

(iii) Methods of compliance. Your employer is required to assure that no employee is exposed to lead in excess of the PEL. The standard establishes a priority of methods to be used to meet the PEL.

(iv) Respiratory protection.

(A) Your employer is required to provide and assure your use of respirators when your exposure to lead is not controlled below the PEL by other means. The employer must pay the cost of the respirator. Whenever you request one, your employer is also required to provide you a respirator even if your air exposure level does not exceed the PEL. You might desire a respirator when, for example, you have received medical advice that your lead absorption should be decreased. Or, you may intend to have children in the near future, and want to reduce the level of lead in your body to minimize adverse reproductive effects. While respirators are the least satisfactory means of controlling your exposure, they are capable of providing significant protection if properly chosen, fitted, worn, cleaned, maintained, and replaced when they stop providing adequate protection.

(B) Your employer is required to select respirators from the seven types listed in Table ((H)) I of ((the respiratory protection)) this section ((of chapter 296-62 WAC)). Any respirator chosen must be approved by the Mine Safety and Health Administration (MSHA) or the National Institute for Occupational Safety and Health (NIOSH). This respirator selection table will enable your employer to choose a type of respirator which will give you a proper amount of protection based on your airborne lead exposure. Your employer may select a type of respirator that provides greater protection than that required by the standard; that is, one recommended for a higher concentration of lead than is present in your work place. For example, a powered air purifying respirator (PAPR) is much more protective than a typical negative-pressure respirator, and may also be more comfortable to wear. A PAPR has a filter, cartridge or canister to clean the air, and a power source which continuously blows filtered air into your breathing zone. Your employer might make a PAPR available to you to ease the burden of having to wear a respirator for long periods of time.

(C) Your employer must also start a respiratory protection program. This program must include written procedures for the proper selection, use, cleaning, storage, and maintenance of respirators.

(D) Your employer must assure that your respirator facepiece fits properly. Proper fit of a respirator facepiece is critical. Obtaining a proper fit on each employee may require your employer to make available two or three different mask types. Any respirator which has a filter, cartridge or canister which cleans the work room air before you breathe it and which requires the force of your inhalation to draw air through the filtering element is a negative pressure respirator. A positive pressure respirator supplies air to you directly. A quantitative fit test uses a sophisticated machine to measure the amount, if any, of test material that leaks into the facepiece of your respirator. Appendix D describes "qualitative" procedures which are acceptable under certain conditions.

(E) You must also receive from your employer proper training in the use of respirators. Your employer is required

to teach you how to wear a respirator, to know why it is needed, and to understand its limitations.

(F) The standard provides that if your respirator uses filter elements, you must be given an opportunity to change the filter elements whenever an increase in breathing resistance is detected. You also must be permitted to periodically leave your work area to wash your face and respirator facepiece whenever necessary to prevent skin irritation. If you ever have difficulty breathing during a fit test or while using a respirator, your employer must make a medical examination available to you to determine whether you can safely wear a respirator. The result of this examination may be to give you a positive pressure respirator (which reduces breathing resistance) or to provide alternative means of protection.

(v) Protective work clothing and equipment. If you are exposed to lead above the PEL, or if you are exposed to lead compounds such as lead arsenate or lead azide which can cause skin and eye irritation, your employer must provide you with protective work clothing and equipment appropriate for the hazard. If work clothing is provided, it must be provided in a clean and dry condition at least weekly, and daily if your airborne exposure to lead is greater than 200  $\mu\text{g}/\text{m}^3$ . Appropriate protective work clothing and equipment can include coveralls or similar full-body work clothing, gloves, hats, shoes or disposable shoe coverlets, and face shields or vented goggles. Your employer is required to provide all such equipment at no cost to you. He or she is responsible for providing repairs and replacement as necessary and also is responsible for the cleaning, laundering or disposal of protective clothing and equipment. Contaminated work clothing or equipment must be removed in change rooms and not worn home or you will extend your exposure and expose your family since lead from your clothing can accumulate in your house, car, etc. Contaminated clothing which is to be cleaned, laundered or disposed of must be placed in closed containers in the change room. At no time may lead be removed from protective clothing or equipment by any means which disperses lead into the work room air.

(vi) Housekeeping. Your employer must establish a housekeeping program sufficient to maintain all surfaces as free as practicable of accumulations of lead dust. Vacuuming is the preferred method of meeting this requirement, and the use of compressed air to clean floors and other surfaces is absolutely prohibited. Dry or wet sweeping, shoveling, or brushing may not be used except where vacuuming or other equally effective methods have been tried and do not work. Vacuums must be used and emptied in a manner which minimizes the reentry of lead into the work place.

(vii) Hygiene facilities and practices.

(A) The standard requires that change rooms, showers and filtered air lunchrooms be constructed and made available to workers exposed to lead above the PEL. When the PEL is exceeded, the employer must assure that food and beverage is not present or consumed, tobacco products are not present or used, and cosmetics are not applied, except in these facilities. Change rooms, showers and lunchrooms, must be used by workers exposed in excess of the PEL. After showering, no clothing or equipment worn during the shift may be worn home and this includes shoes and underwear. ~~((Your own clothing worn during the shift should be carried home and cleaned carefully so that it does not~~

~~contaminate your home.~~) Lunchrooms may not be entered with protective clothing or equipment unless surface dust has been removed by vacuuming, downdraft booth or other cleaning methods. Finally, workers exposed above the PEL must wash both their hands and faces prior to eating, drinking, smoking or applying cosmetics.

(B) All of the facilities and hygiene practices just discussed are essential to minimize additional sources of lead absorption from inhalation or ingestion of lead that may accumulate on you, your clothes or your possessions. Strict compliance with these provisions can virtually eliminate several sources of lead exposure which significantly contribute to excessive lead absorption.

(viii) Medical surveillance.

(A) The medical surveillance program is part of the standard's comprehensive approach to the prevention of lead-related disease. Its purpose is to supplement the main thrust of the standard which is aimed at minimizing airborne concentrations of lead and sources of ingestion. Only medical surveillance can determine if the other provisions of the standard have effectively protected you as an individual. Compliance with the standard's provision will protect most workers from the adverse effects of lead exposure, but may not be satisfactory to protect individual workers (I) who have high body burdens of lead acquired over past years, (II) who have additional uncontrolled sources of nonoccupational lead exposure, (III) who exhibit unusual variations in lead absorption rates, or (IV) who have specific nonwork related medical conditions which could be aggravated by lead exposure (e.g., renal disease, anemia). In addition, control systems may fail, or hygiene and respirator programs may be inadequate. Periodic medical surveillance of individual workers will help detect those failures. Medical surveillance will also be important to protect your reproductive ability - regardless of whether you are a man or a woman.

(B) All medical surveillance required by the standard must be performed by or under the supervision of a licensed physician. The employer must provide required medical surveillance without cost to employees and at a reasonable time and place. The standard's medical surveillance program has two parts - periodic biological monitoring, and medical examinations.

(C) Your employer's obligation to offer medical surveillance is triggered by the results of the air monitoring program. Medical surveillance must be made available to all employees who are exposed in excess of the action level for more than 30 days a year. The initial phase of the medical surveillance program, which included blood lead level tests and medical examinations, must be completed for all covered employees no later than 180 days from the effective date of this standard. Priority within this first round of medical surveillance must be given to employees whom the employer believes to be at greatest risk from continued exposure (for example, those with the longest prior exposure to lead, or those with the highest current exposure). Thereafter, the employer must periodically make medical surveillance - both biological monitoring and medical examinations - available to all covered employees. Additionally, employers must offer blood lead and ZPP level sampling and analysis to all potentially lead exposed employees in accordance with subsection (11)(a)(ii) of this section.

(D) Biological monitoring under the standard consists of blood lead level (PbB) and zinc protoporphyrin tests at least every six months after the initial PbB test. A zinc protoporphyrin (ZPP) test is a very useful blood test which measures an effect of lead on your body. If a worker's PbB exceeds  $40 \text{ ((}\mu\text{g/100g)} \text{)} \mu\text{g/dl}$ , the monitoring frequency must be increased from every six months to at least every two months and not reduced until two consecutive PbBs indicate a blood lead level below  $40 \text{ ((}\mu\text{g/100g)} \text{)} \mu\text{g/dl}$ . Each time your PbB is determined to be over  $(40 \text{ ((}\mu\text{g/100g)} \text{)} \text{)} \underline{25 \mu\text{g/dl}}$ , your employer must notify you of this in writing within five working days of the receipt of the test results. The employer must also inform you that the standard requires temporary medical removal with economic protection when your PbB exceeds certain criteria (see Discussion of Medical Removal Protection - subsection (12)). During the first year of the standard, this removal criterion is  $(80 \text{ ((}\mu\text{g/100g)} \text{)} \text{)} \underline{50 \mu\text{g/dl}}$ . Anytime your PbB exceeds  $(80 \text{ ((}\mu\text{g/100g)} \text{)} \text{)} \underline{50 \mu\text{g/dl}}$  your employer must make available to you a prompt follow-up PbB test to ascertain your PbB. If the two tests both exceed  $(80 \text{ ((}\mu\text{g/100g)} \text{)} \text{)} \underline{50 \mu\text{g/dl}}$  and you are temporarily removed, then your employer must make successive PbB tests available to you on a monthly basis during the period of your removal.

(E) Medical examinations beyond the initial one must be made available on an annual basis if your blood lead levels exceeds  $40 \text{ ((}\mu\text{g/100g)} \text{)} \mu\text{g/dl}$  at any time during the preceding year. The initial examination will provide information to establish a baseline to which subsequent data can be compared. An initial medical examination must also be made available (prior to assignment) for each employee being assigned for the first time to an area where the airborne concentration of lead equals or exceeds the action level. In addition, a medical examination or consultation must be made available as soon as possible if you notify your employer that you are experiencing signs or symptoms commonly associated with lead poisoning or that you have difficulty breathing while wearing a respirator or during a respirator fit test. You must also be provided a medical examination or consultation if you notify your employer that you desire medical advice concerning the effects of current or past exposure to lead on your ability to procreate a healthy child.

(F) Finally, appropriate follow-up medical examinations or consultations may also be provided for employees who have been temporarily removed from exposure under the medical removal protection provisions of the standard (see item (ix) below).

(G) The standard specifies the minimum content of preassignment and annual medical examinations. The content of other types of medical examinations and consultations is left up to the sound discretion of the examining physician. Preassignment and annual medical examinations must include (I) a detailed work history and medical history, (II) a thorough physical examination, and (III) a series of laboratory tests designed to check your blood chemistry and your kidney function. In addition, at any time upon your request, a laboratory evaluation of male fertility will be made (microscopic examination of a sperm sample), or a pregnancy test will be given.

(H) The standard does not require that you participate in any of the medical procedures, tests, etc., which your

employer is required to make available to you. Medical surveillance can, however, play a very important role in protecting your health. You are strongly encouraged, therefore, to participate in a meaningful fashion. Generally, your employer will choose the physician who conducts medical surveillance under the lead standard - unless you and your employer can agree on the choice of a physician or physicians. Some companies and unions have agreed in advance, for example, to use certain independent medical laboratories or panels of physicians. Any of these arrangements are acceptable so long as required medical surveillance is made available to workers.

(I) The standard requires your employer to provide certain information to a physician to aid in his or her examination of you. This information includes (I) the standard and its appendices, (II) a description of your duties as they relate to lead exposure, (III) your exposure level, (IV) a description of personal protective equipment you wear, (V) prior blood level results, and (VI) prior written medical opinions concerning you that the employer has. After a medical examination or consultation the physician must prepare a written report which must contain (I) the physician's opinion as to whether you have any medical conditions which places you at increased risk of material impairment to health from exposure to lead, (II) any recommended special protective measures to be provided to you, (III) any blood lead level determinations, and (IV) any recommended limitation on your use of respirators. This last element must include a determination of whether you can wear a powered air purifying respirator (PAPR) if you are found unable to wear a negative pressure respirator.

(J) The medical surveillance program of the lead standard may at some point in time serve to notify certain workers that they have acquired a disease or other adverse medical condition as a result of occupational lead exposure. If this is true these workers might have legal rights to compensation from public agencies, their employers, firms that supply hazardous products to their employers, or other persons. Some states have laws, including worker compensation laws, that disallow a worker to learn of a job-related health impairment to sue, unless the worker sues within a short period of time after learning of the impairment. (This period of time may be a matter of months or years.) An attorney can be consulted about these possibilities. It should be stressed that WISHA is in no way trying to either encourage or discourage claims or lawsuits. However, since results of the standard's medical surveillance program can significantly affect the legal remedies of a worker who has acquired a job-related disease or impairment, it is proper for WISHA to make you aware of this.

(K) The medical surveillance section of the standard also contains provisions dealing with chelation. Chelation is the use of certain drugs (administered in pill form or injected into the body) to reduce the amount of lead absorbed in body tissues. Experience accumulated by the medical and scientific communities has largely confirmed the effectiveness of this type of therapy for the treatment of very severe lead poisoning. On the other hand it has also been established that there can be a long list of extremely harmful side effects associated with the use of chelating agents. The medical community has balanced the advantages and disadvantages resulting from the use of chelating agents in

various circumstances and has established when the use of these agents is acceptable. The standard includes these accepted limitations due to a history of abuse of chelation therapy by some lead companies. The most widely used chelating agents are calcium disodium EDTA, (Ca Na<sub>2</sub>EDTA), Calcium Disodium Versenate (Versenate), and d-penicillamine (penicillamine or Cupramine).

(L) The standard prohibits "prophylactic chelation" of any employee by any person the employer retains, supervises or controls. "Prophylactic chelation" is the routine use of chelating or similarly acting drugs to prevent elevated blood levels in workers who are occupationally exposed to lead, or the use of these drugs to routinely lower blood lead levels to predesignated concentrations believed to be safe. It should be emphasized that where an employer takes a worker who has no symptoms of lead poisoning and has chelation carried out by a physician (either inside or outside of a hospital) solely to reduce the worker's blood lead level, that will generally be considered prophylactic chelation. The use of a hospital and a physician does not mean that prophylactic chelation is not being performed. Routine chelation to prevent increased or reduce current blood lead levels is unacceptable whatever the setting.

(M) The standard allows the use of "therapeutic" or "diagnostic" chelation if administered under the supervision of a licensed physician in a clinical setting with thorough and appropriate medical monitoring. Therapeutic chelation responds to severe lead poisoning where there are marked symptoms. Diagnostic chelation, involves giving a patient a dose of the drug then collecting all urine excreted for some period of time as an aid to the diagnosis of lead poisoning.

(N) In cases where the examining physician determines that chelation is appropriate, you must be notified in writing of this fact before such treatment. This will inform you of a potentially harmful treatment, and allow you to obtain a second opinion.

(O) The employer shall assess and correct deficiencies in engineering controls, hygiene facilities, respirator protection, work practices and personal hygiene, and respirator use within thirty days whenever there is a blood lead level requiring temporary medical removal or the physician's written opinion indicates increased risk from exposure or there are laboratory or clinical findings consistent with lead toxicity.

(ix) Medical removal protection.

(A) Excessive lead absorption subjects you to increased risk of disease. Medical removal protection (MRP) is a means of protecting you when for whatever reasons, other methods, such as engineering controls, work practices, and respirators, have failed to provide the protection you need. MRP involves the temporary removal of a worker from his or her regular job to a place of significantly lower exposure without any loss of earnings, seniority, or other employment rights of benefits. The purpose of this program is to cease further lead absorption and allow your body to naturally excrete lead which has previously been absorbed. Temporary medical removal can result from an elevated blood lead level, or a medical opinion. Up to eighteen months of protection is provided as a result of either form of removal. The vast majority of removed workers, however, will return to their former jobs long before this eighteen month period expires. The standard contains special provisions to deal



with the extraordinary but possible case where a long-term worker's blood lead level does not adequately decline during eighteen months of removal.

(B) ~~((During the first year of the standard,))~~ If your blood lead level is ~~((80 µg/100g))~~ 50 µg/dl or above you must be removed from any exposure where your air lead level without a respirator would be ~~((100))~~ 30 µg/m<sup>3</sup> or above. If you are removed from your normal job you may not be returned until your blood lead level declines to at least ~~((60 µg/100g))~~ 40 µg/dl. These criteria for removal and return will change according to the following schedule:

TABLE 1

Effective Date	Removal Blood Level ((µg/100g)) µg/dl)	Air Lead (µg/m <sup>3</sup> )	Return Blood Lead ((µg/100g)) µg/dl)
<del>((9/6/81</del>	<del>At or above 70</del>	<del>50 or above</del>	<del>At or below 50</del>
<del>9/6/82</del>	<del>At or above 60</del>	<del>30 or above</del>	<del>At or below 40</del>
<del>9/6/84</del>	<del>At or above 50</del>	<del>30 or above</del>	<del>At or below 40</del>
	<del>averaged over six months))</del>		
<u>12/10/94</u>	<u>At or above 50</u>	<u>30 or above</u>	<u>At or below 40</u>
<u>12/11/95</u>	<u>At or above 45</u>	<u>30 or above</u>	<u>At or below 35</u>
<u>12/11/96</u>	<u>At or above 40</u>	<u>30 or above</u>	<u>At or below 30</u>
<u>12/11/97</u>	<u>At or above 35</u>	<u>30 or above</u>	<u>At or below 25</u>
<u>12/11/98</u>	<u>At or above 30</u>	<u>30 or above</u>	<u>At or below 25</u>

(C) You may also be removed from exposure even if your blood lead levels are below these criteria if a final medical determination indicates that you temporarily need reduced lead exposure for medical reasons. If the physician who is implementing your employers medical program makes a final written opinion recommending your removal or other special protective measures, your employer must implement the physician's recommendation. If you are removed in this manner, you may only be returned when the physician indicates it is safe for you to do so.

(D) The standard does not give specific instructions dealing with what an employer must do with a removed worker. Your job assignment upon removal is a matter for you, your employer and your union (if any) to work out consistent with existing procedures for job assignments. Each removal must be accomplished in a manner consistent with existing collective bargaining relationships. Your employer is given broad discretion to implement temporary removals so long as no attempt is made to override existing agreements. Similarly, a removed worker is provided no right to veto an employer's choice which satisfies the standard.

(E) In most cases, employers will likely transfer removed employees to other jobs with sufficiently low lead exposure. Alternatively, a worker's hours may be reduced so that the time weighted average exposure is reduced, or he or she may be temporarily laid off if no other alternative is feasible.

(F) In all of these situations, MRP benefits must be provided during the period of removal - i.e., you continue to receive the same earnings, seniority, and other rights and benefits you would have had if you had not been removed. Earnings include more than just your base wage; it includes overtime, shift differentials, incentives, and other compensation you would have earned if you had not been removed.

During the period of removal you must also be provided with appropriate follow-up medical surveillance. If you were removed because your blood lead level was too high, you must be provided with a monthly blood test. If a medical opinion caused your removal, you must be provided medical tests or examinations that the physician believes to be appropriate. If you do not participate in this follow-up medical surveillance, you may lose your eligibility for MRP benefits.

(G) When you are medically eligible to return to your former job, your employer must return you to your "former job status." This means that you are entitled to the position, wages, benefits, etc., you would have had if you had not been removed. If you would still be in your old job if no removal had occurred, that is where you go back. If not, you are returned consistent with whatever job assignment discretion your employer would have had if no removal had occurred. MRP only seeks to maintain your rights, not expand them or diminish them.

(H) If you are removed under MRP and you are also eligible for worker compensation or other compensation for lost wages, your employer's MRP benefits obligation is reduced by the amount that you actually receive from these other sources. This is also true if you obtain other employment during the time you are laid off with MRP benefits.

(I) The standard also covers situations where an employer voluntarily removes a worker from exposure to lead due to the effects of lead on the employee's medical condition, even though the standard does not require removal. In these situations MRP benefits must still be provided as though the standard required removal. Finally, it is important to note that in all cases where removal is required, respirators cannot be used as a substitute. Respirators may be used before removal becomes necessary, but not as an alternative to a transfer to a low exposure job, or to a lay-off with MRP benefits.

(x) Employee information and training.

(A) Your employer is required to provide an information and training program for all employees exposed to lead above the action level or who may suffer skin or eye irritation from lead. This program must inform these employees of the specific hazards associated with their work environment, protective measures which can be taken, the danger of lead to their bodies (including their reproductive systems), and their rights under the standard. In addition, your employer must make readily available to all employees, included those exposed below the action level, a copy of the standard and its appendices and must distribute to all employees any materials provided to the employer under the Washington Industrial Safety and Health Act (WISHA).

~~((Your employer is required to complete this training for all employees by March 4, 1981. After this date,))~~ All new employees must be trained prior to initial assignment to areas where there is possibility of exposure over the action level. This training program must also be provided at least annually thereafter.

(xi) Signs. The standard requires that the following warning sign be posted in work areas where the exposure to lead exceeds the PEL:

PROPOSED

WARNING  
LEAD WORK AREA  
NO SMOKING OR EATING

(xii) Recordkeeping.

(A) Your employer is required to keep all records of exposure monitoring for airborne lead. These records must include the name and job classification of employees measured, details of the sampling and analytic techniques, the results of this sampling and the type of respiratory protection being worn by the person sampled. Your employer is also required to keep all records of biological monitoring and medical examination results. These must include the names of the employees, the physician's written opinion and a copy of the results of the examination. All of the above kinds of records must be kept for 40 years, or for at least 20 years after your termination of employment, whichever is longer.

(B) Recordkeeping is also required if you are temporarily removed from your job under the MRP program. This record must include your name and social security number, the date of your removal and return, how the removal was or is being accomplished, and whether or not the reason for the removal was an elevated blood lead level. Your employer is required to keep each medical removal record only for as long as the duration of an employee's employment.

(C) The standard requires that if you request to see or copy environmental monitoring, blood lead level monitoring, or medical removal records, they must be made available to you or to a representative that you authorize. Your union also has access to these records. Medical records other than PbBs must also be provided to you upon request, to your physician or to any other person whom you may specifically designate. Your union does not have access to your personal medical records unless you authorize their access.

(xiii) Observations of monitoring. When air monitoring for lead is performed at your work place as required by this standard, your employer must allow you or someone you designate to act as an observer of the monitoring. Observers are entitled to an explanation of the measurement procedure, and to record the results obtained. Since results will not normally be available at the time of the monitoring, observers are entitled to record or receive the results of the monitoring when returned by the laboratory. Your employer is required to provide the observer with any personal protective devices required to be worn by employees working in the areas that is being monitored. The employer must require the observer to wear all such equipment and to comply with all other applicable safety and health procedures.

(xiv) Effective date. The standard's ~~((effective date is September 6, 1980;))~~ effect and the employer's obligation under the standard begins ~~((to come into effect as of that))~~ on the effective date. The standard was originally adopted as WAC 296-62-07349 and later recodified to WAC 296-62-07521.

(c) Appendix C. Medical Surveillance Guidelines.

(i) Introduction.

(A) The primary purpose of the Washington Industrial Safety and Health Act of 1973 is to assure, so far as possible, safe and healthful working conditions for every working man and woman. The occupational health standard for inorganic lead\* was promulgated to protect workers

exposed to inorganic lead including metallic lead, all inorganic lead compounds and organic lead soaps.

\*The term inorganic lead used throughout the medical surveillance appendices is meant to be synonymous with the definition of lead set forth in the standard.

(B) Under this final standard ~~((in effect as of September 6, 1980;))~~ the occupational exposure to inorganic lead is to be limited to 50 µg/m<sup>3</sup> (micrograms per cubic meter) based on an eight-hour time-weighted average (TWA). This level of exposure eventually must be achieved through a combination of engineering, work practice and other administrative controls. ~~((Periods of time ranging from one to ten years are provided for different industries to implement these controls which are based on individual industry considerations;))~~ Until these controls are in place, respirators must be used to meet the 50 µg/m<sup>3</sup> exposure limit.

(C) The standard also provides for a program of biological monitoring and medical surveillance for all employees exposed to levels of inorganic lead above the action level of 30 µg/m<sup>3</sup> for more than thirty days per year.

(D) The purpose of this document is to outline the medical surveillance provisions of the standard for inorganic lead, and to provide further information to the physician regarding the examination and evaluation of workers exposed to inorganic lead.

(E) Item (ii) provides a detailed description of the monitoring procedure including the required frequency of blood testing for exposed workers, provisions for medical removal protection (MRP), the recommended right of the employee to a second medical opinion, and notification and recordkeeping requirements of the employer. A discussion of the requirements for respirator use and respirator monitoring and WISHA's position on prophylactic chelation therapy are also included in this section.

(F) Item (iii) discusses the toxic effects and clinical manifestations of lead poisoning and effects of lead intoxication on enzymatic pathways in heme synthesis. The adverse effects on both male and female reproductive capacity and on the fetus are also discussed.

(G) Item (iv) outlines the recommended medical evaluation of the worker exposed to inorganic lead including details of the medical history, physical examination, and recommended laboratory tests, which are based on the toxic effects of lead as discussed in item (ii).

(H) Item (v) provides detailed information concerning the laboratory tests available for the monitoring of exposed workers. Included also is a discussion of the relative value of each test and the limitations and precautions which are necessary in the interpretation of the laboratory results.

~~((The Airborne levels to be achieved without reliance or respirator protection through a combination of engineering and work practice or other administrative controls are illustrated in the following table:))~~

Industry	Permissible Lead Level/Compliance Date		
	200µg/m <sup>3</sup>	100µg/m <sup>3</sup>	50µg/m <sup>3</sup>
Primary Lead Production	1973	06/29/84	06/29/91
Secondary Lead Production	1973	06/29/84	06/29/91
Lead Acid Battery Manufacturing	1973	06/29/83	06/29/91
Automobile Mfg./Solder Grinding	1973	N/A	03/08/97

PROPOSED



<del>Electronics, Gray Iron</del>			
<del>Foundries, Ink Mfg.,</del>			
<del>Paints and Coatings Mfg.,</del>			
<del>Can Mfg., Wallpaper Mfg.,</del>			
<del>and Printing.</del>	1973	N/A	06/29/91
<del>Lead Chemical Mfg.,</del>			
<del>Nonferrous Foundries,</del>			
<del>Leaded Steel Mfg., Battery</del>			
<del>Breaking in the Collection</del>			
<del>and Processing of Scrap</del>			
<del>(when not a part of</del>			
<del>secondary lead smelter)</del>			
<del>Secondary Copper Smelter,</del>			
<del>Brass and Bronze Ingot</del>			
<del>Production.</del>	1973	N/A	N/A <sup>†*</sup>
All Other Industries	1973	N/A	09/08/92

\* Feasibility of achieving the PEL by engineering and work practice controls for these industries has yet to be resolved in court, therefore no date has been scheduled.)

(ii) Medical surveillance and monitoring requirements for workers exposed to inorganic lead.

(A) Under the occupational health standard for inorganic lead, a program of biological monitoring and medical surveillance is to be made available to all employees exposed to lead above the action level of 30 µg/m<sup>3</sup> TWA for more than thirty days each year. This program consists of periodic blood sampling and medical evaluation to be performed on a schedule which is defined by previous laboratory results, worker complaints or concerns, and the clinical assessment of the examining physician. Additionally, employers must offer blood lead and ZPP level sampling and analysis to all potentially lead-exposed employees in accordance with subsection (11)(a)(ii) of this section.

(B) Under this program, the blood lead level of all employees who are exposed to lead above the action level of 30 µg/m<sup>3</sup> is to be determined at least every six months. The frequency is increased to every two months for employees whose last blood lead level was between ~~((40 µg/100g))~~ 40 µg/dl whole blood and the level requiring employee medical removal to be discussed below. For employees who are removed from exposure to lead due to an elevated blood lead, a new blood lead level must be measured monthly. Zinc protoporphyrin (ZPP) measurement is strongly recommended on each occasion that a blood lead level measurement is made.

(C) An annual medical examination and consultation performed under the guidelines discussed in item (iv) is to be made available to each employee for whom a blood test conducted at any time during the preceding twelve months indicated a blood lead level at or above ~~((40 µg/100g))~~ 40 µg/dl. Also, an examination is to be given to all employees prior to their assignment to an area in which airborne lead concentrations reach or exceed the action level. In addition, a medical examination must be provided as soon as possible after notification by an employee that the employee has developed signs or symptoms commonly associated with lead intoxication, that the employee desires medical advice regarding lead exposure and the ability to procreate a healthy child, or that the employee has demonstrated difficulty in breathing during a respirator fitting test or during respirator use. An examination is also to be made available to each employee removed from exposure to lead due to a risk of sustaining material impairment to health, or otherwise limited or specially protected pursuant to medical recommendations.

(D) Results of biological monitoring or the recommendations of an examining physician may necessitate removal of an employee from further lead exposure pursuant to the standard's medical removal program (MRP). The object of the MRP program is to provide temporary medical removals to workers either with substantially elevated blood lead levels or otherwise at risk of sustaining material health impairment from continued substantial exposure to lead. ~~((The following guidelines which are summarized in Table 10 were created under the standard for the temporary removal of an exposed employee and his or her subsequent return to work in an exposure area.~~

PROPOSED

TABLE 10

	Effective Date				
	Sept. 6, 1980	Sept. 6, 1981	Sept. 6, 1982	Sept. 6, 1983	Sept. 6, 1984 (Final)
A. Blood lead level requiring employee medical removal (level must be confirmed with second follow-up blood lead level within two weeks of first report.)	> 80 µg/100g.	> 70 µg/100g.	> 60 µg/100g.	> 60 µg/100g.	> 60 µg/100g. as average of last three blood samples or all blood samples over previous 6 months (whichever is over a longer time period) is 50 µg/100g or greater unless last sample is 40 µg/100g or less.
B. Frequency which employees exposed to action level of lead (30 µg/m <sup>3</sup> TWA) must have blood lead level checked. (ZPP is also strongly recommended in each occasion that a blood test is obtained):					
1. Last blood lead level less than 40 µg/100g.....	Every 6 months.	Every 6 months.	Every 6 months.	Every 6 months.	Every 6 months.
2. Last blood lead level between 40 µg/100g and level requiring medical removal (see A above)....	Every 2 months.	Every 2 months.	Every 2 months.	Every 2 months.	Every 2 months.
3. Employees removed from exposure to lead because of an elevated blood lead level.....	Every 1 month.	Every 1 month.	Every 1 month.	Every 1 month.	Every 1 month.
C. Permissible airborne exposure limit for workers removed from work due to an elevated blood lead level (without regard to respirator protection).	100 µg/m <sup>3</sup> 8 hr TWA	50 µg/m <sup>3</sup> 8 hr TWA	30 µg/m <sup>3</sup> 8 hr TWA	30 µg/m <sup>3</sup> 8 hr TWA	30 µg/m <sup>3</sup> 8 hr TWA
D. Blood lead level confirmed with a second blood analysis, at which employee may return to work. Permissible exposure without regard to respirator protection is listed by industry in Table 1.	> 60 µg/100g	> 50 µg/100g	> 40 µg/100g	> 40 µg/100g	> 40 µg/100g

NOTE: When medical opinion indicates that an employee is at risk of material impairment from exposure to lead, the physician can remove an employee from exposures exceeding the action level (or less) or recommend special protective measures as deemed appropriate and necessary. Medical monitoring during the medical removal period can be more stringent than noted in the table above if the physician so specifies. Return to work or removal of limitations and special protection is permitted when the physician indicates that the worker is no longer at risk of material impairment.

PROPOSED

(E) Under the standard's ultimate worker removal criteria, a worker is to be removed from any work having any eight-hour TWA exposure to lead of 30 µg/m<sup>3</sup> or more ((whenever either of the following circumstances apply)). ((#)) Beginning December 11, 1998, a blood lead level of ((60 µg/100g)) 30 µg/dl or greater is obtained and confirmed by a second follow-up blood lead level performed within two weeks after the employer receives the results of the first blood sample test((, or (II) the average of the previous three blood lead determinations or the average of all blood lead determinations conducted during the previous six months, whichever encompasses the longest time period, equals or exceeds 50 µg/100g, unless the last blood sample indicates a blood lead level at or below 40 µg/100g, in which case the employee need not be removed. Medical removal is to continue until two consecutive blood lead levels are 40 µg/100g or less)).

(F) ((During the first two years that the ultimate removal criteria are being phased in, the return criteria have been set to assure that a worker's blood lead level has substantially declined during the period of removal. From March 1, 1979, to March 1, 1980, the blood lead level requiring employee medical removal is 80 µg/100g. Workers found to have a confirmed blood lead at this level or greater need only be removed from work having a daily eight hour

~~TWA exposure to lead at or above 100 µg/m<sup>3</sup>. Workers so removed are to be returned to work when their blood lead levels are at or below 60 µg/100g of whole blood. From March 1, 1980, to March 1, 1981, the blood lead level requiring medical removal is 70 µg/100g. During this period workers need only be removed from jobs having a daily eight hour TWA exposure to lead at or above 50 µg/m<sup>3</sup> and are to be returned to work when a level of 50 µg/100g is achieved. Beginning March 1, 1981, return depends on the worker's blood lead level declining to 40 µg/100g of whole blood.)) From December 10, 1994, through December 10, 1995, the blood lead level requiring employee medical removal is 50 µg/dl. Workers found to have a confirmed blood lead level at this level or greater need to be removed from work having exposures to lead. Workers so removed are to return to work when their blood lead levels are at or below 40 µg/dl whole blood. From December 11, 1995, through December 10, 1996, the blood lead level requiring medical removal is 45 µg/dl. During this period workers need to be removed from jobs having exposures to lead and are returned to work when a level of 35 µg/dl is achieved. From December 11, 1996, through December 10, 1997, the blood lead level requiring medical removal is 40 µg/dl. During this period workers need to be removed from jobs having exposures to lead and are returned to work when a~~

level of 30 µg/dl is achieved. From December 11, 1997, through December 10, 1998, the blood lead level requiring medical removal is 35 µg/dl. During this period workers need to be removed from jobs having exposures to lead and are returned to work when a level of 25 µg/dl is achieved. Beginning December 11, 1998, the blood lead level requiring medical removal is 30 µg/dl for a worker exposed to lead and returned to work when a level of 25 µg/dl is reached.

(G) As part of the standard, the employer is required to notify in writing each employee whose whole blood lead level exceeds (~~(40 µg/100g)~~) 25 µg/dl. In addition, each such employee is to be informed that the standard requires medical removal with MRP benefits, discussed below, when an employee's blood lead level exceeds the above defined limits.

(H) In addition to the above blood lead level criteria, temporary worker removal may also take place as a result of medical determinations and recommendations. Written medical opinions must be prepared after each examination pursuant to the standard. If the examining physician includes medical finding, determination or opinion that the employee has a medical condition which places the employee at increased risk of material health impairment from exposure to lead, then the employee must be removed from exposure to lead at or above the action level. Alternatively, if the examining physician recommends special protective measures for an employee (e.g., use of a powered air purifying respirator) or recommends limitations on an employee's exposure to lead, then the employer must implement these recommendations. Recommendations may be more stringent than the specific provisions of the standard. The examining physician, therefore, is given broad flexibility to tailor special protective procedures to the needs of individual employees. This flexibility extends to the evaluation and management of pregnant workers and male and female workers who are planning to conceive children. Based on the history, physical examination, and laboratory studies, the physician might recommend special protective measures or medical removal for an employee who is pregnant or who is planning to conceive a child when, in the physician's judgment, continued exposure to lead at the current job would pose a significant risk. The return of the employee to his or her former job status, or the removal of special protections or limitations, depends upon the examining physician determining that the employee is no longer at increased risk of material impairment or that the special measures are no longer needed.

(I) During the period of any form of special protection or removal, the employer must maintain the worker's earnings, seniority, and other employment rights and benefits (as though the worker has not been removed) for a period of up to eighteen months. This economic protection will maximize meaningful worker participation in the medical surveillance program, and is appropriate as part of the employer's overall obligation to provide a safe and healthful work place. The provisions of MRP benefits during the employee's removal period may, however, be conditioned upon participation in medical surveillance.

(J) On rare occasions, an employee's blood lead level may not acceptably decline within eighteen months of removal. This situation will arise only in unusual circumstances, thus the standard relies on an individual medical

examination to determine how to protect such an employee. This medical determination is to be based on both laboratory values, including lead levels, zinc protoporphyrin levels, blood counts, and other tests felt to be warranted, as well as the physician's judgment that any symptoms or findings on physical examination are a result of lead toxicity. The medical determination may be that the employee is incapable of ever safely returning to his or her former job status. The medical determination may provide additional removal time past eighteen months for some employees or specify special protective measures to be implemented.

(K) The lead standard provides for a multiple physician review in cases where the employee wishes a second opinion concerning potential lead poisoning or toxicity. If an employee wishes a second opinion, he or she can make an appointment with a physician of his or her choice. This second physician will review the findings, recommendations or determinations of the first physician and conduct any examinations, consultations or tests deemed necessary in an attempt to make a final medical determination. If the first and second physicians do not agree in their assessment they must try to resolve their differences. If they cannot reach an agreement then they must designate a third physician to resolve the dispute.

(L) The employer must provide examining and consulting physicians with the following specific information: A copy of the lead regulations and all appendices, a description of the employee's duties as related to exposure, the exposure level to lead and any other toxic substances (if applicable), a description of personal protective equipment used, blood lead levels, and all prior written medical opinions regarding the employee in the employer's possession or control. The employer must also obtain from the physician and provide the employee with a written medical opinion containing blood lead levels, the physician's opinion as to whether the employee is at risk of material impairment to health, any recommended protective measures for the employee if further exposure is permitted, as well as any recommended limitations upon an employee's use of respirators.

(M) Employers must instruct each physician not to reveal to the employer in writing or in any other way his or her findings, laboratory results, or diagnoses which are felt to be unrelated to occupational lead exposure. They must also instruct each physician to advise the employee of any occupationally or nonoccupationally related medical condition requiring further treatment or evaluation.

(N) The standard provides for the use of respirators when engineering and other primary controls have not been fully implemented. However, the use of respirator protection shall not be used in lieu of temporary medical removal due to elevated blood lead levels or findings that an employee is at risk of material health impairment. This is based on the numerous inadequacies of respirators including skin rash where the facepiece makes contact with the skin, unacceptable stress to breathing in some workers with underlying cardiopulmonary impairment, difficulty in providing adequate fit, the tendency for respirators to create additional hazards by interfering with vision, hearing, and mobility, and the difficulties of assuring the maximum effectiveness of a complicated work practice program involving respirators. Respirators do, however, serve a useful function where engineering and work practice are inadequate by providing

interim or short-term protection, provided they are properly selected for the environment in which the employee will be working, properly fitted to the employee, maintained and cleaned periodically, and worn by the employee when required.

(O) In its final standard on occupational exposure to inorganic lead, WISHA has prohibited prophylactic chelation. Diagnostic and therapeutic chelation are permitted only under the supervision of a licensed physician with appropriate medical monitoring in an acceptable clinical setting. The decision to initiate chelation therapy must be made on an individual basis and take into account the severity of symptoms felt to be a result of lead toxicity along with blood lead levels, ZPP levels and other laboratory tests as appropriate. EDTA and penicillamine, which are the primary chelating agents used in the therapy of occupational lead poisoning, have significant potential side effects and their use must be justified on the basis of expected benefits to the worker.

(P) Unless frank and severe symptoms are present, therapeutic chelation is not recommended given the opportunity to remove a worker from exposure and allow the body to naturally excrete accumulated lead. As a diagnostic aid, the chelation mobilization test using CA-EDTA has limited applicability. According to some investigators, the tests can differentiate between lead-induced and other nephropathies. The test may also provide an estimation of the mobile fraction of the total body lead burden.

(Q) Employers are required to assure that accurate records are maintained on exposure monitoring, medical surveillance, and medical removal for each employee. Exposure monitoring and medical surveillance records must be kept for forty years or the duration of employment plus twenty years, whichever is longer, while medical removal records must be maintained for the duration of employment. All records required under the standard must be made available upon request to representatives of the director of the department of labor and industries. Employers must also make environmental and biological monitoring and medical removal records available to affected employees and to former employees or their authorized employee representatives. Employees or their specifically designated representatives have access to their entire medical surveillance records.

(R) In addition, the standard requires that the employer inform all workers exposed to lead at or above the action level of the provisions of the standard and all its appendices, the purpose and description of medical surveillance and provisions for medical removal protection if temporary removal is required. An understanding of the potential health effects of lead exposure by all exposed employees along with full understanding of their rights under the lead standard is essential for an effective monitoring program.

(S) The employer shall assess and correct deficiencies in engineering controls, hygiene facilities, respirator protection, work practices and personal hygiene, and respirator use within thirty days whenever there is a blood lead level requiring temporary medical removal or the physician's written opinion indicates increased risk from exposure or there are laboratory or clinical findings consistent with lead toxicity.

(iii) Adverse health effects of inorganic lead.

(A) Although the toxicity of lead has been known for 2,000 years, the knowledge of the complex relationship between lead exposure and human response is still being refined. Significant research into the toxic properties of lead continues throughout the world, and it should be anticipated that our understanding of thresholds of effects and margins of safety will be improved in future years. The provisions of the lead standard are founded on two prime medical judgments; first, the prevention of adverse health effects from exposure to lead throughout a working lifetime requires that worker blood lead levels be maintained at or below ((40  $\mu\text{g}/100\text{g}$ )) 25  $\mu\text{g}/\text{dl}$ , and second, the blood lead levels of workers, male or female, who intend to parent in the near future should be maintained below ((30  $\mu\text{g}/100\text{g}$ )) 25  $\mu\text{g}/\text{dl}$  to minimize adverse reproduction health effects to the parent and developing fetus. The adverse effects of lead on reproduction are being actively researched and WISHA encourages the physician to remain abreast of recent developments in the area to best advise pregnant workers or workers planning to conceive children.

(B) The spectrum of health effects caused by lead exposure can be sub-divided into five developmental states; normal, physiological changes of uncertain significance, pathophysiological changes, overt symptoms (morbidity), and mortality. Within this process there are no sharp distinctions, but rather a continuum of effects. Boundaries between categories overlap due to the wide variation of individual ((responses)) responses and exposures in the working population. WISHA's development of the lead standard focused on pathophysiological changes as well as later stages of disease.

(I) Heme synthesis inhibition.

a) The earliest demonstrated effect of lead involves its ability to inhibit at least two ((enzymes)) enzymes of the heme synthesis pathway at very low blood levels. Inhibition of delta aminolevulinic acid dehydrase (ALA-D) which catalyzes the conversion of delta-aminolevulinic acid (ALA) to protoporphyrin is observed at a blood lead level below 20(( $\mu\text{g}/100\text{g}$ ))  $\mu\text{g}/\text{dl}$  whole blood. At a blood lead level of 40 (( $\mu\text{g}/100\text{g}$ ))  $\mu\text{g}/\text{dl}$ , more than twenty percent of the population would have seventy percent inhibition of ALA-D. There is an exponential increase in ALA excretion at blood lead levels greater than 40 (( $\mu\text{g}/100\text{g}$ ))  $\mu\text{g}/\text{dl}$ .

b) Another enzyme, ferrochelatase, is also inhibited at low blood lead levels. Inhibition of ferrochelatase leads to increased free erythrocyte protoporphyrin (FEP) in the blood which can then bind to zinc to yield zinc protoporphyrin. At a blood lead level of 50(( $\mu\text{g}/100\text{g}$ ))  $\mu\text{g}/\text{dl}$  or greater, nearly 100 percent of the population will have an increase FEP. There is also an exponential relationship between blood lead levels greater than 40 (( $\mu\text{g}/100\text{g}$ ))  $\mu\text{g}/\text{dl}$  and the associated ZPP level, which has led to the development of the ZPP screening test for lead exposure.

c) While the significance of these effects is subject to debate, it is WISHA's position that these enzyme disturbances are early stages of a disease process which may eventually result in the clinical symptoms of lead poisoning. Whether or not the effects do progress to the later stages of clinical disease, disruption of these enzyme processes over a working lifetime is considered to be a material impairment of health.

d) One of the eventual results of lead-induced inhibition of enzymes in the heme synthesis pathway is anemia which

can be asymptomatic if mild but associated with a wide array of symptoms including dizziness, fatigue, and tachycardia when more severe. Studies have indicated that lead levels as low as 50 ( $\mu\text{g}/100\text{g}$ )  $\mu\text{g}/\text{dl}$  can be associated with a definite decreased hemoglobin, although most cases of lead-induced anemia, as well as shortened red-cell survival times, occur at lead levels exceeding 80 ( $\mu\text{g}/100\text{g}$ )  $\mu\text{g}/\text{dl}$ . Inhibited hemoglobin synthesis is more common in chronic cases whereas shortened erythrocyte life span is more common in acute cases.

e) In lead-induced anemias, there is usually a reticulocytosis along with the presence of basophilic stippling, and ringed sideroblasts, although none of the above are pathognomonic for lead-induced anemia.

#### (II) Neurological effects.

a) Inorganic lead had been found to have toxic effects on both the central and peripheral nervous systems. The earliest stage of lead-induced central nervous system effects first manifest themselves in the form of behavioral disturbances and central nervous system symptoms including irritability, restlessness, insomnia and other sleep disturbances, fatigue, vertigo, headache, poor memory, tremor, depression, and apathy. With more severe exposure, symptoms can progress to drowsiness, stupor, hallucinations, delirium, convulsions and coma.

b) The most severe and acute form of lead poisoning which usually follows ingestion or inhalation of large amounts of lead is acute encephalopathy which may arise precipitously with the onset of intractable seizures, coma, cardiorespiratory arrest, and death within 48 hours.

c) While there is disagreement about what exposure levels are needed to produce the earliest symptoms, most experts agree that symptoms definitely can occur at blood lead levels of 60 ( $\mu\text{g}/100\text{g}$ )  $\mu\text{g}/\text{dl}$  whole blood and therefore recommend a ( $40\text{ }\mu\text{g}/100\text{g}$ ) 25  $\mu\text{g}/\text{dl}$  maximum. The central nervous system effects frequently are not reversible following discontinued exposure or chelation therapy and when improvement does occur, it is almost always only partial.

d) The peripheral neuropathy resulting from lead exposure characteristically involves only motor function with minimal sensory damage and has a marked predilection for the extensor muscles of the most active extremity. The peripheral neuropathy can occur with varying degrees of severity. The earliest and mildest form which can be detected in workers with blood lead levels as low as 50 ( $\mu\text{g}/100\text{g}$ )  $\mu\text{g}/\text{dl}$  is manifested by slowing or motor nerve conduction velocity often without clinical symptoms. With progression of the neuropathy there is development of painless extensor muscle weakness usually involving the extensor muscles of the fingers and hand in the most active upper extremity, followed in severe cases by wrist drop, much less commonly, foot drop.

e) In addition to slowing of nerve conduction, electromyographical studies in patients with blood lead levels greater than 50 ( $\mu\text{g}/100\text{g}$ )  $\mu\text{g}/\text{dl}$  have demonstrated a decrease in the number of acting motor unit potentials, an increase in the duration of motor unit potentials, and spontaneous pathological activity including fibrillations and fasciculation. Whether these effects occur at levels of 40 ( $\mu\text{g}/100\text{g}$ )  $\mu\text{g}/\text{dl}$  is undetermined.

f) While the peripheral neuropathies can occasionally be reversed with therapy, again such recovery is not assured particularly in the more severe neuropathies and often improvement is only partial. The lack of reversibility is felt to be due in part to segmental demyelination.

(III) Gastrointestinal. Lead may also effect the gastrointestinal system producing abdominal colic or diffuse abdominal pain, constipation, obstipation, diarrhea, anorexia, nausea and vomiting. Lead colic rarely develops at blood lead levels below 80 ( $\mu\text{g}/100\text{g}$ )  $\mu\text{g}/\text{dl}$ .

#### (IV) Renal.

a) Renal toxicity represents one of the most serious health effects of lead poisoning. In the early stages of disease nuclear inclusion bodies can frequently be identified in proximal renal tubular cells. Renal functions remain normal and the changes in this stage are probably reversible. With more advanced disease there is progressive interstitial fibrosis and impaired renal function. Eventually extensive interstitial fibrosis ensues with sclerotic glomeruli and dilated and atrophied proximal tubules; all represent end stage kidney disease. Azotemia can be progressive, eventually resulting in frank uremia necessitating dialysis. There is occasionally associated hypertension and hyperuricemia with or without gout.

b) Early kidney disease is difficult to detect. The urinalysis is normal in early lead nephropathy and the blood urea nitrogen and serum creatinine increase only when two-thirds of kidney function is lost. Measurement of creatinine clearance can often detect earlier disease as can other methods of measurement of glomerular filtration rate. An abnormal Ca-EDTA mobilization test has been used to differentiate between lead-induced and other nephropathies, but this procedure is not widely accepted. A form of Fanconi syndrome with aminoaciduria, glycosuria, and hyperphosphaturia indicating severe injury to the proximal renal tubules is occasionally seen in children.

#### (V) Reproductive effects.

a) Exposure to lead can have serious effects on reproductive function in both males and females. In male workers exposed to lead there can be a decrease in sexual drive, impotence, decreased ability to produce healthy sperm, and sterility. Malformed sperm (teratospermia), decreased number of sperm (hypospermia), and sperm with decreased motility (asthenospermia) can occur. Teratospermia has been noted at mean blood lead levels of 53 ( $\mu\text{g}/100\text{g}$ )  $\mu\text{g}/\text{dl}$  and hypospermia and asthenospermia at 41 ( $\mu\text{g}/100\text{g}$ )  $\mu\text{g}/\text{dl}$ . Furthermore, there appears to be a dose-response relationship for teratospermia in lead exposed workers.

b) Women exposed to lead may experience menstrual disturbances including dysmenorrhea, menorrhagia and amenorrhea. Following exposure to lead, women have a higher frequency of sterility, premature births, spontaneous miscarriages, and stillbirths.

c) Germ cells can be affected by lead and cause genetic damage in the egg or sperm cells before conception and result in failure to implant, miscarriage, stillbirth, or birth defects.

d) Infants of mothers with lead poisoning have a higher mortality during the first year and suffer from lowered birth weights, slower growth, and nervous system disorders.

e) Lead can pass through the placental barrier and lead levels in the mother's blood are comparable to concentra-

tions of lead in the umbilical cord at birth. Transplacental passage becomes detectable at 12-14 weeks of gestation and increases until birth.

f) There is little direct data on damage to the fetus from exposure to lead but it is generally assumed that the fetus and newborn would be at least as susceptible to neurological damage as young children. Blood lead levels of ~~((50-60 µg/100g))~~ 25-40 µg/dl in children can cause ~~((significant))~~ measurable neurobehavioral impairments, and there is evidence of ~~((hyperactivity))~~ abnormal cognitive development and behavior at blood levels as low as ~~((25 µg/100g))~~ 10 µg/dl. Given the overall body of literature concerning the adverse health effects of lead in children, WISHA feels that the blood lead level in children should be maintained below ~~((30 µg/100g))~~ 10 µg/dl ~~((with a population mean of 15 µg/100g))~~. Blood lead levels in the fetus and newborn likewise should not exceed ~~((30 µg/100g))~~ 10 µg/dl.

g) Because of lead's ability to pass through the placental barrier and also because of the demonstrated adverse effects of lead on reproductive function in both males and females as well as the risk of genetic damage of lead on both the ovum and sperm, WISHA recommends a ~~((30 µg/100g))~~ 25 µg/dl maximum permissible blood lead level in both males and females who wish to bear children.

(IV) Other toxic effects.

a) Debate and research continue on the effects of lead on the human body. Hypertension has frequently been noted in occupationally exposed individuals although it is difficult to assess whether this is due to lead's adverse effects on the kidneys or if some other mechanism is involved.

b) Vascular and electrocardiographic changes have been detected but have not been well characterized. Lead is thought to impair thyroid function and interfere with the pituitary-adrenal axis, but again these effects have not been well defined.

(iv) Medical evaluation.

(A) The most important principle in evaluating a worker for any occupational disease including lead poisoning is a high index of suspicion on the part of the examining physician. As discussed in Section (ii), lead can affect numerous organ systems and produce a wide array of signs and symptoms, most of which are nonspecific and subtle in nature at least in the early stages of disease. Unless serious concern for lead toxicity is present, many of the early clues to diagnosis may easily be overlooked.

(B) The crucial initial step in the medical evaluation is recognizing that a worker's employment can result in exposure to lead. The worker will frequently be able to define exposures to lead and lead-containing materials but often will not volunteer this information unless specifically asked. In other situations the worker may not know of any exposures to lead but the suspicion might be raised on the part of the physician because of the industry or occupation of the worker. Potential occupational exposure to lead and its compounds occur in at least 120 occupations, including lead smelting, the manufacture of lead storage batteries, the manufacture of lead pigments and products containing pigments, solder manufacture, shipbuilding and ship repair, auto manufacturing, construction, and painting.

(C) Once the possibility for lead exposure is raised, the focus can then be directed toward eliciting information from

the medical history, physical exam, and finally from laboratory data to evaluate the worker for potential lead toxicity.

(D) A complete and detailed work history is important in the initial evaluation. A listing of all previous employment with information on work processes, exposure to fumes or dust, known exposures to lead or other toxic substances, respiratory protection used, and previous medical surveillance should all be included in the worker's record. Where exposure to lead is suspected, information concerning on-the-job personal hygiene, smoking or eating habits in work areas, laundry procedures, and use of any protective clothing or respiratory protection equipment should be noted. A complete work history is essential in the medical evaluation of a worker with suspected lead toxicity, especially when long-term effects such as neurotoxicity and nephrotoxicity are considered.

(E) The medical history is also of fundamental importance and should include a listing of all past and current medical conditions, current medications including proprietary drug intake, previous surgeries and hospitalizations, allergies, smoking history, alcohol consumption, and also nonoccupational lead exposures such as hobbies (hunting, riflery). Also known childhood exposures should be elicited. Any previous history of hematological, neurological, gastrointestinal, renal, psychological, gynecological, genetic, or reproductive problems should be specifically noted.

(F) A careful and complete review of systems must be performed to assess both recognized complaints and subtle or slowly acquired symptoms which the worker might not appreciate as being significant. The review of symptoms should include the following:

- General - weight loss, fatigue, decreased appetite.
- Head, Eyes, Ears, Nose, Throat (HEENT) - headaches, visual disturbance or decreased visual acuity, hearing deficits or tinnitus, pigmentation of the oral mucosa, or metallic taste in mouth.
- Cardio-pulmonary - shortness of breath, cough, chest pains, palpitations, or orthopnea.
- Gastrointestinal - nausea, vomiting, heartburn, abdominal pain, constipation or diarrhea.
- Neurologic - irritability, insomnia, weakness (fatigue), dizziness, loss of memory, confusion, hallucinations, incoordination, ataxia, decreased strength in hands or feet, disturbance in gait, difficulty in climbing stairs, or seizures.
- Hematologic - pallor, easy fatigability, abnormal blood loss, melena.
- Reproductive (male or female and spouse where relevant) - history of infertility, impotence, loss of libido, abnormal menstrual periods, history of miscarriages, stillbirths, or children with birth defects.
- Musculo-skeletal - muscle and joint pains.

PROPOSED

(G) The physical examination should emphasize the neurological, gastrointestinal, and cardiovascular systems. The worker's weight and blood pressure should be recorded and the oral mucosa checked for pigmentation characteristic of a possible Burtonian or lead line on the gingiva. It should be noted, however, that the lead line may not be present even in severe lead poisoning if good oral hygiene is practiced.

(H) The presence of pallor on skin examination may indicate an anemia, which if severe might also be associated with a tachycardia. If an anemia is suspected, an active search for blood loss should be undertaken including potential blood loss through the gastrointestinal tract.

(I) A complete neurological examination should include an adequate mental status evaluation including a search for behavioral and psychological disturbances, memory testing, evaluation for irritability, insomnia, hallucinations, and mental clouding. Gait and coordination should be examined along with close observation for tremor. A detailed evaluation of peripheral nerve function including careful sensory and motor function testing is warranted. Strength testing particularly of extensor muscle groups of all extremities is of fundamental importance.

(J) Cranial nerve evaluation should also be included in the routine examination.

(K) The abdominal examination should include auscultation for bowel sounds and abnormal bruits and palpation for organomegaly, masses, and diffuse abdominal tenderness.

(L) Cardiovascular examination should evaluate possible early signs of congestive heart failure. Pulmonary status should be addressed particularly if respirator protection is contemplated.

(M) As part of the medical evaluation, the lead standard requires the following laboratory studies.

(I) Blood lead level.

(II) Hemoglobin and hematocrit determinations, red cell indices, and examination of the peripheral blood smear to evaluate red blood cell morphology.

(III) Blood urea nitrogen.

(IV) Serum creatinine.

(V) Routine urinalysis with microscopic examination.

(VI) A zinc protoporphyrin level.

(N) In addition to the above, the physician is authorized to order any further laboratory or other tests which he or she deems necessary in accordance with sound medical practice. The evaluation must also include pregnancy testing or laboratory evaluation of male fertility if requested by the employee.

(O) Additional tests which are probably not warranted on a routine basis but may be appropriate when blood lead and ZPP levels are equivocal include delta aminolevulinic acid and coproporphyrin concentrations in the urine, and dark-field illumination for detection of basophilic stippling in red blood cells.

(P) If an anemia is detected further studies including a careful examination of the peripheral smear, reticulocyte count, stool for occult blood, serum iron, total iron binding capacity, bilirubin, and, if appropriate vitamin B12 and folate may be of value in attempting to identify the cause of the anemia.

(Q) If a peripheral neuropathy is suspected, nerve conduction studies are warranted both for diagnosis and as a basis to monitor any therapy.

(R) If renal disease is questioned, a 24-hour urine collection for creatinine clearance, protein, and electrolytes may be indicated. Elevated uric acid levels may result from lead-induced renal disease and a serum uric acid level might be performed.

(S) An electrocardiogram and chest x-ray may be obtained as deemed appropriate.

(T) Sophisticated and highly specialized testing should not be done routinely and where indicated should be under the direction of a specialist.

(v) Laboratory evaluation.

(A) The blood level at present remains the single most important test to monitor lead exposure and is the test used in the medical surveillance program under the lead standard to guide employee medical removal. The ZPP has several advantages over the blood lead level. Because of its relatively recent development and the lack of extensive data concerning its interpretation, the ZPP currently remains an ancillary test.

(B) This section will discuss the blood lead level and ZPP in detail and will outline their relative advantages and disadvantages. Other blood tests currently available to evaluate lead exposure will also be reviewed.

(C) The blood lead level is a good index of current or recent lead absorption when there is no anemia present and when the worker has not taken any chelating agents. However, blood lead levels along with urinary lead levels do not necessarily indicate the total body burden of lead and are not adequate measures of past exposure. One reason for this is that lead has a high affinity for bone and up to 90 percent of the body's total lead is deposited there. A very important component of the total lead body burden is lead in soft tissue (liver, kidneys, and brain). This fraction of the lead body burden, the biologically active lead, is not entirely reflected by blood lead levels since it is a function of the dynamics of lead absorption, distribution, deposition in bone and excretion. Following discontinuation of exposure to lead, the excess body burden is only slowly mobilized from bone and other relatively stable stores and excreted. Consequently, a high blood lead level may only represent recent heavy exposure to lead without a significant total body excess and likewise a low blood lead level does not exclude an elevated total body burden of lead.

(D) Also due to its correlation with recent exposures, the blood lead level may vary considerably over short time intervals.

(E) To minimize laboratory error and erroneous results due to contamination, blood specimens must be carefully collected after thorough cleaning of the skin with appropriate methods using lead-free containers and analyzed by a reliable laboratory. Under the standard, samples must be analyzed in laboratories which are approved by ~~((the Center for Disease Control (CDC) or which have received satisfactory grades in proficiency testing by the CDC in the previous year))~~ OSHA. Analysis is to be made using atomic absorption spectrophotometry anodic stripping; voltammetry or any method which meets the accuracy requirements set forth by the standard.



(F) The determination of lead in urine is generally considered a less reliable monitoring technique than analysis of whole blood primarily due to individual variability in urinary excretion capacity as well as the technical difficulty of obtaining accurate 24 hour urine collections. In addition, workers with renal insufficiency, whether due to lead or some other cause, may have decreased lead clearance and consequently urine lead levels may underestimate the true lead burden. Therefore, urine lead levels should not be used as a routine test.

(G) The zinc protoporphyrin test, unlike the blood lead determination, measures an adverse metabolic effect of lead and as such is a better indicator of lead toxicity than the level of blood lead itself. The level of ZPP reflects lead absorption over the preceding three to four months, and therefore is a better indicator of lead body burden. The ZPP requires more time than the blood lead to read significantly elevated levels; the return to normal after discontinuing lead exposure is also slower. Furthermore, the ZPP test is simpler, faster, and less expensive to perform and no contamination is possible. Many investigators believe it is the most reliable means of monitoring chronic lead absorption.

(H) Zinc protoporphyrin results from the inhibition of the enzyme ferrochelatase which catalyzes the insertion of an iron molecule into the protoporphyrin molecule, which then becomes heme. If iron is not inserted into the molecule then zinc, having a greater affinity for protoporphyrin, takes place in the iron, forming ZPP.

(I) An elevation in the level of circulating ZPP may occur at blood lead levels as low as 20-30 (~~( $\mu\text{g}/100\text{g}$ )~~)  $\mu\text{g}/\text{dl}$  in some workers. Once the blood lead level has reached 40 (~~( $\mu\text{g}/100\text{g}$ )~~)  $\mu\text{g}/\text{dl}$  there is more marked rise in the ZPP value from its normal range of less than 100  $\mu\text{g}/100\text{ml}$ . Increases in blood lead levels beyond 40 (~~( $\mu\text{g}/100\text{g}$ )~~)  $\mu\text{g}/\text{dl}$  are associated with exponential increases in ZPP.

(J) Whereas blood lead levels fluctuate over short time spans, ZPP levels remain relatively stable. ZPP is measured directly in red blood cells and is present for the cell's entire 120 day lifespan. Therefore, the ZPP level in blood reflects the average ZPP production over the previous three to four months and consequently the average lead exposure during that time interval.

(K) It is recommended that a hematocrit be determined whenever a confirmed ZPP of 50  $\mu\text{g}/100\text{ml}$  whole blood is obtained to rule out a significant underlying anemia. If the ZPP is in excess of 100 $\mu\text{g}/100\text{ml}$  and not associated with abnormal elevations in blood lead levels, the laboratory should be checked to be sure the blood leads were determined using atomic absorption spectrophotometry, anodic stripping voltammetry or any method which meets the accuracy requirements set forth by the standard (~~(by a CDC approved laboratory which is experienced in lead level determinations)~~). Repeat periodic blood lead studies should be obtained in all individuals with elevated ZPP levels to be certain that an associated elevated blood lead level has not been missed due to transient fluctuations in blood leads.

(L) ZPP has characteristic fluorescence spectrum with a peak at 594nm which is detectable with a hematofluorimeter. The hematofluorimeter is accurate and portable and can provide on-site, instantaneous results for workers who can be frequently tested via a finger prick.

(M) However, careful attention must be given to calibration and quality control procedures. Limited data on blood lead - ZPP correlations and the ZPP levels which are associated with the adverse health effects discussed in item (ii) are the major limitations of the test. Also it is difficult to correlate ZPP levels with environmental exposure and there is some variation of response with age and sex. Nevertheless, the ZPP promises to be an important diagnostic test for the early detection of lead toxicity and its value will increase as more data is collected regarding its relationship to other manifestations of lead poisoning.

(N) Levels of delta-aminolevulinic acid (ALA) in the urine are also used as a measure of lead exposure. Increasing concentrations of ALA are believed to result from the inhibition of the enzyme delta-aminolevulinic acid dehydrase (ALA-D). Although the test is relatively easy to perform, inexpensive, and rapid, the disadvantages include variability in results, the necessity to collect a complete 24 hour urine sample which has a specific gravity greater than 1.010, and also the fact that ALA decomposes in the presence of light.

(O) The pattern of porphyrin excretion in the urine can also be helpful in identifying lead intoxication. With lead poisoning, the urine concentrations of coproporphyrins I and II, porphobilinogen and uroporphyrin I rise. The most important increase, however, is that of coproporphyrin III; levels may exceed 5,000 (~~( $\mu\text{g}/\text{L}$ )~~)  $\mu\text{g}/\text{L}$  in the urine in lead poisoned individuals, but its correlation with blood lead levels and ZPP are not as good as those of ALA. Increases in urinary porphyrins are not diagnostic of lead toxicity and may be seen in porphyria, some liver diseases, and in patients with high reticulocyte counts.

(vi) Summary.

(A) The WISHA standard for inorganic lead places significant emphasis on the medical surveillance of all workers exposed to levels of inorganic lead above the action level of 30  $\mu\text{g}/\text{m}^3$  TWA. The physician has a fundamental role in this surveillance program, and in the operation of the medical removal protection program.

(B) Even with adequate worker education on the adverse health effects of lead and appropriate training in work practices, personal hygiene and other control measures, the physician has a primary responsibility for evaluating potential lead toxicity in the worker. It is only through a careful and detailed medical and work history, a complete physical examination and appropriate laboratory testing that an accurate assessment can be made. Many of the adverse health effects of lead toxicity are either irreversible or only partially reversible and therefore early detection of disease is very important.

(C) This document outlines the medical monitoring program as defined by the occupational safety and health standard for inorganic lead. It reviews the adverse health effects of lead poisoning and describes the important elements of the history and physical examinations as they relate to these adverse effects.

(D) It is hoped that this review and discussion will give the physician a better understanding of the WISHA standard with the ultimate goal of protecting the health and well-being of the worker exposed to lead under his or her care.

(d) Appendix D. Qualitative Fit Test Protocols. This appendix specifies the only allowable qualitative fit test



(QLFT) protocols permissible for compliance with WAC 296-62-07521 (7)(c)(ii).

(i) Isoamyl acetate protocol.

(A) Odor threshold screening.

(I) Three 1-liter glass jars with metal lids (e.g., Mason or Ball jars) are required.

(II) Odor-free water (e.g., distilled or spring water) at approximately 25° C shall be used for the solutions.

(III) The isoamyl acetate (IAA) (also known as isopentyl acetate) stock solution is prepared by adding 1 cc of pure IAA to 800 cc of odor-free water in a 1-liter jar and shaking for 30 seconds. This solution shall be prepared new at least weekly.

(IV) The screening test shall be conducted in a room separate from the room used for actual fit testing. The two rooms shall be well ventilated but may not be connected to the same recirculating ventilation system.

(V) The odor test solution is prepared in a second jar by placing .4 cc of the stock solution into 500 cc of odor-free water using a clean dropper or pipette. Shake for 30 seconds and allow to stand two to three minutes so that the IAA concentration above the liquid may reach equilibrium. This solution may be used for only one day.

(VI) A test blank is prepared in a third jar by adding 500 cc of odor-free water.

(VII) The odor test and test blank jars shall be labeled 1 and 2 for jar identification. If the labels are put on the lids they can be periodically dried off and switched to avoid people thinking the same jars always has the IAA.

(VIII) The following instructions shall be typed on a card and placed on the table in front of the two test jars (i.e., 1 and 2); "The purpose of this test is to determine if you can smell banana oil at low concentrations. The two bottles in front of you contain water. One of these bottles also contains a small amount of banana oil. Be sure the covers are on tight, then shake each bottle for two seconds. Unscrew the lid of each bottle, one at a time, and sniff at the mouth of the bottle. Indicate to the test conductor which bottle contains banana oil."

(IX) The mixtures used in the IAA odor detection test shall be prepared in an area separate from where the test is performed, in order to prevent olfactory fatigue in the subject.

(X) If the test subject is unable to correctly identify the jar containing the odor test solution, the IAA QLFT may not be used.

(XI) If the test subject correctly identifies the jar containing the odor test solution he or she may proceed to respirator selection and fit testing.

(B) Respirator selection.

(I) The test subject shall be allowed to select the most comfortable respirator from a large array of various sizes and manufacturers that includes at least three sizes of elastomeric half facepieces and units of at least two manufacturers.

(II) The selection process shall be conducted in a room separate from the fit-test chamber to prevent odor fatigue. Prior to the selection process, the test subject shall be shown how to put on a respirator, how it should be positioned on the face, how to set strap tension and how to assess a "comfortable" respirator. A mirror shall be available to assist the subject in evaluating the fit and positioning of the

respirator. This may not constitute formal training on respirator use, only a review.

(III) The test subject should understand that he or she is being asked to select the respirator which provides the most comfortable fit. Each respirator represents a different size and shape and, if fit properly, will provide adequate protection.

(IV) The test subject holds each facepiece up to his or her face and eliminates those which are obviously not giving a comfortable fit. Normally, selection will begin with a half-mask and if a fit cannot be found here, the subject will be asked to go to the full facepiece respirators. (A small percentage of users will not be able to wear any half-masks.)

(V) The more comfortable facepieces are recorded; the most comfortable mask is donned and worn at least five minutes to assess comfort. Assistance in assessing comfort can be given by discussing the points in (VI) below. If the test subject is not familiar with using a particular respirator, he or she shall be directed to don the mask several times and to adjust the straps each time, so that he or she becomes adept at setting proper tension on the straps.

(VI) Assessment of comfort shall include reviewing the following points with the test subject:

- Chin properly placed.
- Positioning of mask on nose.
- Strap tension.
- Fit across nose bridge.
- Room for safety glasses.
- Distance from nose to chin.
- Room to talk.
- Tendency to slip.
- Cheeks filled out.
- Self-observation/in mirror.
- Adequate time for assessment.

(VII) The test subject shall conduct the conventional negative and positive-pressure fit checks (e.g., see ANSI Z88.2-1980). Before conducting the negative or positive-pressure checks, the subject shall be told to "seat" his or her mask by rapidly moving the head side-to-side and up and down, taking a few deep breaths.

(VIII) The test subject is now ready for fit testing.

(IX) After passing the fit test, the test subjects shall be questioned again regarding the comfort of the respirator. If it has become uncomfortable, another model of respirator shall be tried.

(X) The employee shall be given the opportunity to select a different facepiece and be retested if during the first two weeks of on-the-job wear, the chosen facepiece becomes unacceptably uncomfortable.

(C) Fit test.

(I) The fit test chamber shall be substantially similar to a clear 55 gallon drum liner suspended inverted over a two foot diameter frame, so that the top of the chamber is about six inches above the test subject's head. The inside top center of the chamber shall have a small hook attached.

(II) Each respirator used for the fitting and fit testing shall be equipped with organic vapor cartridges or offer protection against organic vapors. The cartridges or masks shall be changed at least weekly.

(III) After selecting, donning, and properly adjusting a respirator himself or herself, the test subject shall wear it to the fit testing room. This room shall be separate from the

room used for odor threshold screening and respirator selection, and shall be well ventilated, as by an exhaust fan or lab (~~hook~~) hood, to prevent general room contamination.

(IV) A copy of the following test exercises and rainbow (or equally effective) passage shall be taped to the inside of the test chamber:

a) Normal breathing.

b) Deep breathing. Be certain breaths are deep and regular.

c) Turning head from side-to-side. Be certain movement is complete. Alert the test subject not to bump the respirator on the shoulders. Have the test subject inhale when his or her head is at either side.

d) Nodding head up-and-down. Be sure certain motions are complete and made about every second. Alert the test subject not to bump the respirator on the chest. Have the test subject inhale when his or her head is in the fully up position.

e) Talking. Talk aloud and slowly for several minutes. The following paragraph is called the Rainbow Passage. Reading it will result in a wide range of facial movements, and thus be useful to satisfy this requirement. Alternative passages which serve the same purpose may also be used.

Rainbow Passage. When the sunlight strikes raindrops in the air, they act like a prism and form a rainbow. The rainbow is a division of white light into many beautiful colors. These take the shape of a long round arch with its path high above, and its two ends apparently beyond the horizon. There is, according to legend, a boiling pot of gold at one end. People look but no one ever finds it. When a man looks for something beyond reach, his friends say he is looking for the pot of gold at the end of the rainbow.

f) Normal breathing.

(V) Each test subject shall wear his or her respirator for at least ten minutes before starting the fit test.

(VI) Upon entering the test chamber, the test subject shall be given a six inch by five inch piece of paper towel or other porous absorbent single ply material, folded in half and wetted with three-quarters of one cc of pure IAA. The test subject will hang the wet towel on the hook at the top of the chamber.

(VII) Allow two minutes for the IAA test concentration to be reached before starting the fit-test exercises. This would be an appropriate time to talk with the test subject, to explain the fit test, the importance of his or her cooperation, the purpose of the head exercises, or to demonstrate some of the exercises.

(VIII) Each exercise described in segment (IV) above shall be performed for at least one minute.

(IX) If at any time during the test, the subject detects the banana-like odor of IAA, he or she shall quickly exit from the test chamber and leave the test area to avoid olfactory fatigue.

(X) Upon returning to the selection room, the subject shall remove the respirator, repeat the odor sensitivity test, select and put on another respirator, return to the test chamber, etc. The process continues until a respirator that fits well has been found. Should the odor sensitivity test be failed, the subject shall wait about 5 minutes before retesting. Odor sensitivity will usually have returned by this time.

(XI) If a person cannot be fitted with the selection of half-mask respirators, include full facepiece models in the

selection process. When a respirator is found that passes the test, its efficiency shall be demonstrated for the subject by having (~~him~~) them break the face seal and take a breath before exiting the chamber.

(XII) When the test subject leaves the chamber he or she shall remove the saturated towel, returning it to the test conductor. To keep the area from becoming contaminated, the used towels shall be kept in a self-sealing bag. There is no significant IAA concentration buildup in the test chamber from subsequent tests.

(XIII) Persons who have successfully passed this fit test may be assigned the use of the tested respirator in atmospheres with up to ten times the PEL of airborne lead. In other words this IAA protocol may be used to assign a protection factor no higher (~~that~~) than ten.

(ii) Saccharin solution aerosol protocol.

(A) Taste threshold screening.

(I) Threshold screening as well as fit testing employees shall use an enclosure about the head and shoulders that is approximately twelve inches in diameter by fourteen inches tall with at least the front portion clear and that allows free movement of the head when a respirator is worn. An enclosure substantially similar to the 3M hood assembly of part #FT 14 and FT 15 combined is adequate.

(II) The test closure shall have a three-quarter inch hole in front of the test subject's nose and mouth area to accommodate the nebulizer nozzle.

(III) The entire screening and testing procedure shall be explained to the test subject prior to the conduct of the screening test.

(IV) The test subject shall don the test enclosure. For the threshold screening test, he or she shall breathe through his or her open mouth with tongue extended.

(V) Using a DeVilbiss Model 40 Inhalation Medication Nebulizer or equivalent, the test conductor shall spray the threshold check solution into the enclosure. This nebulizer shall be clearly marked to distinguish it from the fit test solution nebulizer.

(VI) The threshold check solution consists of 0.83 grams of sodium saccharin, USP water. It can be prepared by putting 1 cc of the test solution (see (C)(VI) below) in 100 cc of water.

(VII) To produce the aerosol the nebulizer bulb is firmly squeezed so that it collapses completely, then is released and allowed to fully expand.

(VIII) Ten squeezes are repeated rapidly and then the test subject is asked whether the saccharin can be tasted.

(IX) If the first response is negative, ten more squeezes are repeated rapidly and the test subject is again asked whether the saccharin is tasted.

(X) If the second response is negative ten more squeezes are repeated rapidly and the test subject is again asked whether the saccharin is tasted.

(XI) The test conductor will take note of the number of squeezes required to elicit a taste response.

(XII) If the saccharin is not tasted after thirty squeezes (Step (A)(IX)) the test subject may not perform the saccharin fit test.

(XIII) If a taste response is elicited, the test subject shall be asked to take note of the taste for reference in the fit test.

(XIV) Correct use of the nebulizer means that approximately 1 cc of liquid is used at a time in the nebulizer body.

(XV) The nebulizer shall be thoroughly rinsed in water, shaken dry, and refilled at least each morning and afternoon or at least every four hours.

(B) Respirator selection. Respirators shall be selected as described in Section (i)(B) above, except that each respirator shall be equipped with a particulate filter cartridge.

(C) Fit test.

(I) The fit test uses the same enclosure described in (i)(B)(I) and (II) above.

(II) Each test subject shall wear his or her respirator for at least ten minutes before starting the fit test.

(III) The test subject shall don the enclosure while wearing the respirator selected on Section (A) above. The respirator shall be properly adjusted and equipped with a particulate filter cartridge.

(IV) The test subject may not eat, drink (except plain water), or chew gum for fifteen minutes before the test.

(V) A second DeVilbiss Model 40 Inhalation Medication Nebulizer or equivalent is used to spray the fit test solution into the enclosure. This nebulizer shall be clearly marked to distinguish it from the screening test solution nebulizer.

(VI) The first test solution is prepared by adding 83 grams of sodium saccharin to 100 cc of warm water.

(VII) As before, the test subject shall breathe through the open mouth with tongue extended.

(VIII) The nebulizer is inserted into the hole in the front of the enclosure and the fit test solution is sprayed into the enclosure using the same technique as for the taste threshold screening and the same number of squeezes required to elicit a taste response in the screening. (See (A)(X) above.)

(IX) After generation of the aerosol the test subject shall be instructed to perform the following exercises for one minute each.

a) Normal breathing.

b) Deep breathing. Be certain breaths are deep and regular.

c) Turning head from side-to-side. Be certain movement is complete. Alert the test subject not to bump the respirator on the shoulders. Have the test subject inhale when his or her head is at either side.

d) Nodding head up-and-down. Be certain motions are complete. Alert the test subject not to bump the respirator on the chest. Have the test subject inhale when his or her head is in the fully up position.

e) Talking. Talk aloud and slowly for several minutes. The following paragraph is called the Rainbow Passage. Reading it will result in a wide range of facial movements, and thus be useful to satisfy this requirement. Alternative passages which serve the same purpose may also be used.

Rainbow Passage. When the sunlight strikes raindrops in the air, they act like a prism and form a rainbow. The rainbow is a division of white light into many beautiful colors. These take the shape of a long round arch with its path high above, and its two ends apparently beyond the horizon. There is, according to legend, a boiling pot of gold at one end. People look but no one ever finds it. When a man looks for something beyond reach, his friends say he is looking for the pot of gold at the end of the rainbow.

(X) Every thirty seconds, the aerosol concentration shall be replenished using one-half the number of squeezes as initially (C)(VIII).

(XI) The test subject shall so indicate to the test conductor if at any time during the fit test the taste of saccharin is detected.

(XII) If the saccharin is detected the fit is deemed unsatisfactory and a different respirator shall be tried.

(XIII) Successful completion of the test protocol shall allow the use of the tested respirator in contaminated atmospheres up to ten times the PEL. In other words this protocol may be used to assign protection factors no higher than ten.

(iii) Irritant fume protocol.

(A) Respirator Selection. Respirators shall be selected as described in Section (i)(B) above, except that each respirator shall be equipped with high efficiency cartridges.

(B) Fit Test.

(I) The test subject shall be allowed to smell a weak concentration of the irritant smoke to familiarize him or her with its characteristic odor.

(II) The test subject shall properly don the respirator selected as above, and wear it for at least ~~(ten)~~ ten minutes before starting the fit test.

(III) The test conductor shall review this protocol with the test subject before testing.

(IV) The test subject shall perform the conventional positive pressure and negative pressure fit checks. Failure of either check shall be cause to select an alternate respirator.

(V) Break both ends of a ventilation smoke tube containing stannic oxychloride, such as the MSA part No. 5645, or equivalent. Attach a short length of tubing to one end of the smoke tube. Attach the other end of the smoke tube to a low pressure air pump set to deliver 200 milliliters per minute.

(VI) Advise the subject that the smoke can be irritating to the eyes and instruct him or her to keep his or her eyes closed while the test is performed.

(VII) The test conductor shall direct the stream of irritant smoke from the tube toward the face seal area of the test subject. The conductor shall begin at least twelve inches from the facepiece and gradually move to within one inch, moving around the whole perimeter of the mask.

(VIII) The following exercises shall be performed while the respirator seal is being challenged by the smoke. Each shall be performed for one minute.

a) Normal breathing.

b) Deep breathing. Be certain breaths are deep and regular.

c) Turning head from side-to-side. Be certain movement is complete. Alert the test subject not to bump the respirator on the shoulders. Have the test subject inhale when his or her head is at either side.

d) Nodding head up-and-down. Be certain motions are complete. Alert the test subject not to bump the respirator on the chest. Have the test subject inhale when his or her head is in the fully up position.

e) Talking—slowly and distinctly, count backwards from 100.

f) Normal breathing.

(IX) If the irritant smoke produces an involuntary reaction (cough) by the test subject, the test conductor shall stop the test. In this case the tested respirator is rejected and another respirator shall be selected.

(X) Each test subject passing the smoke test without evidence of a response shall be given a sensitivity check of the smoke from the same tube to determine whether he or she reacts to the smoke. Failure to evoke a response shall void the test.

(XI) Steps (B)(IV), (VII), and (VIII) of this protocol shall be performed in a location with exhaust ventilation sufficient to prevent general contamination of the testing area by the irritant smoke.

(XII) Respirators successfully tested by the protocol may be used in contaminated atmospheres up to ten times the PEL. In other words this protocol may be used to assign protection factors not exceeding ten.

**AMENDATORY SECTION** (Amending Order 93-07, filed 10/29/93, effective 12/10/93)

**WAC 296-155-17621 Medical surveillance.** (1) General.

(a) The employer shall make available initial medical surveillance to employees occupationally exposed on any day to lead at or above the action level. Initial medical surveillance consists of biological monitoring in the form of blood sampling and analysis for lead and zinc protoporphyrin levels.

(b) The employer shall institute a medical surveillance program in accordance with subsections (2) and (3) of this section for all employees who are or may be exposed by the employer at or above the action level for more than 30 days in any consecutive 12 months;

(c) Any employer whose lead-exposed employees would not be required to be in a medical surveillance program according to subdivision (b) of this subsection, but who employs at least one person to perform any of the following tasks more than 30 days in any consecutive twelve months, must offer blood lead level determination to all potentially lead-exposed employees according to the schedule and provisions in subsection (2)(a)(iv) of this section:

(i) Any open flame operation involving lead-containing solder in a manner producing molten solder or airborne particulate solder, including sanding, cutting, or grinding lead-containing solder; or

(ii) Where lead containing coatings or paint are present; abrasive blasting, welding, cutting, torch burning, manual demolition of structures (e.g., dry wall), manual scraping, manual sanding, heat gun applications, power tool cleaning, rivet busting, cleanup activities where dry expendable abrasives are used, abrasive blasting enclosure movement and removal; or

(iii) Spray painting with lead-containing paint; or

(iv) Using lead-containing mortar; or

(v) Lead burning; or

(vi) Cutting, burning, or melting of lead-containing materials; or

(vii) Other operations for which the employer has reason to believe employees have exposures to lead which may result in whole blood lead levels greater than 25 µg/dl.

(d) The employer shall assure that all medical examinations and procedures are performed by or under the supervision of a licensed physician.

~~((d))~~ (e) The employer shall make available the required medical surveillance including multiple physician

review under subsection (3)(c) without cost to employees and at a reasonable time and place.

(2) Biological monitoring.

(a) Blood lead and ZPP level sampling and analysis. The employer shall make available biological monitoring in the form of blood sampling and analysis for lead and zinc protoporphyrin levels to each employee covered by subsection (1)(a) and (b) of this section on the following schedule:

(i) For each employee covered by subsection (1)(b) of this section, at least every 2 months for the first 6 months and every 6 months thereafter;

(ii) For each employee covered by subsection (1)(a) or (b) of this section whose last blood sampling and analysis indicated a blood lead level at or above 40 µg/dl, at least every two months. This frequency shall continue until two consecutive blood samples and analyses indicate a blood lead level below 40 µg/dl; and

(iii) For each employee who is removed from exposure to lead due to an elevated blood lead level at least monthly during the removal period.

(iv) For each potentially lead-exposed employee covered under subsection (1)(c) of this section, at least every twelve months. If the employer has reason to believe that lead exposures vary during the year, then biological monitoring must be conducted during a period expected to have the greatest exposure. If an employer finds all employees' blood lead levels are less than 25 µg/dl whole blood for two consecutive years, the testing may be reduced to at least once every twenty-four months, during a period of peak lead exposure. If an employer finds all employees' blood lead levels are less than 15 µg/dl whole blood for two consecutive years, the biological monitoring program may be suspended. When ever there has been a change of equipment, control, personnel, or a new task has been initiated that may result in employees being overexposed to lead, the employer shall reinitiate annual biological monitoring as specified in this paragraph.

(v) Where the employer has previously conducted biological monitoring and the data were obtained within the past twenty-four months during work operations conducted under workplace conditions closely resembling the processes, type of material, control methods, work practices, and environmental conditions used and prevailing in the employer's current operations, the employer may rely on such earlier monitoring results to satisfy the requirements of this item and item (iv) of this subdivision if sampling and analytical methods meet the accuracy and confidence levels of subdivision (c) of this subsection.

(b) Follow-up blood sampling tests. Whenever the results of a blood lead level test indicate that an employee's blood lead level exceeds the numerical criterion for medical removal under WAC 296-155-17623 (1)(a), the employer shall provide a second (follow-up) blood sampling test within two weeks after the employer receives the results of the first blood sampling test.

(c) Accuracy of blood lead level sampling and analysis. Blood lead level sampling and analysis provided pursuant to this WAC 296-155-176 shall have an accuracy (to a confidence level of 95 percent) within plus or minus 15 percent or 6 µg/dl, whichever is greater, and shall be conducted by a laboratory approved by OSHA.

(d) Employee notification.

(i) Within five working days after the receipt of biological monitoring results, the employer shall notify each employee in writing of their blood lead level; and

(ii) The employer shall notify each employee whose blood lead level exceeds ((40)) 25 µg/dl that the standard requires temporary medical removal with Medical Removal Protection benefits when an employee's blood lead level exceeds the numerical criterion for medical removal under WAC 296-155-17623 (1)(a).

(3) Medical examinations and consultations.

(a) Frequency. The employer shall make available medical examinations and consultations to each employee covered by subsection (1)(b) of this section on the following schedule:

(i) At least annually for each employee for whom a blood sampling test conducted at any time during the preceding 12 months indicated a blood lead level at or above 40 µg/dl;

(ii) As soon as possible, upon notification by an employee either that the employee has developed signs or symptoms commonly associated with lead intoxication, that the employee desires medical advice concerning the effects of current or past exposure to lead on the employee's ability to procreate a healthy child, that the employee is pregnant, or that the employee has demonstrated difficulty in breathing during a respirator fitting test or during use; and

(iii) As medically appropriate for each employee either removed from exposure to lead due to a risk of sustaining material impairment to health, or otherwise limited pursuant to a final medical determination.

(b) Content. The content of medical examinations made available pursuant to subdivision (a)(ii) and (iii) of this subsection shall be determined by an examining physician and, if requested by an employee, shall include pregnancy testing or laboratory evaluation of male fertility. Medical examinations made available pursuant to subdivision (a)(i) of this subsection shall include the following elements:

(i) A detailed work history and a medical history, with particular attention to past lead exposure (occupational and non-occupational), personal habits (smoking, hygiene), and past gastrointestinal, hematologic, renal, cardiovascular, reproductive and neurological problems;

(ii) A thorough physical examination, with particular attention to teeth, gums, hematologic, gastrointestinal, renal, cardiovascular, and neurological systems. Pulmonary status should be evaluated if respiratory protection will be used;

(iii) A blood pressure measurement;

(iv) A blood sample and analysis which determines:

(A) Blood lead level;

(B) Hemoglobin and hematocrit determinations, red cell indices, and examination of peripheral smear morphology;

(C) Zinc protoporphyrin;

(D) Blood urea nitrogen; and,

(E) Serum creatinine;

(v) A routine urinalysis with microscopic examination; and

(vi) Any laboratory or other test relevant to lead exposure which the examining physician deems necessary by sound medical practice.

(c) Multiple physician review mechanism.

(i) If the employer selects the initial physician who conducts any medical examination or consultation provided

to an employee by WAC 296-155-176, the employee may designate a second physician:

(A) To review any findings, determinations or recommendations of the initial physician; and

(B) To conduct such examinations, consultations, and laboratory tests as the second physician deems necessary to facilitate this review.

(ii) The employer shall promptly notify an employee of the right to seek a second medical opinion after each occasion that an initial physician conducts a medical examination or consultation pursuant to WAC 296-155-176. The employer may condition its participation in, and payment for, the multiple physician review mechanism upon the employee doing the following within fifteen days after receipt of the foregoing notification, or receipt of the initial physician's written opinion, whichever is later:

(A) The employee informing the employer that they intend to seek a second medical opinion; and

(B) The employee initiating steps to make an appointment with a second physician.

(iii) If the findings, determinations or recommendations of the second physician differ from those of the initial physician, then the employer and the employee shall assure that efforts are made for the two physicians to resolve any disagreement.

(iv) If the two physicians have been unable to quickly resolve their disagreement, then the employer and the employee through their respective physicians shall designate a third physician:

(A) To review any findings, determinations or recommendations of the prior physicians; and

(B) To conduct such examinations, consultations, laboratory tests and discussions with the prior physicians as the third physician deems necessary to resolve the disagreement of the prior physicians.

(v) The employer shall act consistent with the findings, determinations and recommendations of the third physician, unless the employer and the employee reach an agreement which is otherwise consistent with the recommendations of at least one of the three physicians.

(d) Information provided to examining and consulting physicians.

(i) The employer shall provide an initial physician conducting a medical examination or consultation under WAC 296-155-176 with the following information:

(A) A copy of this regulation for lead including all Appendices;

(B) A description of the affected employee's duties as they relate to the employee's exposure;

(C) The employee's exposure level or anticipated exposure level to lead and to any other toxic substance (if applicable);

(D) A description of any personal protective equipment used or to be used;

(E) Prior blood lead determinations; and

(F) All prior written medical opinions concerning the employee in the employer's possession or control.

(ii) The employer shall provide the foregoing information to a second or third physician conducting a medical examination or consultation under WAC 296-155-176 upon request either by the second or third physician, or by the employee.

(e) Written medical opinions.

(i) The employer shall obtain and furnish the employee with a copy of a written medical opinion from each examining or consulting physician which contains only the following information:

(A) The physician's opinion as to whether the employee has any detected medical condition which would place the employee at increased risk of material impairment of the employee's health from exposure to lead;

(B) Any recommended special protective measures to be provided to the employee, or limitations to be placed upon the employee's exposure to lead;

(C) Any recommended limitation upon the employee's use of respirators, including a determination of whether the employee can wear a powered air purifying respirator if a physician determines that the employee cannot wear a negative pressure respirator; and

(D) The results of the blood lead determinations.

(ii) The employer shall instruct each examining and consulting physician to:

(A) Not reveal either in the written opinion or orally, or in any other means of communication with the employer, findings, including laboratory results, or diagnoses unrelated to an employee's occupational exposure to lead; and

(B) Advise the employee of any medical condition, occupational or nonoccupational, which dictates further medical examination or treatment.

(f) Alternate physician determination mechanisms. The employer and an employee or authorized employee representative may agree upon the use of any alternate physician determination mechanism in lieu of the multiple physician review mechanism provided by subdivision (c) of this subsection so long as the alternate mechanism is as expeditious and protective as the requirements contained in this section.

(4) Chelation.

(a) The employer shall assure that any person whom he retains, employs, supervises or controls does not engage in prophylactic chelation of any employee at any time.

(b) If therapeutic or diagnostic chelation is to be performed by any person in subdivision (a) of this subsection, the employer shall assure that it be done under the supervision of a licensed physician in a clinical setting with thorough and appropriate medical monitoring and that the employee is notified in writing prior to its occurrence.

(5) Actions triggered by medical examinations and biological monitoring.

(a) Whenever:

(i) The results of biological monitoring carried out in accordance with this section indicate a blood lead level requiring temporary medical removal; or

(ii) The physician's written opinion indicates a detected medical condition which would place the employee at increased risk of material impairment of the employee's health from exposure to lead or which indicates any recommended special protective measures to be provided to the employee or limitations to be placed upon the employee's exposure to lead; or

(iii) The results of a medical examination carried out in accordance with this section indicate any laboratory or clinical finding consistent with lead toxicity.

(b) The employer shall take the following corrective actions:

(i) The employer, within 30 days, shall assess the maintenance and effectiveness of the relevant engineering controls, the hygiene facilities, the respiratory protection program the employee's work practices and personal hygiene, and the employee's respirator use, if any; and

(ii) Within 30 days of the assessment, the employer shall take all reasonable steps to correct the deficiencies found in the assessment that may be responsible for the employee's medical examination and test results.

AMENDATORY SECTION (Amending Order 93-07, filed 10/29/93, effective 12/10/93)

**WAC 296-155-17623 Medical removal protection.**

(1) Temporary medical removal and return of an employee.

(a) Temporary removal due to elevated blood lead levels. ~~((The employer shall remove an employee from work having an exposure to lead at or above the action level on each occasion that a periodic and a follow-up blood sampling test conducted pursuant to WAC 296-155-176 indicate that the employee's blood lead level is at or above 50 µg/dl; and))~~

(i) First year of standard (12/10/94 through 12/10/95). During the first year following the effective date of the standard, the employer shall remove an employee from work having an exposure to lead or as specified in WAC 296-155-17621 (1)(c) on each occasion that a periodic and a follow-up blood sampling test conducted pursuant to this section indicate that the employee's blood lead level is at or above 50 µg/dl whole blood.

(ii) Second year of standard (12/11/95 through 12/10/96). During the second year following the effective date of the standard, the employer shall remove an employee from work having an exposure to lead or as specified in WAC 296-155-17621 (1)(c) on each occasion that a periodic and a follow-up blood sampling test conducted pursuant to this section indicate that the employee's blood lead level is at or above 45 µg/dl whole blood;

(iii) Third year of standard (12/11/96 through 12/10/97). During the third year following the effective date of the standard, the employer shall remove an employee from work having an exposure to lead or as specified in WAC 296-155-17621 (1)(c) on each occasion that a periodic and a follow-up blood sampling test conducted pursuant to this section indicate that the employee's blood lead level is at or above 40 µg/dl whole blood;

(iv) Fourth year of standard (12/11/97 through 12/10/98). During the fourth year following the effective date of the standard, the employer shall remove an employee from work having an exposure to lead or as specified in WAC 296-155-17621 (1)(c) on each occasion that a periodic and a follow-up blood sampling test conducted pursuant to this section indicate that the employee's blood lead level is at or above 35 µg/dl whole blood;

(v) Fifth year of standard (12/11/98) and thereafter. During the fifth year following the effective date of the standard, the employer shall remove an employee from work having an exposure to lead or as specified in WAC 296-155-17621 (1)(c) on each occasion that a periodic and a follow-up blood sampling test conducted pursuant to this section

indicate that the employee's blood lead level is at or above 30 µg/dl whole blood.

(b) Temporary removal due to a final medical determination.

(i) The employer shall remove an employee from work having an exposure to lead at or above the action level on each occasion that a final medical determination results in a medical finding, determination, or opinion that the employee has a detected medical condition which places the employee at increased risk of material impairment to health from exposure to lead.

(ii) For the purposes of WAC 296-155-176, the phrase "final medical determination" means the written medical opinion on the employees' health status by the examining physician or, where relevant, the outcome of the multiple physician review mechanism or alternate medical determination mechanism used pursuant to the medical surveillance provisions of WAC 296-155-176.

(iii) Where a final medical determination results in any recommended special protective measures for an employee, or limitations on an employee's exposure to lead, the employer shall implement and act consistent with the recommendation.

(c) Return of the employee to former job status.

(i) The employer shall return an employee to their former job status:

(A) For an employee removed due to a blood lead level at or above 50 µg/dl, when two consecutive blood sampling tests indicate that the employee's blood lead level is at or below 40 µg/dl whole blood;

(B) For an employee removed due to a blood lead level at or above 45 µg/dl, when two consecutive blood sampling tests indicate that the employee's blood lead level is at or below 35 µg/dl whole blood;

(C) For an employee removed due to a blood lead level at or above 40 µg/dl when two consecutive blood sampling tests indicate that the employee's blood lead level is at or below 30 µg/dl whole blood;

(D) For an employee removed due to a blood lead level at or above 35 µg/dl, when two consecutive blood sampling tests indicate that the employee's blood lead level is at or below 25 µg/dl whole blood;

(E) For an employee removed due to a blood lead level at or above 30 µg/dl, when two consecutive blood sampling tests indicate that the employee's blood lead level is at or below 25 µg/dl whole blood;

(F) For an employee removed due to a final medical determination, when a subsequent final medical determination results in a medical finding, determination, or opinion that the employee no longer has a detected medical condition which places the employee at increased risk of material impairment to health from exposure to lead.

(ii) For the purposes of WAC 296-155-176, the requirement that an employer return an employee to their former job status is not intended to expand upon or restrict any rights an employee has or would have had, absent temporary medical removal, to a specific job classification or position under the terms of a collective bargaining agreement.

(d) Removal of other employee special protective measure or limitations. The employer shall remove any limitations placed on an employee or end any special protective measures provided to an employee pursuant to a

final medical determination when a subsequent final medical determination indicates that the limitations or special protective measures are no longer necessary.

(e) Employer options pending a final medical determination. Where the multiple physician review mechanism, or alternate medical determination mechanism used pursuant to the medical surveillance provisions of WAC 296-155-176, has not yet resulted in a final medical determination with respect to an employee, the employer shall act as follows:

(i) Removal. The employer may remove the employee from exposure to lead, provide special protective measures to the employee, or place limitations upon the employee, consistent with the medical findings, determinations, or recommendations of any of the physicians who have reviewed the employee's health status.

(ii) Return. The employer may return the employee to their former job status, end any special protective measures provided to the employee, and remove any limitations placed upon the employee, consistent with the medical findings, determinations, or recommendations of any of the physicians who have reviewed the employee's health status, with two exceptions.

(A) If the initial removal, special protection, or limitation of the employee resulted from a final medical determination which differed from the findings, determinations, or recommendations of the initial physician or;

(B) If the employee has been on removal status for the preceding eighteen months due to an elevated blood lead level, then the employer shall await a final medical determination.

(2) Medical removal protection benefits.

(a) Provision of medical removal protection benefits. The employer shall provide an employee up to eighteen (18) months of medical removal protection benefits on each occasion that an employee is removed from exposure to lead or otherwise limited pursuant to WAC 296-155-176.

(b) Definition of medical removal protection benefits. For the purposes of WAC 296-155-176, the requirement that an employer provide medical removal protection benefits means that, as long as the job the employee was removed from continues, the employer shall maintain the total normal earnings, seniority and other employment rights and benefits of an employee, including the employee's right to their former job status as though the employee had not been medically removed from the employee's job or otherwise medically limited.

(c) Follow-up medical surveillance during the period of employee removal or limitation. During the period of time that an employee is medically removed from their job or otherwise medically limited, the employer may condition the provision of medical removal protection benefits upon the employee's participation in follow-up medical surveillance made available pursuant to WAC 296-155-176.

(d) Workers' compensation claims. If a removed employee files a claim for workers' compensation payments for a lead-related disability, then the employer shall continue to provide medical removal protection benefits pending disposition of the claim. To the extent that an award is made to the employee for earnings lost during the period of removal, the employer's medical removal protection obligation shall be reduced by such amount. The employer shall



receive no credit for workers' compensation payments received by the employee for treatment-related expenses.

(e) Other credits. The employer's obligation to provide medical removal protection benefits to a removed employee shall be reduced to the extent that the employee receives compensation for earnings lost during the period of removal either from a publicly or employer-funded compensation program, or receives income from employment with another employer made possible by virtue of the employee's removal.

(f) Voluntary removal or restriction of an employee. Where an employer, although not required by WAC 296-155-176 to do so, removes an employee from exposure to lead or otherwise places limitations on an employee due to the effects of lead exposure on the employee's medical condition, the employer shall provide medical removal protection benefits to the employee equal to that required by subdivisions (a) and (b) of this subsection.

**AMENDATORY SECTION** (Amending Order 93-07, filed 10/29/93, effective 12/10/93)

**WAC 296-155-17652 Appendix B to WAC 296-155-176—Employee standard summary.** This appendix summarizes key provisions of the standard for lead in construction that you as a worker should become familiar with.

(1) Permissible exposure limit (PEL)—WAC 296-62-17607.

The standard sets a permissible exposure limit (PEL) of 50 micrograms of lead per cubic meter of air ( $50 \mu\text{g}/\text{m}^3$ ), averaged over an 8-hour workday which is referred to as a time-weighted average (TWA). This is the highest level of lead in air to which you may be permissibly exposed over an 8-hour workday. However, since this is an 8-hour average, short exposures above the PEL are permitted so long as for each 8-hour work day your average exposure does not exceed this level. This standard, however, takes into account the fact that your daily exposure to lead can extend beyond a typical 8-hour workday as the result of overtime or other alterations in your work schedule. To deal with this situation, the standard contains a formula which reduces your permissible exposure when you are exposed more than 8 hours. For example, if you are exposed to lead for 10 hours a day, the maximum permitted average exposure would be  $40 \mu\text{g}/\text{m}^3$ .

(2) Exposure assessment—WAC 296-155-17609.

If lead is present in your workplace in any quantity, your employer is required to make an initial determination of whether any employee's exposure to lead exceeds the action level ( $30 \mu\text{g}/\text{m}^3$  averaged over an 8-hour day). Employee exposure is that exposure which would occur if the employee were not using a respirator. This initial determination requires your employer to monitor workers' exposures unless the employee has objective data which can demonstrate conclusively that no employee will be exposed to lead in excess of the action level. Where objective data is used in lieu of actual monitoring the employer must establish and maintain an accurate record, documenting its relevancy in assessing exposure levels for current job conditions. If such objective data is available, the employer need proceed no further on employee exposure assessment

until such time that conditions have changed and the determination is no longer valid.

Objective data may be compiled from various sources, e.g., insurance companies and trade associations and information from suppliers or exposure data collected from similar operations. Objective data may also comprise previously-collected sampling data including area monitoring. If it cannot be determined through using objective data that worker exposure is less than the action level, your employer must conduct monitoring or must rely on relevant previous personal sampling, if available. Where monitoring is required for the initial determination, it may be limited to a representative number of employees who are reasonably expected to have the highest exposure levels. If your employer has conducted appropriate air sampling for lead in the past 12 months, they may use these results, provided they are applicable to the same employee tasks and exposure conditions and meet the requirements for accuracy as specified in the standard. As with objective data, if such results are relied upon for the initial determination, your employer must establish and maintain a record as to the relevancy of such data to current job conditions.

If there have been any employee complaints of symptoms which may be attributable to exposure to lead or if there is any other information or observations which would indicate employee exposure to lead, this must also be considered as part of the initial determination. If this initial determination shows that a reasonable possibility exists that any employee may be exposed, without regard to respirators, over the action level, your employer must set up an air monitoring program to determine the exposure level representative of each employee exposed to lead at your workplace. In carrying out this air monitoring program, your employer is not required to monitor the exposure of every employee, but they must monitor a representative number of employees and job types. Enough sampling must be done to enable each employee's exposure level to be reasonably represent full shift exposure. In addition, these air samples must be taken under conditions which represent each employee's regular, daily exposure to lead. Sampling performed in the past 12 months may be used to determine exposures above the action level if such sampling was conducted during work activities essentially similar to present work conditions.

The standard lists certain tasks which may likely result in exposures to lead in excess of the PEL and, in some cases, exposures in excess of 50 times the PEL. If you are performing any of these tasks, your employer must provide you with appropriate respiratory protection, protective clothing and equipment, change areas, hand washing facilities, biological monitoring, and training until such time that an exposure assessment is conducted which demonstrates that your exposure level is below the PEL.

If you are exposed to lead and air sampling is performed, your employer is required to notify you in writing within 5 working days of the air monitoring results which represent your exposure. If the results indicate that your exposure exceeds the PEL (without regard to your use of a respirator), then your employer must also notify you of this in writing, and provide you with a description of the corrective action that has been taken or will be taken to reduce your exposure.



Your exposure must be rechecked by monitoring, at least every six months if your exposure is at or over the action level but below the PEL. Your employer may discontinue monitoring for you if 2 consecutive measurements, taken at least 7 days apart, are at or below the action level. Air monitoring must be repeated every 3 months if you are exposed over the PEL. Your employer must continue monitoring for you at this frequency until 2 consecutive measurements, taken at least 7 days apart, are below the PEL but above the action level, at which time your employer must repeat monitoring of your exposure every six months and may discontinue monitoring only after your exposure drops to or below the action level. However, whenever there is a change of equipment, process, control, or personnel or a new type of job is added at your workplace which may result in new or additional exposure to lead, your employer must perform additional monitoring.

(3) Methods of compliance—WAC 296-155-17611.

Your employer is required to assure that no employee is exposed to lead in excess of the PEL as an 8-hour TWA. The standard for lead in construction requires employers to institute engineering and work practice controls including administrative controls to the extent feasible to reduce employee exposure to lead. Where such controls are feasible but not adequate to reduce exposures below the PEL they must be used nonetheless to reduce exposures to the lowest level that can be accomplished by these means and then supplemented with appropriate respiratory protection.

Your employer is required to develop and implement a written compliance program prior to the commencement of any job where employee exposures may reach the PEL as an 8-hour TWA. The standard identifies the various elements that must be included in the plan. For example, employers are required to include a description of operations in which lead is emitted, detailing other relevant information about the operation such as the type of equipment used, the type of material involved, employee job responsibilities, operating procedures and maintenance practices. In addition, your employer's compliance plan must specify the means that will be used to achieve compliance and, where engineering controls are required, include any engineering plans or studies that have been used to select the control methods. If administrative controls involving job rotation are used to reduce employee exposure to lead, the job rotation schedule must be included in the compliance plan. The plan must also detail the type of protective clothing and equipment, including respirators, housekeeping and hygiene practices that will be used to protect you from the adverse effects of exposure to lead.

The written compliance program must be made available, upon request, to affected employees and their designated representatives, and the director.

Finally, the plan must be reviewed and updated at least every 6 months to assure it reflects the current status in exposure control.

(4) Respiratory protection—WAC 296-155-17613.

Your employer is required to provide and assure your use of respirators when your exposure to lead is not controlled below the PEL by other means. The employer must pay the cost of the respirator. Whenever you request one, your employer is also required to provide you a respirator even if your air exposure level is not above the PEL. You

might desire a respirator when, for example, you have received medical advice that your lead absorption should be decreased. Or, you may intend to have children in the near future, and want to reduce the level of lead in your body to minimize adverse reproductive effects. While respirators are the least satisfactory means of controlling your exposure, they are capable of providing significant protection if properly chosen, fitted, worn, cleaned, maintained, and replaced when they stop providing adequate protection.

Your employer is required to select respirators from the types listed in Table I of the Respiratory Protection section of the standard. Any respirator chosen must be approved by the Mine Safety and Health Administration (MSHA) or the National Institute for Occupational Safety and Health (NIOSH). This respirator selection table will enable your employer to choose a type of respirator which will give you a proper amount of protection based on your airborne lead exposure. Your employer may select a type of respirator that provides greater protection than that required by the standard; that is, one recommended for a higher concentration of lead than is present in your workplace. For example, a powered air purifying respirator (PAPR) is much more protective than a typical negative pressure respirator, and may also be more comfortable to wear. A PAPR has a filter, cartridge or canister to clean the air, and a power source which continuously blows filtered air into your breathing zone. Your employer might make a PAPR available to you to ease the burden of having to wear a respirator for long periods of time. The standard provides that you can obtain a PAPR upon request.

Your employer must also start a Respiratory Protection Program. This program must include written procedures for the proper selection, use, cleaning, storage, and maintenance of respirators.

Your employer must assure that your respirator facepiece fits properly. Proper fit of a respirator facepiece is critical. Obtaining a proper fit on each employee may require your employer to make available two or three different mask types. In order to assure that your respirator fits properly and that facepiece leakage is minimized, your employer must give you either a qualitative fit test or a quantitative fit test (if you use a negative pressure respirator) in accordance with appendix D. Any respirator which has a filter, cartridge or canister which cleans the work room air before you breathe it and which requires the force of your inhalation to draw air through the filtering element is a negative pressure respirator. A positive pressure respirator supplies air to you directly. A quantitative fit test uses a sophisticated machine to measure the amount, if any, of test material that leaks into the facepiece of your respirator.

You must also receive from your employer proper training in the use of respirators. Your employer is required to teach you how to wear a respirator, to know why it is needed, and to understand its limitations.

Your employer must test the effectiveness of your negative pressure respirator initially and at least every six months thereafter with a "qualitative fit test." In this test, the fit of the facepiece is checked by seeing if you can smell a substance placed outside the respirator. If you can, there is appreciable leakage where the facepiece meets your face.

The standard provides that if your respirator uses filter elements, you must be given an opportunity to change the

filter elements whenever an increase in breathing resistance is detected. You also must be permitted to periodically leave your work area to wash your face and respirator facepiece whenever necessary to prevent skin irritation. If you ever have difficulty in breathing during a fit test or while using a respirator, your employer must make a medical examination available to you to determine whether you can safely wear a respirator. The result of this examination may be to give you a positive pressure respirator (which reduces breathing resistance) or to provide alternative means of protection.

(5) Protective work clothing and equipment—WAC 296-155-17615.

If you are exposed to lead above the PEL as an 8-hour TWA, without regard to your use of a respirator, or if you are exposed to lead compounds such as lead arsenate or lead azide which can cause skin and eye irritation, your employer must provide you with protective work clothing and equipment appropriate for the hazard. If work clothing is provided, it must be provided in a clean and dry condition at least weekly, and daily if your airborne exposure to lead is greater than 200 µg/m<sup>3</sup>. Appropriate protective work clothing and equipment can include coveralls or similar full-body work clothing, gloves, hats, shoes or disposable shoe coverlets, and face shields or vented goggles. Your employer is required to provide all such equipment at no cost to you. In addition, your employer is responsible for providing repairs and replacement as necessary, and also is responsible for the cleaning, laundering or disposal of protective clothing and equipment.

The standard requires that your employer assure that you follow good work practices when you are working in areas where your exposure to lead may exceed the PEL. With respect to protective clothing and equipment, where appropriate, the following procedures should be observed prior to beginning work:

- ◆ Change into work clothing and shoe covers in the clean section of the designated changing areas;
- ◆ Use work garments of appropriate protective gear, including respirators before entering the work area; and
- ◆ Store any clothing not worn under protective clothing in the designated changing area.

Workers should follow these procedures upon leaving the work area:

- ◆ HEPA vacuum heavily contaminated protective work clothing while it is still being worn. At no time may lead be removed from protective clothing by any means which result in uncontrolled dispersal of lead into the air;
- ◆ Remove shoe covers and leave them in the work area;
- ◆ Remove protective clothing and gear in the dirty area of the designated changing area. Remove protective coveralls by carefully rolling down the garment to reduce exposure to dust.
- ◆ Remove respirators last; and
- ◆ Wash hands and face.

Workers should follow these procedures upon finishing work for the day (in addition to procedures described above):

- ◆ Where applicable, place disposal coveralls and shoe covers with the abatement waste;

- ◆ Contaminated clothing which is to be cleaned, laundered or disposed of must be placed in closed containers in the change room.
- ◆ Clean protective gear, including respirators, according to standard procedures;
- ◆ Wash hands and face again.

If showers are available, take a shower and wash hair. If shower facilities are not available at the work site, shower immediately at home and wash hair.

(6) Housekeeping—WAC 296-155-17617.

Your employer must establish a housekeeping program sufficient to maintain all surfaces as free as practicable of accumulations of lead dust. Vacuuming is the preferred method of meeting this requirement, and the use of compressed air to clean floors and other surfaces is generally prohibited unless removal with compressed air is done in conjunction with ventilation systems designed to contain dispersal of the lead dust. Dry or wet sweeping, shoveling, or brushing may not be used except where vacuuming or other equally effective methods have been tried and do not work. Vacuums must be used equipped with a special filter called a high-efficiency particulate air (HEPA) filter and emptied in a manner which minimizes the reentry of lead into the workplace.

(7) Hygiene facilities and practices—WAC 296-155-17619.

The standard requires that hand washing facilities be provided where occupational exposure to lead occurs. In addition, change areas, showers (where feasible), and lunchrooms or eating areas are to be made available to workers exposed to lead above the PEL. Your employer must assure that except in these facilities, food and beverage is not present or consumed, tobacco products are not present or used, and cosmetics are not applied, where airborne exposures are above the PEL. Change rooms provided by your employer must be equipped with separate storage facilities for your protective clothing and equipment and street clothes to avoid cross-contamination. After showering, no required protective clothing or equipment worn during the shift may be worn home. It is important that contaminated clothing or equipment be removed in change areas and not be worn home or you will extend your exposure and expose your family since lead from your clothing can accumulate in your house, car, etc.

Lunchrooms or eating areas may not be entered with protective clothing or equipment unless surface dust has been removed by vacuuming, downdraft booth, or other cleaning method. Finally, workers exposed above the PEL must wash both their hands and faces prior to eating, drinking, smoking or applying cosmetics.

All of the facilities and hygiene practices just discussed are essential to minimize additional sources of lead absorption from inhalation or ingestion of lead that may accumulate on you, your clothes, or your possessions. Strict compliance with these provisions can virtually eliminate several sources of lead exposure which significantly contribute to excessive lead absorption.

(8) Medical surveillance—WAC 296-155-17621.

The medical surveillance program is part of the standard's comprehensive approach to the prevention of lead-related disease. Its purpose is to supplement the main thrust of the standard which is aimed at minimizing airborne

concentrations of lead and sources of ingestion. Only medical surveillance can determine if the other provisions of the standard have affectively protected you as an individual. Compliance with the standard's provision will protect most workers from the adverse effects of lead exposure, but may not be satisfactory to protect individual workers:

- ♦ Who have high body burdens of lead acquired over past years,
- ♦ Who have additional uncontrolled sources of non-occupational lead exposure,
- ♦ Who exhibit unusual variations in lead absorption rates, or
- ♦ Who have specific non-work related medical conditions which could be aggravated by lead exposure (e.g., renal disease, anemia).

In addition, control systems may fail, or hygiene and respirator programs may be inadequate. Periodic medical surveillance of individual workers will help detect those failures. Medical surveillance will also be important to protect your reproductive ability—regardless of whether you are a man or woman.

All medical surveillance required by the standard must be performed by or under the supervision of a licensed physician. The employer must provide required medical surveillance without cost to employees and at a reasonable time and place. The standard's medical surveillance program has two parts—periodic biological monitoring and medical examinations. Your employer's obligation to offer you medical surveillance is triggered by the results of the air monitoring program. Full medical surveillance must be made available to all employees who are or may be exposed to lead in excess of the action level for more than 30 days a year and whose blood lead level exceeds 40 µg/dl. Initial medical surveillance consisting of blood sampling and analysis for lead and zinc protoporphyrin must be provided to all employees exposed at any time (1 day) above the action level. Additionally, lead-exposed employees that would not be required to be in a medical surveillance program according to WAC 296-155-17621 (1)(b) are required to be offered a blood lead level and ZPP determination to all potentially exposed workers performing tasks outlined in WAC 296-155-17621 (1)(c) for more than 30 days in any consecutive 12 months. This includes:

- (a) Any operation involving lead-containing solder in a manner producing molten solder or airborne particulate solder, sanding, cutting or grinding lead-containing solder; or
- (b) Applying or heating lead-containing solder; or
- (c) Where lead-containing coatings or paint are present: Abrasive blasting, welding, cutting, torch burning, manual demolition of structures, manual scraping, manual sanding, heat gun applications, power tool cleaning, rivet busting, cleanup activities where dry expendable abrasives are used;  
or
- (d) Spray painting with lead-containing paint; or
- (e) Using lead-containing mortar; or
- (f) Lead burning; or
- (g) Cutting, burning, or melting of lead-containing materials; and

(h) Any other operation for which the employer has reason to believe employees have exposure to lead which may result in whole blood lead levels greater than 25 µg/dl.

Biological monitoring under the standard must be provided at least every 2 months for the first 6 months and every 6 months thereafter until your blood lead level is below 40 µg/dl. A zinc protoporphyrin (ZPP) test is a very useful blood test which measures an adverse metabolic effect of lead on your body and is therefore an indicator of lead toxicity.

If your BLL exceeds 40 µg/dl the monitoring frequency must be increased from every 6 months to at least every 2 months and not reduced until two consecutive BLLs indicate a blood lead level below 40 µg/dl. Each time your BLL is determined to be over 40 µg/dl, your employer must notify you of this in writing within five working days of their receipt of the test results. The employer must also inform you that the standard requires temporary medical removal with economic protection when your BLL exceeds 50 µg/dl. (See Discussion of medical removal protection—WAC 296-155-17623.) During the first year of the standard, this removal criterion is 50 µg/dl. Anytime your BLL exceeds 50 µg/dl your employer must make available to you within two weeks of receipt of these test results a second follow-up BLL test to confirm your BLL. If the two tests both exceed 50 µg/dl, and you are temporarily removed, then your employer must make successive BLL tests available to you on a monthly basis during the period of your removal.

Medical examinations beyond the initial one must be made available on an annual basis if your blood lead level exceeds 40 µg/dl at any time during the preceding year and you are being exposed above the airborne action level of 30 µg/m<sup>3</sup> for 30 or more days per year. The initial examination will provide information to establish a baseline to which subsequent data can be compared.

An initial medical examination to consist of blood sampling and analysis for lead and zinc protoporphyrin must also be made available (prior to assignment) for each employee being assigned for the first time to an area where the airborne concentration of lead equals or exceeds the action level at any time. In addition, a medical examination or consultation must be made available as soon as possible if you notify your employer that you are experiencing signs or symptoms commonly associated with lead poisoning or that you have difficulty breathing while wearing a respirator or during a respirator fit test. You must also be provided a medical examination or consultation if you notify your employer that you desire medical advice concerning the effects of current or past exposure to lead on your ability to procreate a healthy child.

Finally, appropriate follow-up medical examinations or consultations may also be provided for employees who have been temporarily removed from exposure under the medical removal protection provisions of the standard. (See subsection (9), below.)

The standard specifies the minimum content of pre-assignment and annual medical examinations. The content of other types of medical examinations and consultations is left up to the sound discretion of the examining physician. Preassignment and annual medical examinations must include:

- ♦ A detailed work history and medical history;
- ♦ A thorough physical examination, including an evaluation of your pulmonary status if you will be required to use a respirator;

- ◆ A blood pressure measurement; and
- ◆ A series of laboratory tests designed to check your blood chemistry and your kidney function.

In addition, at any time upon your request, a laboratory evaluation of male fertility will be made (microscopic examination of a sperm sample), or a pregnancy test will be given.

The standard does not require that you participate in any of the medical procedures, tests, etc. which your employer is required to make available to you. Medical surveillance can, however, play a very important role in protecting your health. You are strongly encouraged, therefore, to participate in a meaningful fashion. The standard contains a multiple physician review mechanism which will give you a chance to have a physician of your choice directly participate in the medical surveillance program. If you are dissatisfied with an examination by a physician chosen by your employer, you can select a second physician to conduct an independent analysis. The two doctors would attempt to resolve any differences of opinion, and select a third physician to resolve any firm dispute. Generally your employer will choose the physician who conducts medical surveillance under the lead standard—unless you and your employer can agree on the choice of a physician or physicians. Some companies and unions have agreed in advance, for example, to use certain independent medical laboratories or panels of physicians. Any of these arrangements are acceptable so long as required medical surveillance is made available to workers.

The standard requires your employer to provide certain information to a physician to aid in their examination of you. This information includes:

- ◆ The standard and its appendices,
- ◆ A description of your duties as they relate to occupational lead exposure,
- ◆ Your exposure level or anticipated exposure level,
- ◆ A description of any personal protective equipment you wear,
- ◆ Prior blood lead level results, and
- ◆ Prior written medical opinions concerning you that the employer has.

After a medical examination or consultation the physician must prepare a written report which must contain:

- ◆ The physician's opinion as to whether you have any medical condition which places you at increased risk of material impairment to health from exposure to lead,
- ◆ Any recommended special protective measures to be provided to you,
- ◆ Any blood lead level determinations, and
- ◆ Any recommended limitation on your use of respirators.

This last element must include a determination of whether you can wear a powered air purifying respirator (PAPR) if you are found unable to wear a negative pressure respirator.

The medical surveillance program of the lead standard may at some point in time serve to notify certain workers that they have acquired a disease or other adverse medical condition as a result of occupational lead exposure. If this is true, these workers might have legal rights to compensation from public agencies, their employers, firms that supply hazardous products to their employers, or other persons.

Some states have laws, including worker compensation laws, that disallow a worker who learns of a job-related health impairment to sue, unless the worker sues within a short period of time after learning of the impairment. (This period of time may be a matter of months or years.) An attorney can be consulted about these possibilities. It should be stressed that WISHA is in no way trying to either encourage or discourage claims or lawsuits. However, since results of the standard's medical surveillance program can significantly affect the legal remedies of a worker who has acquired a job-related disease or impairment, it is proper for WISHA to make you aware of this.

The medical surveillance section of the standard also contains provisions dealing with chelation. Chelation is the use of certain drugs (administered in pill form or injected into the body) to reduce the amount of lead absorbed in body tissues. Experience accumulated by the medical and scientific communities has largely confirmed the effectiveness of this type of therapy for the treatment of very severe lead poisoning. On the other hand, it has also been established that there can be a long list of extremely harmful side effects associated with the use of chelating agents. The medical community has balanced the advantages and disadvantages resulting from the use of chelating agents in various circumstances and has established when the use of these agents is acceptable. The standard includes these accepted limitations due to a history of abuse of chelation therapy by some lead companies. The most widely used chelating agents are calcium disodium EDTA, (Ca Na<sub>2</sub> EDTA), Calcium Disodium Versenate (Versenate), and d-penicillamine (penicillamine or Cupramine).

The standard prohibits "prophylactic chelation" of any employee by any person the employer retains, supervises or controls. "Prophylactic chelation" is the routine use of chelating or similarly acting drugs to prevent elevated blood lead levels in workers who are occupationally exposed to lead, or the use of these drugs to routinely lower blood lead levels to predesignated concentrations believed to be "safe". It should be emphasized that where an employer takes a worker who has no symptoms of lead poisoning and has chelation carried out by a physician (either inside or outside of a hospital) solely to reduce the worker's blood lead level, that will generally be considered prophylactic chelation. The use of a hospital and a physician does not mean that prophylactic chelation is not being performed. Routine chelation to prevent increased or reduce current blood lead levels is unacceptable whatever the setting.

The standard allows the use of "therapeutic" or "diagnostic" chelation if administered under the supervision of a licensed physician in a clinical setting with thorough and appropriate medical monitoring. Therapeutic chelation responds to severe lead poisoning where there are marked symptoms. Diagnostic chelation involved giving a patient a dose of the drug then collecting all urine excreted for some period of time as an aid to the diagnosis of lead poisoning.

In cases where the examining physician determines that chelation is appropriate, you must be notified in writing of this fact before such treatment. This will inform you of a potentially harmful treatment, and allow you to obtain a second opinion.

(9) Medical removal protection—WAC 296-155-17623.

Excessive lead absorption subjects you to increased risk of disease. Medical removal protection (MRP) is a means of protecting you when, for whatever reasons, other methods, such as engineering controls, work practices, and respirators, have failed to provide the protection you need. MRP involves the temporary removal of a worker from their regular job to a place of significantly lower exposure without any loss of earnings, seniority, or other employment rights or benefits. The purpose of this program is to cease further lead absorption and allow your body to naturally excrete lead which has previously been absorbed. Temporary medical removal can result from an elevated blood lead level, or a medical opinion. For up to 18 months, or for as long as the job the employee was removed from lasts, protection is provided as a result of either form of removal. The vast majority of removed workers, however, will return to their former jobs long before this eighteen month period expires.

You may also be removed from exposure even if your blood lead level is below 50 µg/dl if a final medical determination indicates that you temporarily need reduced lead exposure for medical reasons. If the physician who is implementing your employers medical program makes a final written opinion recommending your removal or other special protective measures, your employer must implement the physician's recommendation. If you are removed in this manner, you may only be returned when the doctor indicates that it is safe for you to do so.

The standard does not give specific instructions dealing with what an employer must do with a removed worker. Your job assignment upon removal is a matter for you, your employer and your union (if any) to work out consistent with existing procedures for job assignments. Each removal must be accomplished in a manner consistent with existing collective bargaining relationships. Your employer is given broad discretion to implement temporary removals so long as no action is made to override existing agreements. Similarly, a removed worker is provided no right to veto an employer's choice which satisfies the standard.

In most cases, employers will likely transfer removed employees to other jobs with sufficiently low lead exposure. Alternatively, a worker's hours may be reduced so that the time weighted average exposure is reduced, or they may be temporarily laid off if no other alternative is feasible.

In all of these situation, MRP benefits must be provided during the period of removal—i.e., you continue to receive the same earnings, seniority, and other rights and benefits you would have had if you had not been removed. Earnings includes more than just your base wage; it includes overtime, shift differentials, incentives, and other compensation you would have earned if you had not been removed. During the period of removal you must also be provided with appropriate follow-up medical surveillance. If you were removed because your blood lead level was too high, you must be provided with a monthly blood test. If a medical opinion caused your removal, you must be provided medical tests or examinations that the doctor believes to be appropriate. If you do not participate in this follow up medical surveillance, you may lose your eligibility for MRP benefits.

When you are medically eligible to return to your former job, your employer must return you to your "former job status." This means that you are entitled to the position, wages, benefits, etc., you would have had if you had not

been removed. If you would still be in your old job if no removal had occurred that is where you go back. If not, you are returned consistent with whatever job assignment discretion your employer would have had if no removal had occurred. MRP only seeks to maintain your rights, not expand them or diminish them.

If you are removed under MRP and you are also eligible for worker compensation or other compensation for lost wages, your employer's MRP benefits obligation is reduced by the amount that you actually receive from these other sources. This is also true if you obtain other employment during the time you are laid off with MRP benefits.

The standard also covers situations where an employer voluntarily removes a worker from exposure to lead due to the effects of lead on the employee's medical condition, even though the standard does not require removal. In these situations MRP benefits must still be provided as though the standard required removal. Finally, it is important to note that in all cases where removal is required, respirators cannot be used as a substitute. Respirators may be used before removal becomes necessary, but not as an alternative to a transfer to a low exposure job, or to a lay-off with MRP benefits.

(10) Employee information and training—WAC 296-155-17625.

Your employer is required to provide an information and training program for all employees exposed to lead above the action level or who may suffer skin or eye irritation from lead compounds such as lead arsenate or lead azide. The program must train these employees regarding the specific hazards associated with their work environment, protective measures which can be taken, including the contents of any compliance plan in effect, the danger of lead to their bodies (including their reproductive systems), and their rights under the standard. All employees must be trained prior to initial assignment to areas where there is a possibility of exposure over the action level.

This training program must also be provided at least annually thereafter unless further exposure above the action level will not occur.

(11) Signs—WAC 296-155-17627.

The standard requires that the following warning sign be posted in work areas where the exposure to lead exceeds the PEL:

WARNING  
LEAD WORK AREA  
POISON  
NO SMOKING OR EATING

These signs are to be posted and maintained in a manner which assures that the legend is readily visible.

(12) Recordkeeping—WAC 296-155-17629.

Your employer is required to keep all records of exposure monitoring for airborne lead. These records must include the name and job classification of employees measured, details of the sampling and analytical techniques, the results of this sampling, and the type of respiratory protection being worn by the person sampled. Such records are to be retained for at least 30 years. Your employer is also required to keep all records of biological monitoring and medical examination results. These records must include the names of the employees, the physician's written opinion, and

a copy of the results of the examination. Medical records must be preserved and maintained for the duration of employment plus 30 years. However, if the employee's duration of employment is less than one year, the employer need not retain that employee's medical records beyond the period of employment if they are provided to the employee upon termination of employment.

Recordkeeping is also required if you are temporarily removed from your job under the medical removal protection program. This record must include your name and Social Security number, the date of your removal and return, how the removal was or is being accomplished, and whether or not the reason for the removal was an elevated blood lead level. Your employer is required to keep each medical removal record only for as long as the duration of an employee's employment.

The standard requires that if you request to see or copy environmental monitoring, blood lead level monitoring, or medical removal records, they must be made available to you or to a representative that you authorize. Your union also has access to these records. Medical records other than BLL's must also be provided upon request to you, to your physician or to any other person whom you may specifically designate. Your union does not have access to your personal medical records unless you authorize their access.

(13) Observation of monitoring—WAC 296-155-17631.

When air monitoring for lead is performed at your workplace as required by this standard, your employer must allow you or someone you designate to act as an observer of the monitoring. Observers are entitled to an explanation of the measurement procedure, and to record the results obtained. Since results will not normally be available at the time of the monitoring, observers are entitled to record or receive the results of the monitoring when returned by the laboratory. Your employer is required to provide the observer with any personal protective devices required to be worn by employees working in the area that is being monitored. The employer must require the observer to wear all such equipment and to comply with all other applicable safety and health procedures.

(14) Startup date—WAC 296-155-17635.

Employer obligations under the standard begin as of that date with full implementation of engineering controls as soon as possible but no later than within 4 months, and all other provisions completed as soon as possible, but no later than within 2 months from the effective date.

(15) For additional information.

(a) A copy of the standard for lead in construction can be obtained free of charge by calling or writing to the department of labor and industries, Post Office Box 44620, Mailstop 44620, Olympia, Washington 98504-4620; Telephone (206) 956-5527.

(b) Additional information about the standard, its enforcement, and your employer's compliance can be obtained from the nearest office listed in your telephone directory under the state of Washington, department of labor and industries.

**AMENDATORY SECTION** (Amending Order 93-07, filed 10/29/93, effective 12/10/93)

**WAC 296-155-17654 Appendix C to WAC 296-155-176—Medical surveillance guidelines.** (1) Introduction.

The primary purpose of the Washington Industrial Safety and Health Act of 1973 is to assure, so far as possible, safe and healthful working conditions for every working man and woman. The occupational health standard for lead in construction is designed to protect workers exposed to inorganic lead including metallic lead, all inorganic lead compounds and organic lead soaps.

Under this standard occupational exposure to inorganic lead is to be limited to 50  $\mu\text{g}/\text{m}^3$  (micrograms per cubic meter) based on an 8 hour time-weighted average (TWA). This permissible exposure limit (PEL) must be achieved through a combination of engineering, work practice and administrative controls to the extent feasible. Where these controls are in place but are found not to reduce employee exposures to or below the PEL, they must be used nonetheless, and supplemented with respirators to meet the 50  $\mu\text{g}/\text{m}^3$  exposure limit.

The standard also provides for a program of biological monitoring for employees exposed to lead above the action level at any time, and additional medical surveillance for all employees exposed to levels of inorganic lead above 30  $\mu\text{g}/\text{m}^3$  (TWA) for more than 30 days per year and whose BLL exceeds 40  $\mu\text{g}/\text{dl}$ . In addition, a program of biological monitoring is to be made available to all potentially lead-exposed employees performing tasks more than 30 days in any consecutive 12 months as outlined in WAC 296-155-17621 (1)(c).

The purpose of this document is to outline the medical surveillance provisions of the standard for inorganic lead in construction, and to provide further information to the physician regarding the examination and evaluation of workers exposed to inorganic lead.

Subsection (2) provides a detailed description of the monitoring procedure including the required frequency of blood testing for exposed workers, provisions for medical removal protection (MRP), the recommended right of the employee to a second medical opinion, and notification and recordkeeping requirements of the employer. A discussion of the requirements for respirator use and respirator monitoring and WISHA's position on prophylactic chelation therapy are also included in this subsection.

Subsection (3) discusses the toxic effects and clinical manifestations of lead poisoning and effects of lead intoxication on enzymatic pathways in heme synthesis. The adverse effects on both male and female reproductive capacity and on the fetus are also discussed.

Subsection (4) outlines the recommended medical evaluation of the worker exposed to inorganic lead, including details of the medical history, physical examination, and recommended laboratory tests, which are based on the toxic effects of lead as discussed in subsection (3).

Subsection (5) provides detailed information concerning the laboratory tests available for the monitoring of exposed workers. Included also is a discussion of the relative value of each test and the limitations and precautions which are necessary in the interpretation of the laboratory results.

(2) Medical surveillance and monitoring requirements for workers exposed to inorganic lead.

Under the standard for inorganic lead in the construction industry, initial medical surveillance consisting of biological monitoring to include blood lead and ZPP level determination shall be provided to employees exposed to lead at or above the action level on any one day, or to all potentially lead-exposed employees performing tasks as outlined in WAC 296-155-17621 (1)(c). In addition, a program of biological monitoring is to be made available to all employees exposed above the action level at any time and additional medical surveillance is to be made available to all employees exposed to lead above  $30 \mu\text{g}/\text{m}^3$  TWA for more than 30 days each year and whose BLL exceeds  $40 \mu\text{g}/\text{dl}$ . This program consists of periodic blood sampling and medical evaluation to be performed on a schedule which is defined by previous laboratory results, worker complaints or concerns, and the clinical assessment of the examining physician.

Under this program, the blood lead level (BLL) of all employees who are exposed to lead above  $30 \mu\text{g}/\text{m}^3$  for more than 30 days per year or whose blood lead is above  $40 \mu\text{g}/\text{dl}$  but exposed for no more than 30 days per year is to be determined at least every two months for the first six months of exposure and every six months thereafter. The frequency is increased to every two months for employees whose last blood lead level was  $40 \mu\text{g}/\text{dl}$  or above. For employees who are removed from exposure to lead due to an elevated blood lead, a new blood lead level must be measured monthly. A zinc protoporphyrin (ZPP) measurement is strongly recommended on each occasion that a blood lead level measurement is made.

An annual medical examination and consultation performed under the guidelines discussed in subsection (4) is to be made available to each employee exposed above  $30 \mu\text{g}/\text{m}^3$  for more than 30 days per year for whom a blood test conducted at any time during the preceding 12 months indicated a blood lead level at or above  $40 \mu\text{g}/\text{dl}$ . Also, an examination is to be given to all employees prior to their assignment to an area in which airborne lead concentrations reach or exceed the  $30 \mu\text{g}/\text{m}^3$  for more than 30 days per year. In addition, a medical examination must be provided as soon as possible after notification by an employee that the employee has developed signs or symptoms commonly associated with lead intoxication, that the employee desires medical advice regarding lead exposure and the ability to procreate a healthy child, or that the employee has demonstrated difficulty in breathing during a respirator fitting test or during respirator use. An examination is also to be made available to each employee removed from exposure to lead due to a risk of sustaining material impairment to health, or otherwise limited or specially protected pursuant to medical recommendations.

Results of biological monitoring or the recommendations of an examining physician may necessitate removal of an employee from further lead exposure pursuant to the standard's medical removal protection (MRP) program. The object of the MRP program is to provide temporary medical removal to workers either with substantially elevated blood lead levels or otherwise at risk of sustaining material health impairment from continued substantial exposure to lead.

Under the standard's ultimate worker removal criteria, ~~((a worker is to be removed from any work))~~ potentially

exposed workers performing tasks outlined in WAC 296-155-17621 (1)(c), or workers having an eight hour TWA exposure to lead of  $30 \mu\text{g}/\text{m}^3$  shall be removed from any work when their blood lead level reaches ~~((50))~~  $30 \mu\text{g}/\text{dl}$  and is confirmed by a second follow-up blood lead level performed within two weeks after the employer receives the results of the first blood sampling test. Return of the employee to their job status depends on a worker's blood lead level declining to ~~((40))~~  $25 \mu\text{g}/\text{dl}$ .

As part of the standard, the employer is required to notify in writing each employee whose blood lead level exceeds  $40 \mu\text{g}/\text{dl}$ . In addition each such employee is to be informed that the standard requires medical removal with MRP benefits, discussed below, when an employee's blood lead level exceeds the above defined limit.

In addition to the above blood lead level criterion, temporary worker removal may also take place as a result of medical determinations and recommendations. Written medical opinions must be prepared after each examination pursuant to the standard. If the examining physician includes a medical finding, determination or opinion that the employee has a medical condition which places the employee at increased risk of material health impairment from exposure to lead, then the employee must be removed from exposure to lead at or above  $30 \mu\text{g}/\text{m}^3$ . Alternatively, if the examining physician recommends special protective measures for an employee (e.g., use of a powered air purifying respirator) or recommends limitations on an employee's exposure to lead, then the employer must implement these recommendations.

Recommendations may be more stringent than the specific provisions of the standard. The examining physician, therefore, is given broad flexibility to tailor special protective procedures to the needs of individual employees. This flexibility extends to the evaluation and management of pregnant workers and male and female workers who are planning to raise children. Based on the history, physical examination, and laboratory studies, the physician might recommend special protective measures or medical removal for an employee who is pregnant or who is planning to conceive a child when, in the physician's judgment, continued exposure to lead at the current job would pose a significant risk. The return of the employee to their former job status, or the removal of special protections or limitations, depends upon the examining physician determining that the employee is no longer at increased risk of material impairment or that special measures are no longer needed.

During the period of any form of special protection or removal, the employer must maintain the worker's earnings, seniority, and other employment rights and benefits (as though the worker had not been removed) for a period of up to 18 months or for as long as the job the employee was removed from lasts if less than 18 months. This economic protection will maximize meaningful worker participation in the medical surveillance program, and is appropriate as part of the employer's overall obligation to provide a safe and healthful workplace. The provisions of MRP benefits during the employee's removal period may, however, be conditioned upon participation in medical surveillance.

The lead standard provides for a multiple physician review in cases where the employee wishes a second opinion concerning potential lead poisoning or toxicity. If an



employee wishes a second opinion, they can make an appointment with a physician of their choice. This second physician will review the findings, recommendations or determinations of the first physician and conduct any examinations, consultations or tests deemed necessary in an attempt to make a final medical determination. If the first and second physicians do not agree in their assessment they must try to resolve their differences. If they cannot reach an agreement then they must designate a third physician to resolve the dispute.

The employer must provide examining and consulting physicians with the following specific information: A copy of the lead regulations and all appendices, a description of the employee's duties as related to exposure, the exposure level or anticipated level to lead and any other toxic substances (if applicable), a description of personal protective equipment used, blood lead levels, and all prior written medical opinions regarding the employee in the employer's possession or control. The employer must also obtain from the physician and provide the employee with a written medical opinion containing blood lead levels, the physician's opinion as to whether the employee is at risk of material impairment to health, any recommended protective measures for the employee if further exposure is permitted, as well as any recommended limitations upon an employee's use of respirators.

Employers must instruct each physician not to reveal to the employer in writing or in any other way their findings, laboratory results, or diagnoses which are felt to be unrelated to occupational lead exposure. They must also instruct each physician to advise the employee of any occupationally or non-occupationally related medical condition requiring further treatment or evaluation.

The standard provides for the use of respirators where engineering and other primary controls are not effective. However, the use of respirator protection shall not be used in lieu of temporary medical removal due to elevated blood lead levels or findings that an employee is at risk of material health impairment. This is based on the numerous inadequacies of respirators including skin rash where the facepiece makes contact with the skin, unacceptable stress to breathing in some workers with underlying cardiopulmonary impairment, difficulty in providing adequate fit, the tendency for respirators to create additional hazards by interfering with vision, hearing, and mobility, and the difficulties of assuring the maximum effectiveness of a complicated work practice program involving respirators. Respirators do, however, serve a useful function where engineering and work practice controls are inadequate by providing supplementary, interim, or short-term protection, provided they are properly selected for the environment in which the employee will be working, properly fitted to the employee, maintained and cleaned periodically, and worn by the employee when required.

In its standard on occupational exposure to inorganic lead in the construction industry, WISHA has prohibited prophylactic chelation. Diagnostic and therapeutic chelation are permitted only under the supervision of a licensed physician with appropriate medical monitoring in an acceptable clinical setting. The decision to initiate chelation therapy must be made on an individual basis and take into account the severity of symptoms felt to be a result of lead toxicity along with blood lead levels, ZPP levels, and other

laboratory tests as appropriate. EDTA and penicillamine which are the primary chelating agents used in the therapy of occupational lead poisoning have significant potential side effects and their use must be justified on the basis of expected benefits to the worker. Unless frank and severe symptoms are present, therapeutic chelation is not recommended, given the opportunity to remove a worker from exposure and allow the body to naturally excrete accumulated lead. As a diagnostic aid, the chelation mobilization test using CA-EDTA has limited applicability. According to some investigators, the test can differentiate between lead-induced and other nephropathies. The test may also provide an estimation of the mobile fraction of the total body lead burden.

Employers are required to assure that accurate records are maintained on exposure assessment, including environmental monitoring, medical surveillance, and medical removal for each employee. Exposure assessment records must be kept for at least 30 years. Medical surveillance records must be kept for the duration of employment plus 30 years except in cases where the employment was less than one year. If duration of employment is less than one year, the employer need not retain this record beyond the term of employment if the record is provided to the employee upon termination of employment. Medical removal records also must be maintained for the duration of employment. All records required under the standard must be made available upon request to the director. Employers must also make environmental and biological monitoring and medical removal records available to affected employees and to former employees or their authorized employee representatives. Employees or their specifically designated representatives have access to their entire medical surveillance records.

In addition, the standard requires that the employer inform all workers exposed to lead at or above  $30 \mu\text{g}/\text{m}^3$  of the provisions of the standard and all its appendices, the purpose and description of medical surveillance and provisions for medical removal protection if temporary removal is required. An understanding of the potential health effects of lead exposure by all exposed employees along with full understanding of their rights under the lead standard is essential for an effective monitoring program.

### (3) Adverse health effects of inorganic lead.

Although the toxicity of lead has been known for 2,000 years, the knowledge of the complex relationship between lead exposure and human response is still being refined. Significant research into the toxic properties of lead continues throughout the world, and it should be anticipated that our understanding of thresholds of effects and margins of safety will be improved in future years. The provisions of the lead standard are founded on two prime medical judgments: First, the prevention of adverse health effects from exposure to lead throughout a working lifetime requires that worker blood lead levels be maintained at or below  $40 \mu\text{g}/\text{dl}$  and second, the blood lead levels of workers, male or female, who intend to parent in the near future should be maintained below  $30 \mu\text{g}/\text{dl}$  to minimize adverse reproductive health effects to the parents and developing fetus. The adverse effects of lead on reproduction are being actively researched and WISHA encourages the physician to remain abreast of recent developments in the area to best advise pregnant workers or workers planning to conceive children.



The spectrum of health effects caused by lead exposure can be subdivided into five developmental stages: Normal, physiological changes of uncertain significance, pathophysiological changes, overt symptoms (morbidity), and mortality. Within this process there are no sharp distinctions, but rather a continuum of effects. Boundaries between categories overlap due to the wide variation of individual responses and exposures in the working population. WISHA's development of the lead standard focused on pathophysiological changes as well as later stages of disease.

(a) Heme synthesis inhibition. The earliest demonstrated effect of lead involves its ability to inhibit at least two enzymes of the heme synthesis pathway at very low blood lead levels. Inhibition of delta aminolevulinic acid dehydrase (ALA-D) which catalyzes the conversion of delta-aminolevulinic acid (ALA) to protoporphyrin is observed at a blood lead level below 20 µg/dl. At a blood lead level of 40 µg/dl, more than 20% of the population would have 70% inhibition of ALA-D. There is an exponential increase in ALA excretion at blood lead levels greater than 40 µg/dl.

Another enzyme, ferrochelatase, is also inhibited at low blood lead levels. Inhibition of ferrochelatase leads to increased free erythrocyte protoporphyrin (FEP) in the blood which can then bind to zinc to yield zinc protoporphyrin. At a blood lead level of 50 µg/dl or greater, nearly 100% of the population will have an increase in FEP. There is also an exponential relationship between blood lead levels greater than 40 µg/dl and the associated ZPP level, which has led to the development of the ZPP screening test for lead exposure.

While the significance of these effects is subject to debate, it is WISHA's position that these enzyme disturbances are early stages of a disease process which may eventually result in the clinical symptoms of lead poisoning. Whether or not the effects do progress to the later stages of clinical disease, disruption of these enzyme processes over a working lifetime is considered to be a material impairment of health.

One of the eventual results of lead-induced inhibition of enzymes in the heme synthesis pathway is anemia which can be asymptomatic if mild but associated with a wide array of symptoms including dizziness, fatigue, and tachycardia when more severe. Studies have indicated that lead levels as low as 50 µg/dl can be associated with a definite decreased hemoglobin, although most cases of lead-induced anemia, as well as shortened red-cell survival times, occur at lead levels exceeding 80 µg/dl. Inhibited hemoglobin synthesis is more common in chronic cases whereas shortened erythrocyte life span is more common in acute cases.

In lead-induced anemias, there is usually a reticulocytosis along with the presence of basophilic stippling, and ringed sideroblasts, although none of the above are pathognomonic for lead-induced anemia.

(b) Neurological effects. Inorganic lead has been found to have toxic effects on both the central and peripheral nervous systems. The earliest stages of lead-induced central nervous system effects first manifest themselves in the form of behavioral disturbances and central nervous system symptoms including irritability, restlessness, insomnia and other sleep disturbances, fatigue, vertigo, headache, poor memory, tremor, depression, and apathy. With more severe exposure, symptoms can progress to drowsiness, stupor, hallucinations, delirium, convulsions and coma.

The most severe and acute form of lead poisoning which usually follows ingestion or inhalation of large amounts of lead is acute encephalopathy which may arise precipitously with the onset of intractable seizures, coma, cardiorespiratory arrest, and death within 48 hours.

While there is disagreement about what exposure levels are needed to produce the earliest symptoms, most experts agree that symptoms definitely can occur at blood lead levels of 60 µg/dl whole blood and therefore recommend a 40 µg/dl maximum. The central nervous system effects frequently are not reversible following discontinued exposure or chelation therapy and when improvement does occur, it is almost always only partial.

The peripheral neuropathy resulting from lead exposure characteristically involves only motor function with minimal sensory damage and has a marked predilection for the extensor muscles of the most active extremity. The peripheral neuropathy can occur with varying degrees of severity. The earliest and mildest form which can be detected in workers with blood lead levels as low as 50 µg/dl is manifested by slowing of motor nerve conduction velocity often without clinical symptoms. With progression of the neuropathy there is development of painless extensor muscle weakness usually involving the extensor muscles of the fingers and hand in the most active upper extremity, followed in severe cases by wrist drop or, much less commonly, foot drop.

In addition to slowing of nerve conduction, electromyographical studies in patients with blood lead levels greater than 50 µg/dl have demonstrated a decrease in the number of acting motor unit potentials, an increase in the duration of motor unit potentials, and spontaneous pathological activity including fibrillations and fasciculations. Whether these effects occur at levels of 40 µg/dl is undetermined.

While the peripheral neuropathies can occasionally be reversed with therapy, again such recovery is not assured particularly in the more severe neuropathies and often improvement is only partial. The lack of reversibility is felt to be due in part to segmental demyelination.

(c) Gastrointestinal. Lead may also affect the gastrointestinal system producing abdominal colic or diffuse abdominal pain, constipation, obstipation, diarrhea, anorexia, nausea and vomiting. Lead colic rarely develops at blood lead levels below 80 µg/dl.

(d) Renal. Renal toxicity represents one of the most serious health effects of lead poisoning. In the early stages of disease nuclear inclusion bodies can frequently be identified in proximal renal tubular cells. Renal function remains normal and the changes in this stage are probably reversible. With more advanced disease there is progressive interstitial fibrosis and impaired renal function. Eventually extensive interstitial fibrosis ensues with sclerotic glomeruli and dilated and atrophied proximal tubules; all represent end stage kidney disease. Azotemia can be progressive, eventually resulting in frank uremia necessitating dialysis. There is occasionally associated hypertension and hyperuricemia with or without gout.

Early kidney disease is difficult to detect. The urinalysis is normal in early lead nephropathy and the blood urea nitrogen and serum creatinine increase only when two-thirds of kidney function is lost. Measurement of creatinine clearance can often detect earlier disease as can other

methods of measurement of glomerular filtration rate. An abnormal Ca-EDTA mobilization test has been used to differentiate between lead-induced and other nephropathies, but this procedure is not widely accepted. A form of Fanconi syndrome with aminoaciduria, glycosuria, and hyperphosphaturia indicating severe injury to the proximal renal tubules is occasionally seen in children.

(e) Reproductive effects. Exposure to lead can have serious effects on reproductive function in both males and females. In male workers exposed to lead there can be a decrease in sexual drive, impotence, decreased ability to produce healthy sperm, and sterility. Malformed sperm (teratospermia), decreased number of sperm (hypospermia), and sperm with decreased motility (asthenospermia) can all occur. Teratospermia has been noted at mean blood lead levels of 53  $\mu\text{g}/\text{dl}$  and hypospermia and asthenospermia at 41  $\mu\text{g}/\text{dl}$ . Furthermore, there appears to be a dose-response relationship for teratospermia in lead exposed workers.

Women exposed to lead may experience menstrual disturbances including dysmenorrhea, menorrhagia and amenorrhea. Following exposure to lead, women have a higher frequency of sterility, premature births, spontaneous miscarriages, and stillbirths.

Germ cells can be affected by lead and cause genetic damage in the egg or sperm cells before conception and result in failure to implant, miscarriage, stillbirth, or birth defects.

Infants of mothers with lead poisoning have a higher mortality during the first year and suffer from lowered birth weights, slower growth, and nervous system disorders.

Lead can pass through the placental barrier and lead levels in the mother's blood are comparable to concentrations of lead in the umbilical cord at birth. Transplacental passage becomes detectable at 12-14 weeks of gestation and increases until birth.

There is little direct data on damage to the fetus from exposure to lead but it is generally assumed that the fetus and newborn would be at least as susceptible to neurological damage as young children. Blood lead levels of 50-60  $\mu\text{g}/\text{dl}$  in children can cause significant neurobehavioral impairments and there is evidence of hyperactivity at blood lead levels as low as 25  $\mu\text{g}/\text{dl}$ . Given the overall body of literature concerning the adverse health effects of lead in children, WISHA feels that the blood lead level in children should be maintained below 30  $\mu\text{g}/\text{dl}$  with a population mean of 15  $\mu\text{g}/\text{dl}$ . Blood lead levels in the fetus and newborn likewise should not exceed 30  $\mu\text{g}/\text{dl}$ .

Because of lead's ability to pass through the placental barrier and also because of the demonstrated adverse effects of lead on reproductive function in both the male and female as well as the risk of genetic damage of lead on both the ovum and sperm, WISHA recommends a 30  $\mu\text{g}/\text{dl}$  maximum permissible blood lead level in both males and females who wish to bear children.

(f) Other toxic effects. Debate and research continue on the effects of lead on the human body. Hypertension has frequently been noted in occupationally exposed individuals although it is difficult to assess whether this is due to lead's adverse effects on the kidney or if some other mechanism is involved. Vascular and electrocardiographic changes have been detected but have not been well characterized. Lead is thought to impair thyroid function and interfere with the

pituitary-adrenal axis, but again these effects have not been well defined.

#### (4) Medical evaluation.

The most important principle in evaluating a worker for any occupational disease including lead poisoning is a high index of suspicion on the part of the examining physician. As discussed in section (3), lead can affect numerous organ systems and produce a wide array of signs and symptoms, most of which are non-specific and subtle in nature at least in the early stages of disease. Unless serious concern for lead toxicity is present, many of the early clues to diagnosis may easily be overlooked.

The crucial initial step in the medical evaluation is recognizing that a worker's employment can result in exposure to lead. The worker will frequently be able to define exposures to lead and lead containing materials but often will not volunteer this information unless specifically asked. In other situations the worker may not know of any exposures to lead but the suspicion might be raised on the part of the physician because of the industry or occupation of the worker. Potential occupational exposure to lead and its compounds occur in many occupations in the construction industry, including demolition and salvaging operations, removal or encapsulation of materials containing lead, construction, alteration, repair or renovation of structures containing lead, transportation, disposal, storage or containment of lead or lead-containing materials on construction sites, and maintenance operations associated with construction activities.

Once the possibility for lead exposure is raised, the focus can then be directed toward eliciting information from the medical history, physical exam, and finally from laboratory data to evaluate the worker for potential lead toxicity.

A complete and detailed work history is important in the initial evaluation. A listing of all previous employment with information on job description, exposure to fumes or dust, known exposures to lead or other toxic substances, a description of any personal protective equipment used, and previous medical surveillance should all be included in the worker's record. Where exposure to lead is suspected, information concerning on-the-job personal hygiene, smoking or eating habits in work areas, laundry procedures, and use of any protective clothing or respiratory protection equipment should be noted. A complete work history is essential in the medical evaluation of a worker with suspected lead toxicity, especially when long term effects such as neurotoxicity and nephrotoxicity are considered.

The medical history is also of fundamental importance and should include a listing of all past and current medical conditions, current medications including proprietary drug intake, previous surgeries and hospitalizations, allergies, smoking history, alcohol consumption, and also non-occupational lead exposures such as hobbies (hunting, riflery). Also known childhood exposures should be elicited. Any previous history of hematological, neurological, gastrointestinal, renal, psychological, gynecological, genetic, or reproductive problems should be specifically noted.

A careful and complete review of systems must be performed to assess both recognized complaints and subtle or slowly acquired symptoms which the worker might not appreciate as being significant. The review of symptoms should include the following:

- ◆ General—weight loss, fatigue, decreased appetite.
- ◆ Head, eyes, ears, nose, throat (HEENT)—headaches, visual disturbances or decreased visual acuity, hearing deficits or tinnitus, pigmentation of the oral mucosa, or metallic taste in mouth.
- ◆ Cardio-pulmonary—shortness of breath, cough, chest pains, palpitations, or orthopnea.
- ◆ Gastrointestinal—nausea, vomiting, heartburn, abdominal pain, constipation or diarrhea.
- ◆ Neurologic—irritability, insomnia, weakness (fatigue), dizziness, loss of memory, confusion, hallucinations, incoordination, ataxia, decreased strength in hands or feet, disturbances in gait, difficulty in climbing stairs, or seizures.
- ◆ Hematologic—pallor, easy fatigability, abnormal blood loss, melena.
- ◆ Reproductive (male and female and spouse where relevant)—history of infertility, impotence, loss of libido, abnormal menstrual periods, history of miscarriages, stillbirths, or children with birth defects.
- ◆ Musculo-skeletal—muscle and joint pains.

The physical examination should emphasize the neurological, gastrointestinal, and cardiovascular systems. The worker's weight and blood pressure should be recorded and the oral mucosa checked for pigmentation characteristic of a possible Burtonian or lead line on the gingiva. It should be noted, however, that the lead line may not be present even in severe lead poisoning if good oral hygiene is practiced.

The presence of pallor on skin examination may indicate an anemia which, if severe, might also be associated with a tachycardia. If an anemia is suspected, an active search for blood loss should be undertaken including potential blood loss through the gastrointestinal tract.

A complete neurological examination should include an adequate mental status evaluation including a search for behavioral and psychological disturbances, memory testing, evaluation for irritability, insomnia, hallucinations, and mental clouding. Gait and coordination should be examined along with close observation for tremor. A detailed evaluation of peripheral nerve function including careful sensory and motor function testing is warranted. Strength testing particularly of extensor muscle groups of all extremities is of fundamental importance.

Cranial nerve evaluation should also be included in the routine examination.

The abdominal examination should include auscultation for bowel sounds and abdominal bruits and palpation for organomegaly, masses, and diffuse abdominal tenderness.

Cardiovascular examination should evaluate possible early signs of congestive heart failure. Pulmonary status should be addressed particularly if respirator protection is contemplated.

As part of the medical evaluation, the lead standard requires the following laboratory studies:

- ◆ Blood lead level.
- ◆ Hemoglobin and hematocrit determinations, red cell indices, and examination of the peripheral blood smear to evaluate red blood cell morphology.
- ◆ Blood urea nitrogen.
- ◆ Serum creatinine.

- ◆ Routine urinalysis with microscopic examination.
- ◆ A zinc protoporphyrin level.

In addition to the above, the physician is authorized to order any further laboratory or other tests which they deem necessary in accordance with sound medical practice. The evaluation must also include pregnancy testing or laboratory evaluation of male fertility if requested by the employee. Additional tests which are probably not warranted on a routine basis but may be appropriate when blood lead and ZPP levels are equivocal include delta aminolevulinic acid and coproporphyrin concentrations in the urine, and dark-field illumination for detection of basophilic stippling in red blood cells.

If an anemia is detected further studies including a careful examination of the peripheral smear, reticulocyte count, stool for occult blood, serum iron, total iron binding capacity, bilirubin, and, if appropriate, vitamin B12 and folate may be of value in attempting to identify the cause of the anemia.

If a peripheral neuropathy is suspected, nerve conduction studies are warranted both for diagnosis and as a basis to monitor any therapy.

If renal disease is questioned, a 24 hour urine collection for creatinine clearance, protein, and electrolytes may be indicated. Elevated uric acid levels may result from lead-induced renal disease and a serum uric acid level might be performed.

An electrocardiogram and chest x-ray may be obtained as deemed appropriate.

Sophisticated and highly specialized testing should not be done routinely and where indicated should be under the direction of a specialist.

#### (5) Laboratory evaluation.

The blood lead level at present remains the single most important test to monitor lead exposure and is the test used in the medical surveillance program under the lead standard to guide employee medical removal. The ZPP has several advantages over the blood lead level. Because of its relatively recent development and the lack of extensive data concerning its interpretation, the ZPP currently remains an ancillary test.

This section will discuss the blood lead level and ZPP in detail and will outline their relative advantages and disadvantages. Other blood tests currently available to evaluate lead exposure will also be reviewed.

The blood lead level is a good index of current or recent lead absorption when there is no anemia present and when the worker has not taken any chelating agents. However, blood lead levels along with urinary lead levels do not necessarily indicate the total body burden of lead and are not adequate measures of past exposure. One reason for this is that lead has a high affinity for bone and up to 90% of the body's total lead is deposited there. A very important component of the total lead body burden is lead in soft tissue (liver, kidney, and brain). This fraction of the lead body burden, the biologically active lead, is not entirely reflected by blood lead levels since it is a function of the dynamics of lead absorption, distribution, deposition in bone and excretion. Following discontinuation of exposure to lead, the excess body burden is only slowly mobilized from bone and other relatively stable body stores and excreted. Consequently, a high blood lead level may only represent recent heavy

exposure to lead without a significant total body excess and likewise a low blood lead level does not exclude an elevated total body burden of lead.

Also due to its correlation with recent exposures, the blood lead level may vary considerably over short time intervals.

To minimize laboratory error and erroneous results due to contamination, blood specimens must be carefully collected after thorough cleaning of the skin with appropriate methods using lead-free blood containers and analyzed by a reliable laboratory. Under the standard, samples must be analyzed in laboratories which are approved by OSHA. Analysis is to be made using atomic absorption spectrophotometry, anodic stripping voltammetry or any method which meets the accuracy requirements set forth by the standard.

The determination of lead in urine is generally considered a less reliable monitoring technique than analysis of whole blood primarily due to individual variability in urinary excretion capacity as well as the technical difficulty of obtaining accurate 24 hour urine collections. In addition, workers with renal insufficiency, whether due to lead or some other cause, may have decreased lead clearance and consequently urine lead levels may underestimate the true lead burden. Therefore, urine lead levels should not be used as a routine test.

The zinc protoporphyrin test, unlike the blood lead determination, measures an adverse metabolic effect of lead and as such is a better indicator of lead toxicity than the level of blood lead itself. The level of ZPP reflects lead absorption over the preceding 3 to 4 months, and therefore is a better indicator of lead body burden. The ZPP requires more time than the blood lead to read significantly elevated levels; the return to normal after discontinuing lead exposure is also slower. Furthermore, the ZPP test is simpler, faster, and less expensive to perform and no contamination is possible. Many investigators believe it is the most reliable means of monitoring chronic lead absorption.

Zinc protoporphyrin results from the inhibition of the enzyme ferrochelatase which catalyzes the insertion of an iron molecule into the protoporphyrin molecule, which then becomes heme. If iron is not inserted into the molecule then zinc, having a greater affinity for protoporphyrin, takes the place of the iron, forming ZPP.

An elevation in the level of circulating ZPP may occur at blood lead levels as low as 20-30 µg/dl in some workers. Once the blood lead level has reached 40 µg/dl there is more marked rise in the ZPP value from its normal range of less than 100 µg/dl 100 ml. Increases in blood lead levels beyond 40 µg/100 g are associated with exponential increases in ZPP.

Whereas blood lead levels fluctuate over short time spans, ZPP levels remain relatively stable. ZPP is measured directly in red blood cells and is present for the cell's entire 120 day life-span. Therefore, the ZPP level in blood reflects the average ZPP production over the previous 3-4 months and consequently the average lead exposure during that time interval.

It is recommended that a hematocrit be determined whenever a confirmed ZPP of 50 µg/100 ml whole blood is obtained to rule out a significant underlying anemia. If the ZPP is in excess of 100 µg/100 ml and not associated with abnormal elevations in blood lead levels, the laboratory

should be checked to be sure that blood leads were determined using atomic absorption spectrophotometry anodic stripping voltammetry, or any method which meets the accuracy requirements set forth by the standard by an OSHA approved laboratory which is experienced in lead level determinations. Repeat periodic blood lead studies should be obtained in all individuals with elevated ZPP levels to be certain that an associated elevated blood lead level has not been missed due to transient fluctuations in blood leads.

ZPP has a characteristic fluorescence spectrum with a peak at 594 nm which is detectable with a hematofluorimeter. The hematofluorimeter is accurate and portable and can provide on-site, instantaneous results for workers who can be frequently tested via a finger prick.

Careful attention must be given to calibration and quality control procedures. Limited data on blood lead-ZPP correlations and the ZPP levels which are associated with the adverse health effects discussed in subsection (3) are the major limitations of the test. Also it is difficult to correlate ZPP levels with environmental exposure and there is some variation of response with age and sex. Nevertheless, the ZPP promises to be an important diagnostic test for the early detection of lead toxicity and its value will increase as more data is collected regarding its relationship to other manifestations of lead poisoning.

Levels of delta-aminolevulinic acid (ALA) in the urine are also used as a measure of lead exposure. Increasing concentrations of ALA are believed to result from the inhibition of the enzyme delta-aminolevulinic acid dehydrase (ALA-D). Although the test is relatively easy to perform, inexpensive, and rapid, the disadvantages include variability in results, the necessity to collect a complete 24 hour urine sample which has a specific gravity greater than 1.010, and also the fact that ALA decomposes in the presence of light.

The pattern of porphyrin excretion in the urine can also be helpful in identifying lead intoxication. With lead poisoning, the urine concentrations of coproporphyrins I and II, porphobilinogen and uroporphyrin I rise. The most important increase, however, is that of coproporphyrin III; levels may exceed 5,000 µg/l in the urine in lead poisoned individuals, but its correlation with blood lead levels and ZPP are not as good as those of ALA. Increases in urinary porphyrins are not diagnostic of lead toxicity and may be seen in porphyria, some liver diseases, and in patients with high reticulocyte counts.

Summary. The Washington Industrial Safety and Health Act's standard for inorganic lead in the construction industry places significant emphasis on the medical surveillance of all workers exposed to levels of inorganic lead above 30 µg/m<sup>3</sup> TWA. The physician has a fundamental role in this surveillance program, and in the operation of the medical removal protection program.

Even with adequate worker education on the adverse health effects of lead and appropriate training in work practices, personal hygiene and other control measures, the physician has a primary responsibility for evaluating potential lead toxicity in the worker. It is only through a careful and detailed medical and work history, a complete physical examination and appropriate laboratory testing that an accurate assessment can be made. Many of the adverse health effects of lead toxicity are either irreversible or only

partially reversible and therefore early detection of disease is very important.

This document outlines the medical monitoring program as defined by the occupational safety and health standard for inorganic lead. It reviews the adverse health effects of lead poisoning and describes the important elements of the history and physical examinations as they relate to these adverse effects. Finally, the appropriate laboratory testing for evaluating lead exposure and toxicity is presented.

It is hoped that this review and discussion will give the physician a better understanding of the WISHA standard with the ultimate goal of protecting the health and well-being of the worker exposed to lead under their care.

**WSR 94-15-095**  
**PROPOSED RULES**  
**DEPARTMENT OF**  
**LABOR AND INDUSTRIES**  
[Filed July 20, 1994, 10:27 a.m.]

Original Notice.

Title of Rule: See Purpose below.

Purpose: Chapter 296-24 WAC, General safety and health standards, federal-initiated proposed amendments to chapter 296-24 WAC, published in Federal Register Volume 59, Number 66, dated April 6, 1994, are made to be more consistent with current consensus regarding good industry practices, as reflected by current applicable American National Standards Institute (ANSI) standards. The proposed amendments will provide guidance for the selection and use of personal protective equipment (PPE) and clarify performance-oriented requirements; add requirements for written certification of hazard assessment and equipment selection, defective and damaged equipment, and training; add a new section addressing hazards to hands; and add two new nonmandatory appendices (A and B) to provide guidance to employers and employees relating to PPE for eye, face, head, foot and hand hazards. The federal wording "common sense" was changed to "reasonable diligence" in Appendix B. The state retained its existing protection from flying objects in WAC 296-24-084, which is not proposed in the federal standard. Other federal-initiated amendments are made to make minor wording changes and to remove unnecessary references or descriptions. These amendments are made to make the standard at least as effective as the federal standards. Federal-initiated proposed amendments to chapter 296-24 WAC, published in Federal Register Volume 59, Number 63, dated April 1, 1994, are made to modify employer requirements for reporting of fatalities and multiple hospitalization incidents. Employers will be required to report fatalities or multiple hospitalizations within 8 hours after the employer learns of it. Reporting information requirements are also specified. These amendments are made to make the standard at least as effective as the federal standards. Federal-initiated proposed amendments to chapter 296-24 WAC, published in Federal Register Volume 59, Number 20, dated January 31, 1994, are made to change requirements for testing frequency and storage of rubber personal protective equipment and to update references. These amendments are made to make the standard identical

to the federal standards. State-initiated proposed amendments to chapter 296-24 WAC are made to summarize and move text relating to the requirements for eye and face protectors from WAC 296-24-07801 to 296-24-07501 (1)(c); include information indicating where specific standards, rules, or regulations referenced are available for review; replace references to the Division of Industrial Safety and Health with the department; correct references to specific gender; and to renumber subsections, subdivisions, and items as required by the code reviser. Other wording changes are made for clarification; chapter 296-27 WAC, Recordkeeping and reporting, federal-initiated proposed amendments to chapter 296-27 WAC, published in Federal Register Volume 59, Number 63, dated April 1, 1994, are made to modify employer requirements for reporting of fatalities and multiple hospitalization incidents. Employers will be required to report fatalities or multiple hospitalizations within 8 hours after the employer learns of it. Reporting information requirements are also specified. These amendments are made to make the standard at least as effective as the federal standards. State-initiated proposed amendments to chapter 296-27 WAC are made to replace references to the Division of Industrial Safety and Health with the department; to correct references to specific gender; and to renumber subsections, subdivisions, and items as required by the code reviser. Other wording changes are made for clarification; chapter 296-32 WAC, Safety standards for telecommunications, federal-initiated proposed amendment to chapter 296-32 WAC, published in Federal Register Volume 59, Number 20, dated January 31, 1994, is made to change the rubber glove testing requirement from 9 months to 6 months. These amendments are made to make the standard at least as effective as the federal standards. State-initiated proposed amendments to chapter 296-32 WAC are made to correct references necessitated by the federal-initiated change, published in Federal Register Volume 59, Number 66, dated April 6, 1994, to chapter 296-24 WAC, Part A-2, Personal Protective Equipment; chapter 296-45 WAC, Safety standards—Electrical workers, federal-initiated proposed amendments to chapter 296-45 WAC, published in Federal Register Volume 59, Number 20, dated January 31, 1994, add requirements for training and retraining of electrical workers, transformers, testing hot sticks, and use of nonflammable clothing when there is a potential for arcing. New sections are added for communication facilities, power generation, hazardous energy control (lockout/tagout) procedures, and testing and test facilities. These new sections add requirements for posting radiation warning signs for microwave transmission; add requirements for interlocks, changing brushes, chemical cleaning of boilers, and coal and ash handling, etc.; add lockout/tagout requirements for electric power generation installations; and add requirements for safe work practices for high voltage laboratories, shops, and substations. Other federal-initiated proposed amendments to chapter 296-45 WAC are made to change high voltage scope from 750 volts to 600 volts to be identical to the federal standard. These amendments are made to make the standard at least as effective as the federal standards. State-initiated proposed amendments to chapter 296-45 WAC are made to renumber subsections, subdivisions, and items as required by the code reviser; replaces references to the Division of Industrial Safety and Health with the department;

corrects references, and corrects references to specific gender. Other wording changes are made for clarification; chapter 296-54 WAC, Safety standards—Logging operations, state-initiated proposed amendments to chapter 296-54 WAC are made to correct references necessitated by the federal-initiated change to chapter 296-24 WAC, Part A-2, Personal Protective Equipment; chapter 296-62 WAC, General occupational health standards, state-initiated proposed amendments to chapter 296-62 WAC are made to correct references necessitated by the federal-initiated change to chapter 296-24 WAC, Part A-2, Personal Protective Equipment; chapter 296-78 WAC, Safety standards for sawmills and woodworking operations, federal-initiated proposed amendments to chapter 296-78 WAC, published in Federal Register Volume 59, Number 63, dated April 1, 1994, are made to modify employer requirements for reporting of fatalities and multiple hospitalization incidents. Employers will be required to report fatalities or multiple hospitalizations within 8 hours after the employer learns of it. Reporting information requirements are also specified. These amendments are made to make the standard at least as effective as the federal standards. State-initiated proposed amendments to chapter 296-78 WAC are made to correct references necessitated by the federal-initiated change to chapter 296-24 WAC, Part A-2, Personal Protective Equipment; to replace references to the Division of Industrial Safety and Health with the department; to correct references to specific gender; and to renumber subsections, subdivisions, and items as required by the code reviser. Other wording changes are made for clarification; chapter 296-79 WAC, Safety standards for pulp, paper, and paperboard mills and converters, state-initiated proposed amendments to chapter 296-79 WAC are made to correct references necessitated by the federal-initiated change to chapter 296-24 WAC, Part A-2, Personal Protective Equipment; and chapter 296-306 WAC, Safety standards for agriculture, federal-initiated proposed amendments to chapter 296-78 WAC, published in Federal Register Volume 59, Number 63, dated April 1, 1994, are made to modify employer requirements for reporting of fatalities and multiple hospitalization incidents. Employers will be required to report fatalities or multiple hospitalizations within 8 hours after the employer learns of it. Reporting information requirements are also specified. These amendments are made to make the standard at least as effective as the federal standards. State-initiated proposed amendments to chapter 296-306 WAC are made to correct references necessitated by the federal-initiated change to chapter 296-24 WAC, Part A-2, Personal Protective Equipment; to replace references to the Division of Industrial Safety and Health with the department; to correct references to specific gender; and to renumber subsections, subdivisions, and items as required by the code reviser. Other wording changes are made for clarification.

Statutory Authority for Adoption: Chapter 49.17 RCW.

Statute Being Implemented: RCW 49.17.040, [49.17].050, [49.17].060.

Summary: See Purpose above.

Name of Agency Personnel Responsible for Drafting: Marcia Holt, 7273 Linderson Way, Tumwater, WA, (206) 956-5530; Implementation and Enforcement: Suzanne Mager, 7273 Linderson Way, Tumwater, WA, (206) 956-5495.

Name of Proponent: Department of Labor and Industries, governmental.

Rule is necessary because of federal law, Federal Register Volume 59, Number 66, April 6, 1994; Federal Register Volume 59, Number 63, April 1, 1994; and Federal Register Volume 59, Number 20, January 31, 1994.

Explanation of Rule, its Purpose, and Anticipated Effects: See Purpose above.

Proposal Changes the Following Existing Rules: See Purpose above.

Has a Small Business Economic Impact Statement Been Prepared Under Chapter 19.85 RCW? No. A small business economic impact statement is not required as federal and state-initiated proposed changes to the above referenced standards are made solely to comply with federal regulations or are housekeeping changes and will not require any additional compliance requirements.

Hearing Location: Department of Labor and Industries Building, Auditorium, 7273 Linderson Way, Tumwater, WA, on August 23, 1994, at 9:30 a.m.

Assistance for Persons with Disabilities: Contact Linda Dausener by August 10, 1994, TDD (206) 956-4615, or (206) 956-5527.

Submit Written Comments to: Suzanne L. Mager, Assistant Director, Division of Consultation and Compliance, P.O. Box 44620, Olympia, WA 98507-4620, by August 30, 1994. In addition to written comments, the department will accept comments submitted to the following voice mail number and telefacsimile machine number: Voice mail (206) 956-5525; and FAX (206) 956-5529. Comments submitted by FAX must be ten pages or less.

Date of Intended Adoption: September 30, 1994.

July 20, 1994  
Dorette M. Markham  
for Mark O. Brown  
Director

AMENDATORY SECTION (Amending Order 73-5, filed 5/9/73 and Order 73-4, filed 5/7/73)

**WAC 296-24-007 Incorporation of standards of national organization.** Whenever a provision of this chapter incorporates by reference a national code or portion thereof which has been adopted by and is currently administered by another state agency, compliance with those provisions adopted and administered by such other state agency, if from a more recent edition of such national code, will be deemed to be prima facie evidence of compliance with the provisions of this chapter.

The specific standard(s), rule(s) or regulation(s) referenced in Title 296 WAC are available for review through local department of labor and industries offices. The standards are also available through the local library system or directly from the issuing organization.

AMENDATORY SECTION (Amending Order 91-07, filed 11/22/91, effective 12/24/91)

**WAC 296-24-020 Management's responsibility.** (1) It shall be the responsibility of management to establish, supervise, and enforce, in a manner which is effective in practice:

(a) A safe and healthful working environment.



(b) An accident prevention program as required by these standards.

(c) Training programs to improve the skill and competency of all employees in the field of occupational safety and health. Such training shall include the on-the-job instructions on the safe use of powered materials handling equipment, machine tool operations, use of toxic materials and operation of utility systems prior to assignments to jobs involving such exposures.

(2) After the emergency actions following accidents that cause serious injuries that have immediate symptoms, a preliminary investigation of the cause of the accident shall be conducted. The investigation shall be conducted by a person designated by the employer, the immediate supervisor of the injured employee, witnesses, employee representative, and any other person with the special expertise required to evaluate the facts relating to the cause of the accident. The findings of the investigation shall be documented by the employer for reference at any following formal investigation. If the employee representative is the business agent of the employee bargaining unit (~~that~~) and is unavailable to participate without delaying the investigation group, the employer may proceed, and satisfy the requirements of subsection (2) of this section by using one of the following alternatives:

(a) The shop steward acts as the employee representative.

(b) An employee representative member of the safety committee acts as the employee representative.

(c) The employees select a person to represent them.

(3) Reporting of fatality or multiple hospitalization (~~accidents~~) incidents.

(a) Within ~~(24)~~ eight hours after the ~~(occurrence of an employment accident which results in an immediate or probable fatality to one or more employees, or which results in hospitalization of two or more employees, the employer of any employee so injured or killed shall report the accident either orally or in writing to the nearest office of the department. The reporting may be by telephone or telegraph. The reporting shall relate the circumstances of the accident, the number of fatalities, and the extent of any injuries. The director may require such additional reports, in writing or otherwise, as deemed necessary, concerning the accident.)~~ fatality or probable fatality of any employee from a work-related incident or the inpatient hospitalization of two or more employees as a result of a work-related incident, the employer of any employees so affected, shall orally report the fatality/multiple hospitalization by telephone or in person to the nearest office of the department or by using the OSHA toll-free central telephone number, 1-800-321-6742.

(i) This requirement applies to each such fatality or hospitalization of two or more employees which occurs within thirty days of the incident.

(ii) Exception: If the employer does not learn of a reportable incident at the time it occurs and the incident would otherwise be reportable under this subsection, the employer shall make a report within eight hours of the time the incident is reported to any agent or employee of the employer.

(iii) Each report required by this subsection shall relate the following information: Establishment name, location of the incident, time of the incident, number of fatalities or

hospitalized employees, contact person, phone number, and a brief description of the incident.

(b) Equipment involved in an (~~accident~~) incident resulting in an immediate or probable fatality or in the inpatient hospitalization of two or more employees, shall not be moved, until a representative of the (~~division of industrial safety and health~~) department investigates the (~~accident~~) incident and releases such equipment, except where removal is essential to prevent further (~~accident~~) incident. Where necessary to remove the victim, such equipment may be moved only to the extent of making possible such removal.

(c) Upon arrival of (~~division of industrial safety and health~~) the department's investigator, employer shall assign to assist the investigator, the immediate supervisor and all employees who were witnesses to the (~~accident~~) incident, or whoever the investigator deems necessary to complete the investigation.

(4) Each employer shall maintain in each establishment a system for maintaining records of occupational injuries and illnesses as prescribed by WAC 296-27-030.

Note: Recordable cases include:

1. Every occupational death.
2. Every industrial illness.
3. Every occupational injury that involves one of the following:
  - a. Unconsciousness.
  - b. Inability to perform all phases of regular job.
  - c. Inability to work full time on regular job.
  - d. Temporary assignment to another job.
  - e. Medical treatment beyond first-aid.

(5) All employers with eleven or more employees shall record occupational injury and illness information on forms OSHA 101 - Supplementary Record Occupational Injuries and Illnesses and OSHA 200 - Log and Summary. Forms other than OSHA 101 may be substituted for the Supplementary Record of Occupational Injuries and Illnesses if they contain the same items.

(6) Machinery, tools, materials or equipment, whether owned by the employer or under control of another firm or individual, which does not meet the compliance requirements of this chapter, or any other applicable vertical standard of a specific industry, shall not be utilized by employees.

(7) Each employer shall post and keep posted a notice or notices (the WISHA Poster, Job safety and health protection; form F416-081-000) to be furnished by the (~~division of industrial safety and health~~) department of labor and industries, informing employees of the protections and obligations provided for in the act. For assistance and information, including copies of the act, and of specific safety and health standards, employees should contact the employer or the nearest office of the department of labor and industries. Such notice or notices shall be posted by the employer at each establishment in a conspicuous place or places where notices to employees are customarily posted. Each employer shall take steps to assure that such notices are not altered, defaced, or covered by other material.

AMENDATORY SECTION (Amending Order 73-5, filed 5/9/73 and Order 73-4, filed 5/7/73)

**WAC 296-24-07501 General requirements.** (1) Application.

(a) Protective equipment, including personal protective equipment for eyes, face, head, and extremities, protective clothing, respiratory devices, and protective shields and barriers, shall be provided, used, and maintained in a sanitary and reliable condition wherever it is necessary by reason of hazards of processes or environment, chemical hazards, radiological hazards, or mechanical irritants encountered in a manner capable of causing injury or impairment in the function of any part of the body through absorption, inhalation or physical contact.

(b) Employee owned equipment. Where employees provide their own protective equipment, the employer shall be responsible to assure its adequacy, including proper maintenance, and sanitation of such equipment.

(c) Design. All personal protective equipment shall be of safe design and construction for the work to be performed. Protectors shall be durable, fit snugly and shall not unduly interfere with the movements of the wearer.

(2) Hazard assessment and equipment selection.

(a) The employer shall assess the workplace to determine if hazards are present, or are likely to be present, which necessitate the use of personal protective equipment (PPE). If such hazards are present, or likely to be present, the employer shall:

(i) Select, and have each affected employee use, the types of PPE that will protect the affected employee from the hazards identified in the hazard assessment;

(ii) Communicate selection decisions to each affected employee; and

(iii) Select PPE that properly fits each affected employee.

Note: Nonmandatory Appendix B contains an example of procedures that would comply with the requirement for a hazard assessment.

(b) The employer shall verify that the required workplace hazard assessment has been performed through a written certification that identifies the workplace evaluated; the person certifying that the evaluation has been performed; the date(s) of the hazard assessment; and, which identifies the document as a certification of hazard assessment.

(3) Defective and damaged equipment. Defective or damaged personal protective equipment shall not be used.

(4) Training.

(a) The employer shall provide training to each employee who is required by this section to use PPE. Each such employee shall be trained to know at least the following:

(i) When PPE is necessary;

(ii) What PPE is necessary;

(iii) How to properly don, doff, adjust, and wear PPE;

(iv) The limitations of the PPE; and

(v) The proper care, maintenance, useful life and disposal of the PPE.

(b) Each affected employee shall demonstrate an understanding of the training specified in (a) of this subsection, and the ability to use PPE properly, before being allowed to perform work requiring the use of PPE.

(c) When the employer has reason to believe that any affected employee who has already been trained does not have the understanding and skill required by (b) of this subsection, the employer shall retrain each such employee.

Circumstances where retraining is required include, but are not limited to, situations where:

(i) Changes in the workplace render previous training obsolete; or

(ii) Changes in the types of PPE to be used render previous training obsolete; or

(iii) Inadequacies in an affected employee's knowledge or use of assigned PPE indicate that the employee has not retained the requisite understanding or skill.

(d) The employer shall verify that each affected employee has received and understood the required training through a written certification that contains the name of each employee trained, the date(s) of training, and that identifies the subject of the certification.

AMENDATORY SECTION (Amending Order 73-5, filed 5/9/73 and Order 73-4, filed 5/7/73)

WAC 296-24-07801 General. ((1) Protective eye and face equipment shall be required where there is a reasonable probability of injury that can be prevented by such equipment. In such cases, employers shall make conveniently available a type of protector suitable for the work to be performed, and employees shall use such protectors. No unprotected person shall knowingly be subjected to a hazardous environmental condition. Suitable eye protectors shall be provided where machines or operations present the hazard of flying objects, glare, liquids, injurious radiation, or a combination of these hazards.

(2) Protectors shall:

(a) Provide adequate protection against the particular hazards for which they are designed.

(b) Be reasonably comfortable when worn under the designated conditions.

(c) Fit snugly and shall not unduly interfere with the movements of the wearer.

(d) Be durable.

(e) Be capable of being disinfected.

(f) Be easily cleanable.

(3) Protectors should be kept clean and in good repair.

(4) Persons whose vision requires the use of corrective lenses in spectacles, and who are required by this standard to wear eye protection, shall wear goggles or spectacles of one of the following types:

(a) Spectacles whose protective lenses provide optical correction.

(b) Goggles that can be worn over corrective spectacles without disturbing the adjustment of the spectacles.

(c) Goggles that incorporate corrective lenses mounted behind the protective lenses.

(5) Every protector shall be distinctly marked to facilitate identification of the manufacturer.

(6) When limitations or precautions are indicated by the manufacturer, they shall be transmitted to the user and care taken to see that such limitations and precautions are strictly observed.

(7) Design, construction, testing, and use of devices for eye and face protection shall be in accordance with American National Standard for Occupational and Educational Eye and Face Protection, Z87.1-1968.)) (1) Each affected employee shall use appropriate eye or face protection when exposed to eye or face hazards from flying particles, molten



metal, liquid chemicals, acids or caustic liquids, chemical gases or vapors, or potentially injurious light radiation.

(2) Each affected employee shall use eye protection that provides side protection when there is a hazard from flying objects. Detachable side protectors (e.g., clip-on or slide-on side shields) meeting the pertinent requirements of this section are acceptable.

(3) Each affected employee who wears prescription lenses while engaged in operations that involve eye hazards shall wear eye protection that incorporates the prescription in its design, or shall wear eye protection that can be worn over the prescription lenses without disturbing the proper position of the prescription lenses or the protective lenses.

(4) Eye and face PPE shall be distinctly marked to facilitate identification of the manufacturer.

(5) Each affected employee shall use equipment with filter lenses that have a shade number appropriate for the work being performed for protection from injurious light radiation. The following is a listing of appropriate shade numbers for various operations.

Filter Lenses for Protection Against Radiant Energy

<u>Operations</u>	<u>Electric Size 1/32 (inches)</u>	<u>Arc Current</u>	<u>Minimum* Protective Shade</u>
<u>Shielded metal arc welding</u>	<u>Less than 3</u>	<u>Less than 60</u>	<u>7</u>
	<u>3-5</u>	<u>60-160</u>	<u>8</u>
	<u>5-8</u>	<u>160-250</u>	<u>10</u>
	<u>More than 8</u>	<u>250-550</u>	<u>11</u>
<u>Gas metal arc welding and flux cored arc welding</u>		<u>Less than 60</u>	<u>7</u>
		<u>60-160</u>	<u>10</u>
		<u>160-250</u>	<u>10</u>
		<u>250-500</u>	<u>10</u>
<u>Gas Tungsten arc welding</u>		<u>Less than 50</u>	<u>8</u>
		<u>50-150</u>	<u>8</u>
		<u>150-500</u>	<u>10</u>
<u>Air carbon Arc cutting</u>	<u>(Light)</u>	<u>Less than 500</u>	<u>10</u>
	<u>(Heavy)</u>	<u>500-1000</u>	<u>11</u>
<u>Plasma arc welding</u>		<u>Less than 20</u>	<u>6</u>
		<u>20-100</u>	<u>8</u>
		<u>100-400</u>	<u>10</u>
		<u>400-800</u>	<u>11</u>
<u>Plasma arc cutting</u>	<u>(Light)</u>	<u>Less than 300</u>	<u>8</u>
	<u>(Medium)**</u>	<u>300-400</u>	<u>9</u>
	<u>(Heavy)**</u>	<u>400-800</u>	<u>10</u>
<u>Torch brazing</u>			<u>3</u>
<u>Torch soldering</u>			<u>2</u>
<u>Carbon arc welding</u>			<u>14</u>

Filter Lenses for Protection Against Radiant Energy

<u>Operations</u>	<u>Plate thickness (inches)</u>	<u>Plate thickness (mm)</u>	<u>Minimum* Protective Shade</u>
<u>Gas welding:</u>	<u>Light</u>	<u>Under 1/8</u>	<u>4</u>
	<u>Medium</u>	<u>1/8 to 1/2</u>	<u>5</u>
	<u>Heavy</u>	<u>Over 1/2</u>	<u>6</u>
<u>Oxygen cutting:</u>	<u>Light</u>	<u>Under 1</u>	<u>3</u>
	<u>Medium</u>	<u>1 to 6</u>	<u>4</u>
	<u>Heavy</u>	<u>Over 6</u>	<u>5</u>

\* As a rule of thumb, start with a shade that is too dark to see the weld zone. Then go to a lighter shade which gives sufficient view of the weld zone without going below the minimum. In oxyfuel gas welding or cutting where the torch produces a high yellow light, it is desirable to use a filter lens that absorbs the yellow or sodium line in the visible light of the (spectrum) operation.

\*\* These values apply where the actual arc is clearly seen. Experience has shown that lighter filters may be used when the arc is hidden by the workpiece.

(6) Criteria for protective eye and face devices.

(a) Protective eye and face devices purchased after February 20, 1995, shall comply with ANSI Z87.1-1989, "American National Standard Practice for Occupational and Educational Eye and Face Protection," which is incorporated by reference, or shall be demonstrated by the employer to be equally effective.

(b) Eye and face protective devices purchased before February 20, 1995, shall comply with the ANSI standard "American National Standard Practice for Occupational and Educational Eye and Face Protection," ANSI Z87.1-1968 or shall be demonstrated by the employer to be equally effective.

AMENDATORY SECTION (Amending Order 90-18, filed 1/10/91, effective 2/12/91)

WAC 296-24-084 Occupational head protection. (1) ((Helmets for the protection of employees against impact and penetration of falling and flying objects shall meet the specifications contained in American National Standards Institute, Z89.1-1969, Safety Requirements for Industrial Head Protection.

(2) Helmets for the head protection of employees exposed to high voltage electrical shock and burns shall meet the specifications contained in American National Standards Institute, Z89.2-1970.)) General requirements.

(a) Each affected employee shall wear protective helmets when working in areas where there is a potential for injury to the head from falling and flying objects.

(b) Protective helmets designed to reduce electrical shock hazard shall be worn by each such affected employee when near exposed electrical conductors which could contact the head.

(2) Criteria for protective helmets.

(a) Protective helmets purchased after February 20, 1995, shall comply with ANSI Z89.1-1986, "American National Standard for Personnel Protection—Protective Headwear for Industrial Workers- Requirements," which is incorporated by reference, or shall be demonstrated to be equally effective.

(b) Protective helmets purchased before February 20, 1995, shall comply with the ANSI standard "American National Standard Safety Requirements for Industrial Head Protection," ANSI Z89.1-1969, or shall be demonstrated by the employer to be equally effective.

(3) Persons working in the shops around machinery or in locations which present a hair catching or fire hazard shall wear caps or other type of head covering which completely covers the hair. Caps with metal buttons or metal visors shall not be worn around electrical hazards.

Note 1: The following will define hair lengths considered hazardous:

- (a) When the length would exceed the circumference of exposed revolving shafts or tools in fixed machines by 200 percent.
- (b) When the length would exceed the radius of pressure rolls with exposed in-running nip points.
- (c) When the employee is exposed to an ignition source and the employee may, with hair aflame, run into an area containing class -1 flammable liquids or combustible atmospheres.
- (d) When exposures require personal protective devices, such as mask-type respirators or ear-cup-type hearing protection devices, and hair, either facial or head, would interfere with a proper seal.

Note 2: When hair length is judged hazardous from a hair catching standpoint (instances (a) or (b) under interpretations in Note 1) minimal confinement shall be within netting which controls all loose ends.

Note 3: If hazardous from fire hazard aspects (instance (c) of Note 1) the hair must be confined within a solid-type material.

(4) ~~((Hard hats))~~ Protective helmets shall be worn by employees who work around or under scaffolds or other overhead structures, or who are otherwise exposed to the hazards of falling materials and propelled objects.

AMENDATORY SECTION (Amending Order 73-5, filed 5/9/73 and Order 73-4, filed 5/7/73)

**WAC 296-24-088 Occupational foot protection.** (1) General requirements. Each affected employee shall wear protective footwear when working in areas where there is a danger of foot injuries due to falling and rolling objects, or objects piercing the sole, and where such employee's feet are exposed to electrical hazards.

(2) Criteria for protective footwear.

(a) Protective footwear purchased after February 20, 1995, shall comply with ANSI Z41-1991, "American National Standard for Personal Protection—Protective Footwear," which is incorporated by reference, or shall be demonstrated by the employer to be equally effective.

(b) Protective footwear purchased before February 20, 1995, shall comply with the ANSI standard "USA Standard for Men's Safety-Toe Footwear," ANSI Z41.1-1967, which is incorporated by reference, or shall be demonstrated by the employer to be equally effective.

(3) Calks or other suitable footwear which will afford reasonable protection from slipping shall be worn while working on logs.

~~((a) Safety toe footwear for employees shall meet the requirements and specifications in American National Standard for Men's Safety-Toe Footwear, Z41.1-1967.~~

~~(2) Workmen who work in areas where there is a possibility of foot injury due to falling or rolling objects shall wear safety type footwear.))~~

NEW SECTION

**WAC 296-24-090 Hand protection.** (1) General requirements. Employers shall select and require employees to use appropriate hand protection when employees' hands are exposed to hazards such as those from skin absorption of harmful substances; severe cuts or lacerations; severe abrasions; punctures; chemical burns; thermal burns; and harmful temperature extremes.

(2) Selection. Employers shall base the selection of the appropriate hand protection on an evaluation of the performance characteristics of the hand protection relative to the

task(s) to be performed, conditions present, duration of use, and the hazards and potential hazards identified.

AMENDATORY SECTION (Amending Order 73-5, filed 5/9/73 and Order 73-4, filed 5/7/73)

**WAC 296-24-092 Electrical protective (~~devices~~) equipment.** (1) ~~((Rubber protective equipment for electrical workers shall conform to the requirements established in the American National Standards Institute Standards as specified in the following list:~~

Item	Standard
Rubber insulating gloves.	J6.6 1971.
Rubber matting for use around electric apparatus.	J6.7 1935 (R1971).
Rubber insulating blankets.	J6.4 1971.
Rubber insulating hoods.	J6.2 1950 (R1971).
Rubber insulating line hose.	J6.1 1950 (R1971).
Rubber insulating sleeves.	J6.5 1971.))

Design requirements. Insulating blankets, matting, covers, line hose, gloves, and sleeves made of rubber shall meet the following requirements:

(a) Manufacture and marking.

(i) Blankets, gloves, and sleeves shall be produced by a seamless process.

(ii) Each item shall be clearly marked as follows:

- (A) Class 0 equipment shall be marked Class 0.
- (B) Class 1 equipment shall be marked Class 1.
- (C) Class 2 equipment shall be marked Class 2.
- (D) Class 3 equipment shall be marked Class 3.
- (E) Class 4 equipment shall be marked Class 4.
- (F) Nonozone-resistant equipment other than matting shall be marked Type I.

(G) Ozone-resistant equipment other than matting shall be marked Type II.

(H) Other relevant markings, such as the manufacturer's identification and the size of the equipment, may also be provided.

(iii) Markings shall be nonconducting and shall be applied in such a manner as not to impair the insulating qualities of the equipment.

(iv) Markings on gloves shall be confined to the cuff portion of the glove.

(b) Electrical requirements.

(i) Equipment shall be capable of withstanding the a-c proof-test voltage specified in Table A-2 or the d-c proof-test voltage specified in Table A-3.

(A) The proof-test shall reliably indicate that the equipment can withstand the voltage involved.

(B) The test voltage shall be applied continuously for three minutes for equipment other than matting and shall be applied continuously for one minute for matting.

(C) Gloves shall also be capable of withstanding the a-c proof-test voltage specified in Table A-2 after a sixteen-hour water soak. (See the note following (c)(ii)(B) of this subsection.)

PROPOSED

(ii) When the a-c proof-test is used on gloves, the 60 hertz proof-test current may not exceed the values specified in Table A-2 at any time during the test period.

(A) If the a-c proof-test is made at a frequency other than 60 hertz, the permissible proof-test current shall be computed from the direct ratio of the frequencies.

(B) For the test, gloves (right side out) shall be filled with tap water and immersed in water to a depth that is in accordance with Table A-4. Water shall be added to or removed from the glove, as necessary, so that the water level is the same inside and outside the glove.

(C) After the sixteen-hour water soak specified in (b)(i)(C) of this subsection, the 60-hertz proof-test current may exceed the values given in Table A-2 by not more than 2 milliamperes.

(iii) Equipment that has been subjected to a minimum breakdown voltage test may not be used for electrical protection. (See the note following (c)(ii)(B) of this subsection.)

(iv) Material used for Type II insulating equipment shall be capable of withstanding an ozone test, with no visible effects. The ozone test shall reliably indicate that the material will resist ozone exposure in actual use. Any visible signs of ozone deterioration of the material, such as checking, cracking, breaks, or pitting, is evidence of failure to meet the requirements for ozone-resistant material. (See the note following (c)(ii)(B) of this subsection.)

(c) Workmanship and finish.

(i) Equipment shall be free of harmful physical irregularities that can be detected by the tests or inspections required under this section.

(ii) Surface irregularities that may be present on all rubber goods because of imperfections on forms or molds or because of inherent difficulties in the manufacturing process and that may appear as indentations, protuberances, or imbedded foreign material are acceptable under the following conditions:

(A) The indentation or protuberance blends into a smooth slope when the material is stretched.

(B) Foreign material remains in place when the insulating material is folded and stretches with the insulating material surrounding it.

Note: Rubber insulating equipment meeting the following national consensus standards is deemed to be in compliance with subsection (1) of this section:  
American Society for Testing and Materials (ASTM) D 120-87, Specification for Rubber Insulating Gloves.  
ASTM D 178-88, Specification for Rubber Insulating Matting.  
ASTM D 1048-88a, Specification for Rubber Insulating Blankets.  
ASTM D 1049-88, Specification for Rubber Insulating Covers.  
ASTM D 1050-90, Specification for Rubber Insulating Line Hose.  
ASTM D 1051-87, Specification for Rubber Insulating Sleeves.  
 These standards contain specifications for conducting the various tests required in subsection (1) of this section. For example, the a-c and d-c proof-tests, the breakdown test, the water soak procedure, and the ozone test mentioned in this paragraph are described in detail in the ASTM standards.

(2) In-service care and use.

(a) Electrical protective equipment shall be maintained in a safe, reliable condition.

(b) The following specific requirements apply to insulating blankets, covers, line hose, gloves, and sleeves made of rubber:

(i) Maximum use voltages shall conform to those listed in Table A-5.

(ii) Insulating equipment shall be inspected for damage before each day's use and immediately following any incident that can reasonably be suspected of having caused damage. Insulating gloves shall be given an air test, along with the inspection.

(iii) Insulating equipment with any of the following defects may not be used:

(A) A hole, tear, puncture, or cut;

(B) Ozone cutting or ozone checking (the cutting action produced by ozone on rubber under mechanical stress into a series of interlacing cracks);

(C) An embedded foreign object;

(D) Any of the following texture changes: Swelling, softening, hardening, or becoming sticky or inelastic.

(E) Any other defect that damages the insulating properties.

(iv) Insulating equipment found to have other defects that might affect its insulating properties shall be removed from service and returned for testing under (b)(viii)(ix) of this subsection.

(v) Insulating equipment shall be cleaned as needed to remove foreign substances.

(vi) Insulating equipment shall be stored in such a location and in such a manner as to protect it from light, temperature extremes, excessive humidity, ozone, and other injurious substances and conditions.

(vii) Protector gloves shall be worn over insulating gloves.

(viii) Electrical protective equipment shall be subjected to periodic electrical tests. Test voltages and the maximum intervals between tests shall be in accordance with Table A-5 and Table A-6.

(ix) The test method used under (b)(viii) and (xi) of this subsection shall reliably indicate whether the insulating equipment can withstand the voltages involved.

Note: Standard electrical test methods considered as meeting this requirement are given in the following national consensus standards:  
American Society for Testing and Materials (ASTM) D 120-87, Specification for Rubber Insulating Gloves.  
ASTM D 1048-88a, Specification for Rubber Insulating Blankets.  
ASTM D 1049-88, Specification for Rubber Insulating Covers.  
ASTM D 1050-90, Specification for Rubber Insulating Line Hose.  
ASTM D 1051-87, Specification for Rubber Insulating Sleeves.  
ASTM F 478-92, Specification for In-Service Care of Insulating Line Hose and Covers.  
ASTM F 479-88a, Specification for In-Service Care of Insulating Blankets.  
ASTM F 496-91, Specification for In-Service Care of Insulating Gloves and Sleeves.

(x) Insulating equipment failing to pass inspections or electrical tests shall not be used by employees, except as follows:

(A) Rubber insulating line hose could be used in shorter lengths with the defective portion cut off.

(B) Rubber insulating blankets could be repaired using a compatible patch that results in physical and electrical properties equal to those of the blanket.

(C) Rubber insulating blankets could be salvaged by severing the defective area from the undamaged portion of the blanket. The resulting undamaged area shall not be smaller than twenty-two inches by twenty-two inches (560 mm by 560 mm) for Class 1, 2, 3, and 4 blankets.

(xi) Repaired insulating equipment shall be retested before it may be used by employees.

(xii) The employer shall certify that equipment has been tested in accordance with the requirements of (b)(viii), (ix), and (xi) of this subsection. The certification shall identify the equipment that passed the test and the date it was tested.

Note: Marking of equipment and entering the results of the tests and the dates of testing onto logs are two acceptable means of meeting this requirement.

Table A-2. -A-C Proof-Test Requirements  
Maximum proof-test current, mA (gloves only)

Class of equipment	Proof-test voltage rms V	267-mm (10.5-in) glove	356-mm (14-in) glove	406-mm (16-in) glove	457-mm (18-in) glove
0	5,000	8	12	14	16
1	10,000		14	16	18
2	20,000		16	18	20
3	30,000		18	20	22
4	40,000			22	24

Table A-3.-D-C Proof-Test Requirements

Class of equipment	Proof-test voltage
0	20,000
1	40,000
2	50,000
3	60,000
4	70,000

Note: The d-c voltages listed in this table are not appropriate for proof testing rubber insulating line hose or covers. For this equipment, d-c proof-tests shall use a voltage high enough to indicate that the equipment can be safely used at the voltages listed in Table A-4. See ASTM D 1050-90 and ASTM D 1049-88 for further information on proof tests for rubber insulating line hose and covers.

Table A-4.-Glove Tests-Water Level<sup>1, 2</sup>

Class of glove	A-C proof-test		D-C proof-test	
	mm.	in.	mm.	in.
0	38	1.5	38	1.5
1	38	1.5	51	2.0
2	64	2.5	76	3.0
3	89	3.5	102	4.0
4	127	5.0	153	6.0

<sup>1</sup>The water level is given as the clearance from the cuff of the glove to the water line, with a tolerance of 13 mm. (0.5 in.).

<sup>2</sup>If atmospheric conditions make the specified clearances impractical, the clearances may be increased by a maximum of 25 mm. (1 in.).

Table A-5.-Rubber Insulating Equipment Voltage Requirements

Class of equipment	Maximum use voltage <sup>1</sup>	Retest voltage <sup>2</sup>	Retest voltage <sup>2</sup>
	a-c-rms	a-c-rms	d-c-rms
0	1,000	5,000	20,000
1	7,500	10,000	40,000
2	17,000	20,000	50,000
3	26,500	30,000	60,000
4	36,000	40,000	70,000

<sup>1</sup>The maximum use voltage is the a-c voltage (rms) classification of the protective equipment that designates the maximum nominal design/voltage of the energized system that may be safely worked. The nominal design voltage is equal to the phase-to-phase voltage on multiphase circuits. However, the phase-to-ground potential is considered to be the nominal design/voltage:

1. If there is no multiphase exposure in a system area and if the voltage exposure is limited to the phase-to-ground potential, or

2. If the electrical equipment and devices are insulated or isolated or both so that the multiphase exposure on a grounded wye circuit is removed.

<sup>2</sup>The proof-test voltage shall be applied continuously for at least one minute, but no more than three minutes.

Table A-6.-Rubber Insulating Equipment Test Intervals

Type of equipment	When to test
Rubber insulating line hose	Upon indication that insulating value is suspect.
Rubber insulating covers	Upon indication that insulating value is suspect.
Rubber insulating blankets	Before first issue and every 12 months thereafter.
Rubber insulating gloves	Before first issue and every 6 months thereafter.
Rubber insulating sleeves	Before first issue and every 12 months thereafter.

((2)) (3) Where switches or fuses of more than 150 volts to ground are not guarded during ordinary operations, suitable insulating floors, mats or platforms shall be provided on which the operator must stand while handling the switches.

**NEW SECTION**

**WAC 296-24-096 Appendix A to Part A-2—References for further information (nonmandatory).** The documents in Appendix A provide information which may be helpful in understanding and implementing the standards in Part A-2.

1. Bureau of Labor Statistics (BLS). "Accidents Involving Eye Injuries." Report 597, Washington, D.C.: BLS, 1980.

2. Bureau of Labor Statistics (BLS). "Accidents Involving Face Injuries." Report 604, Washington, D.C.: BLS, 1980.

PROPOSED

3. Bureau of Labor Statistics (BLS). "Accidents Involving Head Injuries." Report 605, Washington, D.C.: BLS, 1980.

4. Bureau of Labor Statistics (BLS). "Accidents Involving Foot Injuries." Report 626, Washington, D.C.: BLS, 1981.

5. National Safety Council. "Accident Facts," Annual edition, Chicago, IL: 1981.

6. Bureau of Labor Statistics (BLS). "Occupational Injuries and Illnesses in the United States by Industry," Annual edition, Washington, D.C.: BLS.

7. National Society to Prevent Blindness. "A Guide for Controlling Eye Injuries in Industry," Chicago, IL: 1982.

## NEW SECTION

**WAC 296-24-098 Appendix B to Part A-2—Nonmandatory compliance guidelines for hazard assessment and personal protective equipment selection.** This Appendix is intended to provide compliance assistance for employers and employees in implementing requirements for a hazard assessment and the selection of personal protective equipment.

(1) Controlling hazards. PPE devices alone should not be relied on to provide protection against hazards, but should be used in conjunction with guards, engineering controls, and sound manufacturing practices.

(2) Assessment and selection. It is necessary to consider certain general guidelines for assessing the foot, head, eye and face, and hand hazard situations that exist in an occupational or educational operation or process, and to match the protective devices to the particular hazard. It should be the responsibility of the safety officer to exercise reasonable diligence and appropriate expertise to accomplish these tasks.

(3) Assessment guidelines. In order to assess the need for PPE the following steps should be taken:

(a) Survey. Conduct a walk-through survey of the areas in question. The purpose of the survey is to identify sources of hazards to workers and co-workers. Consideration should be given to the basic hazard categories:

- (i) Impact;
- (ii) Penetration;
- (iii) Compression (roll-over);
- (iv) Chemical;
- (v) Heat;
- (vi) Harmful dust;
- (vii) Light (optical) radiation.

(b) Sources. During the walk-through survey the safety officer should observe:

(i) Sources of motion; i.e., machinery or processes where any movement of tools, machine elements or particles could exist, or movement of personnel that could result in collision with stationary objects;

(ii) Sources of high temperatures that could result in burns, eye injury or ignition of protective equipment, etc.;

(iii) Types of chemical exposures;

(iv) Sources of harmful dust;

(v) Sources of light radiation, i.e., welding, brazing, cutting, furnaces, heat treating, high intensity lights, etc.;

(vi) Sources of falling objects or potential for dropping objects;

(vii) Sources of sharp objects which might pierce the feet or cut the hands;

(viii) Sources of rolling or pinching objects which could crush the feet;

(ix) Layout of workplace and location of co-workers; and

(x) Any electrical hazards. In addition, injury/accident data should be reviewed to help identify problem areas.

(c) Organize data. Following the walk-through survey, it is necessary to organize the data and information for use in the assessment of hazards. The objective is to prepare for an analysis of the hazards in the environment to enable proper selection of protective equipment.

(d) Analyze data. Having gathered and organized data on a workplace, an estimate of the potential for injuries should be made. Each of the basic hazards (subsection (3)(a) of this section) should be reviewed and a determination made as to the type, level of risk, and seriousness of potential injury from each of the hazards found in the area. The possibility of exposure to several hazards simultaneously should be considered.

(4) Selection guidelines. After completion of the procedures in subsection (3) of this section, the general procedure for selection of protective equipment is to:

(a) Become familiar with the potential hazards and the type of protective equipment that is available, and what it can do; i.e., splash protection, impact protection, etc.;

(b) Compare the hazards associated with the environment; i.e., impact velocities, masses, projectile shape, radiation intensities, with the capabilities of the available protective equipment;

(c) Select the protective equipment which ensures a level of protection greater than the minimum required to protect employees from the hazards; and

(d) Fit the user with the protective device and give instructions on care and use of the PPE. It is very important that end users be made aware of all warning labels for and limitations of their PPE.

(5) Fitting the device. Careful consideration must be given to comfort and fit. PPE that fits poorly will not afford the necessary protection. Continued wearing of the device is more likely if it fits the wearer comfortably. Protective devices are generally available in a variety of sizes. Care should be taken to ensure that the right size is selected.

(6) Devices with adjustable features. Adjustments should be made on an individual basis for a comfortable fit that will maintain the protective device in the proper position. Particular care should be taken in fitting devices for eye protection against dust and chemical splash to ensure that the devices are sealed to the face. In addition, proper fitting of helmets is important to ensure that it will not fall off during work operations. In some cases a chin strap may be necessary to keep the helmet on an employee's head. (Chin straps should break at a reasonably low force, however, so as to prevent a strangulation hazard.) Where manufacturer's instructions are available, they should be followed carefully.

(7) Reassessment of hazards. It is the responsibility of the safety officer to reassess the workplace hazard situation as necessary, by identifying and evaluating new equipment and processes, reviewing accident records, and reevaluating the suitability of previously selected PPE.

PROPOSED

(8) Selection chart guidelines for eye and face protection. Some occupations (not a complete list) for which eye protection should be routinely considered are: Carpenters, electricians, machinists, mechanics and repairers, millwrights, plumbers and pipe fitters, sheet metal workers and tinsmiths, assemblers, sanders, grinding machine operators, lathe and milling machine operators, sawyers, welders, laborers, chemical process operators and handlers, and timber cutting and logging workers. The following chart provides general guidance for the proper selection of eye and face protection to protect against hazards associated with the listed hazard "source" operations.

Source	Eye and Face Protection Selection Chart Assessment of Hazard	Protection	
IMPACT—Chipping, grinding machining, masonry work, sawing, drilling, chiseling, powered fastening, riveting, woodworking, and sanding.	Flying fragments, objects, large chips, particles sand, dirt, etc.	Spectacles with side protection, goggles, face shields. See notes 1, 3, 5, 6, 10. For severe exposure use face shield	
HEAT—Furnace operations, pouring, casting, hot dipping, and welding.	Hot sparks	Face shields, goggles, spectacles with side protection. For severe exposure use face shield. See notes 1, 2, 3.	
	Splash from molten metals	Face shields worn over goggles. See notes 1, 2, 3.	
	High temperature exposure	Screen face shields, reflective face shields. See notes 1, 2, 3.	
CHEMICALS—Acid and chemicals handling, plating.	Splash	Goggles, eyecup and cover types. For severe degreasing exposure, use face shield. See notes 3, 11.	
	Irritating mists	Special-purpose goggles.	
DUST—Woodworking, dusty conditions.	Nuisance dust	Goggles, eyecup and buffing, general cover types. See note 8.	
LIGHT and/or RADIATION—	Welding: Electric arc.	Optical radiation	Welding helmets or welding shields. Typical shades: 10-14. See notes 9, 12.
		Optical radiation	Welding goggles or welding face shield. Typical shades: Gas welding 4-8, cutting 3-6, brazing 3-4. See note 9.
	Cutting, Torch brazing, Torch soldering.	Optical radiation	Spectacles or welding face shield. Typical shades, 1.5-3. See notes 3, 9.

Glare.

Poor vision

Spectacles with shaded or special-purpose lenses, as suitable. See notes 9, 10.

Notes to Eye and Face Protection Selection Chart:

- Care should be taken to recognize the possibility of multiple and simultaneous exposure to a variety of hazards. Adequate protection against the highest level of each of the hazards should be provided. Protective devices do not provide unlimited protection.
- Operations involving heat may also involve light radiation. As required by the standard, protection from both hazards must be provided.
- Face shields should only be worn over primary eye protection (spectacles or goggles).
- As required by the standard, filter lenses must meet the requirements for shade designations in WAC 296-24-07801(5). Tinted and shaded lenses are not filter lenses unless they are marked or identified as such.
- As required by the standard, persons whose vision requires the use of prescription (Rx) lenses must wear either protective devices fitted with prescription (Rx) lenses or protective devices designed to be worn over regular prescription (Rx) eyewear.
- Wearers of contact lenses must also wear appropriate eye and face protection devices in a hazardous environment. It should be recognized that dusty and/or chemical environments may represent an additional hazard to contact lens wearers.
- Caution should be exercised in the use of metal frame protective devices in electrical hazard areas.
- Atmospheric conditions and the restricted ventilation of the protector can cause lenses to fog. Frequent cleansing may be necessary.
- Welding helmets or face shields should be used only over primary eye protection (spectacles or goggles).
- Nonsideshield spectacles are available for frontal protection only, but are not acceptable eye protection for the sources and operations listed for "impact."
- Ventilation should be adequate, but well protected from splash entry. Eye and face protection should be designed and used so that it provides both adequate ventilation and protects the wearer from splash entry.
- Protection from light radiation is directly related to filter lens density. See note (4). Select the darkest shade that allows task performance.

(9) Selection guidelines for head protection. All head protection (helmets) is designed to provide protection from impact and penetration hazards caused by falling or flying objects. Head protection is also available which provides protection from electric shock and burn. When selecting head protection, knowledge of potential electrical hazards is important. Class A helmets, in addition to impact and penetration resistance, provide electrical protection from low-voltage conductors (they are proof tested to 2,200 volts). Class B helmets, in addition to impact and penetration resistance, provide electrical protection from high-voltage conductors (they are proof tested to 20,000 volts). Class C helmets provide impact and penetration resistance (they are usually made of aluminum which conducts electricity), and should not be used around electrical hazards. Where falling or flying object hazards are present, helmets must be worn. Some examples include: Working below other workers who are using tools and materials which could fall; working around or under conveyor belts which are carrying parts or materials; working below machinery or processes which might cause material or objects to fall; and working on exposed energized conductors. Some examples of occupations for which head protection should be routinely considered are: Carpenters, electricians, linemen, mechanics and

repairers, plumbers and pipe fitters, assemblers, packers, wrappers, sawyers, welders, laborers, freight handlers, timber cutting and logging, stock handlers, and warehouse laborers.

(10) Selection guidelines for foot protection. Safety shoes and boots which meet the ANSI Z41-1991 Standard provide both impact and compression protection. Where necessary, safety shoes can be obtained which provide puncture protection. In some work situations, metatarsal protection should be provided, and in other special situations electrical conductive or insulating safety shoes would be appropriate. Safety shoes or boots with impact protection would be required for carrying or handling materials such as packages, objects, parts or heavy tools, which could be dropped; and, for other activities where objects might fall onto the feet. Safety shoes or boots with compression protection would be required for work activities involving skid trucks (manual material handling carts) around bulk rolls (such as paper rolls) and around heavy pipes, all of which could potentially roll over an employee's feet. Safety shoes or boots with puncture protection would be required where sharp objects such as nails, wire, tacks, screws, large staples, scrap metal, etc., could be stepped on by employees causing a foot injury. Some occupations (not a complete list) for which foot protection should be routinely considered are: Shipping and receiving clerks, stock clerks, carpenters, electricians, machinists, mechanics and repairers, plumbers and pipe fitters, structural metal workers, assemblers, drywall installers and lathers, packers, wrappers, craters, punch and stamping press operators, sawyers, welders, laborers, freight handlers, gardeners and grounds-keepers, timber cutting and logging workers, stock handlers and warehouse laborers.

(11)(a) Selection guidelines for hand protection. Gloves are often relied upon to prevent cuts, abrasions, burns, and skin contact with chemicals that are capable of causing local or systemic effects following dermal exposure. WISHA is unaware of any gloves that provide protection against all potential hand hazards, and commonly available glove materials provide only limited protection against many chemicals. Therefore, it is important to select the most appropriate glove for a particular application and to determine how long it can be worn, and whether it can be reused. It is also important to know the performance characteristics of gloves relative to the specific hazard anticipated; e.g., chemical hazards, cut hazards, flame hazards, etc. These performance characteristics should be assessed by using standard test procedures. Before purchasing gloves, the employer should request documentation from the manufacturer that the gloves meet the appropriate test standard(s) for the hazard(s) anticipated. Other factors to be considered for glove selection in general include:

(i) As long as the performance characteristics are acceptable, in certain circumstances, it may be more cost effective to regularly change cheaper gloves than to reuse more expensive types; and

(ii) The work activities of the employee should be studied to determine the degree of dexterity required, the duration, frequency, and degree of exposure of the hazard, and the physical stresses that will be applied.

(b) With respect to selection of gloves for protection against chemical hazards:

(i) The toxic properties of the chemical(s) must be determined; in particular, the ability of the chemical to cause

local effects on the skin and/or to pass through the skin and cause systemic effects;

(ii) Generally, any "chemical resistant" glove can be used for dry powders;

(iii) For mixtures and formulated products (unless specific test data are available), a glove should be selected on the basis of the chemical component with the shortest breakthrough time, since it is possible for solvents to carry active ingredients through polymeric materials; and

(iv) Employees must be able to remove the gloves in such a manner as to prevent skin contamination.

(12) Cleaning and maintenance. It is important that all PPE be kept clean and properly maintained. Cleaning is particularly important for eye and face protection where dirty or fogged lenses could impair vision. For the purposes of compliance with WAC 296-24-07501 (1)(a) and (b), PPE should be inspected, cleaned, and maintained at regular intervals so that the PPE provides the requisite protection. It is also important to ensure that contaminated PPE which cannot be decontaminated is disposed of in a manner that protects employees from exposure to hazards.

**AMENDATORY SECTION** (Amending Order 73-5, filed 5/9/73 and Order 73-4, filed 5/7/73)

**WAC 296-24-70005 Protective clothing.** (1) General requirements. Employees exposed to the hazards created by welding, cutting, or brazing operations shall be protected by personal protective equipment in accordance with the requirements of (~~WAC 296-24-07501~~) chapter 296-24 WAC, Part A-2. Appropriate protective clothing required for any welding operation will vary with the size, nature and location of the work to be performed.

(2) Specified protective clothing. Protective means which may be employed are as follows:

(a) Except when engaged in light work, all welders should wear flameproof gauntlet gloves.

(b) Flameproof aprons made of leather, asbestos, or other suitable material may also be desirable as protection against radiated heat and sparks.

(c) Woolen clothing preferable to cotton because it is not so readily ignited and helps protect the welder from changes in temperature. Cotton clothing, if used, should be chemically treated to reduce its combustibility. All outer clothing such as jumpers or overalls should be reasonably free from oil or grease.

(d) Sparks may lodge in rolled-up sleeves or pockets of clothing, or cuffs of overalls or trousers. It is therefore recommended that sleeves and collars be kept buttoned and pockets be eliminated from the front of overalls and aprons. Trousers or overalls should not be turned up on the outside.

Note: For heavy work, fire-resistant leggings, high boots, or other equivalent means should be used.

(e) In production work a sheet metal screen in front of the worker's legs can provide further protection against sparks and molten metal in cutting operations.

(f) Capes or shoulder covers made of leather or other suitable materials should be worn during overhead welding or cutting operations. Leather skull caps may be worn under helmets to prevent head burns.

(g) For overhead welding and cutting, or welding and cutting in extremely confined spaces, ear protection is sometimes desirable.

(h) Where there is exposure to sharp or heavy falling objects, or a hazard of bumping in confined spaces, hard hats or head protectors shall be used.

**AMENDATORY SECTION** (Amending Order 86-02, filed 1/17/86)

**WAC 296-27-090 Reporting of fatality or multiple hospitalization (~~(accidents)~~) incidents.** (1) Within ~~((twenty-four))~~ eight hours after the ~~((occurrence of an employment accident which results in an immediate or probable fatality to one or more employees, or which results in hospitalization of two or more employees, the employer of any employee so injured or killed shall report the accident either orally or in writing to the nearest office of the department. The reporting may be by telephone or telegraph. The reporting shall relate the circumstances of the accident, the number of fatalities, and the extent of any injuries. The director may require such additional reports, in writing or otherwise, as he deems necessary, concerning the accident.))~~ fatality or probable fatality of any employee from a work-related incident or the inpatient hospitalization of two or more employees as a result of a work-related incident, the employer of any employees so affected, shall orally report the fatality/multiple hospitalization by telephone or in person, to the nearest office of the department or by using the OSHA toll-free central telephone number, 1-800-321-6742.

(a) This requirement applies to each such fatality or hospitalization of two or more employees which occurs within thirty days of the incident.

(b) Exception: If any employer does not learn of a reportable incident at the time it occurs and the incident would otherwise be reportable under this subsection, the employer shall make a report within eight hours of the time the incident is reported to any agent or employee of the employer.

(c) Each report required by this subsection shall relate the following information: Establishment name, location of the incident, time of the incident, number of fatalities or hospitalized employees, contact person, phone number, and a brief description of the incident.

(2) Equipment involved in an ~~((accident))~~ incident resulting in an immediate fatality or in the in-patient hospitalization of two or more employees shall not be moved until a representative of the ~~((division of industrial safety and health))~~ department of labor and industries investigates the ~~((accident))~~ incident and authorizes removal of such equipment, when removal of such equipment is necessary in order to prevent further ~~((accident))~~ incident or to remove the victim, such equipment may be moved as required.

**AMENDATORY SECTION** (Amending Order 82-22, filed 6/11/82)

**WAC 296-32-250 Tools and personal protective equipment—General.** (1) Personal protective equipment, protective devices and special tools needed for the work of employees shall be provided and the employer shall ensure that they are used by employees.

(a) Before each day's use the employer shall ensure that these personal protective devices, tools, and equipment are carefully inspected by a competent person to ascertain that they are in good condition.

(b) Tools found to be defective shall be taken out of service.

(2) Head protection. ~~((Head protection meeting the requirements of ANSI Z89.2-1971, "Safety Requirements for Industrial Protective Helmets for Electrical Workers,))~~ Class B<sup>(2)</sup> protective helmets shall be provided whenever there is exposure to overhead hazards and/or possible high voltage electrical contact.

(a) Employees working in areas where there is a possible danger of head injury from impact, falling or flying objects, shall be protected by protective helmets. ~~((These helmets shall meet the specifications contained in American National Standards Institute, Z89.1-1969, Safety Requirements for Industrial Head Protection.))~~

(b) ~~((The employer shall insure that the head protection is used by the employee.))~~ Criteria for protective helmets.

(i) Protective helmets purchased after February 20, 1995, shall comply with ANSI Z89.1-1986, "American National Standard for Personnel Protection—Protective Headwear for Industrial Workers—Requirements," which is incorporated by reference, or shall be demonstrated to be equally effective.

(ii) Protective helmets purchased before February 20, 1995, shall comply with the ANSI standard "American National Standard Safety Requirements for Industrial Head Protection," ANSI Z89.1-1969, or shall be demonstrated by the employer to be equally effective.

(3) Eye protection. Protective eye and face equipment shall be required where there is a possibility of injury that can be prevented by such equipment. In such cases, employers shall make conveniently available a type of protector suitable for the work to be performed, and employees shall use such protectors.

Note: See chapter 296-24 WAC, Part A-2, for additional personal protective equipment requirements.

(4) Tent heaters, torches and open flame. Open flames shall not be used within ground tents or on platforms within aerial tents unless:

(a) The tent covers are constructed of fire resistant materials, and

(b) Ventilation is provided to maintain safe oxygen levels and avoid harmful buildup of combustion products and combustible gases.

(5) Portable power equipment.

(a) All portable power equipment used in the telecommunications industry shall be grounded.

(b) Nominal 120V, or less, portable generators used for providing power at work locations do not require grounding if the output circuit is completely isolated from the frame of the unit.

(c) Grounding shall be omitted when using soldering irons, guns or wire-wrap tools on telecommunication circuits.

(6) Vehicle-mounted utility generators. Vehicle-mounted utility generators used for providing nominal 240V AC or less for powering portable tools and equipment need not be grounded to earth if all of the following conditions are met:



(a) One side of the voltage source is solidly strapped to the metallic structure of the vehicle;

(b) Grounding-type outlets are used, with a "grounding" conductor between the outlet grounding terminal and the side of the voltage source that is strapped to the vehicle;

(c) All metallic encased tools and equipment that are powered from this system are equipped with three-wire cords and grounding-type attachment plugs, except as designated in subsection (7) of this section.

(7) Portable lights, tools and appliances. When operated from commercial power such metal parts of these devices shall be grounded, unless these tools or appliances are protected by a system of double insulation, or its equivalent. Where such a system is employed, the equipment shall be distinctively marked to indicate double insulation.

(8) Lead work. When operated from commercial power the metal housing of electric solder pots shall be grounded. Electric solder pots may be used with the power equipment described in this subsection, without a grounding conductor.

The employer shall ensure that wiping gloves or cloths and eye protection are used in lead wiping operations. A drip pan to catch hot lead drippings shall also be provided and used.

(9) Fire extinguishers.

(a) Fire extinguishers shall be provided for the protection of both the building structure and the occupancy hazards contained therein.

(b) Employees shall be familiar with the location and operation of fire extinguishers.

(c) Any fire extinguishers showing defects shall be removed from service.

(d) Fire extinguishers shall be thoroughly examined and/or recharged or repaired to insure operability and safety once every year.

(e) Each fire extinguisher shall have a durable tag securely attached to show the maintenance or recharge date and the initials or signature of the person performing this service.

**AMENDATORY SECTION** (Amending Order 76-38, filed 12/30/76)

**WAC 296-32-260 Rubber insulating equipment.** (1) Rubber insulating equipment designed for the voltage levels to be encountered shall be provided and the employer shall ensure that they are used by employees as required by this section. This equipment shall meet the electrical and physical requirements contained in ANSI J6.6-1971 "Standard Specifications for Rubber Insulating Gloves," and ANSI J6.4-1971 "Standard Specifications for Rubber Insulating Blankets," with the exception that the maximum proof test current for a 14-inch Class I glove shall be no more than 14mA, and with the further exception that existing 14-inch Class I rubber gloves that meet a maximum proof test current of 14 mA and a minimum breakdown voltage of 10,000 volts (RMS) acquired prior to January 1, 1976, may be used as long as these gloves comply with the retest requirements of subsection (2) of this section.

(2) The employer is responsible for periodic retesting of all insulating gloves, blankets, and other rubber insulating equipment. This retesting shall be electrical, visual and

mechanical. The following maximum retesting intervals shall apply:

<u>Gloves shall be tested every six months.</u>		
( <del>Gloves</del> ) Blankets, and Other Insulating Equipment	Natural Rubber (Months)	Synthetic Rubber (Months)
New _____	12	18
Reissued _____	9	15

(3) Protector for gloves. Approved protectors must be worn at all times over rubber gloves. Inner liners may be worn if desired.

(4) Protective equipment fabricated of material other than rubber shall provide electrical and mechanical protection at least equal to that of the rubber equipment.

(5)(a) Gloves and blankets shall be marked to indicate compliance with the retest schedule and shall be marked with the date the next test date is due.

(b) Any rubber gloves found to be defective shall be removed from service and marked as being defective.

(6) Insulating gloves and blankets shall be stored away from direct sunlight, steampipes, radiators and other sources of excessive heat.

(7) Gloves and blankets shall not be folded while in storage. A separate container shall be provided for rubber blankets and blankets shall be wiped clean and rolled before placing in container.

(8) Inspect rubber goods. Before using a pair of rubber gloves or rubber blankets, workers shall personally inspect each glove for defects and give an air test, and the blanket shall be visually inspected for cracks or cuts before using.

Note: Grasp the cuff at opposite sides and twirl the gloves so as to roll it up the cuff and produce air pressure within the glove, then look for leaks and thin places in the rubber.

(9) Patching rubber goods is prohibited; rubber protective equipment shall not be vulcanized or patched.

(10) Rubber gloves for workers. (a) A pair of rubber gloves, specifically designed for the protection of workers, shall be assigned each worker when required to work on or be exposed to energized parts.

(b) Rubber gloves when not in use shall be carried in a bag provided and designed for that purpose.

**AMENDATORY SECTION** (Amending Order 76-38, filed 12/30/76)

**WAC 296-45-650 Electrical workers safety rules—Foreword.** The purpose of this chapter is to make the workplace of electrical employees as free from recognized hazard as is reasonably possible. The observance of these rules may in some instances require that speed and work performance be subordinated to the safety of employees. Since the purpose of these rules is the safety of employees, it is expected that those employees engaged in the work for which these rules are intended will, in good faith, adhere to the provisions of this chapter. This chapter is not intended to be a complete description of the work to be done nor is it complete in the sense that additional or unusual hazards may not exist for which there is no regulation or rule. In the event a hazard exists which is not contemplated by this

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chapter, it is expected that the ((foreman)) leadworker and employees will in good faith mutually discuss the particular hazard and arrive at a method of performing the work with the greatest degree of safety.

The department of labor and industries is the sole and paramount administrative agency responsible for the administration and interpretation of this chapter and the Washington Industrial Safety and Health Act of 1973. If there exists a question as to the meaning of any provision of this chapter, such question must first be directed to the department of labor and industries and its authorized representatives.

Experience has proven that the majority of injuries and deaths are preventable. Most injuries and deaths are not due to defective equipment but are due to failure on the part of the employees and those in authority to observe safety rules and failure to use safety devices. In the last analysis, this chapter is a compilation of experience and common sense. Electrical safety requires that the work be properly planned, executed by the use of good judgment and under the direction of intelligent supervision.

AMENDATORY SECTION (Amending Order 76-38, filed 12/30/76)

**WAC 296-45-65003 Scope and application.** (1) The work for which this chapter is enacted is a specialized type of construction work and, insofar as it is specialized, such operations, procedures and work require a particular type of rule or regulation which is generally embodied within this chapter. The purpose of this chapter shall be to avoid those hazards peculiar to the industry, the purpose for which this chapter is designed, and this chapter shall include employees and employers whose business and work include power distribution and transmission lines. The standards apply to all such construction work of an electrical nature regardless of the general nature of the business. The criterion for application of this chapter shall be the nature of the particular work to be or which is being performed. That work which is intended to be encompassed within the provisions of the mandatory and recommended provisions of this chapter shall include that work, conditions, practices, means, operations and processes performed at or on power distribution and transmission line installations, regardless of location, whether such installation for power distribution is (are) above ground or below ground, and shall include such adjacent and supporting structures as are fairly encompassed by these regulations.

Generally, the nature of the work will be such that industrial insurance premiums could reasonably be said to be reportable; (as of the effective date of this chapter) under WAC 296-17-521 (Class 5-8); WAC 296-17-522 (Class 6-1); and WAC 296-17-539 (Class 13-1). This guideline applies insofar as said class either directly or indirectly is related to the construction, erection, maintenance, repair, alteration, or other operation involving power distribution and transmission lines.

(2) Communication lines and work directed communication lines as defined in chapter 296-32 WAC (safety rules for telecommunications) are subject to the provisions of chapter 296-32 WAC and are not encompassed within the scope of this chapter.

(3) These standards shall apply to installations under the exclusive control of electric utilities used for the purpose of communications or metering, or for generation, control, transformation, transmission, and distribution of electric energy, which are located in buildings used exclusively by the electric utilities for such purposes, or located outdoors on property owned or leased by the electric utilities or on public highways, streets, roads, etc., or outdoors by established rights on private property.

(4) Operation, conditions, work methods and other work related situations or activities not specifically covered by this chapter are subject to the rules and regulations of chapter 296-24 WAC, general safety and health standards; chapter 296-62 WAC, general occupational health standards; chapter 296-155 WAC, safety standards for construction work; and, insofar as applicable to employee safety and health, chapter 19.29 RCW. Additionally, operations, conditions, work methods and other work related situations or activities may be subject to additional rules and regulations depending upon the nature of the work being performed.

(5) Under certain circumstances, an employer may obtain a variance from the director of the department of labor and industries or ((his)) an authorized representative. Until such time as a variance is granted, the employer and employees must comply with the mandatory provisions of this chapter. The procedure and requirements for variances are found in ((WAC 296-350-200 through 296-350-280)) chapter 296-350 WAC.

(6) These rules shall not apply to the use of existing electrical installations during their lifetime, provided they are maintained in good condition and in accordance with the applicable safety factor requirements and the rules in effect at the time they were installed, and provided that reconstruction shall conform to the rules as herein provided.

(7) Any rule, regulation or standard contained within this chapter, if subject to interpretation, shall be interpreted so as to achieve employee safety, which is the ultimate purpose of this chapter.

(8) Should a rule or standard contained within this chapter conflict, in any manner, with a standard or rule contained within a general (horizontal) chapter, the standard or rule contained herein shall apply so long as the work being done is electrical work involving power distribution and transmission lines. Should a standard or rule contained within this chapter conflict, in any manner, with a standard or rule contained within a specialized (vertical) chapter (one which applies to a particular type of work), the standard or rule contained herein shall apply as long as the work being performed involves power distribution and transmission lines as hereinbefore defined. Should there be a conflict between two or more standards or rules contained within this chapter, the standard or rule which affords the worker greater safety shall apply.

(9) Neither the promulgation of these rules, nor anything contained in these rules shall be construed as affecting the relative status or civil rights or liabilities between employers and their employees and/or the employees of others and/or the public generally; nor shall the use herein of the words "duty" and "responsibility" or either, import or imply liability other than provided for in the industrial insurance and safety laws of the state of Washington, to any person for injuries due to negligence predicated upon failure to perform or

discharge any such "duty" or "responsibility," but failure on the part of the employees, (~~(foreman)~~) leadworker, or employer to comply with any compulsory rule may be cause for the department of labor and industries to take action in accordance with the industrial insurance and safety laws.

(10) "Shall" and "must" as used in this chapter make the provisions mandatory. "Should," "may," or "it is recommended" are used to indicate the provisions are not mandatory but are recommended.

(11) If any section, subsection, phrase, or provisions of this chapter or part thereof should be held invalid by any court for any reason, such invalidity shall not in any way affect the validity of the remainder of this chapter, unless such decision renders the remainder of the provision unintelligible, or changes the meaning of such other provision or provisions.

(12) When the language used in this chapter indicates that it is the responsibility, duty, or obligation of the (~~(foreman)~~) leadworker or other employee, it shall also be the employer's responsibility, obligation, and duty.

Whenever this chapter refers to the provisions of another safety and health standard or statute affecting safety and health, such reference refers to the statute or code in effect at the time the work is being performed.

**AMENDATORY SECTION** (Amending Order 76-38, filed 12/30/76)

**WAC 296-45-65005 Definitions.** These definitions are applicable to chapter 296-45 WAC.

(1) "Aerial manlift equipment." All types of equipment such as extended towers, boom-mounted cages or baskets, and truck-mounted ladders. This equipment is primarily designed to place personnel and equipment aloft to work on elevated structures and equipment.

(2) "Apprentice." An employee who is being trained to be (~~(a journeyman)~~) journey level.

(3) "Approved." Meets or exceeds the recognized standards of safety within the industry.

(4) "Approved protectors." Gloves worn over rubber insulating gloves which are of such material or substance and so constructed as to protect the rubber gloves from abrasions, lacerations, or other physical damage which might otherwise occur to rubber gloves. Approved protectors must conform to the standards which are recognized by the industry.

(5) "Automatic circuit recloser." A self-controlled device for automatically interrupting and reclosing an alternating current circuit with a predetermined sequence of opening and reclosing followed by resetting, hold closed, or lockout operation.

(6) "Barrier." A physical obstruction which is intended to prevent contact with energized lines or equipment.

(7) "Barricade." A physical obstruction such as tapes, screens, or cones intended to warn and limit access to a hazardous area.

(8) "Belts."

(a) "Lineman's body belt." A waist belt of approved material with a front buckle, two "D" rings for attaching safety straps and multiple loop strap for holding tools.

(b) "Strap." An adjustable leather, web, nylon, or other approved material in various lengths which permit free use

of both hands in circling of post, pole, girder, etc. The safety strap permits the employee to assume a safe working position.

(c) "Construction belt." A strong leather, web, or other approved material belt at least 1 3/4 inches wide that may be equipped with fixed or adjustable "D" rings for attaching safety straps or lanyards.

(d) "Lanyard." A flexible line or strap of high tensile strength with snap hooks at one or both ends. They serve as safety straps or tail lines for use with belts or harness.

(9) "Bond." An electrical connection from one conductive element to another for the purpose of minimizing potential differences or providing adequate conductivity for fault current or for mitigation of leakage current and electrolytic action.

(10) "Bushing." An insulating structure including a through conductor, or providing a passageway for such a conductor, with provision for mounting on a barrier, conducting or otherwise, for the purpose of insulating the conductor from the barrier and conducting current from one side of the barrier to the other.

(11) "Cable." A conductor with insulation, or a stranded conductor with or without insulation and other coverings (single-conductor cable) or a combination of conductors insulated from one another (multiple-conductor cable).

(12) "Cable sheath." A protective covering applied to cables. A cable sheath may consist of multiple layers of which one or more is conductive.

(13) "Circuit." A conductor or system of conductors through which an electric current is intended to flow.

(14) "Clearance (operating power lines and equipment)." The certification by the proper authority that a specified line or piece of equipment is deenergized, that the proper precautionary measures have been taken and the line or equipment is being turned over to the employee.

(15) "Climbing space." The vertical space reserved along the side of poles or structures to permit ready access to equipment and conductors located on poles or structures.

(16) "Communication lines." The conductors and their supporting or containing structures which are used for public or private signal or communication service: *Provided*, That such lines operate at potentials not exceeding 400 volts to ground or (~~(750)~~) 600 volts between any two points of the circuit: *Provided further*, That the transmitted power does not exceed 150 watts. When operating at less than 150 volts, no limit is placed on the capacity of the system.

Communication lines generally include telephone, telegraph, cable antenna TV, railroad signal, data, clock, fire, police alarm, community television antenna, or other similar systems conforming with the above. Lines used for signaling purposes, but not included under the above definition, are considered as supply lines of the same voltage and are to be so run.

(17) "Conductor." Any material, usually in the form of a wire, cable, or bus bar which is approved for carrying an electric current.

(18) "Conductor shielding." An envelope which encloses the conductor of a cable and provides an equipotential surface in contact with the cable insulation.

(19) "Current-carrying part." A conducting part intended to be connected in an electric circuit to a source of

voltage. Noncurrent-carrying parts are those not intended to be so connected.

(20) "De-energized (or dead)." Free from any electrical connection to a source of potential difference and from electrical charges. "Dead" is used only with reference to current-carrying parts which are sometimes alive or energized.

(21) "Designated or authorized employee." A qualified person delegated to perform specific duties under the conditions existing.

(22) "Effectively grounded." Intentionally connected to earth through a ground connection or connections of sufficiently low impedance and having sufficient current-carrying capacity to prevent the buildup of voltages which may result in undue hazard to connected equipment or to persons.

(23) "Electric line truck." Any vehicle used to transport ~~((men))~~ workers, tools, and material, which serves as a traveling workshop for electric power line construction and maintenance work. It may be equipped with a boom and auxiliary equipment for setting poles, digging holes, and elevating material and/or workers.

(24) "Electric supply lines." Those conductors used to transmit electric energy together with necessary supporting and containing structures. Signal lines of more than 400 volts to ground are always electric supply lines if they are installed and used as electric supply lines.

(25) "Emergency." An unforeseen occurrence endangering life, limb, or property.

(26) "Enclosed." Surrounded by a case, cage, fence or otherwise which will protect the contained equipment and prevent accidental contact of a person with live parts.

(27) "Energized, alive, or live." Electrically connected to a source of potential difference or electrically charged so as to have a potential different from that of the earth or different from that of adjacent conductors or equipment. Electrical connections of less than 100 volts are not considered energized. Communication or signal lines as defined in this chapter are not considered energized.

(28) "Equipment." A general term which includes fittings, devices, appliances, fixtures, apparatus, and comparable equipment used as part of, or in connection with, an electrical power transmission and distribution system, or utility communication systems over 400 volts.

(29) "Exposed." Not isolated or guarded.

(30) "Fault current." As used in this chapter means the current that flows in an electrical system because of a defect in the circuit induced accidentally or otherwise.

(31) "Fixed ladder." A ladder which is permanently secured to a structure.

(32) "Foreman or ~~((man-in-charge))~~ leadworker." The person directly in charge of workers doing the work, regardless of title.

(33) "Foreign operation." Any business or work being performed which does not come within the mandatory scope and application of this chapter; an operation which would otherwise be subject to the provisions of this chapter may be subject to the provisions of another chapter in the event the employees performing the particular work were not competent as defined within the provisions of this chapter.

(34) "Guarded." Protected by personnel, covered, fenced, or enclosed by means of approved casings, barrier rails, screens, mats, platforms, or other approved devices in

accordance with standard barricading techniques designed to prevent dangerous approach or contact by persons or conductive objects.

(35) "Ground" (reference)." That conductive body, usually earth or a system ground, to which an electric potential is referenced.

(36) "Ground" (as a noun). A conductive connection, whether intentional or accidental, by which an electric circuit or equipment is connected to reference ground.

(37) "Ground" (as a verb). The connecting or establishment of a connection, whether by intention or accident, of an electric circuit or equipment to reference ground.

(38) "Grounding." For the purpose of these rules, means the act of placing shorts and grounds on de-energized conductors and equipment.

(39) "Grounding electrode (ground electrode)." A conductor embedded in the earth, used for maintaining ground potential on conductors connected to it, and for dissipating into the earth current conducted to it.

(40) "Grounding electrode resistance." The resistance of the grounding electrode to earth.

(41) "Grounding electrode conductor (grounding conductor)." A conductor used to connect equipment or the grounded circuit of a wiring system to a grounding electrode.

(42) "Grounded conductor." A system or circuit conductor which is intentionally grounded.

(43) "Grounded system." A system of conductors in which at least one conductor or point (usually the middle wire, or neutral point of transformer or generator windings) is intentionally grounded either solidly or through a current-limiting device (not a current-interrupting device).

(44) "~~((Groundman))~~ Groundperson." A member of crew working on ground under direction of ~~((foreman))~~ a leadworker.

(45) "Hotline tools and ropes." Those tools and ropes which are specifically designed for work on energized high voltage lines and equipment.

(46) "Insulated." Separated from other conducting surfaces by a dielectric substance including air space offering a high resistance to the passage of current. When any object is said to be insulated, it is understood to be insulated in an approved manner for the conditions to which it is subjected. Insulated covering of conductors is one means of making the conductor insulated.

(47) "Insulation (as applied to cable)." That which is relied upon to insulate the conductor from other conductors or conducting parts or from ground.

(48) "Insulation shielding." An envelope which encloses the insulation of a cable and provides an equipotential surface in contact with cable insulation.

(49) "Isolated." An object that is not readily accessible to persons unless special means of access are used.

(50) "Manhole." A subsurface enclosure which personnel may enter and which is used for the purpose of installing, operating, and maintaining equipment and/or cable.

(51) "Neutral." A system in which one conductor is used as the neutral for one or more circuits; one conductor may be used as the neutral for both primary and secondary circuits of a distribution system.

(52) "Pole." Any device used to support a power distribution or transmission line. The pole may be made of any substance including wood, concrete, metal, is usually

cylindrical in shape and comparatively slender. It is the upright standard to which is affixed part of the power distribution and transmission line system as defined in this chapter.

(53) "Portable ladder." As used in this chapter means a ladder capable of being moved by hand or manually and one which is usually moved into position by hand.

(54) "Power dispatcher (load dispatcher or system operator)." A person who has been designated by the employer as having authority over switching and clearances of high voltage lines and station equipment.

(55) "Protective devices." Those devices such as rubber gloves, rubber blankets, line hose, rubber boots, or other insulating devices, which are specifically designed for the protection of employees.

(56) "Public highway." For the purpose of these rules shall include every way, land, road, street, boulevard, and every other way or place in the state open as a matter of right to public vehicular travel, both inside and outside the limits of cities and towns, regardless of ownership.

(57) "Pulling tension." The longitudinal force exerted on a cable during installation.

(58) "Qualified person or qualified employee." A person who is familiar with the construction of, or operation of such lines and/or equipment that concerns ~~((his))~~ his/her position and who is fully aware of the hazards connected therewith, or, one who has passed a ~~((journeyman's))~~ journey status examination for the particular branch of the electrical trades with which ~~((he))~~ he/she may be connected.

(59) "Secured ladder." A ladder which is not capable of being dislodged from the top by lateral, or jerking motion(s).

(60) "Sheath." As applied to tools carried in lineman's tool belt shall mean a sheath that effectively covers the tool and prevents such tool from falling from the belt.

(61) "Switch." A device for opening and closing or changing the connection of a circuit. In these rules, a switch is understood to be manually operable, unless otherwise stated.

(62) "Tag." A system or method of identifying circuits, systems, or equipment for the purpose of alerting employees and others that the circuit, system, or equipment is being worked on.

(63) "Rubber." Any goods, equipment, or tool made out of either natural or synthetic rubber.

(64) "Unstable material." Earth material, other than running, that because of its nature or the influence of other conditions, cannot be depended upon to remain in place without extra support, such as would be furnished by a system of shoring.

(65) "Vault." An enclosure into which personnel may enter and used for the purpose of installing, operating, or maintaining equipment and cable.

(66) "Voltage." The effective (rms) potential difference between any two conductors or between a conductor and ground. Voltages are expressed in nominal values. The nominal voltage of a system or circuit is the value assigned to a system or circuit of a given voltage class for the purpose of convenient designation. The operating voltage of the system may vary above or below this value.

(67) "Voltage of an effectively grounded circuit." The voltage between any conductor and ground unless otherwise indicated.

(68) "Voltage of a circuit not effectively grounded." The voltage between any two conductors. If one circuit is directly connected to and supplied from another circuit of higher voltage (as in the case of an auto-transformer), both are considered as of the higher voltage, unless the circuit of lower voltage is effectively grounded, in which case its voltage is not determined by the circuit of higher voltage. Direct connection implies electric connection as distinguished from connection merely through electromagnetic or electrostatic induction. Low voltage includes voltages from 100 to ~~((750))~~ 600 volts. High voltage shall mean those voltages of ~~((75+))~~ 601 volts to 230,000. Extra high voltage means any voltage over 230,000 volts. Where the words "high voltage" are used in this chapter it shall include extra high voltage, unless otherwise specified.

AMENDATORY SECTION (Amending Order 89-03, filed 5/15/89, effective 6/30/89)

**WAC 296-45-65009 Employer's responsibility.** (1) The employer shall provide and maintain the necessary protective devices specified in these rules and require the employees to use them properly.

(2) The employer shall develop and maintain a hazard communication program as required by ~~((WAC 296-62-054 through 296-62-05427))~~ Part C, chapter 296-62 WAC, which will provide information to all employees relative to hazardous chemicals or substances to which they are exposed, or may become exposed, in the course of their employment.

(3) There shall be installed and maintained in every fixed establishment employing eight or more persons a safety bulletin board of a size to display and post safety bulletins, newsletters, posters, accident statistics and other safety educational material. It is recommended that safety bulletin boards be painted green and white.

(4) The employer shall require the ~~((foremen))~~ leadworker to observe and enforce all safety rules and shall furnish a copy of the electrical workers' safety rules to each employee who is covered by these rules.

(5) The employer shall appoint only competent workers to supervise other employees and those appointed shall be responsible for the safety of the employees under their supervision.

(6) Training. Employees shall be trained in and familiar with the safety-related work practices, safety procedures, and other safety requirements in this section that pertain to their respective job assignments. Employees shall also be trained in and familiar with any other safety practices, including applicable emergency procedures (such as pole top and manhole rescue), that are not specifically addressed by this section but that are related to their work and are necessary for their safety.

(a) Qualified employees shall also be trained and competent in:

(i) The skills and techniques necessary to distinguish exposed live parts from other parts of electric equipment;

(ii) The skills and techniques necessary to determine the nominal voltage of exposed live parts;

(iii) The minimum approach distances specified in this section corresponding to the voltages to which the qualified employee will be exposed; and

(iv) The proper use of the special precautionary techniques, personal protective equipment, insulating and shielding materials, and insulated tools for working on or near exposed energized parts of electric equipment.

Note: For the purposes of this section, a person must have this training in order to be considered a qualified person.

(b) The employer shall determine, through regular supervision and through inspections conducted on at least an annual basis, that each employee is complying with the safety-related work practices required by this section.

(c) An employee shall receive additional training (or retraining) under any of the following conditions:

(i) If the supervision and annual inspections required by (b) of this subsection indicate that the employee is not complying with the safety-related work practices required by this section; or

(ii) If new technology, new types of equipment, or changes in procedures necessitate the use of safety-related work practices that are different from those which the employee would normally use; or

(iii) If he or she must employ safety-related work practices that are not normally used during his or her regular job duties.

Note: WISHA would consider tasks that are performed less often than once per year to necessitate retraining before the performance of the work practices involved.

(d) The training required by this subsection (6) shall be of the classroom or on-the-job type.

(e) The training shall establish employee proficiency in the work practices required by this section and shall introduce the procedures necessary for compliance with this section.

(f) The employer shall certify that each employee has received the training required by this subsection (6). This certification shall be made when the employee demonstrates proficiency in the work practices involved and shall be maintained for the duration of the employee's employment.

Note: Employment records that indicate that an employee has received the required training are an acceptable means of meeting this requirement.

(7) The employer shall hold safety meetings at least once a month, which meetings shall be held at a reasonable time and place as selected by the employer. The employer shall require all employees subject to provisions of this chapter to attend said meetings: *Provided*, That employees whose presence is otherwise required by reason of an emergency or whose function is such that they cannot leave their station or cease their work without serious detriment to the service provided, such as dispatcher, may be excused from such meeting under those circumstances.

Minutes shall be kept of each safety meeting and retained for a period of one year.

((7)) (8) The employer or a representative(s) designated ((by him)) shall investigate all accidents or injuries of a serious nature and, where possible, take the proper remedial steps to prevent the occurrence of similar accidents.

((8)) (9) The employer shall furnish instructions stating the proper procedure in event of an emergency, which shall include the names of those individuals to be notified and methods of contacting them.

((9)) (10) The employer shall provide and make available to all employees accident report and safety suggestion forms.

((10)) (11) In the case of fatal accident, immediate notice shall be given by the employer or ((his)) an authorized representative either by telephone or telegraph (collect) to the department of labor and industries, ((division of industrial safety and health,)) Olympia, Washington, or any of its branch offices. All such notices shall include time, place, and date of the accident and the employer's name.

((11)) (12) Nothing contained within this chapter shall prohibit an employer or ((his)) an authorized representative from disciplining employees for failure to comply with the provisions of this or any other safety code.

AMENDATORY SECTION (Amending Order 76-38, filed 12/30/76)

WAC 296-45-65011 ((Foreman's)) **Leadworker's responsibility.** (1) Every ((foreman)) leadworker shall understand these and any other applicable safety rules and comply therewith. ((Foremen)) Leadworkers shall require all employees under their direction or supervision to read this chapter and the provisions contained therein and require every employee subject to this chapter to be able to apply this chapter and any provision of this chapter on a day-to-day basis.

(2) ((Foremen)) Leadworkers shall inform employees under their supervision or direction of the type and voltage of circuits on or near which the employees are to work.

(3) ((Foremen)) Leadworkers shall require all employees under their supervision to properly use safety devices and equipment, including barricades, warning flags or signs, or any other device called for to protect employees.

AMENDATORY SECTION (Amending Order 76-38, filed 12/30/76)

WAC 296-45-65013 ((Foreman)) **Leadworker-employee responsibility.** (1) An employee shall protect ((his)) his/her climbing and working space at all times if the conductors are so spaced that in climbing or working ((he)) he/she will be, or where it is possible to come within, the minimum required distances specified in these rules.

(2) ((Foremen)) Leadworkers or supervisors shall in good faith consider verbal or written reports of hazardous conditions and shall, as soon as practicable, investigate and remedy same if warranted.

(3) When hazards are reported by employees, ((foremen)) leadworkers and others having authority shall accept the report in a cooperative manner, and in no case shall an employee be reprimanded or penalized for reporting hazards or potential hazards.

(4) ((Foremen)) Leadworkers shall require all employees under their supervision to keep their belts, spurs, and straps in good working condition. When straps and belts are in poor condition or defective, they shall not be used.

(5) Before leaving a jobsite, ((foremen)) leadworkers shall correct or arrange to give warning of any condition which might result in injury to employees.

(6) No employee shall be permitted or allowed to remain on the jobsite when under the influence of any intoxicating beverage or controlled substance or substances:

PROPOSED

*Provided*, That if an employee is taking prescription medication under the direction of a practicing physician and such prescription does not interfere with the safe performance of the work assigned, such employee may be permitted to work.

(7) No intoxicating beverages or controlled substances shall be consumed on the jobsite other than prescription medication as set forth above.

**AMENDATORY SECTION** (Amending Order 76-38, filed 12/30/76)

**WAC 296-45-65015 Work required of ((foremen)) leadworkers.** (1) A ((foreman)) leadworker cannot properly supervise the work and look out for the safety of employees under ((his)) their direction if required to work as a ((foreman)) leadworker and a ((lineman)) lineworker at the same time.

(2) ((Foremen)) leadworkers should be constantly alert and shall not be required to serve in such dual capacity, except in crews of not more than two ((linemen)) lineworkers, in which case they may work as one of the ((linemen)) lineworkers.

(3) In crews of two ((linemen)) lineworkers or less, each ((lineman)) lineworker may have a ((groundman)) groundworker but, if additional ((linemen)) lineworkers or ((groundmen)) groundworkers are added to the crew, the ((foreman)) leadworker shall confine ((his)) his/her activities to supervising the work, as exhibited below:

Type of Crew	Minimum Requirements
<del>((2 linemen</del>	<del>One lineman as man in charge.</del>
<del>2 linemen plus 1 groundman</del>	<del>One lineman as man in charge or climbing foreman.</del>
<del>2 linemen plus 2 groundmen</del>	<del>One lineman as man in charge or climbing foreman.</del>
<del>2 linemen plus any combination of 3 linemen or groundmen</del>	<del>One nonclimbing foreman.)</del>
2 lineworkers	One lineworker as person-in-charge.
2 lineworkers plus 1 groundworker	One lineworker as person-in-charge or climbing leadworker.
2 lineworkers plus 2 groundworkers	One lineworker as person-in-charge or climbing leadworker.
2 lineworkers plus any combination of 3 lineworkers or groundworkers	One nonclimbing leadworker.

**AMENDATORY SECTION** (Amending Order 76-38, filed 12/30/76)

**WAC 296-45-65017 Employee's responsibility.** (1) Employees shall not engage in horseplay or scuffling while on the job or jobsite and the employer shall not permit horseplay or scuffling while on the jobsite or otherwise in the course of employment.

(2) During such time as any employee is working on or near any energized line or energized equipment in excess of ((750)) 600 volts there shall be no talking or communication other than that which is absolutely necessary and essential for the safe and proper performance of the work. Should there be communication or talk from a person other than an employee, the work shall stop until such time as the distraction ceases.

(3) Employees shall report any hazardous or potentially hazardous condition, operation, means, or work in a con-

structive manner and shall not engage in personality conflicts.

(4) Neither the employer nor the employees shall throw or permit anything to be thrown from elevated position(s) or poles to the ground or lower level, nor shall anything be thrown from the ground or lower level to an elevated position, whether that elevated position is on a pole, aerial manlift or otherwise.

(5) Employees shall report all injuries, regardless of severity, to the employer or designated representative. Report forms furnished by the employer should be used.

**AMENDATORY SECTION** (Amending Order 76-38, filed 12/30/76)

**WAC 296-45-65019 First aid.** In addition to complying with the first aid provisions as found in ((WAC 296-24-060 through 296-24-073)) Part A-1, chapter 296-24 WAC, all employees whose duties require them to work on energized wires, equipment, or to climb poles or related structures, shall take an approved course in controlling bleeding and cardiopulmonary resuscitation, and

(1) All ((linemen)) lineworkers shall be instructed in pole-top rescue and become and remain proficient in its application.

(2) It is recommended that all employees receive basic first aid training.

(3) Safety suggestion forms should, where possible, be used for suggesting the elimination of hazardous conditions and such reported suggestions shall be retained by the employer or ((his)) an authorized representative.

**AMENDATORY SECTION** (Amending Order 76-38, filed 12/30/76)

**WAC 296-45-65021 Tools and protective equipment.**

(1) Protective equipment.

(a) Rubber protective equipment shall be in accordance ((with the provisions of the American National Standards Institute (ANSI), ANSI J6 series as revised in 1971,)) as follows:

Item	Standard
Rubber Insulating Gloves	((J6.6 1971 Edition)) (ASTM) D 120-87
Rubber Matting for Use Around Electrical Apparatus	((J6.7 1971 Edition)) (ASTM) D 178-88
Rubber Insulating Blankets	((J6.4 1971 Edition)) (ASTM) D 1046-88a
Rubber Insulating Hoods	((J6.2 1971 Edition)) (ASTM) D 1049-88
Rubber Insulating Line Hose	((J6.1 1971 Edition)) (ASTM) D 1050-90
Rubber Insulating Sleeves	((J6.5 1971 Edition)) (ASTM) D 1051-87

(b) No protective equipment or material other than rubber shall be used: *Provided*, That such other nonconductive equipment may be used if it provides equal or better (dielectric) electrical and mechanical protection than rubber protective equipment: *Provided*, That the employer obtain before placing in service, manufacturer's data or other data to demonstrate that such nonrubber protective equipment



provided equal or better electrical and mechanical protection than approved rubber equipment.

(c) Protective equipment shall not be used at voltages in excess of that for which the manufacturer has supplied data to the employer demonstrating that it is fit for such voltages.

(d) No protective equipment shall be modified, altered, or used for purposes other than those for which it is designed unless and until the manufacturer has, in writing, agreed or suggested that there be such modification, alteration, or use.

(e) High voltage rubber gloves shall have and pass a minimum dielectric test of at least 10,000 volts.

(f) Each rubber glove before it is used shall be inspected for defects and an approved air test performed. If, upon inspection, rubber gloves are either defective or appear to be defective, they shall not be used.

(g) Before being placed in service, all rubber protective equipment shall be numbered and records kept for test purposes and assignment.

(h) Rubber protective equipment shall not be used unless it has been dielectrically tested within six months and bears marking or identification of the date of the dielectric test: *Provided*, That all rubber gloves and rubber sleeves which are in service must be dielectrically tested every three months and shall not be used unless they have been tested within three months and bear marking or identification of the date of the last dielectric test.

(i) Whenever any rubber protective equipment is dielectrically tested, such testing shall be performed by a person or persons familiar with the testing procedure and in a facility which meets the recognized standards in the industry for such testing. All rubber gloves that are in service shall be tested at a voltage twice the amount for which such rubber equipment is used. Whenever a dielectric test is conducted, the rubber protective equipment shall also be visually inspected in detail for defects.

(j) Approved protectors shall be worn at all times over rubber gloves. Inner liners may be worn if desired.

(k) Rubber gloves when not in use shall be carried in an approved bag provided and designed for that purpose. It shall be provided by the employer and made available to the employees.

(l) Approved rubber gloves and carrying bag shall be assigned to each employee who works with, or is exposed to energized parts.

(m) Rubber protective equipment shall not be vulcanized or patched.

(n) A compartment or box shall be provided on each electric line truck, which box or compartment shall be used for storing rubber protective equipment. No equipment shall be stored in said compartment or box which can or could cause damage to the rubber equipment or goods placed in the compartment or box. Additionally, a separate container or compartment shall be provided for rubber blankets.

(o) Line hose shall not be doubled on themselves at any time. All blankets before storage must be wiped clean and rolled, not folded, before being placed in the container or box.

(p) Protective line equipment of material other than rubber shall be kept clean and visually inspected before each use.

(q) If protective line equipment of material other than rubber is found to be substantially defective or unsuitable for the purpose for which it is designed and intended, said protective line equipment shall not be used for personal protection of employees as may be required in Table 1 of this chapter. Said protective line equipment shall be marked defective but may be otherwise used unless the defect or damage to said protective line equipment creates additional safety hazards.

(r) Line hose or similar type of equipment shall not be used on voltages in excess of 15,000 volts as measured from phase to phase unless the manufacturer specifies otherwise.

(s) All protective hats shall be in accordance with the specifications of ANSI Z89.2-1971 Edition Industrial Protective Helmets for Electrical Workers, Class B, and shall be worn at the jobsite by employees who are exposed to overhead or electrical hazards.

(2) Personal climbing equipment. All ~~(lineman)~~ lineworker body belts, safety straps, lanyards, hooks, and other similar equipment shall comply to this chapter. This rule shall not apply to personal climbing equipment in use at the effective date of this chapter during its lifetime provided such equipment is maintained in good condition and in accordance with the applicable safety rule and requirement in effect at the time such equipment was obtained.

(a) Safety lines shall not be used for shock loading and shall be used only for emergency rescue. All safety lines shall be a minimum one-half inch diameter and three- or four-strand first grade manila or its equivalent in strength (2,650 pounds) and durability.

(b) Defective ropes shall not be used and shall be replaced.

(c) Employees, when working from a hook ladder, must either belt themselves securely to the ladder, attach themselves to the structures by means of a safety line, or belt themselves to ladder safety equipment, which shall consist of a safety rope or belting threaded through the rungs or secured to the ladder at intervals of not more than three feet.

(d) Body belts with straps or lanyards shall be worn by employees working at an elevated position such as on poles, towers, or similar structures: *Provided*, That body belts and lanyards need not be used by employees while erecting transmission towers. Body belts and straps shall be inspected each day for defects before use. Defective body belts and straps shall not be used.

(e) Safety straps shall not be placed around poles above the cross-arm except where it is not possible for the strap to slide or be slipped over the top of the pole by inadvertence of the employee. Neither end of the strap shall be allowed to hang loose or dangle while the employee is ascending or descending poles or other structures.

(f) Body belts and safety straps shall not be stored with sharp-edged tools or near sharp objects. When a body belt, safety strap and climbers are kept in the same container, they shall be stored in such a manner as to avoid cutting or puncturing the material of the body belt or safety strap with the gaffs or climbers.

(g) Employees shall not attach metal hooks or other metal devices to body belts. Leather straps or rawhide thongs shall have hardwood or fibre crossbars. Leather straps and rawhide thongs shall not have metal or other conductive crossbars on them.

(h) Climbing gaffs shall be kept properly sharpened and shall be at least 1-1/8 inches in length.

(3) Ladders.

(a) Portable metal or other portable conductive ladders shall not be used on or near energized line or equipment except where nonconductive ladders present a greater electrical hazard than conductive ladders. A greater electrical hazard would be static electricity such as might be found in extra high voltage substations. All conductive or metal ladders shall be prominently marked and identified as being conductive and shall be grounded when used near energized lines or equipment.

(b) All ladders including hook type ladders used in structures shall be secured to prevent the ladder from being accidentally displaced.

(c) All ladders shall be handled and stored in such a manner as to prevent damage to the ladder.

(d) When ascending or descending a ladder, the employee shall face the ladder and have free use of both hands.

(e) All defective ladders shall be taken out of service and labeled as defective.

(f) When a ladder is being used which is not fixed or otherwise secured, there shall be an attendant to hold the ladder and watch traffic when the work is being done on streets, alleys, sidewalks, or in industrial plants or other places where there exists the possibility of accidental contact with the ladder by third persons or vehicles.

(g) When working on the ladder, employees shall, where possible, tie the top of the ladder to a substantial object to prevent falling unless the ladder is equipped with approved hooks which may be used for the same purpose.

(h) Portable ladders shall not be moved with employees on the ladder.

(i) No employee shall ascend or descend a rolling ladder while it is moving.

(j) No employee shall stand on the top two steps of a step ladder.

(k) No employee shall use a step ladder as a straight ladder.

(l) All ladders shall be of sufficient strength for the use to which they are placed.

(m) Ladders shall always be placed on a secure footing with both legs resting firmly on the lower surface.

(n) Ladders made by fastening cleats or similar devices across a single rail shall not be used.

(4) Hot line tools.

(a) Only hot line tools having manufacturer's certification of withstanding the following minimum tests shall be used:

(i) 100,000 volts per foot of length for 5 minutes when the tool is made of fiberglass; or

(ii) 75,000 volts per foot of length for 3 minutes when the tool is made of wood; or

(iii) Other tests which equal or exceed (i) and (ii) of this subsection.

(b) All hot line tools shall be visually inspected each day before use. All hot line tools shall be wiped clean before being used.

(c) ~~((Defective hot line tools shall not be used and shall be marked as defective and turned in for repair or replacement.~~

~~((d)))~~ If any defect or contamination that could adversely affect the insulating qualities or mechanical integrity of the live-line tool is present after wiping, the tool shall be removed from service and examined and tested according to this section before being returned to service.

(d) Live-line tools used for primary employee protection shall be removed from service every two years and whenever required under this subsection for examination, cleaning, repair, and testing as follows:

(i) Each tool shall be thoroughly examined for defects.

(ii) If a defect or contamination that could adversely affect the insulating qualities or mechanical integrity of the live-line tool is found, the tool shall be repaired and refinished or shall be permanently removed from service. If no such defect or contamination is found, the tool shall be cleaned and waxed.

(iii) The tool shall be tested in accordance with this section under the following conditions:

(A) After the tool has been repaired or refinished; and

(B) After the examination if repair or refinishing is not performed, unless the tool is made of FRP rod or foam-filled FRP tube and the employer can demonstrate that the tool has no defects that could cause it to fail in use.

(iv) The test method used shall be designed to verify the tool's integrity along its entire working length and, if the tool is made of fiberglass-reinforced plastic, its integrity under wet conditions.

(v) The voltage applied during the tests shall be as follows:

(A) 75,000 volts per foot (2461 volts per centimeter) of length for one minute if the tool is made of fiberglass; or

(B) 50,000 volts per foot (1640 volts per centimeter) of length for one minute if the tool is made of wood; or

(C) Other tests that the employer can demonstrate are equivalent.

Note: Guidelines for the examination, cleaning, repairing, and in-service testing of live-line tools are contained in the Institute of Electrical and Electronics Engineers Guide for In-Service Maintenance and Electrical Testing of Live-Line Tools, IEEE Std. 978-1984.

(e) Hot line tools and ropes shall be inspected each day before use. They shall be stored and maintained and used in such a manner as to prevent damage. Hot line tools and ropes shall not be used for purposes other than line work. Wood hot sticks shall be maintained with a surface coating of varnish or other approved treatment to prevent the absorption of moisture into the stick. The maintenance, inspection, storage, and use of such equipment shall be in conformance with the methods and standards recognized by manufacturers and the industry.

(5) Measuring ropes and tapes. ~~((e)))~~ Measuring ropes or measuring tapes which are metal or certain conductive strands shall not be used when working on or near energized lines or parts.

(6) Hand tools.

(a) All power hand tool switches shall comply with the provisions of WAC 296-24-650 through 296-24-67005.

(i) Be equipped with three-wire cord having the ground wire permanently connected to the tool frame and having a means for grounding the other end of the cord except when such three-wire cord increases the hazard to the employees

or where the hand held tool is double insulated and permanently labeled "double insulated."

(ii) Be connected to the power supply by means of an isolating transformer, or other isolated power supply.

(b) All hydraulic tools which are used on or around energized lines or equipment shall use nonconductive hoses having approved strength for the normal operating pressures. The provisions of WAC 296-155-360 (4)(a) and (b) are mandatory.

(c) All pneumatic tools which are used on or around energized lines or equipment shall:

(i) Have nonconducting hoses having approved strength for the normal operating pressures, and

(ii) Have an accumulator on the compressor to collect moisture.

(7) Hand axes shall not be used when working overhead.

(8) Small tools carried in body belts shall be placed so as to present the least danger of coming into accidental contact with live parts.

(9) All tools carried in workers' body belts shall be sheathed: *Provided*, That tower erectors need not comply with this rule except when working on or above electric power equipment or lines.

(10) Tools other than those which are carried in workers' body belts shall not be carried up or lowered down poles or similar structures in belts but shall be raised and lowered by means of an approved container or hand line.

(11) All tools shall be kept in good working condition and shall be properly stored. Defective tools shall be taken out of service.

(12) Tools and loose material shall not be left at the top of poles or structures.

(13) Tools shall be placed where they will not be the cause of injury due to stepping or tripping on them.

(14) The surface and surface preservation of wood tools such as ladders, pike poles, switch sticks, insulating platforms used in electrical work shall be maintained. Only transparent preservatives shall be used. Where ladders and pike poles are not used on or near energized lines and are inspected monthly by qualified inspectors, they may be painted.

(15) Scaffolds shall be constructed and used in conformance with the general safety and health standards (~~((WAC 296-24-82503))~~), Part J-1, chapter 296-24 WAC and the safety standards for construction work (~~((WAC 296-155-485))~~), Part J-1, chapter 296-155 WAC of the state of Washington.

(16) Wearing apparel.

(a) Goggles, rubber gloves, respirators, and other such personal protective devices shall not be interchanged among employees unless they have been sanitized.

(b) Workers shall wear clothing appropriate to the season and the kind of work being performed: *Provided*, That shirts or jumpers with full length sleeves rolled down and protective hats shall be worn when working on or near live parts or while climbing poles.

(c) When working on or near energized parts, employees shall not wear loose dangling watch chains, key chains, or unnecessary metal of any type, and should not wear coats with metal zippers.

(d) The employer shall train each employee who is exposed to the hazards of flames or electric arcs in the hazards involved.

(e) The employer shall ensure that each employee who is exposed to the hazards of flames or electric arcs does not wear clothing that, when exposed to flames or electric arcs, could increase the extent of injury that would be sustained by the employee.

Note: Clothing made from the following types of fabrics, either alone or in blends, is prohibited by this subsection, unless the employer can demonstrate that the fabric has been treated to withstand the conditions that may be encountered or that the clothing is worn in such a manner as to eliminate the hazard involved: Acetate, nylon, polyester, rayon.

(17) When working at night, spotlights or portable lights for emergency lighting shall be provided and used as is necessary to perform work safely.

(18) Sanitary facilities. The requirements of (~~WAC 296-24-120 through 296-24-130(13))~~ Part B-1, chapter 296-24 WAC shall be complied with.

(19) Industrial hygiene. The requirements of chapter 296-62 WAC are mandatory unless they are inconsistent with this chapter.

(20) Fire extinguishers. Employees should know the location and how to operate fire extinguishers in the worksite vicinity.

(21) Foreign attachments and placards. Nails and unauthorized attachments should be removed before climbing above such attachments. When through bolts present a hazard to climbing, they shall be trimmed to a safe length.

(22) Working near or over water. When employees are engaged in work over or near water and when the danger of drowning exists, suitable flotation protection shall be provided and worn as required by (~~WAC 296-24-086~~) Part A-2, chapter 296-24 WAC.

AMENDATORY SECTION (Amending Order 76-38, filed 12/30/76)

**WAC 296-45-65023 Clearances, operating power lines and equipment.** Clearances, directly under the control of the power dispatcher or person acting in that capacity, shall be requested and executed by observing the following rules:

(1) Employers shall designate a qualified person or persons to act in the capacity of power dispatcher, also known as load dispatcher or system operator.

(2) No switch shall be operated and no clearance tag placed or removed without an order from the power dispatcher having jurisdiction, except where standing orders or regulations have been given covering such operations.

(3) In all cases, switching orders must be given directly to the employees in charge of operating the switches by the power dispatcher who has jurisdiction and such communications *must be repeated back word for word to the speaker*. When requesting clearance on lines under the control of the power dispatcher, a person requesting the clearance shall obtain the name of the dispatcher to whom the request was made and the dispatcher shall obtain the name of the person requesting the clearance; and assure (~~himself~~) that the person is qualified to receive such a clearance.

(4) Should it become necessary for a person holding a clearance to leave the job, ~~((he))~~ he/she shall relinquish ~~((his))~~ his/her clearance to the dispatcher and a new clearance shall be taken by another qualified person. ~~((+))~~ In the event of an occurrence which renders it impossible to contact the individual who had a clearance on a given circuit or piece of equipment, that clearance may be released only by the next higher available official who is familiar with the work and has jurisdiction over the circuit or equipment.

(5) The dispatcher shall order clearance tags printed on red cardboard, or equivalent, not less than 2-1/4 inches by 4-1/2 inches, attached to all switches opened or checked open to provide clearance on any line or equipment for employees to work thereon.

(6) Clearance tags attached to substation control devices and to line switches beyond the switchyard of any substation; indicating the limits of the clearance involved; shall state the designation of the switch opened or checked open and tagged; the name of the person to whom the clearance is to be issued; the date and time the switch was opened or checked open; the name of the dispatcher ordering the switching and tagging; and the name of the person doing the switching and tagging.

(7) Clearance tags attached to airbreak switches opened within a substation shall indicate clearly that the line or equipment is cleared for employees to work thereon.

(8) In cases where more than one person will require clearance on the lines or parts of equipment, the power dispatcher must order complete sets of clearance tags for each person requesting clearance.

(9) When two or more crews are engaged in work at any one location on account of emergency or for other reasons, the proper authority may designate one of the ~~((foremen))~~ leadworkers to act as ~~((foreman))~~ leadworker of the combined crews for the purpose of obtaining clearances only.

(10) To meet unforeseen conditions, it will be permissible to tag isolated switches for the dispatcher and issue clearances against this tag. In tagging out inter-utility tie lines, the open switches on the foreign end of the line shall be tagged for the foreign dispatcher requesting the outage who will issue clearances to individuals of ~~((his))~~ the organization against this tag.

(11) No work shall be performed on lines or equipment until the power dispatcher in control of such lines or equipment has clearly granted the clearance. The power dispatcher shall never grant a clearance on lines or equipment before all necessary protective tags are applied, and ~~((his-own))~~ records of such clearance are clear and complete. Before considering any line or equipment to be de-energized, the power dispatcher shall assure ~~((himself))~~ that all switches which could possibly energize the line or equipment in question have been opened, all phases checked open, the switches tagged and, if possible, locked in the open position.

(12) Metal-clad, draw-out switchgear of over ~~((750))~~ 600 volts in which the physical separation of the disconnecting parts is not visible may be used to clear a line or equipment, provided the switchgear is equipped with:

(a) A positive positioning means to insure that the disconnecting contacts are separated;

(b) An isolating shutter which moves into place between the separated contact for circuit isolation; and

(c) A mechanically-connected indicating means to show that the shutter is in place.

(13) In all other cases, only a visible break of all phases shall be regarded as clearing a line or equipment.

(14) Where two or more 5000-volt (or higher) lines are on the same pole or bus structure, arrangements must be made for simultaneous clearances on all such lines unless the person who requested the clearance specifically states that less will be sufficient.

(15) In giving a clearance, the power dispatcher shall make certain that the ~~((man))~~ person to whom the clearance is given is fully aware of the extent or the limits of ~~((his))~~ the clearance.

(16) The person or persons to whom a clearance has been given shall make certain that all protective grounding or short-circuiting devices installed by ~~((him))~~ him/her or persons under ~~((his))~~ his/her direction are removed before clearing the line or equipment to the dispatcher for service.

(17) After receiving notification from the dispatcher that the necessary switching has been done, the person making the request shall take the following precautionary steps before any employee comes in direct contact with the circuit or equipment:

(a) The circuit or equipment shall be tested by generally accepted methods to make certain that it is de-energized.

(b) The circuit or equipment shall be grounded and shorted as prescribed in this section.

(18) No person shall make contact with a circuit or equipment that has not been taken out of service to be worked on until ~~((he))~~ he/she has the circuit or equipment cleared and tagged by ~~((himself))~~ themselves or is working directly under the supervision of one who has the circuit or equipment cleared and tagged for ~~((himself))~~ themselves.

(19) No tag shall be removed and no lines or equipment energized until the clearance has been released to the dispatcher.

(20) There shall be a tag used on any switch, regardless of the voltage or type of construction, where workers are likely to be endangered by the closing of such switch and/or where the switch is not directly visible to the employee protected by the open switch.

AMENDATORY SECTION (Amending Order 91-07, filed 11/22/91, effective 12/24/91)

**WAC 296-45-65026 Personal protective grounding.**

(1) Purpose.

(a) Reduce the potential voltage differences across the worker: The primary function of personal protective grounds is to provide maximum safety for personnel while they are working on de-energized lines or equipment. This will be accomplished by making provisions which will reduce the potential voltage differences at the worksite (voltage across the worker) to a safe value in case the equipment or line being worked on is accidentally energized from any possible source.

(b) Protect from induced voltage: The secondary function is also to protect against induced voltage from adjacent parallel energized lines.

(c) Insure adequate operation of protective devices: The third function is to make the protective devices (relays and

circuit breakers or fuses) disconnect the energizing source within a given time/current relationship.

(2) Application.

(a) Deenergized line: When an energized line over ~~((seven hundred fifty))~~ 600 volts is removed from service to be worked on, the line shall be treated as though it is energized until the line is cleared, tagged, tested, and grounded.

(b) Communication conductors: Bare wire communication conductors on power poles and structures are subject to these rules as energized lines and voltages in excess of ~~((seven hundred fifty))~~ 600 volts unless protected by insulating materials.

(c) New construction: The grounding rule is advisory, rather than compulsory, when work is being done on new construction that is known to be deenergized and it is not possible to energize the line.

(d) Minimum distance from ungrounded conductors: The minimum distance shown in Table 1 of WAC 296-45-65027(14) shall be maintained from ungrounded conductors at the work location. The ground may be omitted if the making of a ground is impractical, or the conditions resulting therefrom are more hazardous than working on the lines or equipment without grounding. However, all work must be done in accordance with this chapter as if the line or equipment is energized.

(3) Grounding equipment.

(a) Availability: Grounding equipment shall be available for use when work is being done on deenergized lines or equipment.

(b) Approved capacity: Grounding equipment shall be of approved current carrying capacity capable of accommodating the maximum fault current to which the line or equipment could be subjected.

(c) Approved connector: Grounding shall be made with an approved connector capable of conducting the available fault current.

(d) Approved ferrules and grounding clamps: Grounding jumpers shall have approved ferrules and grounding clamps that provide mechanical support for jumper cables independent of the electrical connection.

(e) Minimum conductance: A ground lead shall have a minimum conductance of #2 AWG copper.

(4) Testing prior to installation of ground. Before grounds are installed, the deenergized line or equipment shall be tested for voltage by the following approved methods:

(a) Tester testing: Approved testers (audio and/or visual) may be used; however, they shall be tested immediately before and after use to verify that the tester is in good working condition.

(b) Hot line tool testing: A deenergized line may be buzzed or tested, to insure that it is deenergized, using an approved hot line tool with a substantial piece of metal on the end.

(5) Attaching and removing ground(s).

(a) Inspection before use: Grounding equipment shall be given a visual inspection and all mechanical connections shall be checked for tightness before each use.

(b) Ground surface cleaning: The surface to which the ground is to be attached shall be clean before the grounding clamp is installed; otherwise, a self-cleaning clamp shall be used.

(c) Ground attachment procedure: When attaching ground(s), the ground end shall be firmly attached first to a reliable ground and then the other end shall be attached to the line or equipment by means of approved hot line tools.

(d) Ground removal procedure: No ground shall be removed until all employees are clear of the temporary grounded lines or equipment. In those instances where the specific line or equipment that has been previously energized at ~~((750))~~ 600 volts or more is being taken out of service or moved to another location, and it has been identified, isolated, tested and grounded, and the safe distances provided in Table 1 are maintained or barriers are installed to protect against contact with energized sources, and it is no longer possible to energize the line or equipment from any source, the grounds may be removed and the line or equipment may be removed from service or moved to another location. When removing the grounding set, it shall be disconnected from the line or equipment first with an approved hot line tool and lowered to a point below all energized conductors before the ground end is disconnected.

(6) Selection of ground location. Attached grounds: Ground(s) attached to each conductor being worked on are adequate when connected in a manner that will reduce the potential voltage difference across the worksite to a safe level. See examples: Figures A, B, and C.

(7) Testing without ground(s): Ground(s) may be temporarily removed when necessary for testing purposes. During a test procedure, with ground(s) removed, care shall be exercised.

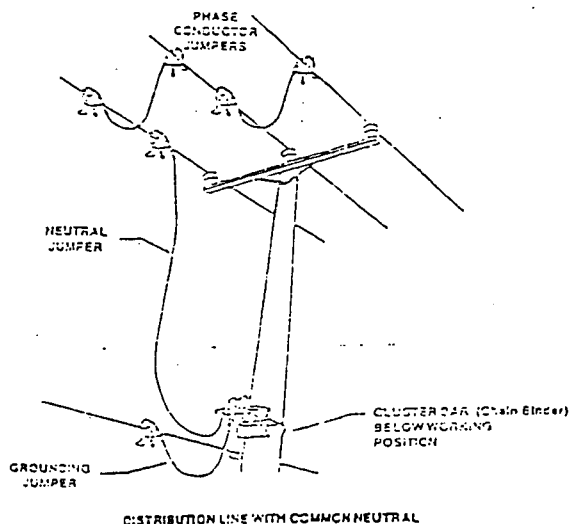
(8) Conductor separation: In cases where the conductor separation at any pole or structure is so great as to make it impractical to apply shorts on all conductors, and where only one conductor is to be worked on, only that conductor which is to be worked on needs to be grounded.

(9) Ground personnel: In cases where ground rods or pole grounds are utilized for personal protective grounding, personnel working on the ground should maintain sufficient distance from such equipment or utilize other approved procedures designed to prevent "touch-and step potential" hazards.

Note: Touch potential hazards refers to the difference in voltage measured between the grounding equipment and a worker in contact with the grounding equipment at the time it is accidentally energized. Step potential hazards refers to the difference in voltage measured between the feet of the worker standing or walking in an electrical field created by high voltage being brought to earth.

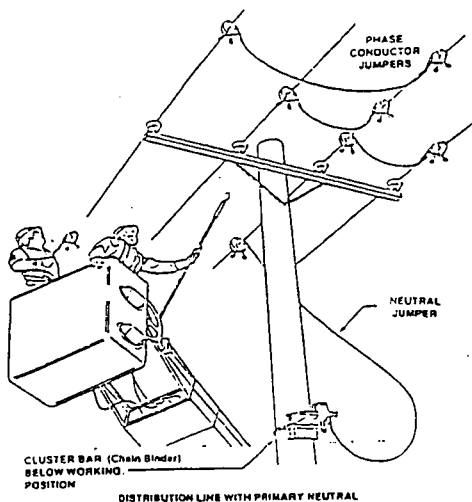
EXAMPLE OF INSTALLATION OF PERSONAL PROTECTIVE GROUNDS ON OVERHEAD LINES

FIGURE A



EXAMPLE OF INSTALLATION OF PERSONAL PROTECTIVE GROUNDS ON OVERHEAD LINES

FIGURE B



hand or with a hot stick. The stand-by shall be so positioned as to be able to observe the other employee, ~~((his))~~ their bodily movements, and verbally warn of any impending dangers. In no case when working in pairs shall employees work simultaneously on energized wires or parts of different phases or polarity.

(b) In cases of necessity the stand-by ~~((man))~~ person may temporarily assist the other employee provided that they both work on wires or parts of the same phase or polarity. Both employees shall so position themselves so that the presence of the second ~~((man))~~ person does not increase the hazard.

(c) While on patrol at night and operating a motor vehicle on public highways, there shall be two employees, at least one of whom shall be a ~~((journeyman lineman))~~ journey level lineworker or otherwise a competent or qualified employee. If repair to line or equipment is found to be of such nature as to require two ~~((linemen))~~ lineworkers, work shall not proceed until additional help has been obtained provided that in cases of emergency where delay would increase the danger to life, limb, or substantial property, one employee may clear the hazard without assistance.

(3) When only one qualified employee is available and ~~((he))~~ is required to work on high voltage, these circuits shall be de-energized while the work is performed except for emergencies.

(4) The provisions of subsection (2) of this section do not apply in the following circumstances:

(a) When re-fusing circuits or equipment with a hot stick.

(b) When operating switches by means of operating handle or switch sticks.

(c) When installing or removing a hot line clamp connection with an approved hot stick on single phase line or apparatus, providing that the connection or disconnection does not interrupt or pick up a load.

(5) Initial determination.

(a) Before any work is performed, the location of energized lines and their condition, the location and condition of energized equipment, the condition of the poles, the location of circuits and equipment including power communication lines, CATV and fire alarm circuits, shall be determined as shall any other particular hazard of a particular work site.

(b) No work shall be performed on energized lines or parts until the voltage of such equipment and lines is determined.

(6) Employees shall not stand on or otherwise come in contact with transformer cases or similar equipment while working on energized lines or equipment.

(7) Employees and conducting objects shall not come within the minimum distances as set forth in Table 1 of energized lines or conductors, except:

(a) When working on voltages of 5 Kv between phases or less employees may come within the distances as set forth in Table 1 if and so long as the employees are wearing approved rubber gloves, or use approved line hoses, rubber blankets, guards or barriers or similar approved protective equipment in such a manner as to protect against accidental contact, if the rubber gloves and other protective equipment is used in an approved manner.

**AMENDATORY SECTION** (Amending Order 76-38, filed 12/30/76)

**WAC 296-45-65027 General requirements.** (1) The live-line bare-handed technique is prohibited on voltages of ~~((750))~~ 600 volts or more.

(2) Number of ~~((men))~~ workers required to do work safely.

(a) Two competent electrical workers shall be required when performing work on energized high voltage lines or equipment or within the distances in Table 1. One of them shall serve principally as a standby ~~((man))~~ person who shall be so located that ~~((he))~~ they may physically reach the other employee in the event of an accident either with ~~((his))~~ their

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(b) Nothing contained herein shall prevent the use of approved hot sticks on any voltage.

(8) Rubber gloves shall be worn or hot sticks used when placing protective equipment on or around energized conductors of voltages of ~~((750))~~ 600 to 5,000 volts.

(9) Rubber gloves shall be worn or hot sticks used when removing tree branches, limbs, or similar objects from contact with high voltages or when such branch, branches, limbs or other conducting object is within the prohibited distance of Table 1. Rubber gloves shall be worn whenever the employee can touch or come within the prohibited distances as provided in Table 1.

(10) Employees should not wear rubber gloves while ascending or descending a pole until such time as the employees become ~~((s))~~ so positioned that ~~((he is))~~ they are likely or capable of touching voltages of ~~((750))~~ 600 or more.

(11) Rubber gloves, line hoses, rubber blankets, and other recognized protective equipment are barriers when used. Such barriers can be used on voltages of 5,000 or less between phases.

(12) It shall not be permissible to consider one part of a high voltage switch or disconnect as de-energized for the purpose of doing work on it if the remainder of the switch or disconnect remains energized unless approved barriers are erected which will prevent employees who are doing the work on such equipment from coming in direct contact with the energized parts.

(13) Conductor support tools such as link sticks, strain carriers, and insulator cradles may be used: *Provided*, That the clear insulation is at least as long as the insulator string or the minimum distance specified in Table 1 for the operating voltage.

(14) TABLE 1:

Voltage Range (phase to phase) Kilovolt	Minimum Working and Clear Hot Stick Distance
<del>((75))</del> <u>60</u> up to 15	2 ft. 0 in.
<u>15</u> up to 35	2 ft. 4 in.
35 up to 46	2 ft. 6 in.
46 up to 72.5	3 ft. 0 in.
72.5 up to 121	3 ft. 4 in.
121 up to 145	3 ft. 6 in.
145 up to 169	3 ft. 8 in.
169 up to 242	5 ft. 0 in.
242 up to 362	7 ft. 0 in. <sup>1</sup>
362 up to 552	11 ft. 0 in. <sup>1</sup>
552 up to 765	15 ft. 0 in. <sup>1</sup>

<sup>1</sup>Note: For these voltages of 242 and up, the minimum working distances and the minimum clear hot stick distance at the work location may be reduced when and so long as such distances are not less than the shortest distance between the energized part and grounded surface.

(15) Foreign operations. All foreign operations as defined within this chapter conducted on or near power lines or energized equipment shall maintain clearance according to the provisions of WAC 296-24-24019.

AMENDATORY SECTION (Amending Order 76-38, filed 12/30/76)

**WAC 296-45-65029 Overhead lines.** (1) General. ~~((a))~~ When working on or with overhead lines, this section shall be complied with as well as the applicable divisions of any other section.

(2) Strength of span and its support.

(a) Precautions shall be taken to determine that the span and the supports thereof are of a strength so as to safely bear the weight of the employee(s) and the equipment used thereon.

(b) Before an employee climbs a pole, it shall be inspected or tested to determine that such pole is safe, both above and below the ground level. If the pole is found to be unsafe for climbing, it must be guyed or braced or otherwise supported in such a manner as to allow the employees to safely perform their work.

(c) Before moving conductors there shall be a thorough inspection for strength and good condition of the adjacent supporting poles, structures, and conductor supporting hardware. Approved safeguards shall be installed on such adjacent poles or structures as may be necessary to prevent unexpected or uncontrolled movement of these adjacent poles, structures or conductors supporting equipment or conductors.

(3) When setting, moving or removing poles using cranes, derricks, gin poles, A-frames, or similar equipment near energized lines or equipment, minimum clearances shall be maintained, as provided by Table 1 except when approved barriers or other line protecting devices have been installed.

(4) Temporary guard poles or structures. Guard poles, towers, or other guard structures installed for the purpose of protecting employees, lines, conductors or equipment during the course of construction shall be installed at the same clearance requirements as for permanent construction and with strength and safety factors as required to safely support the loads that may normally be imposed on them during their use.

(5) The safest possible working position shall be assumed before starting work in the vicinity of energized wires, lines, transformers or similar energized equipment.

(6) No work should be performed in inclement weather on high voltage equipment when conditions are such as to materially increase the hazards to the employees excepting emergency work necessary to restore service.

(7) While work is being performed overhead, tools and materials shall be placed in proper receptacles when not being used. Tools and materials shall not be thrown to or from the employees on the pole or other elevated position(s) but shall be raised and lowered by means of a handline and/or tool bag. Tools and loose materials shall not be left on poles, crossarms, ladders or other elevated structures or positions.

(8) Employees shall not work in elevated positions unless secured so as to prevent accidental falling. They shall be secured by a safety belt or other approved means except when ascending, descending or moving from one location to another while in an elevated position. Before an employee throws ~~((his))~~ his/her weight on a belt, the employee shall determine that the snap or fasteners are properly engaged.



(9) When winches, trucks, or tractors are being used to raise poles, materials, to pull in wires, to pull slack or in any other operation, there shall be an operator at the controls unless the machinery or process is stopped.

(10) (~~Foremen~~) Leadworkers shall designate an employee to give signals when required.

(11) Raising poles, towers or fixtures in the close proximity of high voltage conductors shall be done under the supervision of a qualified employee.

(12) Employees shall not wear climbers on work where they are not required. Employees shall not continue to wear their climbers while working on the ground; except for momentary or short periods of time on the ground.

(13) After a capacitor has been disconnected from its source of supply, workers shall wait five minutes before short-circuiting and grounding them, unless the capacitor is equipped with an adequate grounding and/or short-circuiting device. Employees shall take care not to contact the terminals, jumpers, or line wires connected directly to capacitors until they have been properly short-circuited and/or grounded.

(14) After removal from service, short circuits shall remain on capacitors in storage until returned to service.

(15) Pulling or slacking shall be done only as directed by the (~~lineman~~) lineworker overhead while hoisting or lowering materials by means of a block.

(16) Steel cables shall not be used to raise transformers, poles or any other material except when the cable is rigged below all energized parts at a sufficient distance to prevent any possibility of the cable or conductive material being raised from contacting unguarded energized parts, unless adequately spread, guarded or clearance is maintained as provided in Table 1. The term "energized parts" in this section means wires or equipment carrying more than 300 volts.

(17) Employees shall not crawl over insulator strings but shall use a platform or other approved device to work from when making dead ends or doing other work beyond strings of insulators, at such distance that they cannot reach the work from the pole or fixture. While working on the platform or other device, they shall be secured with safety straps or a rope to prevent falling. The provision of this subsection does not apply to extra high voltage bundle conductors when the use of such equipment may produce additional hazard. Climbing over dead end assemblies is permissible only after they have been completed and pinned in the final position.

(18) When employees are working overhead, employees shall not dig or do any other work that exposes them to danger due to inattention of the work being performed overhead. Employees shall wear approved hard hats when it is necessary to be beneath overhead employees.

(19) Splicers platforms of the type commonly used for splicing or approved ladders securely hooked over or lashed to the strands may be used.

(20) When employees are required to climb through energized circuits of 2.1 KV or more, preventive measures shall be taken so as to minimize the possibility of contact with energized lines. This may include approved spreading and guarding of the energized conductors.

(21) Methods shall be used that will effectively prevent ropes, (excepting hot line ropes) including hand lines,

equipment or materials passing through the conductor level from making contact with the energized conductor or equipment of voltages of 2.1 KV or more. This may include approved spreading or guarding.

(22) All lifting equipment shall be bonded to an effective ground or it shall be considered and worked as energized and barricaded when utilized within the prohibited distance of Table 1 or if during the use of such equipment it is possible that it could come within the prohibited distance of Table 1 it shall be considered energized and barricaded.

(23) Current transformer secondaries. The secondary of a current transformer may not be opened while the transformer is energized. If the primary of the current transformer cannot be deenergized before work is performed on an instrument, a relay, or other section of a current transformer secondary circuit, the circuit shall be bridged so that the current transformer secondary will not be opened.

(24) Series streetlighting. If the open-circuit voltage exceeds 600 volts, the series streetlighting circuit shall be worked in accordance with this section as appropriate. A series loop may only be opened after the streetlighting transformer has been deenergized and isolated from the source of supply or after the loop is bridged to avoid an open-circuit condition.

AMENDATORY SECTION (Amending Order 76-38, filed 12/30/76)

**WAC 296-45-65033 Transmission line construction.**

(1) Metal tower construction.

(a) When working with unstable material, the excavation for pad or pile-type footings in excess of four feet deep shall be either sloped to the angle of repose, or shored as provided in (~~WAC 296-155-660 and 296-155-665~~) Part N, chapter 296-155 WAC. Ladders shall be used for ingress and egress to a pad or pile-type footing excavation, if such excavation is in excess of four feet in depth. Employees shall not enter excavation to clear, clean or free the auger unless shoring is first installed.

(b) A designated employee shall be used in directing mobile equipment when such equipment either is or could come within the area of the fault line of the footing excavation.

(c) No employee shall be permitted to remain in the footing when equipment is being spotted for placement or being moved within an area that is likely to disturb the soil of or in the area of the excavation. This rule applies to excavation regardless of whether the excavation is shored or not.

(d) When necessary to assure the stability of mobile equipment, the location of use for such equipment shall be graded and leveled.

(e) Tower assembly shall be carried out with a minimum exposure to employees for falling objects. Employees shall not work under overhead work unless it is required by the very process and there is no other feasible method of performing the work.

(f) During construction or assembly, guy lines shall be used to maintain and secure parts of sections in position in towers or equivalent means shall be used.

(g) Tower members and sections being assembled shall be supported by an approved method.

(2) No employees shall be permitted under a tower when it is in the process of erection or assembly, except as may be required to guide and secure the section being set.

(a) When erecting towers using hoisting equipment adjacent to energized lines or equipment, such lines or equipment shall be deenergized if practical. If the lines are not deenergized, additional caution shall be used, such as a competent qualified employee to watch in order to maintain the minimum clearance provided in Table 1.

(b) Erection cranes or similar equipment shall be set on firm, level foundations and when the equipment has outriggers, the outriggers shall be properly used.

(c) Tag lines shall be utilized to maintain control of tower sections until the section is positively secure.

(d) The load lines shall not be detached from the tower sections until the section is positively secure.

(e) Except during emergency restoration procedure, erection shall be discontinued in the event of high wind or other adverse weather conditions when such weather conditions materially increase the hazard of the work being performed.

(f) All equipment and rigging shall be regularly inspected and maintained in safe operating condition.

(g) Traffic controls shall be maintained and used when crossing highways and railways with equipment as required by the provisions of ~~((WAC 296-155-300 (7)(a) and (b)))~~ Part E, chapter 296-155 WAC.

(h) A designated employee shall be used and shall observe in order to assure that equipment being moved under or near energized lines or equipment maintains the minimum distance as required in Table 1.

(3) Stringing or removing deenergized conductors.

(a) When stringing or removing deenergized conductors, the provisions of this subdivision shall be complied with.

(b) Prior to stringing operations, there shall be a briefing with all affected employees, setting forth the plan of operation and specifying the type of equipment to be used, grounding devices and procedures to be followed, crossover methods to be employed, and the clearance authorization required, together with any other matters which the particular situation requires. Where conducting objects might contact, or come within the prohibited distance as set forth in Table 1, energized circuits, lines or where there might be a voltage build-up, the conductor being installed or removed shall be grounded first or the employee isolated or insulated.

(c) If the existing line is to be deenergized, proper clearance authorization shall be secured, and the line grounded on both sides of the crossing or the line being crossed shall be treated as energized.

(d) When crossing over energized conductors in excess of ~~((750))~~ 600 volts, rope, nets or guard structures shall be installed so as to prevent accidental contact with the energized conductor(s). Where reasonably practical, the automatic reclosing feature of the circuit interrupting device shall be made inoperative.

(e) When conductors are being strung in or removed, they shall be kept under positive control to prevent accidental contact with energized circuit.

(f) Guard structures members shall be of approved dimension, strength and securely supported to meet the purpose for which they are intended.

(g) Catch-off anchors, rigging and hoists shall be of ample capacity to prevent loss of the lines.

(h) Manufacturer's load rating shall not be exceeded for stringing lines, pulling lines, sock connections, and all load-bearing hardware and accessories.

(i) Pulling lines and accessories shall be inspected prior to each use and replaced or repaired when damaged or when there is a reasonable basis to doubt the dependability of such lines or accessories. The provisions of WAC 296-155-330 (3)(d)(ii) concerning splices shall not apply to stringing and removing of deenergized conductors.

(j) Conductor grips shall not be used on wire ropes unless designed for that particular purpose.

(k) When the conductor or pulling line is being pulled (in motion) employees shall not be permitted directly under overhead operations, nor shall any employee be permitted on the crossarm.

(l) A transmission clipping crew shall have a minimum of two structures clipped in between the crew and the conductor being sagged. When working on bare deenergized conductors, clipping and tying crews shall work between grounds at all times. The grounds shall remain intact until the conductors are clipped in except on dead end structures.

(m) Except during emergency restoration procedures, work from structures shall be discontinued when there exists adverse weather conditions such as high wind or ice on the structures which would make the work more hazardous than usual.

(n) Removing, stringing and clipping operations shall be discontinued during the process of an electrical storm when such storm reasonably presents an additional hazard.

(o) Reel handling equipment, including pulling and braking machines, shall have ample capacity, operate smoothly and be leveled and aligned in accordance with the manufacturer's operating instructions.

(p) Communication between the reel tender and pulling rig operator shall be provided and maintained.

(q) Each pull shall be snubbed or dead ended at both ends before subsequent pulls.

(4) Stringing near, above, below or otherwise adjacent to energized lines.

(a) Before stringing near, above, below, parallel to an existing line, there shall be a determination as to whether or not there exists a possibility of a dangerously induced voltage buildup, particularly during switching and grounding fault conditions. Where such possibility of danger does exist, employer shall comply with provisions of subdivision (3)(a) through (3)(j) of this subsection in addition to the provisions of subsection (3) of this section unless the line is worked as energized.

(b) When stringing adjacent to or near energized lines, the tension stringing method or other methods which preclude accidental contact between the lines being pulled and any employee shall be used.

(c) All pulling and tensioning equipment shall be isolated, insulated or effectively grounded.

(d) A ground shall be installed at the tensioning reel set-up in order to ground each bare conductor, subconductor and overhead ground conductor during stringing operations.

(e) During stringing operations, each bare conductor, subconductor and overhead ground conductor shall be grounded at the first transmission structure adjacent to both the tensioning and pulling set-up and in increments so that no point is more than two miles from a ground, and

(i) The grounds shall be left in place until the conductor installation is completed.

(ii) Such grounds shall be removed as the last step of aerial cleanup.

(iii) Except for moving type grounds, the grounds shall be placed and removed with a hot stick.

(iv) Conductors, subconductors and overhead ground conductors shall be grounded at all dead-end or catch-off points.

(f) A ground shall be located at each side and within 10 feet of working areas where conductors, subconductors or overhead ground conductors are being spliced at ground level. The two ends to be spliced shall be bonded to each other.

(g) All conductors, subconductors and overhead ground conductors shall be bonded to the tower at any isolated tower where it may be necessary to complete work on the transmission line.

(h) Work on dead-end towers shall require grounding on all deenergized lines.

(i) Removal of temporary guards: Temporary guards shall not be removed until the adjacent structures have been clipped: *Provided*, The guard structures may be removed if safety slings have first been installed on adjacent tower or structure.

(j) When performing work from the structure, clipping crews and all others working on conductors, subconductors, or overhead ground conductors shall be protected by individual grounds installed at each such work location.

**AMENDATORY SECTION** (Amending Order 76-38, filed 12/30/76)

**WAC 296-45-65035 Substations.** (1) Before work is performed on any electrically operated circuit breaker, it shall be cleared from the line and the control switch at the breaker opened. Where circuit breakers are operated by springs, solenoids or compressed air, or similar means, proper precautions shall be taken to prevent unauthorized or accidental operation of the device. This provision does not preclude repairs or adjustments that present no hazard to the employee.

(2) Disconnecting switches must be operated with approved sticks provided for that purpose unless said switches are provided with an operating mechanism having an insulated or grounded handle.

(3) Handles for manual operation of oil circuit breakers shall not be left in their sockets.

(4) Approved insulated platforms or mats shall be provided and used by employees while working on any live part of the switchboard on which any wire or appliance carries a potential in excess of 300 volts.

(5) All generators and motors having a potential of more than 300 volts shall have an approved insulated platform or mat, so arranged so as to permit the attendant to stand upon such a platform or mat when working upon live parts of such generator(s) or motor(s).

(6) Work near energized equipment.

(a) When work is performed in an energized substation, authorization shall be obtained from the designated, authorized employee before work is started.

(b) When work is to be done in an energized substation, the following shall be determined prior to the commencement of work:

(i) What facilities are energized, and

(ii) What protective equipment and precautions are necessary for the safety of personnel.

(c) Extraordinary caution shall be exercised in the handling of busbars, tower steel, materials and equipment in the vicinity of energized facilities. The provisions of Table 1 shall be complied with.

(7) Barricades and barriers.

(a) Barricades or barriers shall be installed to prevent accidental contact with energized lines or equipment.

(b) Where appropriate, signs indicating the hazard shall be posted on or near the barricade or barrier. These signs shall comply with the provisions of (~~WAC 296-155-300~~) Part E, chapter 296-155 WAC.

(8) Control panels.

(a) Work on or adjacent to energized control panels shall be performed by designated employees only.

(b) Precautions shall be taken to prevent accidental operation of relays or other devices due to jarring, vibration, or improper wiring.

(9) Mechanized equipment.

(a) Use of vehicles, gin poles, cranes and other equipment in restricted or hazardous areas shall at all times be controlled by a designated employee.

(b) All mobile cranes and derricks shall be effectively grounded when being moved or operated in close proximity to energized lines or equipment, or where there exists a reasonable possibility that said equipment could accidentally move within the prohibited distance as specified in Table 1, or the equipment shall be considered energized.

(10) Storage. (~~(a)~~) The storage requirements of WAC 296-24-21501 through 296-24-21505 are mandatory.

(11) Fences.

(a) When a substation fence must be expanded or removed for construction purposes, a temporary fence affording similar protection shall be provided and installed when the site is unattended, approved interconnection with ground shall be maintained between the temporary fence and permanent fence.

(b) All gates to all unattended substations shall be locked, except when work is in progress.

(12) Footing excavation.

(a) Excavation for auger, pad and piling-type footings for structures and towers shall comply with the provisions set forth for metal tower construction. (See WAC 296-45-65033.)

(b) No employee shall enter an unsupported auger-type excavation if such excavation is in unstable material. Necessary clean-out shall be accomplished without entry.

AMENDATORY SECTION (Amending Order 88-04, filed 5/11/88)

**WAC 296-45-65037 Underground.** (1) Protective barriers, or approved guards and warning signs must be erected before removing manhole covers or making excavations in places accessible to vehicular or pedestrian traffic.

(2) Whenever an opening is made in the street, it shall be properly guarded or covered until same is closed and whenever an obstruction is left in the roadway after dark, it shall be marked with approved lights, flares or similar devices.

(3) When work is to be performed in a manhole or unvented vault:

(i) No entry shall be permitted unless forced ventilation is provided or the atmosphere is found to be safe by testing for oxygen deficiency and the presence of explosive or potentially hazardous gases or fumes.

(ii) When unsafe conditions are detected, by testing or other means, the work area shall be ventilated and otherwise made safe before entry.

(iii) Provisions shall be made for a continuous supply of air as provided for in ~~((WAC 296-62-110))~~ Part L, chapter 296-62 WAC.

(iv) When forced ventilation is not used a method of monitoring said manhole or vault so as to prevent the occurrence of oxygen deficiency due to work being performed in said manhole or vault, and to detect the presence of any explosive gases or fumes which may occur while the employees are working in said manhole or vault.

(4) When open flames are used or smoking is permitted in manholes, adequate mechanical forced air ventilation shall be used.

(5) Before using open flames in a manhole or excavation in an area where combustible gases or liquids may be present, such as near a gasoline service station, the atmosphere of the manhole or excavation shall be tested and found safe or cleared of the combustible gases or liquids prior to the entry.

(6) When work is to be performed in manholes containing any wires or appliances carrying electrical current, they shall be in a sanitary condition.

(7) A ~~((watchman))~~ watchperson shall be kept at the surface when there is any hazard to the employees in the manhole and ~~((he))~~ the watchperson should not leave the manhole unwatched until such time as all employees are out and the cover has been replaced.

(8) Care shall be taken to prevent the possibility of vehicles or pedestrians coming in contact with the wires and equipment.

(9) Trenching and excavating. ~~((a))~~ During excavation or trenching, in order to prevent exposure of employees to the hazards created by damage to dangerous underground facilities, efforts shall be made to determine the location of such facilities and work conducted in a manner designed to avoid damage.

(10) No work shall be permitted to be done in any manhole or subway on any energized wire, cable or appliance carrying more than 300 volts of electricity by less than two competent or qualified persons who shall at all times, while performing such work, be in the same manhole or subway in which work is being done. This rule shall not

apply to work on telephone, telegraph or signal wires or cables.

(11) Trenching and excavation operations shall comply with the provisions of ~~((WAC 296-155-650 and 296-155-660))~~ Part N, chapter 296-155 WAC.

(12)(a) Cables in manholes shall be accessible to employees and clear working space shall be maintained at all times.

(b) Where cables are not permanently identified by tags or otherwise, diagrams and information establishing positive identification and position of the cables shall be provided and supplied to the employees.

(c) Where multiple cables exist in an excavation, cables other than the one being worked on shall be physically protected when necessary.

(d) When multiple cables exist in an excavation, the cables to be worked on shall be identified by approved testing unless its identification is obvious by reason of the distinctive appearance.

(e) Before cutting into a high voltage cable or opening a high voltage splice, the cable shall be de-energized then clearance obtained, tested and then grounded in an approved manner. The cable to be worked on shall be identified by tags or equivalent means.

(f) When working on buried cables or cables in manholes, the metallic sheath continuity shall be maintained by bonding across the opening or by equivalent means.

(13) Insulated platforms or other protective devices shall be provided when work is to be done on energized wires or equipment in manholes.

(14) Tools and materials shall not be left on the ground around or near the manhole opening where they might be pushed or otherwise fall into the hole.

(15) Furnaces shall always be placed in a secure, level position on the downhill side of the manhole to avoid spillage of hot metals or compounds into the manhole.

(16) Materials shall not be thrown into or out of manholes but shall be placed in the proper receptacle and hoisted in and out by means of a rope.

(17) Pulling underground cable. When pulling cable(s) all employees shall be made aware of the hazard of being caught in the sheaves, lashings or winch gears. All employees shall stand clear of the pulling line when the pull is begun or when the line is under tension. This rule applies to all work performed by means of a winch.

(18) Fishing conduit or ducts. When fishing conduit or ducts, it shall first be determined that the fish tape or wires will not contact any energized line or equipment.

(19) WAC 296-45-65023 on clearances and WAC 296-45-65026 on grounding shall be complied with.

AMENDATORY SECTION (Amending Order 83-34, filed 11/30/83)

**WAC 296-45-65038 Underground residential distribution (URD).** (1) General.

(a) Each employee shall be knowledgeable of the equipment provided for their use and shall at all times use this equipment only for the purpose intended.

(b) U.R.D. cables which are properly insulated for the voltages to which they are energized shall be considered as

an effective barrier to protect the employees and table one need not apply.

(i) Workers will take adequate precautions to avoid physical contact with energized U.R.D. cable by using approved procedures and/or protective devices.

(ii) When handling energized U.R.D. primary cables, the work shall be done with approved tools and/or procedures by two qualified employees.

(Exception: Switching is exempt from this rule.)

(iii) When energized terminators or load-break elbows are handled by a hot stick, there shall be two qualified employees at the scene.

(c) When energized pad-mounted transformers or similar equipment are to be left unlocked and open, they shall be attended by a qualified employee.

(d) Approved tools and procedures shall be used to remove any debris, vines, weeds, etc., from an underground system.

(e) A primary and secondary system neutral on any energized circuit shall not be opened under any circumstances except for testing.

(f) Primary and secondary neutrals shall be firmly connected and grounded before the circuit or equipment is energized.

(g) Where different phases are in the same vault, enclosures, or parked in some manner that they could be looped, these phases shall be marked or identified.

(h) Bayonet fuses:

(i) Bayonet fuses shall not be closed into suspected faults or overloads.

(ii) Submersible U.G. transformer installations will require other methods of energizing or deenergizing and bayonet fuses shall not be used for this purpose.

(iii) Bayonet fuses shall only be operated after pad-mount transformers have been properly vented.

(iv) Bayonet fuses shall only be operated in accordance with manufacturing design and rating capabilities.

(2) Opening and guarding holes. Whenever a cover is to be removed from a manhole or underground vault, or making excavations in places accessible to vehicular or pedestrian traffic, the following precautions shall be taken:

(a) Before removal or excavating, protective barriers or approved guards and warning signs shall be erected.

(b) After dark, approved lights, reflectors, or similar devices shall be used.

(c) Where permissible and practical, the truck shall also be placed to guard the work area.

(d) A blow torch or other open flame shall never be used to melt ice around a manhole or underground vault cover.

(e) Care shall be taken to prevent the possibility of vehicles coming in contact with the wires and equipment.

(3) Entering underground structures. Before entry into any manhole or underground vault, the following precautions shall be taken:

(a) Observe subsection (2), opening and guarding holes.

(b) Prior to entering an unvented underground vault or manhole, an inspection shall be made to determine if any hazardous conditions exist. Appropriate safeguards shall be applied as required prior to the performance of any work.

(c) No entry shall be permitted unless forced ventilation is provided or the atmosphere is found safe by testing for oxygen deficiency and for the presence of explosive gases or fumes.

(d) Where unsafe conditions are detected, by testing or other means, the work area shall be ventilated and/or otherwise made safe before entry.

(e) Provisions shall be made for a continuous supply of air as provided in (~~WAC 296-62-110 through 296-62-11013~~) Part L, chapter 296-62 WAC.

(f) When forced ventilation is not used, a method of monitoring for oxygen deficiency and to detect the presence of any explosive gases or fumes shall be used.

(g) In any emergency when it becomes necessary for an employee to enter an underground vault where oxygen deficiency, toxic or explosive gases are present, the employee shall use approved respiratory equipment, and a safety belt to which there is attached a fire retardant life line, attended by a qualified person stationed at the underground vault opening.

(h) A (~~watchman~~) watchperson shall be kept at the surface when there is any hazard to the employees in the manhole and (~~he~~) they should not leave the manhole unwatched until such time as all employees are out and the cover has been replaced.

(i) Except in emergency conditions, a ladder shall always be used when entering or leaving an underground vault.

(4) Working in manholes and underground vaults.

(a) No work shall be permitted to be done in any manhole or subway on any energized wire, cable, or appliance carrying more than 300 volts of electricity by less than two qualified persons who shall at all times, while performing such work, be in the same manhole or subway in which work is being done. This rule shall not apply to work on telephone, telegraph, or signal wires or cables.

(b) Cable in manholes or underground vaults shall be accessible to employees and a clear working space (see items (1)(b)(i) and (ii) of this section) shall be maintained at all times; and/or approved protective guards, barriers, etc. when installed and maintained in compliance with the rules of the department of labor and industries shall be considered as providing adequate working clearance for cables over 5 k.v.

If a manhole and/or underground vault is determined to be unsafe by the (~~man~~) person in charge, no work shall be done in the manhole and/or vault until the unsafe condition is corrected or deenergized.

(c) No work shall be performed on cables or equipment unless they have been properly identified by an approved method.

(d) Tools and materials shall not be thrown into or out of manholes or underground vaults, but shall be placed in proper receptacles and hoisted in and out by means of an approved method.

(5) Working on cables.

(a) Before any work is to be performed on underground cables and apparatus carrying high voltage, they shall be deenergized with the following exceptions:

(i) Replacing fuses, operating switches, closing or opening load-break elbows, when approved protective devices are used.

(ii) Work in the high-voltage compartment of pad-mounted transformers and similar equipment installed above ground, provided the work is done by approved methods.

(b) Where multiple cables exist in an excavation or manhole, cables other than the one being worked on shall be protected.

(c) Only one energized conductor shall be worked on at any one time, and protective means shall be used to insulate or isolate it from all others.

(d) Any cables to be worked on shall be identified by approved testing unless its identification is obvious by reason of the distinctive appearance, such as, tags, color, or other approved methods.

(e) Where work is to be performed on deenergized cables or equipment, the employee directly in charge of the work shall be responsible for determining that the conductors or equipment is deenergized.

(f) After conductors or equipment are cleared for work and the proper clearances have been obtained (WAC 296-45-65023) tests shall be made to determine that the conductors or equipment are deenergized.

(g) When working on underground cables, the metallic sheath continuity shall be maintained by bonding across the opening or by equivalent means.

(h) When work is to be performed in manholes containing any wires or appliances carrying electrical current, they shall be in a sanitary condition.

(i) Insulated platforms or other protective devices shall be provided when work is to be done on energized wires or equipment in manholes.

(6) Grounding. A capacitance charge can remain in the high voltage cables after it has been disconnected from the circuit and a static-type arc can occur when grounds are applied to such cables.

(a) All high voltage cables and equipment that have been energized or could become energized shall be considered as energized until such cables have been grounded.

(b) Grounding shall be done at a point as near to the work locations as possible, except where their installations or use increases the working hazard.

(c) Grounds may be removed for test purposes.

(d) When work is to be done on cables or equipment of a high-voltage underground system, precautions to prevent back-feed shall be taken. This shall include either isolating or grounding of the secondary conductors.

(e) After testing the cable dead, approved grounding devices shall be used. They shall be first connected to a ground before being brought into contact with any deenergized conductors to be grounded. When removed they shall be removed from all circuit conductors before being disconnected from ground.

(f) After grounding the cable, if the (~~workman~~) worker is to work on cable between terminations, (~~he~~) he/she must first spike the cable or use other approved methods of testing. If the cable is to be cut, it shall be cut only with approved hot cutters.

(7) Trenching and excavating.

(a) During excavation or trenching, in order to prevent exposure of employees to the hazards created by damage to underground facilities, the (~~man~~) person in charge shall make every effort to determine the location of such facilities

and conduct the work in a manner designed to avoid damage.

(b) Trenching and excavating operations shall comply with the provisions of (~~WAC 296-155-650 through 296-155-665~~) Part N, chapter 296-155 WAC.

(c) All employees engaged in trenching and excavation operations shall have access at the work site to codes, and/or standards, applicable to such work or shall have been trained in the application of trenching and excavation standards.

(8) Pulling cables. When fishing conduits or ducts, it shall first be determined that the fish tape or wires will not contact any energized lines or equipment.

(9) Heating materials. Furnaces shall always be placed in a secure level position on the downhill side of the manhole to avoid spillage of hot metals or compounds in the manhole and/or underground vault.

(10) Definitions.

(a) Load-break elbow - a connector designed to close and interrupt current on energized circuits within the design current and voltage rating.

(b) Dead-break elbow - a connector designed to be separated and engaged on deenergized circuits only.

(c) Underground network distribution system - an underground electrical installation fed from multiple primary sources directly associated with area-wide secondary network connected into a common grid.

(d) Underground residential distribution system (URD) - an electrical installation normally fed from a single primary source which may feed one or more transformers with secondaries not connected to a common grid.

AMENDATORY SECTION (Amending Order 76-38, filed 12/30/76)

**WAC 296-45-65039 Trolley maintenance, jumpering or bypassing.** (1) Energized trolley wire shall be jumpered when it is to be opened or cut.

(2) Reaching over trolley wire(s) or system(s). (~~Linemen~~) Lineworkers shall not reach over trolley wire(s) unless properly protected by line hose or rubber blanket.

(3) Reaching across sectional insulators. (~~Linemen~~) Lineworkers shall not reach across section insulator(s), insulated spacer(s) or insulated approach.

(4) Polarity on either side of sectionalizing breakers. Since the polarity on both sides of a sectionalizing insulator may be different, it is required that prior to performance of work, tests be performed with approved testing equipment to determine whether or not the polarity is the same or different on one side of the sectional insulator as compared with the other.

(5) Working on hangers. More than one truck crew shall not work on hangers attached to the same span at the same time, without rubber protection.

(6) Workers on hangers of opposite polarity. Trolley hangers and ears of opposite polarity shall not be worked on at the same time when trolley wire is energized.

(7) Checking electric switches. When electric switches are checked for operation, making it necessary to short circuit the contactor to each trolley wire, tools with insulated handles shall be used.

(8) Short circuit due to use of noninsulated or conductive long handled tools. When a hazard of short circuit exists, due to use of noninsulated or conductive long handled

tools, approved protective rubber equipment shall be used as provided in this chapter.

(9) Trolley feeders. When work is to be performed on street railway trolley feeders where it is necessary for workers to work from metal or other grounded poles or fixtures or on poles or fixtures on which grounds are maintained, the feeders shall be deenergized unless the poles or fixtures are insulated before the work is started with approved protective devices in such manner that employees cannot become grounded while working on the feeders, and employees shall wear approved rubber gloves.

**AMENDATORY SECTION** (Amending Order 89-03, filed 5/15/89, effective 6/30/89)

**WAC 296-45-65041 Aerial manlift equipment.** This section applies to aerial manlift equipment as defined in WAC 296-45-65005.

(1) A daily visual inspection and operating tests shall be made in accordance with the manufacturer's recommendation by the assigned operator.

(2) Aerial manlift equipment shall be of the type designed and maintained to meet the following safety factors:

(a) Stability test. All such equipment shall meet or exceed a safety factor of one and one-half to one in all working positions, based upon the posted working load.

(b) Structural and mechanical tests. All such equipment shall meet or exceed a safety factor of 2 to 1 in all working positions, based upon the manufacturer's maximum rated capacity.

The ~~((division of industrial safety and health))~~ department of labor and industries will accept, in lieu of (b) of this subsection, the safety factor test data submitted by the manufacturer by a competent testing laboratory, or by a registered engineering firm. When and if there exists a reasonable doubt as to whether or not the equipment will meet the data required for stability in structural and mechanical testing, the ~~((division))~~ department may require that such testing be performed on such equipment before it can be used. If the ~~((division))~~ department in writing requires that the employer test its equipment or have such equipment tested, the employer will have a reasonable time within which to secure such information as is required by this rule.

(3) Employee shall not move any such equipment in the direction of an obstructed view unless the following requirements have been met. (An obstructed view exists even though the operator is able to see to the rear by reason of a system of mirrors or a mirror.)

(a) Vehicle can be backed up only when observer signals that it is safe to do so or the driver makes a walk-around inspection prior to backing up, or

(b) The vehicle has a reverse signal alarm audible above the surrounding noise level.

(4) Hydraulic fluids.

All hydraulic fluids used for the insulated section of derrick trucks, aerial lifts, and hydraulic tools which are used on or around energized lines or equipment shall be of the insulating type.

(5) Mechanical adjustment or repairs shall not be attempted or performed in the field except by a person qualified to perform such work.

(6) Malfunction or needed repairs of manlift equipment shall be reported to the employee responsible for such repairs as soon as is reasonably possible. Use of equipment which is known to be in need of repairs or is malfunctioning is prohibited when such deficiency creates an unsafe operating condition.

(7) No employee shall ride in the basket while traveling to or from jobsites.

(8) When the support vehicle of any aerial manlift equipment is parked for operation at the jobsite, the brakes shall be set and when outriggers are used, they shall be positioned on pads or a solid surface. Use of outriggers is optional when the support vehicle of aerial manlift equipment is constructed in such a manner that makes the use of outriggers unnecessary, such as with torsion bar stabilizers or other devices that increase stability and eliminates the need for outriggers, even though installed on the vehicle. Wheel chocks shall be installed before using an aerial lift on an incline, provided they can be safely installed. All manufacturer's specifications shall be complied with.

(9) Safety check valves shall be installed in the outrigger hydraulic system which will automatically lock the outrigger in position in case of failure of the hydraulic system except when outriggers are equipped with mechanically self-locking device.

(10) The truck shall not be moved until the boom or ladder is cradled and/or fastened down, the outrigger retracted, and the power take-off disengaged, except for a short move when the truck can be moved with care and under the direction of the employee in the elevated position.

(11) Employees shall not sit or stand on the basket edge, stand on materials placed in or across the basket, or work from a ladder set inside the basket.

(12) The basket shall not be rested on a fixed object(s) so that the weight of the boom is either totally or partially supported by the basket.

(13) Neither the basket, supporting boom or ladder on aerial equipment shall come within the prohibited distance of energized high voltage conductors or equipment as set forth in Table 1 unless protective equipment is used. Special approved insulated tools, insulated fittings and insulated masts need not comply with this section.

(14) When the basket is being used in such a manner that it may contact energized high voltage lines or equipment, the vehicle shall be considered energized at line potential and the following safe practices shall be observed unless such equipment is grounded:

(a) Approved protective devices shall be used.

(b) Before physically contacting, entering or leaving the vehicle, all employees shall make sure that the boom and basket is stationary and not in contact with energized high voltage lines or equipment.

(15) While working in aerial equipment, employees shall wear an approved safety belt attached to the boom or basket, in a secure manner.

(16) No component of aerial devices shall be operated from the ground without permission from the employee in the basket except in case of emergency.

(17) Truck driver shall remain at tower controls while workers are working on towers except when the aerial manlift equipment has been properly chocked to prevent uncontrolled movement. Tower trucks shall be equipped



with a reliable signaling device between the employees working on the tower and the truck driver.

(18) Working on truck towers. Employees shall not stand on tower gates or railings. Work shall not be done from plank(s) placed on tower railings.

(19) Tower truck railings. Towers shall have standard railings and toeboards around the tower and all railings shall be constructed of wood, fiberglass or other nonmetallic material. All railings shall be a vertical height of not less than 36 inches or more than 42 inches from the floor of the platform to the upper surface of the top rail. Intermediate railings shall be midway between the floor and the underside of the top rail. Tower gates shall be so constructed as to prevent accidental opening.

(20) Tower truck decks shall be kept clear of tools, wire and other materials and tools shall be kept in proper storage area when not in use.

(21) (~~Linemen~~) Lineworkers shall not wear climbers or spurs while working on a tower truck.

(22) Employees operating controls of aerial equipment shall not stand on the ground or on separate grounded surface unless wearing rubber gloves or standing on insulated board or mat, where equipment is exposed to or operated in the near vicinity of high voltage conductors.

(23) Operating levers or controls shall be kept clear of tools, materials or obstructions.

(24) Load limits as recommended by the manufacturer of aerial manlift equipment shall not be exceeded. Shock loading of the equipment is prohibited.

(25) Employees shall not climb into or out of the basket or platform while it is elevated or change from one basket to another on dual basket equipment, except in case of emergency or when the employees involved agree that this is the safest way to perform the work. This exception shall not be used to circumvent safety rules.

(26) Employees shall not belt to adjacent poles, structures, or equipment while performing work from aerial devices.

(27) Whenever it is necessary to work beyond the guarded traffic work area, extreme care shall be exercised and all precautions taken to insure the safety of the operation and the employees.

(28) Power tools not in use shall be disconnected from external power sources.

(29) Electrical, hydraulic or air tools shall have safety switches or devices to prevent accidental operation and, in addition, a quick means of disconnecting on electrically operated equipment shall be within easy reach of the operator.

(30) Existing safety rules governing the use of hot line tools, rubber and other protective equipment and safe work practices while performing work from poles or structures shall also apply to work done from aerial manlift equipment.

(31) The basket shall be kept clean and all tools not in use shall be secured or removed.

(32) Approved warning light shall be operating when the boom leaves the cradle. This light shall be visible to approaching traffic when the boom is in position over any traveled area.

(33) A braking system, independent of the drive-line braking system, shall be installed on all aerial manlift

equipment where, from the engineering standpoint, it is feasible.

(34) Safety check valves shall be installed in the hydraulic system of aerial manlift equipment to automatically lock the boom or ladder in position in case of failure to any part of the hydraulic pressure system.

(35) All aerial manlift equipment shall have both upper and lower controls (except ladder trucks need not have upper controls). The upper controls shall not be capable of rendering the lower controls inoperative. The lower controls should be located at or near the base of the aerial structure.

If the lower controls are used, the operator shall have a view of the elevated employee(s) or there shall be communication between the operator and the employee in the elevated aerial structure: *Provided*, That no employee shall be raised, lowered, or moved into or from the elevated position in any aerial manlift equipment unless there is another employee, not in the elevated aerial structure, available at the site to operate the lower controls, except as follows:

(a) Where there is a fixed method permanently attached to or part of the equipment which will permit an employee to descend from the elevated position without lowering the elevated structure, or

(b) Where there is a system which will provide operation from the elevated position in the event of failure or malfunction of the primary system.

This section shall not be interpreted as an exception to any other rule in this chapter.

(36) Controls in aerial manlift equipment shall be protected from accidental operation. Controls of the outriggers shall also be protected from accidental operation. Such protection may be by guarding or equivalent means.

(37) The manufacturer's recommended maximum load limit shall be posted at a conspicuous place near each set of controls and shall be kept in a legible condition.

(38) Side member guys on aerial ladders shall be insulated.

(39) The manufacturer's operator's instructional manual shall be kept on the vehicle.

(40) Operating instructions, proper sequence and maintenance procedures prescribed by the manufacturer for operation of the equipment shall be followed.

#### AMENDATORY SECTION (Amending Order 76-38, filed 12/30/76)

**WAC 296-45-65045 Material handling.** (1) Prior to unloading steel, poles, crossarms and similar materials, the load shall be thoroughly examined to determine if the load has shifted, binders or stakes have broken or the load is otherwise hazardous to employees. ((~~at~~)) The hoist rope shall not be wrapped around the load. This provision shall not apply to electric construction crews when setting or removing poles.

(2) Pole handling.

(a) During pole hauling operations, all loads shall be secured to prevent displacement, and a red flag shall be displayed at the trailing end of the longest pole.

(b) While loading and unloading materials, roadways shall not be blocked unless approved traffic control is used.

(c) When hauling poles during darkness, illuminated warning devices shall be attached to the trailing end of the

longest pole in accordance with the state of Washington motor vehicle code.

(3) Tag lines. When necessary to control loads, tag lines or other approved devices shall be used.

(4) Oil filled equipment. During construction or repair of oil filled equipment, the oil may be stored in temporary containers other than those required by WAC 296-155-270, such as pillow tanks.

(5) Storage of tools and materials. All tools and materials shall be stored in a safe and orderly manner in yards for equipment and other areas.

**AMENDATORY SECTION** (Amending Order 76-38, filed 12/30/76)

**WAC 296-45-65047 Specification for ~~((linemen's))~~ lineworker's belts and similar equipment.** (1) All hardware for ~~((linemen's))~~ lineworker's body belts, safety straps and lanyards shall be drop forged or pressed steel and have a corrosive resistive finish tested to the American Society for Testing and Materials B117 as published in 1964 (50 hour test). Surfaces shall be smooth and free from sharp edges.

(a) All buckles shall be those guaranteed by the manufacturer as having at least a 2,000-pound tensile strength with a maximum permanent deformation no greater than one sixty-fourth inch.

(b) All "D" rings shall be those guaranteed by the manufacturer as having at least a 5,000-pound tensile strength without cracking or breaking.

(c) All snap hooks shall be those guaranteed by the manufacturer as having at least a 5,000-pound tensile strength without distortion sufficient to release the keeper.

(d) All fabric used for safety straps shall be guaranteed by the manufacturer as being capable of withstanding either AC or DC dielectric test of not less than 25,000 volts per foot "dry" for 3 minutes without visible deterioration.

(e) All fabric and leather used shall be that which has been represented by the manufacturer as having been tested for leakage current of 1 milliampere with a potential 3,000 volts when applied to the electrodes positioned 12 inches apart.

(f) The cushion part of the body belt may be either leather or other material provided that it;

(i) Has no exposed rivets on the inside;

(ii) Is at least 3 inches in width;

(iii) Is at least five thirty-seconds inch thick, if made of leather; or have equivalent strength if made of other material.

(iv) Has pocket tabs that extend at least 1-1/2 inches down and three inches back of the inside of circle of each "D" ring for riveting on plier or tool pockets. On shifting "D" belts, this measurement for pocket tabs shall be taken when the "D" ring section is centered.

(v) A maximum of four tool loops shall be so situated on the body belt that four inches of the body belt in the center of the back, measuring from "D" ring to "D" ring, shall be free of tool loops and any other attachments.

(vi) All stitching shall be of minimum 42-pound weight nylon or equivalent thread and shall be lock stitched. Stitching parallel to an edge shall not be less than three-sixteenths inch from edge of narrowest member caught by the thread. The use of cross-stitching on leather is prohibit-

ed. Approved copper, steel or equivalent liners shall be used around the bar of "D" rings to reduce the wear.

(vii) The keeper of snap hooks shall have a spring tension that will not allow the keeper to begin to open with a weight of 2-1/2 pounds or less, but the keeper of snap hooks shall begin to open with a weight of four pounds, when the weight is supported on the keeper against the end of the nose.

(2) Testing ~~((linemen's))~~ lineworker's safety straps, body belts and lanyards shall be in accordance with the following procedure:

(a) Attach one end of the safety strap or lanyard to a rigid support, the other end shall be attached to a 250-pound canvas bag of sand;

(b) Allow the 250-pound canvas bag of sand to free fall 4 feet for (safety strap test) and 6 feet for (lanyard test), in each case stopping the fall of the 250-pound bag;

(c) Failure of the strap or lanyard shall be indicated by any breakage, or slippage sufficient to permit the bag to fall free of the strap or lanyard. The entire "body belt assembly" shall be tested using one "D" ring. A safety strap or lanyard shall be used that is capable of passing the "impact loading test" and attached as required in item (a) of this subdivision. The body belt shall be secured to the 250-pound bag of sand at a point to simulate the waist of a man and allowed to drop as stated in item (b) of this subdivision. Failure of the body belt shall be indicated by any breakage, or slippage sufficient to permit the bag to fall free of the body belt.

(d) Life lines and lanyards shall comply with the provisions of ~~((WAC 296-155-225 (2), (3), (5) and (6)))~~ Part C-1, chapter 296-155 WAC.

**AMENDATORY SECTION** (Amending Order 81-9, filed 6/17/81)

**WAC 296-45-66001 Electrical hazards.** (1) This section applies to tree trimming by contractors under WAC 296-17-506 (Class 1-6), tree trimming near energized power lines on utility property, governmental and privately owned systems.

(2) Definitions applicable to this section.

(a) "Aerial manlift equipment" - all types of equipment such as extended towers, boom-mounted cages or baskets and truck-mounted ladders. This equipment is primarily designed to place personnel and equipment aloft for working.

(b) "Qualified line-clearing tree trimmer" - a tree worker who through related training and on-the-job experience is familiar with the special techniques and hazards involved in line clearing.

(c) "Qualified line-clearing tree-trimmer trainee" - any worker regularly assigned to a line-clearing tree-trimming crew and undergoing related training and on-the-job training who, in the course of such training, has demonstrated ~~((his))~~ the ability to perform ~~((his))~~ duties safely at ~~((his))~~ this level of training.

(d) "Tree trimming ~~((groundman))~~ groundworker" - a member of crew working on the ground under the direction of ~~((foreman))~~ leadworker or tree trimmer.

(3) First aid. In addition to complying with the first aid provisions as found in ~~((WAC 296-24-060 through 296-24-073))~~ Part A-1, chapter 296-24 WAC, all employees whose duties require them to work near energized wires, or climb

trees shall take an approved course in controlling bleeding and cardiopulmonary resuscitation, and be capable of aerial or tree rescue and remain proficient in its application.

**AMENDATORY SECTION** (Amending Order 81-9, filed 6/17/81)

**WAC 296-45-66005 Insulated tools used for tree trimming.** (1) Only insulated tools having manufacturer's certification of withstanding the following minimum tests shall be used:

- (a) 100,000 volts per foot of length for 5 minutes when the tool is made of fiberglass; or
- (b) 75,000 volts per foot of length for 3 minutes when the tool is made of wood; or
- (c) Other tests which equal or exceed (a) and (b) of this subsection.

(2) All insulated tools shall be visually inspected each day before use. All insulated tools shall be wiped clean before being used.

(3) Defective insulated tools shall not be used and shall be marked as defective and turned in for repair or replacement.

(4) Hand tools.

(a) All hydraulic tools which are used near energized lines or equipment shall use nonconductive hoses having approved strength for the normal operating pressures. The provisions of ~~((WAC 296-155-360 (4)(a) and (b)))~~ Part G, chapter 296-155 WAC are mandatory.

(b) All pneumatic tools which are used near energized lines or equipment shall:

- (i) Have nonconducting hoses having approved strength for the normal operating pressures, and
- (ii) Have an accumulator on the compressor to collect moisture.

(5) All tools shall be kept in good working condition and shall be properly stored. Defective tools shall be taken out of service.

(6) Wearing apparel. Goggles, hearing protection, respirators, and other such personal protective devices shall not be interchanged among employees unless they have been sanitized.

**AMENDATORY SECTION** (Amending Order 82-22, filed 6/11/82)

**WAC 296-45-66007 Aerial manlift equipment.** This section applies to aerial manlift equipment as defined in WAC 296-45-65005.

(1) A daily visual inspection and operating tests shall be made in accordance with the manufacturer's recommendation by the assigned operator.

(2) Aerial manlift equipment shall be of the type designed and maintained to meet the following safety factors:

(a) Stability test. All such equipment shall meet or exceed a safety factor of one and one-half to one in all working positions, based upon the posted working load.

(b) Structural and mechanical tests. All such equipment shall meet or exceed a safety factor of 2 to 1 in all working positions, based upon the manufacturer's maximum rated capacity.

(c) The ~~((division of industrial safety and health))~~ department of labor and industries will accept, in lieu of subdivision (b) of this section, the safety factor test data submitted by the manufacturer by a competent testing laboratory, or by a registered engineering firm. When and if there exists a reasonable doubt as to whether or not the equipment will meet the data required for stability in structural and mechanical testing, the ~~((division))~~ department may require that such testing be performed on such equipment before it can be used. If the ~~((division))~~ department in writing requires that the employer test its equipment or have such equipment tested, the employer will have a reasonable time within which to secure such information as is required by this rule.

(3) Employee shall not move any such equipment in the direction of an obstructed view unless the following requirements have been met. (An obstructed view exists even though the operator is able to see to the rear by reason of a system of mirrors or a mirror.)

(a) Vehicle can be backed up only when observer signals that it is safe to do so or the driver makes a walk-around inspection prior to backing up, or

(b) The vehicle has a reverse signal alarm audible above the surrounding noise level.

(4) Hydraulic fluids. All hydraulic fluids used for the insulated section of derrick trucks, aerial lifts, and hydraulic tools which are used around energized lines or equipment shall be of the insulating type.

(5) Mechanical adjustment or repairs shall not be attempted or performed in the field except by a person qualified to perform such work.

(6) Malfunction or needed repairs of manlift equipment shall be reported to the employee responsible for such repairs as soon as is reasonably possible. Use of equipment which is known to be in need of repairs or is malfunctioning is prohibited when such deficiency creates an unsafe operating condition.

(7) No employee shall ride in the basket while traveling to or from jobsites.

(8) When any aerial manlift equipment is parked for operation at the jobsite, the brakes shall be set. Wheel chocks shall be used to prevent accidental movement while parked on an incline. If the aerial manlift equipment has outriggers, the outriggers shall be used in accordance with manufacturer's specifications.

(9) Safety check valves shall be installed in the outrigger hydraulic system which will automatically lock the outrigger in position in case of failure of the hydraulic system except when outriggers are equipped with mechanically self-locking device.

(10) The truck shall not be moved until the boom or ladder is cradled and/or fastened down, the outrigger retracted, and the power take-off disengaged, except for a short move when the truck can be moved with care and under the direction of the employee in the elevated position.

(11) Employees shall not sit or stand on the basket edge, stand on materials placed in or across the basket, or work from a ladder set inside the basket.

(12) The basket shall not be rested on a fixed object(s) so that the weight of the boom is either totally or partially supported by the basket.

(13) Neither the basket, supporting boom or ladder on aerial equipment shall come within the prohibited distance of energized high voltage conductors or equipment as set forth in Table 1 unless protective equipment is installed by a qualified person.

(14) While working in aerial equipment employees shall wear an approved safety belt attached to the boom or basket, in a secure manner.

(15) No component of aerial devices shall be operated from the ground without permission from the employee in the basket except in case of emergency.

(16) Truck driver shall remain at tower controls while workers are working on towers except when the aerial manlift equipment has been properly chocked to prevent uncontrolled movement. Tower trucks shall be equipped with a reliable signaling device between the employees working on the tower and the truck driver.

(17) Operating levers or controls shall be kept clear of tools, materials or obstructions.

(18) Load limits as recommended by the manufacturer of aerial manlift equipment shall not be exceeded. Shock loading of the equipment is prohibited.

(19) A tree trimmer may climb out of a basket into a tree or from a tree back into the basket so long as he is properly tied into the tree during the entire maneuver.

(20) Employees shall not belt to trees, structures, or equipment while performing work from aerial devices.

(21) Whenever it is necessary to work beyond the guarded traffic work area, extreme care shall be exercised and all precautions taken to ensure the safety of the operation and the employees.

(22) Power tools not in use shall be disconnected from external power sources.

(23) Electrical, hydraulic or air tools shall have safety switches or devices to prevent accidental operation and, in addition, a quick means of disconnecting on electrically operated equipment shall be within easy reach of the operator.

(24) The basket shall be kept clean and all tools not in use shall be secured or removed.

(25) Approved warning light shall be operating when the boom leaves the cradle. This light shall be visible to approaching traffic when the boom is in position over any traveled area.

(26) Safety check valves shall be installed in the hydraulic system of aerial manlift equipment to automatically lock the boom or ladder in position in case of failure to any part of the hydraulic pressure system.

(27) All aerial manlift equipment shall have both upper and lower controls (except ladder trucks need not have upper controls). The upper controls shall not be capable of rendering the lower controls inoperative. The lower controls should be located at or near the base of the aerial structure.

If the lower controls are used, the operator shall have a view of the elevated employee(s) or there shall be communication between the operator and the employee in the elevated aerial structure: *Provided*, That no employee shall be raised, lowered, or moved into or from the elevated position in any aerial manlift equipment unless there is another employee, not in the elevated aerial structure, available at the site to operate the lower controls, except as follows:

(a) Where there is a fixed method permanently attached to or part of the equipment which will permit an employee to descend from the elevated position without lowering the elevated structure, or

(b) Where there is a system which will provide operation from the elevated position in the event of failure or malfunction of the primary system.

This section shall not be interpreted as an exception to any other rule in this chapter.

(28) Controls in aerial manlift equipment shall be protected from accidental operation. Controls of the outriggers shall also be protected from accidental operation. Such protection may be by guarding or equivalent means.

(29) The manufacturer's recommended maximum load limit shall be posted at a conspicuous place near each set of controls and shall be kept in a legible condition.

(30) The manufacturer's operator's instruction manual shall be kept on the vehicle.

AMENDATORY SECTION (Amending Order 81-9, filed 6/17/81)

**WAC 296-45-66009 All motor vehicle and trailer operations.** (1) When motor vehicles and trailers are operated on public right-of-way, highways or similar areas, the equipment shall be operated and maintained in conformance with the motor vehicle code of the state of Washington, chapters 46.04 through 46.61 RCW.

((+)) (2) Whenever and wherever such motor vehicle is operated, such equipment shall have a safe functioning brake and an emergency brake. In addition, all motor vehicles and trailers shall have such equipment as is necessary for the safe operation of the vehicle(s).

((2)) (3) When traveling, employees must ride inside the vehicle and shall not ride on the sides or on the top, nor shall employees ascend or descend a motor vehicle when such vehicle is in motion.

((3)) (4) Warning signs, flares and other protective devices shall be used which shall conform with the requirements for road construction or maintenance as set forth in chapter 46.37 RCW.

AMENDATORY SECTION (Amending Order 81-9, filed 6/17/81)

**WAC 296-45-66011 Working in proximity to electrical hazards.** (1) Contractors shall ensure that a close inspection is made by the employee and by the (~~foreman~~) leadworker or supervisor in charge before climbing, entering, or working around any tree, to determine whether an electrical power conductor passes through the tree, or passes within reaching distance of an employee working in the tree.

(2) Employees engaged in trimming, removing, or clearing trees from lines shall be required to consider all overhead electrical power conductors to be energized until such energized lines have been de-energized and grounded in accordance with the system policy.

(3) Only qualified line-clearing tree trimmer or tree trimming trainee familiar with the special techniques and hazards involved in line clearing, shall be permitted to perform the work if it is found that an electrical hazard exists.

PROPOSED

(4) During all tree working operations aloft where an electrical hazard of more than ~~((750))~~ 600 volts exists, there shall be a second employee or trainee qualified in line clearance tree trimming within normal voice communication.

(5) Where tree work is performed by employees qualified in line-clearing tree trimming and trainees qualified in line-clearing tree trimming, the clearances from energized conductors given in Table 1 shall apply.

TABLE 1

Minimum Working Distances from Energized Conductors For Line-Clearing Tree Trimmers and Line-Clearing Tree Trimmer Trainees

Voltage Range (Phase to Phase) (kilovolts)	Minimum Working Distance
2.1 to 15.0	2 ft. 0 in.
15.1 to 35.0	2 ft. 4 in.
35.1 to 46.0	2 ft. 6 in.
46.1 to 72.5	3 ft. 0 in.
72.6 to 121.0	3 ft. 4 in.
138.0 to 145.0	3 ft. 6 in.
161.0 to 169.0	3 ft. 8 in.
230.0 to 242.0	5 ft. 0 in.
345.0 to 362.0	7 ft. 0 in.
500.0 to 552.0	11 ft. 0 in.
700.0 to 765.0	15 ft. 0 in.

(6) Branches hanging on an energized conductor may only be removed using approved insulated tools by a qualified line-clearing tree trimmer.

**AMENDATORY SECTION** (Amending Order 76-38, filed 12/30/76)

**WAC 296-45-67503 Definitions.** (1) "Cargo hooks." A device attached or suspended from an aircraft which is used to connect an external load to the aircraft through direct couplings or by lead lines. This unit has both mechanical and electrical locking/unlocking means.

(2) "Designated employees." Those employees selected or designated by the employer to work under or near helicopters who have first been instructed in hooking, unhooking, guiding and securing the load, including the ~~((signalman))~~ signalperson, all of whom have been instructed in the hazards of helicopter work and who know the provisions of this section.

(3) "Downwash." A down and outward air column from the main rotor system.

(4) "Ground personnel or crew." Those employees who are physically and mentally capable, who are familiar with the hazards of helicopter use in power distribution and transmission line work, and who know these rules and the methods of operation.

(5) "Helicopter," ~~(( $\pm$ ))~~ "helicopter crane," and "rotorcraft." Those aircraft whose support in the air is derived solely from the reaction of a stream of air driven downward by propellers revolving around a vertical axis, which are designed for and capable of carrying external loads. The use of the word helicopter in these rules shall also mean helicopter crane, rotorcraft, or similar device.

(6) "Hooking and unhooking." That process by which an external load is either attached to or released from the cargo hook.

(7) "Positive guide system." A system or method of installing a load into position so that the load is capable of being released from the helicopter without being otherwise secured so that the load will remain in position permanently or until otherwise secured by physical means.

(8) "Rotors." That system of blades which rotates or revolves to supply lift or direction to the rotorcraft.

(9) "Approved rubber gloves." Rubber insulating gloves used for protection of electrical workers from electric shock while working on energized conductors and equipment.

(10) ~~((Signalman))~~ Signalperson. That member of the ground crew that is designated by an employer to direct, signal and otherwise communicate with the operator of the helicopter.

(11) "Sling line." A strap, chain, rope or the like used to securely hold something being lifted, lowered, carried or otherwise suspended.

(12) "Sock line." A rope(s), cable(s) or similar line(s) which is used to pull a conductor line from a reel or to remove existing strung conductors from poles or towers.

(13) "Static charge." A stationary charge of electricity.

(14) "Tag line." A rope or similar device used to guide or control the direction or movement of a load.

**AMENDATORY SECTION** (Amending Order 76-38, filed 12/30/76)

**WAC 296-45-67505 Briefing.** (1) Before work or a job involving helicopters begins, there shall be a discussion between all affected employees which shall include the ground crew, ~~((signalman))~~ signalperson and pilot or operator of the helicopter. The discussion shall cover the particular hazards of the job, the methods of performing the work and the signals to be used. All employees shall, before the beginning of such work or job, understand in detail the hazards, the methods and the signals to be used and these regulations.

(2) Every employee before being allowed to work on or near helicopter(s) operating with or without load shall be advised and understand the hazards involved, the methods of performing the work, the signals being used and these regulations.

**AMENDATORY SECTION** (Amending Order 76-38, filed 12/30/76)

**WAC 296-45-67507 Signals.** (1) The signals between the ~~((signalman))~~ signalperson and the operator of the helicopter shall be those submitted to the Federal Aviation Agency for the particular procedure or job. In the event no signals have been submitted to the Federal Aviation Administration, a system of signaling shall be used which has been reduced to writing and which is capable of being clearly understood by all employees and others involved in the job.

(2) Should there occur a change in the hazards, method of performing the job, signals to be used, or other operating conditions during the course of any particular job, a conference shall immediately be held at which time all affected employees and others, including ~~((signalmen, groundmen))~~ signalpersons, groundworkers, pilot(s), will be advised of

such hazards or change of operation. No employee shall be permitted to work unless such employee and others fully understand the change(s) which have taken place.

**AMENDATORY SECTION** (Amending Order 76-38, filed 12/30/76)

**WAC 296-45-67521 Operator's responsibility.** (1) The helicopter operator shall be responsible for the size, weight and manner in which loads are connected to the helicopter.

((a)) (2) No load shall be made if the helicopter operator believes the lift cannot safely be performed. The employer shall make certain that the operator of the helicopter is able to freely exercise ((his)) their prerogative and judgment as to safe operation of the helicopter itself concerning size, weight and manner by which loads are connected.

((2)) (3) No employee shall work on, under, near or in conjunction with a helicopter whose operation does not correspond with the foregoing provisions.

**AMENDATORY SECTION** (Amending Order 76-38, filed 12/30/76)

**WAC 296-45-67527 Load permitted.** (1) Weight of the external load shall not exceed the manufacturer's load limit.

((4)) (2) A helicopter shall not pull any cable, rope or similar line which is at any point attached to a fixed object other than the helicopter itself. Helicopters may pull a free-wheeling sock line so long as the end of the sock line is not tied to a reel, truck, or other fixed object. Such line cannot be tied to or otherwise secured to the roll-off reel other than by having been wrapped around such reel.

**AMENDATORY SECTION** (Amending Order 76-38, filed 12/30/76)

**WAC 296-45-67531 Signal systems.** (1) Communication shall be maintained between the air crew and ground personnel at all times. Such signal systems shall be understood by the air crew and the ground crew, including ((signalman)) signalpersons, prior to the hoisting of any load. There shall be constant radio and hand signals used. The ((signalman)) signalperson shall have the sole and exclusive function during periods of loading and unloading of signaling and maintaining communications with the pilot. The ((signalman)) signalperson shall be so dressed as to make ((his)) their appearance distinguishable from other members of the ground crew by the operator of the craft. This may be by way of orange-colored gloves, vest, or other wearing apparel. In addition, the ((foreman)) leadworker and one top ((man)) person shall also have an operating transmitter and receiver.

((4)) (2) Designated employees may come within 50 feet of the helicopter when the rotor blades are turning, but no closer, other than to enter the craft or to hook or unhook the load or do other essential functions. Other employee(s) shall not come closer than 100 feet of the craft when it is operating.

**AMENDATORY SECTION** (Amending Order 76-38, filed 12/30/76)

**WAC 296-45-67535 In helicopter.** (1) While in the helicopter, safety belts will remain fastened at all times except when pilot or operator instructs otherwise or while entering or leaving the helicopter.

(2) No smoking in the helicopter unless otherwise permitted by the pilot.

(3) All rack cargo will be secured prior to and during takeoff and flight.

(4) All internal cargo will be secured or otherwise held.

(5) No gear shall be thrown toward or placed in front of the cockpit on or near plexiglass enclosure.

(6) No employee shall lean against or rub the plexiglass.

(7) No employee shall ride in or work under or near a helicopter with less than 15 minutes reserve fuel.

(8) No employee shall have sharp objects in ((his)) their pocket while sitting in or on the helicopter.

(9) No employee shall touch any switch, knob, instrument, or other control or device in the cockpit unless specifically directed by the operator.

(10) No cargo shall be thrown into pans or cargo rack.

(11) No employee shall obscure or otherwise obstruct the pilot's ability to visually see the instruments or flight path during flight or operation.

(12) No employee shall attempt to slow or stop the rotorcraft blades by hand unless directed or instructed to do so and aided by the pilot.

**AMENDATORY SECTION** (Amending Order 76-38, filed 12/30/76)

**WAC 296-45-67543 General.** No employee shall work under or in the near vicinity of helicopters unless the operator has a valid license for operating the craft, knows the signals to be used, has been present at the last briefing held and knows these rules. No employee shall work under or near such craft if the operator is under the influence of intoxicating beverages or prescription medications which affect ((his)) his/her ability, nor shall any employee work under or near such craft if the operator is careless or engages in any negligent or reckless operation of the helicopter.

**NEW SECTION**

**WAC 296-45-680 Communication facilities.** (1) Microwave transmission. The employer shall ensure that no employee looks into an open waveguide or antenna that is connected to an energized microwave source.

(2) If the electromagnetic radiation level within an accessible area associated with microwave communications systems exceeds the radiation protection guide given in chapter 296-62 WAC, Part J-1. The area shall be posted with the warning symbol described in chapter 296-62 WAC, Part J-1. The lower half of the warning symbol shall include the following statements or ones that the employer can demonstrate are equivalent: Radiation in this area may exceed hazard limitations and special precautions are required. Obtain specific instruction before entering.

(3) When an employee works in an area where the electromagnetic radiation could exceed the radiation protection guide, the employer shall institute measures that ensure

that the employee's exposure is not greater than that permitted by that guide. Such measures may include administrative and engineering controls and personal protective equipment.

(4) Power line carrier. Power line carrier work, including work on equipment used for coupling carrier current to power line conductors, shall be performed in accordance with the requirements of this section pertaining to work on energized lines.

#### NEW SECTION

**WAC 296-45-690 Power generation.** (1) This section provides additional requirements and related work practices for power generating plants.

(a) Interlocks and other safety devices.

(i) Interlocks and other safety devices shall be maintained in a safe, operable condition.

(ii) No interlock or other safety device may be modified to defeat its function, except for test, repair, or adjustment of the device.

(b) Changing brushes. Before exciter or generator brushes are changed while the generator is in service, the exciter or generator field shall be checked to determine whether a ground condition exists. The brushes may not be changed while the generator is energized if a ground condition exists.

(c) Access and working space. Sufficient access and working space shall be provided and maintained about electric equipment to permit ready and safe operation and maintenance of such equipment.

Note: Guidelines for the dimensions of access and workspace about electric equipment in generating stations are contained in American National Standard-National Electrical Safety Code, ANSI C2-1987. Installations meeting the ANSI provisions comply with this section. An installation that does not conform to this ANSI standard will, nonetheless, be considered as complying with this section if the employer can demonstrate that the installation provides ready and safe access based on the following evidence:

<sup>1</sup>That the installation conforms to the edition of ANSI C2 that was in effect at the time the installation was made;

<sup>2</sup>That the configuration of the installation enables employees to maintain the minimum approach distances required by this section while they work on exposed, energized parts; and

<sup>3</sup>That the precautions taken when work is performed on the installation provide protection equivalent to the protection that would be provided by access and working space meeting ANSI C2-1987.

(d) Guarding of rooms containing electric supply equipment.

(i) Rooms and spaces in which electric supply lines or equipment are installed shall meet the requirements of this section under the following conditions:

(A) If exposed live parts operating at 50 to 150 volts to ground are located within eight feet of the ground or other working surface inside the room or space;

(B) If live parts operating at 151 to 600 volts and located within eight feet of the ground or other working surface inside the room or space are guarded only by location, as permitted under this section; or

(C) If live parts operating at more than 600 volts are located within the room or space; unless:

(I) The live parts are enclosed within grounded, metal-enclosed equipment whose only openings are designed so

that foreign objects inserted in these openings will be deflected from energized parts; or

(II) The live parts are installed at a height above ground and any other working surface that provides protection at the voltage to which they are energized corresponding to the protection provided by an eight-foot height at 50 volts.

(ii) The rooms and spaces shall be so enclosed within fences, screens, partitions, or walls as to minimize the possibility that unqualified persons will enter.

(iii) Signs warning unqualified persons to keep out shall be displayed at entrances to the rooms and spaces.

(iv) Entrances to rooms and spaces that are not under the observation of an attendant shall be kept locked.

(v) Unqualified persons may not enter the rooms or spaces while the electric supply lines or equipment are energized.

(e) Guarding of energized parts.

(i) Guards shall be provided around all live parts operating at more than 150 volts to ground without an insulating covering, unless the location of the live parts gives sufficient horizontal or vertical or a combination of these clearances to minimize the possibility of accidental employee contact.

Note: Guidelines for the dimensions of clearance distances about electric equipment in generating stations are contained in American National Standard-National Electrical Safety Code, ANSI C2-1987. Installations meeting the ANSI provisions comply with (e)(i) of this subsection. An installation that does not conform to this ANSI standard will, nonetheless, be considered as complying with (e)(i) of this subsection if the employer can demonstrate that the installation provides sufficient clearance based on the following evidence:

<sup>1</sup>That the installation conforms to the edition of ANSI C2 that was in effect at the time the installation was made;

<sup>2</sup>That each employee is isolated from energized parts at the point of closest approach; and

<sup>3</sup>That the precautions taken when work is performed on the installation provide protection equivalent to the protection that would be provided by horizontal and vertical clearances meeting ANSI C2-1987.

(ii) Except for fuse replacement or other necessary access by qualified persons, the guarding of energized parts within a compartment shall be maintained during operation and maintenance functions to prevent accidental contact with energized parts and to prevent tools or other equipment from being dropped on energized parts.

(iii) When guards are removed from energized equipment, barriers shall be installed around the work area to prevent employees who are not working on the equipment, but who are in the area, from contacting the exposed live parts.

(f) Water or steam spaces. The following requirements apply to work in water and steam spaces associated with boilers:

(i) A designated employee shall inspect conditions before work is permitted and after its completion. Eye protection, or full face protection if necessary, shall be worn at all times when condenser, heater, or boiler tubes are being cleaned.

(ii) Where it is necessary for employees to work near tube ends during cleaning, shielding shall be installed at the tube ends.



(g) Chemical cleaning of boilers and pressure vessels. The following requirements apply to chemical cleaning of boilers and pressure vessels:

(i) Areas where chemical cleaning is in progress shall be cordoned off to restrict access during cleaning. If flammable liquids, gases, or vapors or combustible materials will be used or might be produced during the cleaning process, the following requirements also apply:

(A) The area shall be posted with signs restricting entry and warning of the hazards of fire and explosion; and

(B) Smoking, welding, and other possible ignition sources are prohibited in these restricted areas.

(ii) The number of personnel in the restricted area shall be limited to those necessary to accomplish the task safely.

(iii) There shall be ready access to water or showers for emergency use.

Note: See chapter 296-24 WAC, Part B for requirements that apply to the water supply and to washing facilities.

(iv) Employees in restricted areas shall wear protective equipment meeting the requirements of this chapter and including, but not limited to, protective clothing, boots, goggles, and gloves.

(h) Chlorine systems.

(i) Chlorine system enclosures shall be posted with signs restricting entry and warning of the hazard to health and the hazards of fire and explosion.

Note: See chapter 296-62 WAC for requirements necessary to protect the health of employees from the effects of chlorine.

(ii) Only designated employees may enter the restricted area. Additionally, the number of personnel shall be limited to those necessary to accomplish the task safely.

(iii) Emergency repair kits shall be available near the shelter or enclosure to allow for the prompt repair of leaks in chlorine lines, equipment, or containers.

(iv) Before repair procedures are started, chlorine tanks, pipes, and equipment shall be purged with dry air and isolated from other sources of chlorine.

(v) The employer shall ensure that chlorine is not mixed with materials that would react with the chlorine in a dangerously exothermic or other hazardous manner.

(i) Boilers.

(i) Before internal furnace or ash hopper repair work is started, overhead areas shall be inspected for possible falling objects. If the hazard of falling objects exists, overhead protection such as planking or nets shall be provided.

(ii) When opening an operating boiler door, employees shall stand clear of the opening of the door to avoid the heat blast and gases which may escape from the boiler.

(j) Turbine generators.

(i) Smoking and other ignition sources are prohibited near hydrogen or hydrogen sealing systems, and signs warning of the danger of explosion and fire shall be posted.

(ii) Excessive hydrogen makeup or abnormal loss of pressure shall be considered as an emergency and shall be corrected immediately.

(iii) A sufficient quantity of inert gas shall be available to purge the hydrogen from the largest generator.

(k) Coal and ash handling.

(i) Only designated persons may operate railroad equipment.

(ii) Before a locomotive or locomotive crane is moved, a warning shall be given to employees in the area.

(iii) Employees engaged in switching or dumping cars may not use their feet to line up drawheads.

(iv) Drawheads and knuckles may not be shifted while locomotives or cars are in motion.

(v) When a railroad car is stopped for unloading, the car shall be secured from displacement that could endanger employees.

(vi) An emergency means of stopping dump operations shall be provided at railcar dumps.

(vii) The employer shall ensure that employees who work in coal- or ash-handling conveyor areas are trained and knowledgeable in conveyor operation and in the requirements of this section.

(viii) Employees may not ride a coal- or ash-handling conveyor belt at any time. Employees may not cross over the conveyor belt, except at walkways, unless the conveyor's energy source has been deenergized and has been locked out or tagged in accordance with (d) of this subsection.

(ix) A conveyor that could cause injury when started may not be started until personnel in the area are alerted by a signal or by a designated person that the conveyor is about to start.

(x) If a conveyor that could cause injury when started is automatically controlled or is controlled from a remote location, an audible device shall be provided that sounds an alarm that will be recognized by each employee as a warning that the conveyor will start and that can be clearly heard at all points along the conveyor where personnel may be present. The warning device shall be actuated by the device starting the conveyor and shall continue for a period of time before the conveyor starts that is long enough to allow employees to move clear of the conveyor system. A visual warning may be used in place of the audible device if the employer can demonstrate that it will provide an equally effective warning in the particular circumstances involved.

Note: Exception: If the employer can demonstrate that the system's function would be seriously hindered by the required time delay, warning signs may be provided in place of the audible warning device. If the system was installed before (insert date 1 year after publication date), warning signs may be provided in place of the audible warning device until such time as the conveyor or its control system is rebuilt or rewired. These warning signs shall be clear, concise, and legible and shall indicate that conveyors and allied equipment may be started at any time, that danger exists, and that personnel must keep clear. These warning signs shall be provided along the conveyor at areas not guarded by position or location.

(xi) Remotely and automatically controlled conveyors, and conveyors that have operating stations which are not manned or which are beyond voice and visual contact from drive areas, loading areas, transfer points, and other locations on the conveyor path not guarded by location, position, or guards shall be furnished with emergency stop buttons, pull cords, limit switches, or similar emergency stop devices. However, if the employer can demonstrate that the design, function, and operation of the conveyor do not expose an employee to hazards, an emergency stop device is not required.

(A) Emergency stop devices shall be easily identifiable in the immediate vicinity of such locations.

(B) An emergency stop device shall act directly on the control of the conveyor involved and may not depend on the stopping of any other equipment.

(C) Emergency stop devices shall be installed so that they cannot be overridden from other locations.

(xii) Where coal-handling operations may produce a combustible atmosphere from fuel sources or from flammable gases or dust, sources of ignition shall be eliminated or safely controlled to prevent ignition of the combustible atmosphere.

Note: Locations that are hazardous because of the presence of combustible dust are classified as Class II hazardous locations. See chapter 296-24 WAC, Part L.

(xiii) An employee may not work on or beneath overhanging coal in coal bunkers, coal silos, or coal storage areas, unless the employee is protected from all hazards posed by shifting coal.

(xiv) An employee entering a bunker or silo to dislodge the contents shall wear a body harness with lifeline attached. The lifeline shall be secured to a fixed support outside the bunker and shall be attended at all times by an employee located outside the bunker or facility.

(l) Hydroplants and equipment. Employees working on or close to water gates, valves, intakes, forebays, flumes, or other locations where increased or decreased water flow or levels may pose a significant hazard shall be warned and shall vacate such dangerous areas before water flow changes are made.

## NEW SECTION

**WAC 296-45-695 Hazardous energy control (lockout/tagout) procedures.** (1) Application. The provisions of this section apply to the use of lockout/tagout procedures for the control of energy sources in installations for the purpose of electric power generation, including related equipment for communication or metering. Locking and tagging procedures for the deenergizing of electric energy sources which are used exclusively for purposes of transmission and distribution are addressed by WAC 296-45-65023.

Note 1: Installations in electric power generation facilities that are not an integral part of, or inextricably commingled with, power generation processes or equipment are covered under chapter 296-24 WAC.

Note 2: Lockout and tagging procedures that comply with chapter 296-24 WAC will also be deemed to comply with this section if the procedures address the hazards covered by this section.

(2) General.

(a) The employer shall establish a program consisting of energy control procedures, employee training, and periodic inspections to ensure that, before any employee performs any servicing or maintenance on a machine or equipment where the unexpected energizing, start up, or release of stored energy could occur and cause injury, the machine or equipment is isolated from the energy source and rendered inoperative.

(b) The employer's energy control program under this section shall meet the following requirements:

(i) If an energy isolating device is not capable of being locked out, the employer's program shall use a tagout system.

(ii) If an energy isolating device is capable of being locked out, the employer's program shall use lockout, unless the employer can demonstrate that the use of a tagout system will provide full employee protection as follows:

(A) When a tagout device is used on an energy isolating device which is capable of being locked out, the tagout device shall be attached at the same location that the lockout device would have been attached, and the employer shall demonstrate that the tagout program will provide a level of safety equivalent to that obtained by the use of a lockout program.

(B) In demonstrating that a level of safety is achieved in the tagout program equivalent to the level of safety obtained by the use of a lockout program, the employer shall demonstrate full compliance with all tagout-related provisions of this standard together with such additional elements as are necessary to provide the equivalent safety available from the use of a lockout device. Additional means to be considered as part of the demonstration of full employee protection shall include the implementation of additional safety measures such as the removal of an isolating circuit element, blocking of a controlling switch, opening of an extra disconnecting device, or the removal of a valve handle to reduce the likelihood of inadvertent energizing.

(c) After (insert date 120 days after publication), whenever replacement or major repair, renovation, or modification of a machine or equipment is performed, and whenever new machines or equipment are installed, energy isolating devices for such machines or equipment shall be designed to accept a lockout device.

(d) Procedures shall be developed, documented, and used for the control of potentially hazardous energy covered by this section.

(e) The procedure shall clearly and specifically outline the scope, purpose, responsibility, authorization, rules, and techniques to be applied to the control of hazardous energy, and the measures to enforce compliance including, but not limited to, the following:

(i) A specific statement of the intended use of this procedure;

(ii) Specific procedural steps for shutting down, isolating, blocking and securing machines or equipment to control hazardous energy;

(iii) Specific procedural steps for the placement, removal, and transfer of lockout devices or tagout devices and the responsibility for them; and

(iv) Specific requirements for testing a machine or equipment to determine and verify the effectiveness of lockout devices, tagout devices, and other energy control measures.

(f) The employer shall conduct a periodic inspection of the energy control procedure at least annually to ensure that the procedure and the provisions of this section are being followed.

(i) The periodic inspection shall be performed by an authorized employee who is not using the energy control procedure being inspected.

(ii) The periodic inspection shall be designed to identify and correct any deviations or inadequacies.

(iii) If lockout is used for energy control, the periodic inspection shall include a review, between the inspector and

each authorized employee, of that employee's responsibilities under the energy control procedure being inspected.

(iv) Where tagout is used for energy control, the periodic inspection shall include a review, between the inspector and each authorized and affected employee, of that employee's responsibilities under the energy control procedure being inspected, and the elements set forth in this section.

(v) The employer shall certify that the inspections required have been accomplished. The certification shall identify the machine or equipment on which the energy control procedure was being used, the date of the inspection, the employees included in the inspection, and the person performing the inspection.

Note: If normal work schedule and operation records demonstrate adequate inspection activity and contain the required information, no additional certification is required.

(g) The employer shall provide training to ensure that the purpose and function of the energy control program are understood by employees and that the knowledge and skills required for the safe application, usage, and removal of energy controls are acquired by employees. The training shall include the following:

(i) Each authorized employee shall receive training in the recognition of applicable hazardous energy sources, the type and magnitude of energy available in the workplace, and in the methods and means necessary for energy isolation and control.

(ii) Each affected employee shall be instructed in the purpose and use of the energy control procedure.

(iii) All other employees whose work operations are or may be in an area where energy control procedures may be used shall be instructed about the procedures and about the prohibition relating to attempts to restart or reenergize machines or equipment that are locked out or tagged out.

(h) When tagout systems are used, employees shall also be trained in the following limitations of tags:

(i) Tags are essentially warning devices affixed to energy isolating devices and do not provide the physical restraint on those devices that is provided by a lock.

(ii) When a tag is attached to an energy isolating means, it is not to be removed without authorization of the authorized person responsible for it, and it is never to be bypassed, ignored, or otherwise defeated.

(iii) Tags must be legible and understandable by all authorized employees, affected employees, and all other employees whose work operations are or may be in the area, in order to be effective.

(iv) Tags and their means of attachment must be made of materials which will withstand the environmental conditions encountered in the workplace.

(v) Tags may evoke a false sense of security, and their meaning needs to be understood as part of the overall energy control program.

(vi) Tags must be securely attached to energy isolating devices so that they cannot be inadvertently or accidentally detached during use.

(3) Retraining shall be provided by the employer as follows:

(a) Retraining shall be provided for all authorized and affected employees whenever there is a change in their job

assignments, a change in machines, equipment, or processes that present a new hazard or whenever there is a change in the energy control procedures.

(b) Retraining shall also be conducted whenever a periodic inspection reveals, or whenever the employer has reason to believe, that there are deviations from or inadequacies in an employee's knowledge or use of the energy control procedures.

(c) The retraining shall reestablish employee proficiency and shall introduce new or revised control methods and procedures, as necessary.

(d) The employer shall certify that employee training has been accomplished and is being kept up to date. The certification shall contain each employee's name and dates of training.

(4) Protective materials and hardware.

(a) Locks, tags, chains, wedges, key blocks, adapter pins, self-locking fasteners, or other hardware shall be provided by the employer for isolating, securing, or blocking of machines or equipment from energy sources.

(b) Lockout devices and tagout devices shall be singularly identified; shall be the only devices used for controlling energy; may not be used for other purposes; and shall meet the following requirements:

(i) Lockout devices and tagout devices shall be capable of withstanding the environment to which they are exposed for the maximum period of time that exposure is expected.

(ii) Tagout devices shall be constructed and printed so that exposure to weather conditions or wet and damp locations will not cause the tag to deteriorate or the message on the tag to become illegible.

(iii) Tagout devices shall be so constructed as not to deteriorate when used in corrosive environments.

(c) Lockout devices and tagout devices shall be standardized within the facility in at least one of the following criteria: Color, shape, size. Additionally, in the case of tagout devices, print and format shall be standardized.

(d) Lockout devices shall be substantial enough to prevent removal without the use of excessive force or unusual techniques, such as with the use of bolt cutters or metal cutting tools.

(e) Tagout devices, including their means of attachment, shall be substantial enough to prevent inadvertent or accidental removal. Tagout device attachment means shall be of a nonreusable type, attachable by hand, self-locking, and nonreleasable with a minimum unlocking strength of no less than fifty pounds and shall have the general design and basic characteristics of being at least equivalent to a one-piece, all-environment-tolerant nylon cable tie.

(f) Each lockout device or tagout device shall include provisions for the identification of the employee applying the device.

(g) Tagout devices shall warn against hazardous conditions if the machine or equipment is energized and shall include a legend such as the following: Do Not Start, Do Not Open, Do Not Close, Do Not Energize, Do Not Operate.

Note: For specific provisions covering accident prevention tags, see chapter 296-24 WAC.

(5) Energy isolation. Lockout and tagout device application and removal may only be performed by the

authorized employees who are performing the servicing or maintenance.

(6) Notification. Affected employees shall be notified by the employer or authorized employee of the application and removal of lockout or tagout devices. Notification shall be given before the controls are applied and after they are removed from the machine or equipment.

Note: See that the second notification takes place before the machine or equipment is reenergized.

(7) Lockout/tagout application. The established procedures for the application of energy control (the lockout or tagout procedures) shall include the following elements and actions, and these procedures shall be performed in the following sequence:

(a) Before an authorized or affected employee turns off a machine or equipment, the authorized employee shall have knowledge of the type and magnitude of the energy, the hazards of the energy to be controlled, and the method or means to control the energy.

(b) The machine or equipment shall be turned off or shut down using the procedures established for the machine or equipment. An orderly shutdown shall be used to avoid any additional or increased hazards to employees as a result of the equipment stoppage.

(c) All energy isolating devices that are needed to control the energy to the machine or equipment shall be physically located and operated in such a manner as to isolate the machine or equipment from energy sources.

(d) Lockout or tagout devices shall be affixed to each energy isolating device by authorized employees.

(i) Lockout devices shall be attached in a manner that will hold the energy isolating devices in a "safe" or "off" position.

(ii) Tagout devices shall be affixed in such a manner as will clearly indicate that the operation or movement of energy isolating devices from the "safe" or "off" position is prohibited.

(e) Where tagout devices are used with energy isolating devices designed with the capability of being locked out, the tag attachment shall be fastened at the same point at which the lock would have been attached.

(f) Where a tag cannot be affixed directly to the energy isolating device, the tag shall be located as close as safely possible to the device, in a position that will be immediately obvious to anyone attempting to operate the device.

(8) Following the application of lockout or tagout devices to energy isolating devices, all potentially hazardous stored or residual energy shall be relieved, disconnected, restrained, or otherwise rendered safe.

(a) If there is a possibility of reaccumulation of stored energy to a hazardous level, verification of isolation shall be continued until the servicing or maintenance is completed or until the possibility of such accumulation no longer exists.

(b) Before starting work on machines or equipment that have been locked out or tagged out, the authorized employee shall verify that isolation and deenergizing of the machine or equipment have been accomplished. If normally energized parts will be exposed to contact by an employee while the machine or equipment is deenergized, a test shall be performed to ensure that these parts are deenergized.

(9) Release from lockout/tagout. Before lockout or tagout devices are removed and energy is restored to the machine or equipment, procedures shall be followed and actions taken by the authorized employees to ensure the following:

(a) The work area shall be inspected to ensure that nonessential items have been removed and that machine or equipment components are operationally intact.

(b) The work area shall be checked to ensure that all employees have been safely positioned or removed.

(c) After lockout or tagout devices have been removed and before a machine or equipment is started, affected employees shall be notified that the lockout or tagout devices have been removed.

(d) Each lockout or tagout device shall be removed from each energy isolating device by the authorized employee who applied the lockout or tagout device. However, if that employee is not available to remove it, the device may be removed under the direction of the employer, provided that specific procedures and training for such removal have been developed, documented, and incorporated into the employer's energy control program. The employer shall demonstrate that the specific procedure provides a degree of safety equivalent to that provided by the removal of the device by the authorized employee who applied it. The specific procedure shall include at least the following elements:

(i) Verification by the employer that the authorized employee who applied the device is not at the facility;

(ii) Making all reasonable efforts to contact the authorized employee to inform him or her that his or her lockout or tagout device has been removed; and

(iii) Ensuring that the authorized employee has this knowledge before he or she resumes work at that facility.

(10) Additional requirements.

(a) If the lockout or tagout devices must be temporarily removed from energy isolating devices and the machine or equipment must be energized to test or position the machine, equipment, or component thereof, the following sequence of actions shall be followed:

(i) Clear the machine or equipment of tools and materials in accordance with this section;

(ii) Remove employees from the machine or equipment area in accordance with this section;

(iii) Remove the lockout or tagout devices as specified in this section;

(iv) Energize and proceed with the testing or positioning; and

(v) Deenergize all systems and reapply energy control measures in accordance with this section to continue the servicing or maintenance.

(b) When servicing or maintenance is performed by a crew, craft, department, or other group, they shall use a procedure which affords the employees a level of protection equivalent to that provided by the implementation of a personal lockout or tagout device. Group lockout or tagout devices shall be used in accordance with the procedures required by the following specific requirements:

(i) Primary responsibility shall be vested in an authorized employee for a set number of employees working under the protection of a group lockout or tagout device (such as an operations lock);

(ii) Provision shall be made for the authorized employee to ascertain the exposure status of all individual group members with regard to the lockout or tagout of the machine or equipment;

(iii) When more than one crew, craft, department, or other group is involved, assignment of overall job-associated lockout or tagout control responsibility shall be given to an authorized employee designated to coordinate affected work forces and ensure continuity of protection; and

(iv) Each authorized employee shall affix a personal lockout or tagout device to the group lockout device, group lockbox, or comparable mechanism when he or she begins work and shall remove those devices when he or she stops working on the machine or equipment being serviced or maintained.

(c) Procedures shall be used during shift or personnel changes to ensure the continuity of lockout or tagout protection, including provision for the orderly transfer of lockout or tagout device protection between off-going and on-coming employees, to minimize their exposure to hazards from the unexpected energizing or start-up of the machine or equipment or from the release of stored energy.

(d) Whenever outside servicing personnel are to be engaged in activities covered by this section, the on-site employer and the outside employer shall inform each other of their respective lockout or tagout procedures, and each employer shall ensure that his or her personnel understand and comply with restrictions and prohibitions of the energy control procedures being used.

(e) If energy isolating devices are installed in a central location under the exclusive control of a system operator, the following requirements apply:

(i) The employer shall use a procedure that affords employees a level of protection equivalent to that provided by the implementation of a personal lockout or tagout device.

(ii) The system operator shall place and remove lockout and tagout devices in place of the authorized employee.

(iii) Provisions shall be made to identify the authorized employee who is responsible for (that is, being protected by) the lockout or tagout device, to transfer responsibility for lockout and tagout devices, and to ensure that an authorized employee requesting removal or transfer of a lockout or tagout device is the one responsible for it before the device is removed or transferred.

## NEW SECTION

### **WAC 296-45-700 Testing and test facilities. (1)**

**Application.** This section provides for safe work practices for high-voltage and high-power testing performed in laboratories, shops, and substations, and in the field and on electric transmission and distribution lines and equipment. It applies only to testing involving interim measurements utilizing high voltage, high power, or combinations of both, and not to testing involving continuous measurements as in routine metering, relaying, and normal line work.

**Note:** Routine inspection and maintenance measurements made by qualified employees are considered to be routine line work and are not included in the scope of subsection (1) of this section, as long as the hazards related to the use of intrinsic high-voltage or high-power sources require only the normal precautions associated with routine operation and maintenance work required

in the other subsections of this section. Two typical examples of such excluded test work procedures are "phasing-out" testing and testing for a "no-voltage" condition.

#### (2) General requirements.

(a) The employer shall establish and enforce work practices for the protection of each worker from the hazards of high-voltage or high-power testing at all test areas, temporary and permanent. Such work practices shall include, as a minimum, test area guarding, grounding, and the safe use of measuring and control circuits. A means providing for periodic safety checks of field test areas shall also be included.

(b) Employees shall be trained in safe work practices upon their initial assignment to the test area, with periodic reviews and updates provided as required by subsections of this section.

#### (3) Guarding of test areas.

(a) Permanent test areas shall be guarded by walls, fences, or barriers designed to keep employees out of the test areas.

(b) In field testing, or at a temporary test site where permanent fences and gates are not provided, one of the following means shall be used to prevent unauthorized employees from entering:

(i) The test area shall be guarded by the use of distinctively colored safety tape that is supported approximately waist high and to which safety signs are attached;

(ii) The test area shall be guarded by a barrier or barricade that limits access to the test area to a degree equivalent, physically and visually, to the barricade specified in this section; or

(iii) The test area shall be guarded by one or more test observers stationed so that the entire area can be monitored.

(c) The barriers required by this section shall be removed when the protection they provide is no longer needed.

(d) Guarding shall be provided within test areas to control access to test equipment or to apparatus under test that may become energized as part of the testing by either direct or inductive coupling, in order to prevent accidental employee contact with energized parts.

#### (4) Grounding practices.

(a) The employer shall establish and implement safe grounding practices for the test facility.

(i) All conductive parts accessible to the test operator during the time the equipment is operating at high voltage shall be maintained at ground potential except for portions of the equipment that are isolated from the test operator by guarding.

(ii) Wherever ungrounded terminals of test equipment or apparatus under test may be present, they shall be treated as energized until determined by tests to be deenergized.

(b) Visible grounds shall be applied, either automatically or manually with properly insulated tools, to the high-voltage circuits after they are deenergized and before work is performed on the circuit or item or apparatus under test. Common ground connections shall be solidly connected to the test equipment and the apparatus under test.

(c) In high-power testing, an isolated ground-return conductor system shall be provided so that no intentional passage of current, with its attendant voltage rise, can occur in the ground grid or in the earth. However, an isolated

ground-return conductor need not be provided if the employer can demonstrate that both the following conditions are met:

(i) An isolated ground-return conductor cannot be provided due to the distance of the test site from the electric energy source; and

(ii) Employees are protected from any hazardous step and touch potentials that may develop during the test.

Note: See Appendix C of this chapter for information on measures that can be taken to protect employees from hazardous step and touch potentials.

(d) In tests in which grounding of test equipment by means of the equipment grounding conductor located in the equipment power cord cannot be used due to increased hazards to test personnel or the prevention of satisfactory measurements, a ground that the employer can demonstrate affords equivalent safety shall be provided, and the safety ground shall be clearly indicated in the test set-up.

(e) When the test area is entered after equipment is deenergized, a ground shall be placed on the high-voltage terminal and any other exposed terminals.

(i) High capacitance equipment or apparatus shall be discharged through a resistor rated for the available energy.

(ii) A direct ground shall be applied to the exposed terminals when the stored energy drops to a level at which it is safe to do so.

(f) If a test trailer or test vehicle is used in field testing, its chassis shall be grounded. Protection against hazardous touch potentials with respect to the vehicle, instrument panels, and other conductive parts accessible to employees shall be provided by bonding, insulation, or isolation.

(5) Control and measuring circuits.

(a) Control wiring, meter connections, test leads and cables may not be run from a test area unless they are contained in a grounded metallic sheath and terminated in a grounded metallic enclosure or unless other precautions are taken that the employer can demonstrate as ensuring equivalent safety.

(b) Meters and other instruments with accessible terminals or parts shall be isolated from test personnel to protect against hazards arising from such terminals and parts becoming energized during testing. If this isolation is provided by locating test equipment in metal compartments with viewing windows, interlocks shall be provided to interrupt the power supply if the compartment cover is opened.

(c) The routing and connections of temporary wiring shall be made secure against damage, accidental interruptions and other hazards. To the maximum extent possible, signal, control, ground, and power cables shall be kept separate.

(d) If employees will be present in the test area during testing, a test observer shall be present. The test observer shall be capable of implementing the immediate deenergizing of test circuits for safety purposes.

(6) Safety check.

(a) Safety practices governing employee work at temporary or field test areas shall provide for a routine check of such test areas for safety at the beginning of each series of tests.

(b) The test operator in charge shall conduct these routine safety checks before each series of tests and shall verify at least the following conditions:

(i) That barriers and guards are in workable condition and are properly placed to isolate hazardous areas;

(ii) That system test status signals, if used, are in operable condition;

(iii) That test power disconnects are clearly marked and readily available in an emergency;

(iv) That ground connections are clearly identifiable;

(v) That personal protective equipment is provided and used;

(vi) That signal, ground, and power cables are properly separated.

AMENDATORY SECTION (Amending Order 83-34, filed 11/30/83)

**WAC 296-54-511 Personal protective equipment.**

(1) General requirements.

(a) Protective equipment, including personal protective equipment for eyes, face, head, hearing and extremities, protective clothing, respiratory devices and protective shields and barriers, shall be provided, used, and maintained in a sanitary and reliable condition wherever it is necessary by reason of hazards of processes or environment, chemical hazards, radiological hazards, or mechanical irritants encountered in a manner capable of causing injury or impairment in the function of any part of the body through absorption, inhalation or physical contact.

(b) Employee owned equipment. Where employees are required to provide their own protective equipment, the employer shall be responsible to assure its adequacy, including proper maintenance and sanitation of such equipment.

(c) Design. All personal protective equipment shall be of safe design and construction for the work to be performed. All safety belts and attachments shall meet the requirements of section 3 of ANSI A10.14-1975.

(2) Eye and face protection. Protective eye and/or face equipment shall be required and worn where there is a probability of injury that can be prevented by such equipment. In such cases, employers shall make conveniently available a type of protector suitable for the work to be performed, and employees shall use such protectors. Suitable eye protectors shall be provided and worn where machines or operations present the hazard of flying objects, glare, liquids, injurious radiation, or a combination of these hazards.

(3) Respiratory protection. The respiratory protection requirements of the general occupational health standards, chapter 296-62 WAC, shall apply.

(4) Occupational head protection. ~~((Hard hats))~~ Protective helmets meeting the specifications contained in American National Standards Institute (ANSI) ~~((Z89.1-1969))~~, shall be worn by all employees involved in the logging operation or any of its related activities unless such employees are protected by F.O.P.S., cabs or canopies. ~~((Hard hats))~~ Protective helmets shall be maintained in serviceable condition.

(a) Protective helmets purchased after February 20, 1995, shall comply with ANSI Z89.1-1986, "American

National Standard for Personnel Protection—Protective Headwear for Industrial Workers—Requirements," which is incorporated by reference, or shall be demonstrated to be equally effective.

(b) Protective helmets purchased before February 20, 1995, shall comply with the ANSI standard "American National Standard Safety Requirements for Industrial Head Protection," ANSI Z89.1-1969, or shall be demonstrated by the employer to be equally effective.

(5) Personal flotation devices. Employees working on, over or along water, where the danger of drowning exists, shall be provided with and shall wear approved personal flotation devices in accordance with General safety and health standards, WAC 296-24-086.

(6) Occupational footwear.

(a) All employees whose duties require them to walk on logs or boomsticks, shall wear sharp-calked shoes, or the equivalent, except when conditions such as ice, snow, etc., render calks ineffective. When calks are ineffective and other footwear does not afford suitable protection, workers shall not be required to work on logs or boomsticks.

(b) When nonslip type shoes or boots afford a greater degree of employee protection than calk shoes, such as at scaling stations, log sorting yards, etc., then this type footwear may be worn in lieu of calk shoes providing firm ankle support and secure footing are maintained.

(7) Leg protection. Employees whose normal duties require them to operate a power saw shall wear a flexible ballistic nylon pad or pads, sewn or otherwise fastened into the trousers, or other equivalent protection, that will protect the vulnerable area of the legs.

(8) Hand protection. All employees handling lines or other rough materials where there is a reasonable possibility of hand injury, shall wear suitable gloves or other hand protection to prevent injury.

(9) Hearing protection. The hearing protection requirements of the general occupational health standards, chapter 296-62 WAC, shall apply.

(10) Protective clothing. Employees working on landings or in log sorting yards, when working on or from the ground, shall wear highly visible hard hats and/or yellow or orange vests, or similarly colored garments, to enable equipment operators to readily see them. It is recommended that such hard hats and vests or outer garments be of a luminous or reflectorized material. Employees performing duties of a flagperson shall wear a hard hat and vest or garment of contrasting colors. Warning vests and hard hats worn at night shall be of a reflectorized material.

Note: See chapter 296-24 WAC, Part A-2, for additional personal protective equipment requirements.

AMENDATORY SECTION (Amending Order 88-25, filed 11/14/88)

**WAC 296-62-07367 Respiratory protection and personal protective equipment.** (1) General. The employer shall provide respirators, and ensure that they are used, where required by WAC 296-62-07355 through 296-62-07389. Respirators shall be used in the following circumstances.

(a) During the interval necessary to install or implement feasible engineering and work practice controls;

(b) In work operations, such as maintenance and repair activities, vessel cleaning, or other activities for which engineering and work practice controls are not feasible;

(c) In work situations where feasible engineering and work practice controls are not yet sufficient to reduce exposure to or below the TWA or excursion limit; and

(d) In emergencies.

(2) Respirator selection.

(a) Where respirators are required under WAC 296-62-07355 through 296-62-07389, the employer shall select and provide, at no cost to the employee, the appropriate respirator as specified in Table 1, and shall ensure that the employee uses the respirator provided.

(b) The employer shall select respirators from among those jointly approved as being acceptable for protection against EtO by the Mine Safety and Health Administration (MSHA) and by the National Institute for Occupational Safety and Health (NIOSH) under the provisions of 30 CFR Part 11.

(3) Respirator program. Where respiratory protection is required by WAC 296-62-07355 through 296-62-07389, the employer shall institute a respirator program in accordance with WAC 296-62-071.

(4) Protective clothing and equipment. Where eye or skin contact with liquid EtO or EtO solutions may occur, the employer shall select and provide, at no cost to the employee, appropriate protective clothing or other equipment in accordance with ~~((WAC 296-24-07501 and 296-24-07801))~~ chapter 296-24 WAC, Part A-2, and to protect any area of the body that may come in contact with liquid EtO or EtO in solution, and shall ensure that the employee wears the protective clothing and equipment provided.

AMENDATORY SECTION (Amending Order 93-06, filed 10/20/93, effective 12/1/93)

**WAC 296-62-07417 Protective work clothing and equipment.** (1) Provision and use. If an employee is exposed to airborne cadmium above the PEL or where skin or eye irritation is associated with cadmium exposure at any level, the employer shall provide at no cost to the employee, and assure that the employee uses, appropriate protective work clothing and equipment that prevents contamination of the employee and the employee's garments. Protective work clothing and equipment includes, but is not limited to:

(a) Coveralls or similar full-body work clothing;

(b) Gloves, head coverings, and boots or foot coverings; and

(c) Face shields, vented goggles, or other appropriate protective equipment that complies with ~~((WAC 296-24-078))~~ chapter 296-24 WAC, Part A-2.

(2) Removal and storage.

(a) The employer shall assure that employees remove all protective clothing and equipment contaminated with cadmium at the completion of the work shift and do so only in change rooms provided in accordance with WAC 296-62-07419(1).

(b) The employer shall assure that no employee takes cadmium-contaminated protective clothing or equipment from the workplace, except for employees authorized to do so for purposes of laundering, cleaning, maintaining, or disposing of cadmium contaminated protective clothing and



equipment at an appropriate location or facility away from the workplace.

(c) The employer shall assure that contaminated protective clothing and equipment, when removed for laundering, cleaning, maintenance, or disposal, is placed and stored in sealed, impermeable bags or other closed, impermeable containers that are designed to prevent dispersion of cadmium dust.

(d) The employer shall assure that bags or containers of contaminated protective clothing and equipment that are to be taken out of the change rooms or the workplace for laundering, cleaning, maintenance, or disposal shall bear labels in accordance with WAC 296-62-07425(3).

(3) Cleaning, replacement, and disposal.

(a) The employer shall provide the protective clothing and equipment required by subsection (1) of this section in a clean and dry condition as often as necessary to maintain its effectiveness, but in any event at least weekly. The employer is responsible for cleaning and laundering the protective clothing and equipment required by this paragraph to maintain its effectiveness and is also responsible for disposing of such clothing and equipment.

(b) The employer also is responsible for repairing or replacing required protective clothing and equipment as needed to maintain its effectiveness. When rips or tears are detected while an employee is working they shall be immediately mended, or the worksuit shall be immediately replaced.

(c) The employer shall prohibit the removal of cadmium from protective clothing and equipment by blowing, shaking, or any other means that disperses cadmium into the air.

(d) The employer shall assure that any laundering of contaminated clothing or cleaning of contaminated equipment in the workplace is done in a manner that prevents the release of airborne cadmium in excess of the permissible exposure limit prescribed in WAC 296-62-07405.

(e) The employer shall inform any person who launders or cleans protective clothing or equipment contaminated with cadmium of the potentially harmful effects of exposure to cadmium and that the clothing and equipment should be laundered or cleaned in a manner to effectively prevent the release of airborne cadmium in excess of the PEL.

**AMENDATORY SECTION** (Amending Order 92-15, filed 2/3/93, effective 3/15/93)

**WAC 296-62-07617 Protective work clothing and equipment.** (1) Provision and use. Where employees are subject to dermal exposure to MDA, where liquids containing MDA can be splashed into the eyes, or where airborne concentrations of MDA are in excess of the PEL, the employer shall provide, at no cost to the employee, and ensure that the employee uses, appropriate protective work clothing and equipment which prevent contact with MDA such as, but not limited to:

- (a) Aprons, coveralls, or other full-body work clothing;
- (b) Gloves, head coverings, and foot coverings; and
- (c) Face shields, chemical goggles; or

(d) Other appropriate protective equipment which comply with (~~WAC 296-24-078~~) chapter 296-24 WAC, Part A-2.

- (2) Removal and storage.

(a) The employer shall ensure that, at the end of their work shift, employees remove MDA-contaminated protective work clothing and equipment that is not routinely removed throughout the day in change rooms provided in accordance with the provisions established for change rooms.

(b) The employer shall ensure that, during their work shift, employees remove all other MDA-contaminated protective work clothing or equipment before leaving a regulated area.

(c) The employer shall ensure that no employee takes MDA-contaminated work clothing or equipment out of the change room, except those employees authorized to do so for the purpose of laundering, maintenance, or disposal.

(d) MDA-contaminated work clothing or equipment shall be placed and stored in closed containers which prevent dispersion of the MDA outside the container.

(e) Containers of MDA-contaminated protective work clothing or equipment which are to be taken out of change rooms or the workplace for cleaning, maintenance, or disposal shall bear labels warning of the hazards of MDA.

(3) Cleaning and replacement.

(a) The employer shall provide the employee with clean protective clothing and equipment. The employer shall ensure that protective work clothing or equipment required by this paragraph is cleaned, laundered, repaired, or replaced at intervals appropriate to maintain its effectiveness.

(b) The employer shall prohibit the removal of MDA from protective work clothing or equipment by blowing, shaking, or any methods which allow MDA to reenter the workplace.

(c) The employer shall ensure that laundering of MDA-contaminated clothing shall be done so as to prevent the release of MDA in the workplace.

(d) Any employer who gives MDA-contaminated clothing to another person for laundering shall inform such person of the requirement to prevent the release of MDA.

(e) The employer shall inform any person who launders or cleans protective clothing or equipment contaminated with MDA of the potentially harmful effects of exposure.

(f) MDA-contaminated clothing shall be transported in properly labeled, sealed, impermeable bags or containers.

**AMENDATORY SECTION** (Amending Order 91-07, filed 11/22/91, effective 12/24/91)

**WAC 296-78-515 Management's responsibility.** (1) It shall be the responsibility of management to establish, supervise, and enforce, in a manner which is effective in practice:

(a) A safe and healthful working environment.

(b) An accident prevention program as required by these standards.

(c) Training programs to improve the skill and competency of all employees in the field of occupational safety and health. Such training shall include the on-the-job instructions on the safe use of powered materials handling equipment, machine tool operations, use of toxic materials and operation of utility systems prior to assignments to jobs involving such exposures.

(2) The employer shall develop and maintain a hazard communication program as required by (~~WAC 296-62-054 through 296-62-05427~~) chapter 296-62 WAC, Part C, which

will provide information to all employees relative to hazardous chemicals or substances to which they are exposed, or may become exposed, in the course of their employment.

(3) Management shall not assign mechanics, millwrights, or other persons to work on equipment by themselves when there is a probability that the person could fall from elevated work locations or equipment or that a person could be pinned down by heavy parts or equipment so that they could not call for or obtain assistance if the need arises.

Note: This subsection does not apply to operators of motor vehicles, ~~((watchmen))~~ watchperson or certain other jobs which, by their nature, are singular employee assignments. However, a definite procedure for checking the welfare of all employees during their working hours shall be instituted and all employees so advised.

(4) After the emergency actions following accidents that cause serious injuries that have immediate symptoms, a preliminary investigation of the cause of the accident shall be conducted. The investigation shall be conducted by a person designated by the employer, the immediate supervisor of the injured employee, witnesses, employee representative if available and any other person with the special expertise required to evaluate the facts relating to the cause of the accident. The findings of the investigation shall be documented by the employer for reference at any following formal investigation.

(5) Reporting of fatality or multiple hospitalization ~~((accidents))~~ incidents.

(a) ~~Within ((twenty-four)) eight hours after the ((occurrence of an employment accident which results in an immediate or probable fatality(s) or which results in the hospitalization of two or more employees, the employer of any employee so injured or killed shall report the accident, either orally or in writing, to the nearest office of the department. The reporting may be by telephone or telegraph. The reporting shall relate the circumstances of the accident, the number of fatalities, and the extent of any injuries. The director may require such additional reports, in writing or otherwise, as he deems necessary, concerning the accident.)) fatality or probable fatality of any employee from a work-related incident or the inpatient hospitalization of two or more employees as a result of a work-related incident, the employer of any employees so affected shall report the fatality/multiple hospitalization by telephone or in person, to the nearest office of the department or by using the OSHA toll-free central telephone number, 1-800-321-6742.~~

(i) This requirement applies to each such fatality or hospitalization of two or more employees which occurs within thirty days of the incident.

(ii) Exception: If any employer does not learn of a reportable incident at the time it occurs and the incident would otherwise be reportable under this subsection, the employer shall make a report within eight hours of the time the incident is reported to any agent or employee of the employer.

(iii) Each report required by this subsection shall relate the following information: Establishment name, location of the incident, time of the incident, number of fatalities or hospitalized employees, contact person, phone number, and a brief description of the incident.

(b) Equipment involved in an ~~((accident))~~ incident resulting in an immediate or probable fatality or in the inpatient hospitalization of two or more employees, shall not

be moved, until a representative of the ~~((division of industrial safety and health))~~ department investigates the ~~((accident))~~ incident and releases such equipment, except where removal is essential to prevent further ~~((accident))~~ incident. Where necessary to remove the victim, such equipment may be moved only to the extent of making possible such removal.

(c) Upon arrival of ~~((division of industrial safety and health))~~ a department investigator, employer shall assign to assist the investigator, the immediate supervisor and all employees who were witnesses to the ~~((accident))~~ incident, or whoever the investigator deems necessary to complete ~~((his))~~ the investigation.

(6) A system for maintaining records of occupational injuries and illnesses as prescribed by chapter 296-27 WAC.

Note: Recordable cases include:

- (a) Every occupational death.
- (b) Every industrial illness.
- (c) Every occupational injury that involves one of the following:
  - (i) Unconsciousness.
  - (ii) Inability to perform all phases of regular job.
  - (iii) Inability to work full time on regular job.
  - (iv) Temporary assignment to another job.
  - (v) Medical treatment beyond first aid.

All employers with eleven or more employees shall record occupational injury and illness information on forms OSHA 101 - supplementary record occupational injuries and illnesses and OSHA 200 - log and summary. Forms other than OSHA 101 may be substituted for the supplementary record of occupational injuries and illnesses if they contain the same items.

AMENDATORY SECTION (Amending Order 81-21, filed 8/27/81)

**WAC 296-78-525 Accident-prevention programs.**

Each employer shall develop a formal accident-prevention program, tailored to the needs of the particular plant or operation and to the type of hazards involved. The ~~((division))~~ department may be contacted for assistance in developing appropriate programs.

(1) The following are the minimal program elements for all employers:

(a) A safety orientation program describing the employer's safety program and including:

- (i) How and when to report injuries, including instruction as to the location of first-aid facilities.
- (ii) How to report unsafe conditions and practices.
- (iii) The use and care of required personal protective equipment.

(iv) The proper actions to take in event of emergencies including the routes of exiting from areas during emergencies.

(v) Identification of the hazardous gases, chemicals or materials involved along with the instructions on the safe use and emergency action following accidental exposure.

(vi) A description of the employers total safety program.

(vii) An on-the-job review of the practices necessary to perform the initial job assignments in a safe manner.

(b) A designated safety and health committee consisting of management and employee representatives with the employee representatives being elected or appointed by fellow employees.

(2) Each accident-prevention program shall be outlined in written format.

AMENDATORY SECTION (Amending Order 81-21, filed 8/27/81)

**WAC 296-78-670 Glue machines.** (1) Personal protective equipment as required by the general safety and health standard, (~~WAC 296-24-075 through 296-24-092~~) chapter 296-24 WAC, Part A-2, and the general occupational health standard, WAC 296-62-11021, and proper washing facilities with noncaustic soap and sterilizers, shall be provided for all employees handling glue. Rubber gloves and other personal equipment must be sterilized when transferred from one person to another.

(2) Glue spreaders shall be enclosed on the in-running side, leaving only sufficient space to insert the stock.

(3) All glue spreaders shall be equipped with a panic bar or equivalent type device that can be reached from either the infeed or outfeed side of the spreader to shut-off the power in an emergency situation. Such device shall be installed on existing glue spreaders no later than April 1, 1982, and be standard equipment on any glue spreader purchased after January 1, 1982.

(4) All glue mixing and handling rooms where located above work areas shall have water tight floors.

(5) All glue rooms shall be provided with ventilation in accordance with WAC 296-62-110 through 296-62-11013, of the general occupational health standard.

AMENDATORY SECTION (Amending Order 81-21, filed 8/27/81)

**WAC 296-78-71015 Tanks and chemicals.** (1) All open vats and tanks into which workers may fall shall be guarded with standard railings or screen guards in all cases where such guarding is possible with regard to practical operation.

(2) Foundations of elevated tanks shall be accessible for inspections. When the tank platform is more than five feet above the ground a stairway or ladder shall be permanently attached.

(3) Every open tank over five feet in height shall be equipped with fixed standard ladders both inside and out, extending from the bottom to the rim of the tank arranged to be accessible to each other, so far as local conditions permit.

(4) The use of chemicals for treating of lumber for prevention of sap stain or mold or as preservatives, shall conform to the requirements of WAC 296-62-11021, open surface tanks.

(a) Storage, handling, and use of chemicals. Threshold limits. Employees shall not be exposed to airborne concentration of toxic dusts, vapors, mists or gases that exceed the threshold limit values set forth in (~~WAC 296-62-070 through 296-62-080 of the general occupational health standards~~) chapter 296-24 WAC, Part A-2.

(b) Protective equipment. The use of chemicals shall be controlled so as to protect employees from harmful exposure to toxic materials. Where necessary, employees shall be provided with and required to wear such protective equipment as will afford adequate protection against harmful exposure as required by (~~WAC 296-24-075 through 296-24-~~

~~092 of the general safety and health standards~~) chapter 296-24 WAC, Part A-2.

(5)(a) Means shall be provided and used to collect any excess of chemicals used in treating lumber so as to protect workers from accidental contact with harmful concentrations of toxic chemicals or fumes.

(b) Dip tanks containing flammable or combustible liquids shall be constructed, maintained and used in accordance with WAC 296-24-405 of the general safety and health standards.

(c) An evacuation plan shall be developed and implemented for all employees working in the vicinity of dip tanks using flammable and/or combustible liquids. A copy of the plan shall be available at the establishment for inspection at all times. Every employee shall be made aware of the evacuation plan and know what to do in the event of an emergency and be evacuated in accordance with the plan. The plan shall be reviewed with employees at least quarterly and documented.

(d) When automatic foam, automatic carbon dioxide or automatic dry chemical extinguishing systems are used, an alarm device shall be activated to alert employees in the dip tank area before and during the activation of the system. The following combinations of extinguishment systems when used in conjunction with the evacuation plan as stated above will be acceptable in lieu of bottom drains:

(i) A dip tank cover with an automatic foam extinguishing system under the cover, or an automatic carbon dioxide system, or an automatic dry chemical extinguishing system, or an automatic water spray extinguishing system;

(ii) An automatic dry chemical extinguishing system with an automatic carbon dioxide system or a second automatic dry chemical extinguishing system or an automatic foam extinguishing system;

(iii) An automatic carbon dioxide system with a second automatic carbon dioxide system or an automatic foam extinguishing system.

(e) The automatic water spray extinguishing systems, automatic foam extinguishing systems, and dip tank covers shall conform with the requirements of WAC 296-24-405. The automatic carbon dioxide systems and dry chemical extinguishing system shall conform with the requirements of WAC 296-24-615 and 296-24-620.

(6) Where workers are engaged in the treating of lumber with chemicals or are required to handle lumber or other materials so treated, the workers shall be provided with, at no cost to the worker, and required to use such protective equipment as will provide complete protection against contact with toxic chemicals or fumes therefrom.

(7) Sanitation requirements. The requirements of WAC 296-24-120 through 296-24-13013 of the general safety and health standards, shall govern sanitation practices.

(8) The sides of steam vats and soaking pits unless otherwise guarded shall extend forty-two inches above the floor level. The floor adjacent thereto shall be of nonslip construction.

(9) Large steam vats or soaking pits, divided into sections, shall be provided with substantial walkways between each section, each walkway to be provided with standard railings which may be removable if necessary.

AMENDATORY SECTION (Amending Order 81-21, filed 8/27/81)

**WAC 296-78-84005 Dry kilns.** (1) Transfer, kiln and dolly tracks shall be properly maintained at all times and shall have a grade of not more than one and one-fourth percent. Bumpers or stops shall be installed at the ends of all tracks capable of stopping a normal load for which the track is installed. A means shall be provided for chocking or blocking cars.

## (2) Doors.

(a) Main kiln doors. Main kiln doors shall be provided with a method of holding them open while kiln is being loaded.

(b) Counterweights on vertical lift doors shall be boxed or otherwise guarded.

(c) Means shall be provided to firmly secure main doors, when they are disengaged from carriers and hangers, to prevent toppling.

(3) Kilns whose operation requires inside inspection shall be maintained with not less than eighteen inches clearance between loaded cars and the walls of the kiln. The requirements for personal protective equipment specified in (~~WAC 296-24-075 through 296-24-092~~) chapter 296-24 WAC, Part A-2, shall be complied with.

(4) Kiln loads shall be equipped or arranged for easy attachment and detachment of transfer cables. Means for stopping kiln cars shall be available at all times.

(5) Cars shall not be moved until tracks are clear and workers are out of the bight of transfer lines.

(6) When kiln or dolly loads of lumber are permitted to coast through or adjacent to any work area, audible warning shall be given.

(7) Stickers shall not be allowed to protrude more than two inches from the sides of kiln stacks.

(8) Yards and storage areas shall be kept reasonably free of debris and unnecessary obstruction. Warning signs shall be conspicuously posted wherever there is danger from moving vehicles or equipment.

AMENDATORY SECTION (Amending Order 89-03, filed 5/15/89, effective 6/30/89)

**WAC 296-79-050 Personal protection.** (1) Personal protective equipment and clothing. Personal protective clothing and equipment as required by the general safety and health standards and the general occupational health standards shall be furnished by the employer and worn or used by the employee when needed to eliminate or minimize the degree of hazard involved with any specific operation.

(a) Required clothing, caps, etc. Employees shall wear sufficient clothing to protect them from hazards to which they may be exposed while performing their duties. Consideration must be given to temperatures in certain areas in which persons work. Employees whose hair is long enough to be caught in machinery or equipment around which they work shall wear caps, hair nets or other protection which will adequately confine the hair while performing their duties.

Rings or other jewelry which could create a hazard should not be worn by employees while in the performance of their work.

(b) Protective footwear. Employees who work in areas where there is a possibility of foot injury due to falling or rolling objects shall wear safety type footwear. Shoe guards and toe protectors will be supplied by management. Management shall also make safety shoes available for purchase by employees at not more than actual cost to management.

Calks or other suitable footwear which will afford reasonable protection from slipping shall be worn while working on logs. Calk boots shall be made available at cost.

Note: See chapter 296-24 WAC, Part A-2, for additional personal protective equipment requirements.

## (2) Working over or near water.

(a) Employees working over or near water who are exposed to the danger of drowning shall be provided with and shall wear U.S. Coast Guard approved personal flotation devices.

Note: The following exceptions will apply:

(i) When water is known to be chest-deep or less on the exposed worker(s);

(ii) When the employee is protected by standard guardrails;

(iii) When the employee is protected by a safety belt or lanyard; or

(iv) When the employee is within the confines of the cabin of a boat or other equivalent enclosure.

(b) Prior to and after each use, buoyant work devices shall be inspected for defects which would alter their strength or buoyancy. Defective units shall not be used.

(3) Protection from noise. The hearing protection requirements of the general occupational health standards, chapter 296-62 WAC, shall apply.

(4) Respiratory protection. The respiratory protection requirements of the general occupational health standards, chapter 296-62 WAC, shall apply.

AMENDATORY SECTION (Amending Order 93-17, filed 3/2/94, effective 4/15/94)

**WAC 296-306-020 Serious injury reporting.** (1) The employer or someone in his/her behalf shall ~~((notify))~~ orally report to the nearest office of the department of labor and industries within ((24)) eight hours of ((the date of)) an ((accident)) incident that causes a fatal or possibly fatal injury, an ((accident)) incident that involves acute injury or illness from exposure(s) to any pesticides ((or herbicides)) or an ((accident)) incident that causes injury requiring in-patient hospitalization of any employees. The report shall be made by telephone or in person or by using the OSHA toll-free central telephone number, 1-800-321-6742.

(a) This requirement applies to each such fatality or hospitalization of any employee which occurs within thirty days of an incident.

(b) Exception: If the employer does not learn of a reportable incident at the time it occurs and the incident would otherwise be reportable under this subsection, the employer shall make a report within eight hours of the time the incident is reported to any agent or employee of the employer.

(c) Each report required by this subsection shall relate the following information: Establishment name, location of the incident, time of the incident, number of fatalities, hospitalized employees or pesticide exposures, contact

person, phone number, and a brief description of the incident.

(2) When any investigator from the department(~~the division of safety and health~~) arrives, the farm employer shall assign to assist in the investigation any persons the investigator deems necessary.

(3) When a fatality or in-patient hospitalization occurs, equipment involved in the (~~accident~~) incident shall not be moved until after a representative from the (~~division of industrial safety and health~~) department has completed an investigation unless the equipment must be moved to prevent additional (~~accidents~~) incidents, or to remove the victim.

**WSR 94-15-098**  
**PROPOSED RULES**  
**LIQUOR CONTROL BOARD**  
[Filed July 20, 1994, 11:05 a.m.]

Original Notice.

Title of Rule: WAC 314-12-195, requires liquor licensees to post signs warning of possible alcohol related birth defects at specific locations upon licensed premises.

Purpose: Provide additional warning information to people about the possibility of alcohol related birth defects such as fetal alcohol syndrome.

Statutory Authority for Adoption: RCW 66.08.030.

Summary: Requires board provided signs to be placed at specific locations upon liquor licensed premises.

Name of Agency Personnel Responsible for Drafting: Jennifer McDougall, 1025 East Union, Olympia, WA, (206) 664-9657; Implementation and Enforcement: Gary W. Gilbert, 1025 East Union, Olympia, WA, (206) 586-3052.

Name of Proponent: Washington State Liquor Control Board, governmental.

Rule is not necessitated by federal law, federal or state court decision.

Explanation of Rule, its Purpose, and Anticipated Effects: The rule would require all on and off premises liquor licensees to post signs warning of the possible dangers of consumption of alcohol during pregnancy. The signs would be provided without cost by the board and posted at specific locations so as to increase awareness of the possible dangers of consumption of alcohol during pregnancy in relation to alcohol related birth defects.

Proposal does not change existing rules.

Has a Small Business Economic Impact Statement Been Prepared Under Chapter 19.85 RCW? No. The signs would be provided by the Liquor Control Board without charge to the licensees for posting on their respective premises. There would be no cost to the licensees in complying with the requirements of the rule thus a small business economic impact statement was not deemed necessary.

Hearing Location: Washington State Liquor Control Board, Capitol Plaza Building, 1025 East Union, Fifth Floor Conference Room, Olympia, WA, on August 24, 1994, at 9:30 a.m.

Assistance for Persons with Disabilities: Contact ATT TTY/TDD Relay by August 19, 1994, TDD (800) 833-6388.

Submit Written Comments to: Jennifer McDougall, Alcohol Awareness Program, Washington State Liquor

Control Board, P.O. Box 43094, Olympia, WA 98504-0394, FAX (206) 664-0501, by August 22, 1994.

Date of Intended Adoption: August 31, 1994.

July 20, 1994

Mike Murphy

Board Member

NEW SECTION

**WAC 314-12-195 Mandatory signs to be posted warning of the possible dangers of consumption of alcohol during pregnancy.** No later than October 5, 1994, all liquor licensees shall display signs provided by the board warning of the possible danger of birth defects which may be caused as a result of the consumption of alcohol during pregnancy. These signs shall be displayed upon the licensed premises in the following manner:

(1) If a licensee holds a license providing for on-premises consumption, the sign shall be posted in plain view at the main entrance to the liquor licensed portion of the establishment (in a place which is clearly visible to persons entering the licensed premises).

(a) Self-service "mini-bars" in hotel guest rooms shall be exempt.

(b) Airports, convention centers, sports facilities and other licensed premises where more than one location of such sale, service and consumption is authorized, shall post signs in plain view in a place which is clearly visible to the majority of patrons entering or approaching the liquor licensed portion of the premises.

(2) If the licensee holds a license providing for the sale of alcohol for off-premises consumption, the board provided sign shall be posted in plain view at the cash register(s) where alcohol is sold or in plain view at the main entrance to the licensed premises.

(3) If the licensee is a liquor manufacturer, the notices shall be posted in plain view at the main entrance to areas where alcohol is sold for off-premises consumption. If a manufacturer's tasting rooms have separate buildings or separate entrances, the sign shall be posted in plain view at the main entrance to the tasting area.

(4) Signs and replacements shall be available from the enforcement division.

(5) Failure to comply with the provisions of this section shall constitute a violation of the rules of the board and administrative sanctions may be levied.

**WARNING:**



**ZERO Alcohol = ZERO Risk.**

**Alcohol use during pregnancy may cause birth defects such as Fetal Alcohol Syndrome.**

For more information call 1-800-662-9111

PROPOSED

**Reviser's note:** The unnecessary underscoring in the above section occurred in the copy filed by the agency and appears in the Register pursuant to the requirements of RCW 34.08.040.

**WSR 94-15-103**  
**PROPOSED RULES**  
**OFFICE OF**  
**INSURANCE COMMISSIONER**  
 [Filed July 20, 1994, 11:55 a.m.]

**Original Notice.**

**Title of Rule:** Alternative care benefits—General rules as to minimum standards.

**Purpose:** To provide coverage for substitution of less expensive or less intensive care for hospitalization or other institutional care in policies which cover institutional care.

**Other Identifying Information:** Insurance Commissioner Matter No. R 94-16.

**Statutory Authority for Adoption:** RCW 48.01.030, 48.02.060, 48.44.020, 48.44.050, 48-46.060, 48.46.200.

**Statute Being Implemented:** RCW 48.01.030, 48.02.060, 48.44.020, 48.44.050, 48.46.060, 48.46.200.

**Summary:** These rules set minimum standards for alternative care arrangements. Some insurers voluntarily offer alternatives to hospitalization, many do not.

**Reasons Supporting Proposal:** Patients can sometimes be treated in settings other than an institution. These rules set minimum standards for such coverage for policies or contracts issued, amended or renewed on or after January 1, 1995.

**Name of Agency Personnel Responsible for Drafting:** Melodie Bankers, Insurance Building, Olympia, Washington, (206) 586-3574; **Implementation and Enforcement:** Bethany Weidner, Insurance Building, Olympia, Washington, (206) 664-3784.

**Name of Proponent:** Deborah Senn, Insurance Commissioner, governmental.

**Rule is not necessitated by federal law, federal or state court decision.**

**Explanation of Rule, its Purpose, and Anticipated Effects:** These rules set minimum standards for alternative care arrangements. Some insurers voluntarily offer alternatives to hospitalization, many do not. It is anticipated that patients whose medical needs can be met by treatment at a site other than a hospital or nursing home, will be able to stay at home and receive care that would otherwise have to be provided in a more expensive setting because insurance benefits are payable only for institutional care. This contract or policy benefit should save money for the health care system, insurance companies and patients alike.

**Proposal Changes the Following Existing Rules:** These rules set new minimum standards.

**Has a Small Business Economic Impact Statement Been Prepared Under Chapter 19.85 RCW?** Yes. A copy of the statement may be obtained by writing to: Kacy Brandeberry, Office of Insurance Commissioner, Insurance Building, P.O. Box 40255, Olympia, WA 98504-0255, phone (206) 664-3790, or FAX (206) 586-3535.

**Hearing Location:** John L. O'Brien Building, State Capitol Campus, Hearing Room C, Olympia, Washington, on August 23, 1994, at 9:30 a.m.

Submit Written Comments to: Kacy Brandeberry, Insurance Building, P.O. Box 40255, Olympia, WA 98504-0255, FAX (206) 586-3535, by August 22, 1994.

Date of Intended Adoption: August 26, 1994.

July 20, 1994  
 Krishna Fells  
 Chief of Staff  
 for Deborah Senn  
 Insurance Commissioner

NEW SECTION

**WAC 284-46-500 Alternative care—General rules as to minimum standards.** (1) As an alternative to hospitalization or institutionalization of an insured and with the intent to cover placement of the insured patient in the most appropriate and cost-effective setting, every individual, group or blanket policy or contract of a health maintenance organization issued, amended, or renewed on or after January 1, 1995, which provides coverage for hospitalization or other institutional expenses to a resident of this state shall include substitution of home health care provided by home health care agencies licensed under chapter 70.127 RCW, at equal or lesser cost.

(2) In addition, such expenses may include coverage for durable medical equipment which permits the insured to stay at home, care provided in Alzheimer's centers, adult family homes, assisted living facilities, congregate care facilities, adult day health care, home health care and personal care, or similar alternative care arrangements which provide necessary care in less restrictive or less expensive environments.

(3) Substitution of less expensive or less intensive services shall be made only with the consent of the insured and upon the recommendation of the insured's attending physician or licensed health care provider that such services will adequately meet the insured patient's needs. The decision to substitute less expensive or less intensive services shall be determined based on the medical needs of the individual insured patient.

(4) The health maintenance organization may require that home health agencies or similar alternative care providers have written treatment plans which are approved by the insured patient's attending physician or other licensed health care provider.

(5) Coverage may be limited to the maximum benefits which would be payable for hospital or other institutional expenses under the policy or contract, and may include all deductibles and coinsurances which would be payable by the insured under the hospital or other institutional expense coverage of the insured's policy or contract.

NEW SECTION

**WAC 284-96-500 Alternative care—General rules as to minimum standards.** (1) As an alternative to hospitalization or institutionalization of an insured and with the intent to cover placement of the insured patient in the most appropriate and cost-effective setting, every group or blanket disability insurance policy, contract or certificate issued, amended, or renewed on or after January 1, 1995, which provides coverage for hospitalization or other institutional expenses to a resident of this state shall include substitution

of home health care, provided by home health care agencies licensed under chapter 70.127 RCW, at equal or lesser cost.

(2) In addition, such expenses may include coverage for durable medical equipment which permits the insured to stay at home, care provided in Alzheimer's centers, adult family homes, assisted living facilities, congregate care facilities, adult day health care, home health care and personal care, or similar alternative care arrangements which provide necessary care in less restrictive or less expensive environments.

(3) Substitution of less expensive or less intensive services shall be made only with the consent of the insured and upon the recommendation of the insured's attending physician or licensed health care provider that such services will adequately meet the insured patient's needs. The decision to substitute less expensive or less intensive services shall be determined based on the medical needs of the individual insured patient.

(4) The insurer may require that home health agencies or similar alternative care providers have written treatment plans which are approved by the insured patient's attending physician or other licensed health care provider.

(5) Coverage may be limited to the maximum benefits which would be payable for hospital or other institutional expenses under the policy or contract, and may include all deductibles and coinsurances which would be payable by the insured under the hospital or other institutional expense coverage of the insured's policy or contract.

**AMENDATORY SECTION** (Amending Order R-76-4, filed 10/29/76, effective 3/1/77)

**WAC 284-50-330 General rules as to minimum standards.** (1) A "noncancellable," "guaranteed renewable" or "noncancellable and guaranteed renewable" policy shall not provide for termination of coverage of the spouse solely because of the occurrence of an event specified for termination of coverage of the insured, other than nonpayment of premium. The policy shall provide that in the event of the insured's death the spouse of the insured, if covered under the policy, shall become the insured.

(2) The terms "noncancellable," "guaranteed renewable" or "noncancellable and guaranteed renewable" shall not be used without further explanatory language in accordance with the disclosure requirements of WAC 284-50-375(1). The terms "noncancellable" or "noncancellable and guaranteed renewable" may be used only in a policy which the insured has the right to continue in force by the timely payment of premiums set forth in the policy until the age of 65 or to eligibility for Medicare, during which period the insurer has no right to make unilaterally any change in any provision of the policy while the policy is in force: *Provided, however*, any accident and health or accident only policy which provides for periodic payments, weekly or monthly, for a specified period during the continuance of disability resulting from accident or sickness may provide that the insured has the right to continue the policy only to age 60 if, at age 60, the insured has the right to continue the policy in force at least to age 65 while actively or regularly employed. Except as provided above, the term "guaranteed renewable" may be used only in a policy which the insured has the right to continue in force by the timely payment of premiums until the age of 65 or to eligibility for Medicare, during which

period the insurer has no right to make unilaterally any change in any provision of the policy while the policy is in force, except that the insurer may make changes in premium rates by classes: *Provided, however*, any accident and health or accident only policy which provides for periodic payments, weekly or monthly, for a specified period during the continuance of disability resulting from accident or sickness may provide that the insured has the right to continue the policy only to age 60, if at age 60, the insured has the right to continue the policy in force at least to age 65 while actively and regularly employed.

(3) In a family policy covering both husband and wife the age of the younger spouse may be used as the basis for meeting the age and durational requirements of the definitions of "noncancellable" or "guaranteed renewable." However, this requirement shall not prevent termination of coverage of the older spouse upon attainment of the stated age limit (e.g., age 65) so long as the policy may be continued in force as to the younger spouse to the age or for the durational period as specified in said definition.

(4) When accidental death and dismemberment coverage is part of the insurance coverage offered under the contract, the insured shall have the option to include all insureds under such coverage and not just the principal insured.

(5) If a policy contains a status type military service exclusion or a provision which suspends coverage during military service, the policy shall provide, upon receipt of written request, for refund of premiums as applicable to such person on a pro rata basis.

(6) In the event the insurer cancels or refuses to renew, policies providing pregnancy benefits shall provide for an extension of benefits as to pregnancy commencing while the policy is in force and for which benefits would have been payable had the policy remained in force.

(7) Policies providing convalescent or extended care benefits following hospitalization shall not condition such benefits upon admission to the convalescent or extended care facility with a period of less than fourteen days after discharge from the hospital.

(8) In accord with RCW 48.20.420, coverage shall continue for any dependent child who is incapable of self-sustaining employment due to mental retardation or physical handicap, on the date that such child's coverage would otherwise terminate under the policy due to the attainment of a specified age limit for children, and who is chiefly dependent on the insured for support and maintenance. The policy may require that within 31 days of such date the company receive due proof of such incapacity and dependency in order for the insured to elect to continue the policy in force with respect to such child, or that a separate converted policy be issued at the option of the insured or policyholder.

(9) Any policy providing coverage for the recipient in a transplant operation shall also provide reimbursement of any medical expenses of a live donor to the extent that benefits remain and are available under the recipient's policy, after benefits for the recipient's own expenses have been paid.

(10) A policy may contain a provision relating to recurrent disabilities; provided, however, that no such provision shall specify that a recurrent disability be separated by a period greater than six months.



(11) Accidental death and dismemberment benefits shall be payable if the loss occurs within no less than ninety days from the date of the accident, irrespective of total disability. Disability income benefits, if provided, shall not require the loss to commence less than thirty days after the date of accident, nor shall any policy which the insurer cancels or refuses to renew require that it be in force at the time disability commences if the accident occurred while the policy was in force.

(12) Specific dismemberment benefits shall not be in lieu of other benefits unless the specific benefit equals or exceeds the other benefits.

(13) Any accident only policy providing benefits which vary according to the type of accidental cause shall prominently set forth in the outline of coverage the circumstances under which benefits are payable which are lesser than the maximum amount payable under the policy.

(14) All Medicare supplement policies providing in-hospital benefits only shall include in their provided benefits the initial Part A Medicare deductible as established from time to time by the Social Security Administration. Premiums may be reduced or raised to correspond with changes in the covered deductible.

(15) Termination of the policy shall be without prejudice to any continuous loss which commenced while the policy was in force, but the extension of benefits beyond the period the policy was in force may be predicated upon the continuous total disability of the insured, limited to the duration of the policy benefit period, if any, or payment of the maximum benefits.

(16) As an alternative to hospitalization or institutionalization of an insured and with the intent to cover placement of the insured patient in the most appropriate and cost-effective setting, every individual disability insurance policy or contract issued, amended, or renewed on or after January 1, 1995, which provides coverage for hospitalization or other institutional expenses to a resident of this state shall include substitution of home health care, provided by home health care agencies licensed under chapter 70.127 RCW, at equal or lesser cost.

(a) In addition, such expenses may include coverage for durable medical equipment which permits the insured to stay at home, care provided in Alzheimer's centers, adult family homes, assisted living facilities, congregate care facilities, adult day health care, home health care and personal care, or similar alternative care arrangements which provide necessary care in less restrictive or less expensive environments.

(b) Substitution of less expensive or less intensive services shall be made only with the consent of the insured and upon the recommendation of the insured's attending physician or licensed health care provider that such services will adequately meet the insured patient's needs. The decision to substitute less expensive or less intensive services shall be determined based on the medical needs of the individual insured patient.

(c) The insurer may require that home health agencies or similar alternative care providers have written treatment plans which are approved by the insured patient's attending physician or other licensed health care provider.

(d) Coverage may be limited to the maximum benefits which would be payable for hospital or other institutional expenses under the policy or contract, and may include all

deductibles and coinsurances which would be payable by the insured under the hospital or other institutional expense coverage of the insured's policy or contract.

#### NEW SECTION

**WAC 284-44-500 Alternative care—General rules as to minimum standards.** (1) As an alternative to hospitalization or institutionalization of an insured and with the intent to cover placement of the insured patient in the most appropriate and cost-effective setting, every individual, group or blanket policy or contract of a health care service contractor issued, amended, or renewed on or after January 1, 1995, which provides coverage for hospitalization or other institutional expenses to a resident of this state shall include substitution of home health care provided by home health care agencies licensed under chapter 70.127 RCW, at equal or lesser cost.

(2) In addition, such expenses may include coverage for durable medical equipment which permits the insured to stay at home, care provided in Alzheimer's centers, adult family homes, assisted living facilities, congregate care facilities, adult day health care, home health care and personal care, or similar alternative care arrangements which provide necessary care in less restrictive or less expensive environments.

(3) Substitution of less expensive or less intensive services shall be made only with the consent of the insured and upon the recommendation of the insured's attending physician or licensed health care provider that such services will adequately meet the insured patient's needs. The decision to substitute less expensive or less intensive services shall be determined based on the medical needs of the individual insured patient.

(4) The health care service contractor may require that home health agencies or similar alternative care providers have written treatment plans which are approved by the insured patient's attending physician or other licensed health care provider.

(5) Coverage may be limited to the maximum benefits which would be payable for hospital or other institutional expenses under the policy or contract, and may include all deductibles and coinsurances which would be payable by the insured under the hospital or other institutional expense coverage of the insured's policy or contract.

**WSR 94-15-104**

**PROPOSED RULES**

**OFFICE OF**

**INSURANCE COMMISSIONER**

[Filed July 20, 1994, 11:56 a.m.]

Original Notice.

Title of Rule: Coverage for prescribed uses of drugs which are uses other than those stated in the FDA approved labeling of the drug (off-label).

Purpose: The purpose of this rule is to provide minimum standards for the coverage of off-label drugs in policies or contracts which include coverage for prescription drugs.

Other Identifying Information: Insurance Commissioner Matter No. R 94-17.

Statutory Authority for Adoption: RCW 48.01.030, 48.02.060, 48.30.010.

Statute Being Implemented: RCW 48.01.030, 48.30.010.

Summary: Insurance policies which provide coverage for prescription drugs must cover off-label uses of drugs that are FDA approved and which are recognized as effective for treatment in certain standard reference compendia.

Reasons Supporting Proposal: Some insurers now provide coverage for off-label uses of prescription drugs, some do not. This rule prevents unfair claims settlement methods and unfair competition among insurers, health care service contractors and health maintenance organizations.

Name of Agency Personnel Responsible for Drafting: Melodie Bankers, Insurance Building, Olympia, Washington, (206) 586-3574; Implementation and Enforcement: Bethany Weidner, Insurance Building, Olympia, Washington, (206) 664-3784.

Name of Proponent: Deborah Senn, Insurance Commissioner, governmental.

Rule is not necessitated by federal law, federal or state court decision.

Explanation of Rule, its Purpose, and Anticipated Effects: Coverage for prescribed uses of drugs which are used other than those stated in the FDA approved labeling of the drug (off-label). Insurance policies which provide coverage for prescription drugs must cover off-label uses of drugs that are FDA approved and which are recognized as effective for treatment in certain standard reference compendia.

Proposal Changes the Following Existing Rules: Sets minimum standards for coverage for off-label uses of prescriptions.

Has a Small Business Economic Impact Statement Been Prepared Under Chapter 19.85 RCW? Yes. A copy of the statement may be obtained by writing to: Kacy Brandeberry, Office of Insurance Commissioner, Insurance Building, P.O. Box 40255, Olympia, WA 98504-0255, phone (206) 664-3790, or FAX (206) 586-3535.

Hearing Location: John L. O'Brien Building, State Capitol Campus, Hearing Room C, Olympia, Washington, on August 23, 1994, at 9:30 a.m.

Submit Written Comments to: Kacy Brandeberry, Insurance Building, P.O. Box 40255, Olympia, WA 98504-0255, FAX (206) 586-3535, by August 22, 1994.

Date of Intended Adoption: August 26, 1994.

July 20, 1994  
Krishna Fells  
Chief of Staff  
for Deborah Senn  
Insurance Commissioner

## NEW SECTION

**WAC 284-30-450 Insurance policies and contracts—Coverage for drugs.** (1) Authority and purpose.

(a) Some insurers deny payment for drugs that have been approved by the Federal Food and Drug Administration (FDA) when the drugs are used for indications other than those stated in the labelling approved by the FDA (off-label use) while other insurers with similar coverage terms pay for off-label use. Denial of payment for off-label use can

interrupt or effectively deny access to necessary and appropriate treatment for a person being treated for a life-threatening illness.

(b) Equity among insured residents of this state and fair claims settlement practices and fair competition among companies providing coverage to residents of this state require comparable reimbursement for prescribed drugs among insurers, health care service contractors, and health maintenance organizations.

(c) Use of off-label indications often provides efficacious drugs at a lower cost.

(d) To prevent unfair methods of claims settlements, unfair competition, and unfair or deceptive acts or practices of insurers and prohibited acts or practices of health care service contractors or health maintenance organizations, this rule is adopted.

(2) Scope.

This regulation affects all insurance and health benefit policies and contracts providing coverage for drugs to a resident of this state which are issued, amended, delivered or renewed on or after January 1, 1995.

(3) Definitions. The following definitions are used in this section:

(a) "Drug" or "drugs" means any substance prescribed by a physician taken by mouth, injected into a muscle, the skin, a blood vessel, or a cavity of the body, or applied to the skin to treat or prevent a disease, and specifically includes drugs or biologicals used in an anticancer chemotherapeutic regimen for a medically accepted indication or for the treatment of people with HIV or AIDS.

(b) "Off-label" means the prescribed use of a drug which is other than that stated in its FDA approved labelling.

(c) "Peer-reviewed medical literature" means scientific studies printed in journals or other publications in which original manuscripts are published only after having been critically reviewed for scientific accuracy, validity, and reliability by unbiased independent experts. Peer-reviewed medical literature does not include in-house publications of pharmaceutical manufacturing companies.

(d) "Physician" means a medical doctor or other health care provider acting within the scope of his or her professional license.

(e) "Policy" or "contract" means any individual, group or blanket policy of insurance or health benefit contract issued by a disability insurer, health care service contractor, or health maintenance organization which is issued, amended, delivered or renewed on or after January 1, 1995, and which provides coverage for drugs to a resident of this state.

(f) "Standard reference compendia" means:

(i) The American Hospital Formulary Service-Drug Information;

(ii) The American Medical Association Drug Evaluation;

(iii) The United States Pharmacopoeia-Drug Information; or

(iv) Other authoritative compendia as identified from time to time by the Federal Secretary of Health and Human Services or the insurance commissioner.

(4) Standards of coverage.

(a) No insurance policy or contract which provides coverage for prescription drugs to a resident of this state shall exclude coverage of any such drug for a particular indication on the grounds that the drug has not been ap-

proved by the Federal Food and Drug Administration for that indication, if such drug is recognized as effective for treatment of such indication:

- (i) In one of the standard reference compendia;
- (ii) In peer-reviewed medical literature; or
- (iii) By the Federal Secretary of Health and Human Services.

(b) Coverage of a prescription drug required by this section shall also include medically necessary services associated with the administration of the drug.

(c) This regulation shall not be construed to require coverage for any drug when the Federal Food and Drug Administration has determined its use to be contra-indicated.

(d) This regulation shall not be construed to require coverage for experimental drugs not otherwise approved for any indication by the Federal Food and Drug Administration.

**WSR 94-15-105**  
**PROPOSED RULES**  
**OFFICE OF**  
**INSURANCE COMMISSIONER**

[Filed July 20, 1994, 11:59 a.m.]

Original Notice.

Title of Rule: Accelerated benefits.

Purpose: The purpose of the regulation is to regulate accelerated benefits paid under individual life insurance policies and group life insurance policies and also to establish minimum required standards of disclosure to the consumer.

Other Identifying Information: Insurance Commissioner Matter No. R 94-18.

Statutory Authority for Adoption: RCW 48.02.060 (3)(a), 48.30.010.

Statute Being Implemented: RCW 48.11.020, 48.30.018.

Summary: The proposed regulation defines qualifying events for the payment of accelerated benefits, lists permitted payment options, sets minimum standards for disclosure to the consumer, limits administrative expense charges, specifies actuarial standards and reserves and describes a required provision for the resolution of disputes that may arise.

Reasons Supporting Proposal: Consumer protection requires such a rule, since accelerated benefits are becoming more common. Full disclosure to the consumer and a limitation on administrative expense are particularly important.

Name of Agency Personnel Responsible for Drafting: William Kirby, Insurance Building, Olympia, Washington, (206) 586-5597; Implementation and Enforcement: Shirley Polzin, Insurance Building, Olympia, Washington, (206) 664-3860.

Name of Proponent: Deborah Senn, Insurance Commissioner, governmental.

Rule is not necessitated by federal law, federal or state court decision.

Explanation of Rule, its Purpose, and Anticipated Effects: To regulate accelerated benefits in individual and group life insurance policies by setting standards and requiring full disclosure.

Proposal does not change existing rules.

Has a Small Business Economic Impact Statement Been Prepared Under Chapter 19.85 RCW? Yes. A copy of the statement may be obtained by writing to: Kacy Brandeberry, Office of Insurance Commissioner, Insurance Building, P.O. Box 40255, Olympia, WA 98504-0255, phone (206) 664-3790, or FAX (206) 586-3535.

Hearing Location: John L. O'Brien Building, State Capitol Campus, Hearing Room C, Olympia, Washington, on August 23, 1994, at 9:30 a.m.

Submit Written Comments to: Kacy Brandeberry, Insurance Building, P.O. Box 40255, Olympia, WA 98504-0255, FAX (206) 586-3535, by August 22, 1994.

Date of Intended Adoption: August 26, 1994.

July 20, 1994

Krishna Fells

Chief of Staff

for Deborah Senn

Insurance Commissioner

**ACCELERATED LIFE INSURANCE BENEFITS**

**NEW SECTION**

**WAC 284-23-600 Title.** This regulation, WAC 284-23-600 through WAC 284-23-730, inclusive, may be known and cited as "The Washington Regulation on Accelerated Life Insurance Benefits." (Statutory Authority: RCW 48.02.060 and RCW 48.30.010.

**Reviser's note:** The typographical error in the above section occurred in the copy filed by the agency and appears in the Register pursuant to the requirements of RCW 34.08.040.

**NEW SECTION**

**WAC 284-23-610 Authority, finding, purpose, and scope.** (1) The purpose of this regulation, WAC 284-23-600 through 284-23-730, is to define certain minimum standards for the regulation of accelerated benefit provisions of individual and group life insurance policies, a single violation of which will be deemed to constitute an unfair claims settlement practice. The Commissioner finds and hereby defines it to be an unfair act or practice and an unfair method of competition for any insurer to provide accelerated benefits except as provided in this regulation.

(2) The Commissioner finds that accelerated benefits in life insurance policies are primarily mortality risks rather than morbidity risks. The Commissioner further finds that accelerated benefits are optional modes of settlement of proceeds under life insurance proceeds under RCW 48.11.020.

(3) This regulation applies to all accelerated benefit provisions of individual and group life insurance policies and riders which are issued or delivered to a resident of this state, on or after the effective date of this regulation. The regulation applies to both policies and riders. It also applies to solicitations for the sale of accelerated benefits, whether in the form of policies or riders.

(4) This regulation does not apply to any long term care insurance policies, contracts, or certificates.

(5) This regulation does not require inclusion or offering of any accelerated benefit in a life insurance policy. This regulation regulates those accelerated benefits which

individual and group life insurers choose to advertise, offer, or market on or after the effective date of this regulation.

#### NEW SECTION

**WAC 284-23-620 Definitions.** Unless the context clearly requires otherwise, the definitions in this section apply throughout this regulation.

(1) "Accelerated Benefits" means benefits payable under an individual or group life insurance policy. They are primarily mortality risks, rather than morbidity risks. Accelerated benefits may also mean optional modes of settlement of proceeds under life insurance policies. Accelerated benefits are benefits:

(a) Payable to either the policyholder of an individual life policy or to the certificateholder of a group life policy, during the lifetime of the insured, in anticipation of death, or upon the occurrence of certain specified life-threatening, terminal, or catastrophic conditions defined by the policy or rider; and

(b) Which reduce or eliminate the death benefit otherwise payable under the life insurance policy or rider; and

(c) Which are payable upon the occurrence of a single qualifying event which results in the payment of a benefit amount fixed at the time the accelerated benefit is paid.

(2) "Qualified actuary" means a person who is a qualified actuary as defined in WAC 284-05-060.

(3) "Qualifying event" means one or more of the following:

(a) A medical condition which would result in a drastically limited life span as specified in the policy or rider, such as twenty-four months or less;

(b) A medical condition which has required or requires extraordinary medical intervention; For example, major organ transplants or the use of continuous life support, without which the insured would die;

(c) Any condition which usually requires continuous confinement in any eligible institution as defined in the policy or rider, if the insured is expected to remain there for the rest of his or her life;

(d) Any medical condition which, in the absence of extensive or extraordinary medical treatment, would result in a drastically limited life span of the insured. Such medical conditions may include, for example:

(i) Coronary artery disease resulting in an acute infarction or requiring surgery;

(ii) Permanent neurological deficit resulting from cerebral vascular accident;

(iii) End stage renal failure;

(iv) Acquired Immune Deficiency Syndrome; or

(v) Other medical conditions which the Insurance Commissioner approves for any particular filing.

#### NEW SECTION

**WAC 284-23-630 Assignees and beneficiaries.** Prior to the payment of any accelerated benefit, the insurer shall obtain from any assignee or irrevocable beneficiary a signed consent to the terms of the payout. If the insurer paying the accelerated benefit is itself an assignee, its own written consent is not required.

#### NEW SECTION

**WAC 284-23-640 Criteria for payment.** (1) Payment options shall include, the option of taking the benefit as a lump sum. The benefit shall not be made available as an annuity contingent upon the life of the insured.

(2) No insurer may restrict the use of the proceeds from the payment of accelerated benefits.

(3) If any part of the death benefit remains after payment of an accelerated benefit, then any applicable accidental death benefit payable under the policy or rider shall not be affected by the payment of the accelerated benefit.

#### NEW SECTION

**WAC 284-23-650 Disclosure statement.** (1) The words "Accelerated Benefit" must be included in the required title of every life insurance policy or rider that includes a provision for accelerated benefits. Accelerated Benefits shall not be described, advertised, marketed, or sold as either long-term care insurance or as providing long-term care benefits.

(2) Possible tax consequences and possible consequences on eligibility for receipt of Medicare, Medicaid, Social Security, Supplemental Security Income (SSI), or other sources of public funding shall be included in every disclosure statement.

(a) A disclosure statement shall be provided which contains a statement that receipt of accelerated benefits may be taxable and that assistance should be sought from a personal tax advisor. The disclosure statement shall be prominently displayed on the first page of the policy or rider and any other related materials.

(b) The disclosure statement shall contain substantially the following: "If you receive payment of accelerated benefits from a life insurance policy, you may lose your right to receive certain public funds, such as Medicare, Medicaid, Social Security, Supplemental Security, Supplemental Security Income (SSI), and possibly others. Also, receiving accelerated benefits from a life insurance policy may have tax consequences for you. We cannot give you advice about this. You may wish to obtain advice from a tax professional or an attorney before you decide to receive accelerated benefits from a life insurance policy."

(c) The disclosure statement must be provided (i) to the applicant for an individual or group life insurance policy at the time application is made for the policy or rider; and (ii)(A) to the individual insured at the time the owner of an individual life insurance policy submits a request for payment of the accelerated benefit, and before the accelerated benefit is paid, or (B) to the individual certificateholder at the time an individual certificateholder of a group life insurance policy submits a request for payment of the accelerated benefit, and before the accelerated benefit is paid. It is not sufficient to provide this required disclosure statement only to the holder of a group policy.

(3) The disclosure statement shall give a brief and clear description of the accelerated benefit. It shall define all qualifying events which can trigger payment of the accelerated benefit. It shall also describe any effect of payment of accelerated benefits upon the policy's cash value, accumula-

tion account, death benefit, premium, policy loans, and policy liens.

(a) In the case of agent solicited insurance, the agent shall provide the disclosure form to the applicant before or at the time the application is signed. Written acknowledgment of receipt of the disclosure statement shall be signed by the applicant and the agent.

(b) In the case of a solicitation by direct response methods, the insurer shall provide the disclosure form to the applicant at the time the policy is delivered, with a written notice that a full premium refund shall be made if the policy is returned to the insurer within the free look period.

(c) In the case of group life insurance policies, the disclosure statement shall be contained in the certificate of coverage, or in any other related document furnished by the insurer to the certificateholder.

(4) If there is a premium or cost of insurance charge for the accelerated benefit, the insurer shall give the applicant a generic illustration numerically demonstrating any effect of the payment of an accelerated benefit upon the policy's cash value, accumulation account, death benefit, premium, policy loans, or policy liens.

(a) In the case of agent solicited insurance, the agent shall provide the illustration to the applicant either before or at the time the application is signed.

(b) In the case of a solicitation by direct response methods, the insurer shall provide the illustration to the applicant concurrently with delivery of the policy to the applicant.

(c) In the case of group life insurance policies, the disclosure form shall be included in the certificate of insurance or any related document furnished by the insurer to the certificateholder.

(5)(a) Insurers with financing options other than as described in WAC 284-23-645 (1)(b) and (c) of this regulation, shall disclose to the policyowner any premium or cost of insurance charge for the accelerated benefit. Insurers shall make a reasonable effort to assure that the certificateholder on a group policy is made aware of any premium or cost of insurance charge for the accelerated benefits, if he or she is required to pay all or any part of such a premium or cost of insurance charge.

(b) Insurers shall furnish an actuarial demonstration to the Insurance Commissioner when filing an individual or group life insurance policy or rider form that provides accelerated benefits, showing the method used to calculate the cost for the accelerated benefit.

(6) Insurer shall disclose to the policyholder any administrative expense charge. The insurer shall make a reasonable effort to assure that the certificateholder on a group policy is made aware of any administrative expense charge if he or she is required to pay all or any part of any such charge.

(7) When the owner of an individual policy or the certificateholder of a group policy requests payment of an accelerated benefit, within 20 days of receiving the request the insurer shall send a statement to that person, and to any irrevocable beneficiary, showing any effect that payment of an accelerated benefit will have on the policy's cash value, accumulation account, death benefit, premium, policy loans, and policy liens. This statement shall disclose that receipt of accelerated benefit payments may adversely affect the

recipient's eligibility for Medicaid or other government benefits or entitlements. When the insurer pays the accelerated benefit, it shall issue an amended schedule page to the owner of an individual policy, or to the certificateholder of a group policy, showing any new, reduced in-force amount of the policy. When more than one payment of accelerated benefit is permitted under the policy or rider, the insurer shall send a revised statement to the owner of an individual policy, or to the certificateholder of a group policy, when a previous statement has become invalid due to payment of accelerated benefits.

#### NEW SECTION

**WAC 284-23-660 Effective date of the accelerated benefit.** The accelerated benefit provision shall be effective for accidents on the effective date of the policy or rider. The accelerated benefit provision shall be effective for illness no more than thirty (30) days following the effective date of the policy or rider.

#### NEW SECTION

**WAC 284-23-670 Waiver of premiums.** The insurer may offer a waiver of premium for the accelerated benefit provision, even in the absence of a policy waiver of premium provision being in effect. At the time payment of the accelerated benefit is requested, the insurer shall explain to the owner of an individual policy, or the certificateholder of a group policy, any continuing premium requirement necessary to keep the policy in force.

#### NEW SECTION

**WAC 284-23-680 Unfair discrimination.** An insurer shall not unfairly discriminate between insureds with different qualifying events covered under the policy or rider. An insurer may not unfairly discriminate between insureds with similar or identical qualifying events covered under the policy or rider. Insurers may not apply conditions on the payment of the accelerated benefits except those specified in the insured's policy or rider.

#### NEW SECTION

**WAC 284-23-690 Actuarial standards, financing options, effect on cash value, and effect on policy loans.** (1) An insurer shall select one of the following finance options. Under subsection (1)(a) and (1)(b) of this section, the accelerated death benefit is regarded as completely settled. Premiums, if any, payable for the remaining coverage shall be reduced proportionally.

(a) An insurer may require a premium charge or cost of insurance charge for the accelerated benefit. These charges shall be based on sound actuarial principles. No additional charges may be imposed to collect benefits.

(b) An insurer may pay the present value of the face amount of the insured's policy or certificate. The calculation of that present value shall be based upon any applicable discount appropriate to the policy design. The interest rate or interest rate methodology used in the calculation shall be based upon sound actuarial principles and disclosed in the policy or actuarial memorandum. The maximum interest rate used shall be no more than the greater of:

- (i) The current yield on ninety day treasury bills; or
- (ii) The current maximum statutory adjustable policy loan interest rate.

(c) An insurer may accrue an interest charge on the amount of the accelerated benefits. The interest rate or the interest rate methodology used in the calculation shall be based upon sound actuarial principles and shall be disclosed in the policy or the actuarial memorandum. The maximum interest rate used shall be no more than the greater of:

- (i) The current yield on ninety day treasury bills; or
- (ii) The current maximum statutory adjustable policy loan interest rate.

The interest rate accrued on the portion of the lien which is equal in amount to the cash value of the policy at the time the benefit is accelerated shall be no more than the loan interest rate stated in the policy.

(2) Effect on Cash Value. (a) When an accelerated benefit is payable, there shall be no more than a pro rata reduction in the cash value based upon the percentage of death benefit accelerated to produce the accelerated benefit payment; provided, however, that the payment of accelerated benefits, any administrative expense charges, any future premiums, and any accrued interest may be considered a lien against the death benefit of the policy or rider, and the access to any remaining cash value may be restricted to the excess of the cash value over the sum of any other outstanding loans and any lien. Future access to additional policy loans may be limited to any excess of the cash value over the sum of the lien and any other outstanding policy amounts. When payment of an accelerated benefit results in a pro rata reduction in the cash value, the payment may not be applied toward repaying an amount greater than a pro rata portion of any outstanding policy loans.

#### NEW SECTION

##### **WAC 284-23-700 Actuarial disclosure and reserves.**

(1) A qualified actuary shall describe the accelerated benefits, the risks, the expected costs, and the calculation of statutory reserves in an actuarial memorandum accompanying each filing that includes a provision for accelerated benefits. The insurer shall maintain in its files descriptions of the bases and procedures used to calculate benefits payable under these provisions. These descriptions shall be made available for examination by the commissioner upon request.

(2)(a) When benefits are provided through the acceleration of benefits under individual or group life policies, or riders to such policies, policy reserves shall be determined in accordance with the Standard Valuation Law chapter 48.74 RCW. All valuation assumptions used in constructing the reserves shall be determined as appropriate for statutory valuation purposes by a qualified actuary. Mortality tables and interest currently recognized for life insurance reserves by the National Association of Insurance Commissioners may be used, as well as appropriate assumptions for the other provisions incorporated in the policy. The actuary shall follow both actuarial standards and certification for good and sufficient reserves. Reserves in the aggregate shall be sufficient to cover:

- (i) Policies upon which no claim has yet arisen; and

(ii) Policies upon which a claim for one or more payments of accelerated benefits has arisen.

(b) For policies and certificates which provide actuarially equivalent benefits, no additional reserves need to be established.

(c) Policy liens and policy loans, plus any accrued interest, represent assets of the insurer for statutory reporting purposes. For any policy on which the policy lien exceeds the policy's statutory reserve liability, such excess must be held as a non-admitted asset.

#### NEW SECTION

**WAC 284-23-710 Filing requirements.** The filing of all forms containing accelerated benefit provisions, including both policies and riders, is required, pursuant to RCW 48.18.100 and WAC 284-58-130.

#### NEW SECTION

**WAC 284-23-720 Administrative expenses.** All charges or fees for administration or processing requests for any payments of accelerated benefits shall be disclosed and fully described in the policy, rider, and disclosure statement. Any such charge or fee shall be reasonable; shall be assessed no more than once; and may not exceed five hundred dollars.

#### NEW SECTION

**WAC 284-23-730 Resolution of disputes regarding occurrence of qualifying events.** (1) In the event the insured's health care provider and a health care provider appointed by the insurer disagree on whether a qualifying event has occurred, the opinion of the health care provider appointed by the insurer is not binding on the claimant. The parties shall attempt to resolve the matter promptly and amicably. The policy or rider providing the accelerated benefit shall provide that in case the disagreement is not so resolved, the claimant has the right to mediation or binding arbitration conducted by a disinterested third party who has no ongoing relationship with either party. Any such arbitration shall be conducted in accordance with chapter 7.04 RCW. As part of the final decision, the arbitrator or mediator shall award the costs of arbitration to one party or the other or may divide the costs equally or otherwise.

(2) To select the arbitrator or mediator, the claimant shall choose one health care provider, who may or may not be the claimant's regular health care provider or otherwise associated with or related to the claimant. The insurer shall choose one health care provider, who may or may be an employee or otherwise associated with the insurer. Those two choices shall be made within seven days after the later of those two health care providers has been chosen, those two health care providers shall agree on and appoint an arbitrator or mediator. The arbitrator or mediator will hear the case or otherwise commence resolving it within seven days of his or her appointment, and shall render a decision within fourteen days after appointment.

(3) "Health care provider," as used in this regulation, means a health care provider acting within the scope of his or her license.

**Reviser's note:** The typographical errors in the above section occurred in the copy filed by the agency and appear in the Register pursuant to the requirements of RCW 34.08.040.

PROPOSED





**WSR 94-15-001**  
**PERMANENT RULES**  
**DEPARTMENT OF**  
**FISH AND WILDLIFE**

[Order 94-62—Filed July 6, 1994, 4:41 p.m.]

Date of Adoption: June 8, 1994.

Purpose: Amend commercial fishing rules.

Citation of Existing Rules Affected by this Order:  
 Amending WAC 220-22-030, 220-47-304, 220-47-307, 220-47-311, 220-47-401, 220-47-411, and 220-47-412.

Statutory Authority for Adoption: RCW 75.08.080.

Pursuant to notice filed as WSR 94-09-071 on April 20, 1994.

Changes Other than Editing from Proposed to Adopted Version: Port Gamble closure area modified, gill net season adjustments.

Effective Date of Rule: Thirty-one days after filing.

July 5, 1994

Judith Freeman

Deputy

for Robert Turner

Director

**AMENDATORY SECTION** (Amending Order 90-49, filed 6/11/90, effective 7/12/90)

**WAC 220-22-030 Puget Sound Salmon Management and Catch Reporting Areas.** (1) **Area 4B** shall include those waters of Puget Sound easterly of a line projected from the Bonilla Point light on Vancouver Island to the Tatoosh Island light, thence to the most westerly point on Cape Flattery and westerly of a line projected true north from the fishing boundary marker at the mouth of the Sekiu River.

(2) **Area 5** shall include those waters of Puget Sound easterly of a line projected true north from the fishing boundary marker at the mouth of the Sekiu River and westerly of a line projected true north from Low Point.

(3) **Area 6** shall include those waters of Puget Sound easterly of a line projected from the Angeles Point Monument to the William Head light on Vancouver Island, northerly of a line projected from the Dungeness Spit light to the Partridge Point light, westerly of a line projected from the Partridge Point light to the Smith Island light, and southerly of a line projected from the Smith Island light to vessel traffic lane buoy R to the Trial Island light.

(4) **Area 6A** shall include those waters of Puget Sound easterly of a line projected from the Partridge Point light to the Smith Island light to the most northeasterly of the Lawson Reef lighted buoys (RB 1 Qk Fl Bell) to Northwest Island to the Initiative 77 marker on Fidalgo Island and westerly of a line projected from Reservation Head on Fidalgo Island to West Point on Whidbey Island.

(5) **Area 6B** shall include those waters of Puget Sound southerly of a line projected from the Dungeness Spit light to the Partridge Point light, westerly of a line projected from the Partridge Point light to the Point Wilson light and easterly of a line projected 155° true from Dungeness Spit light to Kulo Kala Point.

(6) **Area 6C** shall include those waters of Puget Sound easterly of a line projected true north from Low Point and westerly of a line projected from the Angeles Point Monument to the William Head light on Vancouver Island.

(7) **Area 6D** shall include those waters of Puget Sound westerly of a line projected 155° true from Dungeness Spit light to Kulo Kala Point.

(8) **Area 7** shall include those waters of Puget Sound southerly of a line projected true east-west through Sandy Point Light No. 2 (48 degrees, 47.2 minutes north latitude, 122 degrees, 42.7 minutes west longitude as per U.S. Coast Guard Light List No. 19880), northerly of a line projected from the Trial Island light to vessel traffic lane buoy R to the Smith Island light to the most northeasterly of the Lawson Reef lighted buoys (RB 1 Qk Fl Bell) to Northwest Island to the Initiative 77 marker on Fidalgo Island, and westerly of a line projected from Sandy Point Light No. 2 to Point Migley, thence along the eastern shore-line of Lummi Island to Carter Point, thence to the most northerly tip of Vendovi Island, thence to Clark Point on Guemes Island following the shoreline to Southeast Point on Guemes Island, thence to March Point on Fidalgo Island, excluding those waters of East Sound northerly of a line projected due west from Rosario Point on Orcas Island.

(9) **Area 7A** shall include those waters of Puget Sound northerly of a line projected true east-west through Sandy Point Light No. 2 (48 degrees, 47.2 minutes north latitude, 122 degrees, 42.7 minutes west longitude as per U.S. Coast Guard Light List No. 19880), terminating on the west at the international boundary and on the east at the landfall on Sandy Point.

(10) **Area 7B** shall include those waters of Puget Sound westerly of a line projected 154 degrees true from Sandy Point Light No. 2 (48 degrees, 47.2 minutes north latitude, 122 degrees, 42.7 minutes west longitude as per U.S. Coast Guard Light List No. 19880) to the landfall on Gooseberry Point, easterly of a line projected from Sandy Point Light No. 2 to Point Migley, thence along the eastern shoreline of Lummi Island to Carter Point, thence to the most northerly tip of Vendovi Island, thence to Clark Point on Guemes Island following the shoreline to Southeast Point on Guemes Island, thence to March Point on Fidalgo Island, northerly of the Burlington Northern railroad bridges at the north entrances to Swinomish Channel and westerly of a line projected from William Point light on Samish Island 28° true to the range light near Whiskey Rock on the north shore of Samish Bay and southwesterly of the mouth of Whatcom Creek, defined as a line projected approximately 14 degrees true from the flashing light at the southwest end of the Port of Bellingham North Terminal to the southernmost point of the dike surrounding the Georgia Pacific treatment pond.

(11) **Area 7C** shall include those waters of Puget Sound easterly of a line projected from William Point light on Samish Island 28° true to the range light near Whiskey Rock on the north shore of Samish Bay.

(12) **Area 7D** shall include those waters of Puget Sound easterly of a line projected 154 degrees true from Sandy Point Light No. 2 (48 degrees, 47.2 minutes north latitude, 122 degrees, 42.7 minutes west longitude as per U.S. Coast Guard Light List No. 19880) to the landfall on Gooseberry Point and south of a line projected true east from Sandy Point Light No. 2 to the landfall on Sandy Point.

(13) **Area 7E** shall include those waters of Puget Sound within East Sound northerly of a line projected due west from Rosario Point on Orcas Island.

(14) **Area 8** shall include those waters of Puget Sound easterly of a line projected from West Point on Whidbey Island to Reservation Head on Fidalgo Island, westerly of a line projected from the light on East Point 340° true to the light on Camano Island (Saratoga Pass light #2, Fl Red 4 Sec) southerly of the Burlington Northern railroad bridges at the north entrances to Swinomish Channel and northerly of the state highway 532 bridges between Camano Island and the mainland.

(15) **Area 8A** shall include those waters of Puget Sound easterly of a line projected from the East Point light on Whidbey Island 340° true to the light on Camano Island (Saratoga Pass light #2, Fl Red 4 Sec), northerly of a line projected from the southern tip of Possession Point 110° true to the shipwreck on the opposite shore, southerly of the State Highway 532 bridges between Camano Island and the mainland excluding those waters of Area 8D.

(16) **Area 8D** shall include those waters of Puget Sound inside and easterly of a line projected 225 degrees from the pilings at old Bower's Resort to a point 2,000 feet offshore, thence northwesterly to a point 2,000 feet off Mission Point, thence across the mouth of Tulalip Bay to a point 2,000 feet off Hermosa Point, thence northwesterly following a line 2,000 feet offshore to the intersection with a line projected 233 degrees from the fishing boundary marker on the shore at the slide north of Tulalip Bay.

(17) **Area 9** shall include those waters of Puget Sound southerly and easterly of a line projected from the Partridge Point light to the Point Wilson light, northerly of the site of the Hood Canal Floating Bridge, northerly of a line projected true west from the shoreward end of the Port Gamble tribal dock on Point Julia to the mainland in the community of Port Gamble, excluding those on-reservation waters of Hood Canal north of Port Gamble Bay to the marker at the north end of the Port Gamble Indian Reservation, southerly of a line projected from the southern tip of Possession Point 110° true to the shipwreck on the opposite shore and northerly of a line projected from the Apple Cove Point light to the light at the south end of the Edmond's breakwater at Edwards Point.

(18) **Area 9A** shall include those waters of Puget Sound known as Port Gamble Bay southerly of a line projected true west from the shoreward end of the Port Gamble tribal dock on Point Julia to the mainland in the community of Port Gamble and those on-reservation waters of Hood Canal north of Port Gamble Bay to the marker at the north end of the Port Gamble Indian Reservation.

(19) **Area 10** shall include those waters of Puget Sound southerly of a line projected from the Apple Cove Point light to the light at the south end of the Edmond's breakwater at Edwards Point, westerly of a line projected 233° true from the Azteca Restaurant near Shilshole Marina through entrance piling No. 8 to the southern shore of the entrance to the Lake Washington Ship Canal, westerly of a line projected 185° true from the southwest corner of Pier 91 through the Duwamish Head light to Duwamish Head, northerly of a true east-west line passing through the Point Vashon light, easterly of a line projected from Orchard Point to Beans Point on Bainbridge Island, and northerly and easterly of a line projected true west from Agate Point on Bainbridge Island to the mainland.

(20) **Area 10A** shall include those waters of Puget Sound easterly of a line projected 185° true from the southwest corner of Pier 91 through the Duwamish Head light to Duwamish Head.

(21) **Area 10C** shall include those waters of Lake Washington southerly of the Evergreen Point Floating Bridge.

(22) **Area 10D** shall include those waters of the Sammamish River south of the State Highway 908 Bridge and Lake Sammamish.

(23) **Area 10E** shall include those waters of Puget Sound westerly of a line projected from Orchard Point to Beans Point on Bainbridge Island and southerly and westerly of a line projected true west from Agate Point on Bainbridge Island to the mainland.

(24) **Area 10F** shall include those waters of Puget Sound easterly of a line projected 233° true from the Azteca Restaurant near Shilshole Marina through entrance piling Number 8 to the southern shore of the entrance to the Lake Washington Ship Canal and those waters of the Lake Washington Ship Canal westerly of a line projected from Webster Point true south to the Evergreen Point Floating Bridge including the waters of Salmon Bay, the Lake Washington Ship Canal, Lake Union and Portage Bay.

(25) **Area 10G** shall include those waters of Lake Washington northerly of the Evergreen Point Floating Bridge, easterly of a line projected from Webster Point true south to the Evergreen Point Floating Bridge and those waters of the Sammamish River north of the State Highway 908 Bridge.

(26) **Area 11** shall include those waters of Puget Sound southerly of a true east-west line passing through the Point Vashon light, northerly of a line projected 259 degrees true from Browns Point to the land fall in line with the site of Asarco smelter stack on the opposite shore of Commencement Bay, and northerly of the Tacoma Narrows Bridge.

(27) **Area 11A** shall include those waters of Puget Sound southerly of a line projected 259 degrees true from Browns Point to the land fall in line with the site of Asarco smelter stack on the opposite shore of Commencement Bay.

(28) **Area 12** shall include those waters of Puget Sound southerly of the site of the Hood Canal Floating Bridge and northerly and easterly of a line projected from the Tskutsko Point light to Misery Point.

(29) **Area 12A** shall include those waters of Puget Sound northerly of a line projected from Pulali Point true east to the mainland.

(30) **Area 12B** shall include those waters of Puget Sound southerly of a line projected from Pulali Point true east to the mainland, northerly of a line projected from Ayock Point true east to the mainland, and westerly of a line projected from the Tskutsko Point light to Misery Point.

(31) **Area 12C** shall include those waters of Puget Sound southerly of a line projected from Ayock Point true east to the mainland and northerly and westerly of a line projected from Ayres Point to the public boat ramp at Union.

(32) **Area 12D** shall include those waters of Puget Sound easterly of a line projected from Ayres Point to the public boat ramp at Union.

(33) **Area 13** shall include those waters of Puget Sound southerly of the Tacoma Narrows Bridge and a line projected from Green Point to Penrose Point and northerly and easterly

of a line projected from the Devil's Head light to Treble Point, thence through lighted buoy No. 3 to the mainland and westerly of the railroad trestle at the mouth of Chambers Bay.

(34) **Area 13A** shall include those waters of Puget Sound northerly of a line projected from Green Point to Penrose Point.

(35) **Area 13C** shall include those waters of Puget Sound easterly of the railroad trestle at the mouth of Chambers Bay.

(36) **Area 13D** shall include those waters of Puget Sound westerly of a line projected from the Devil's Head light to Treble Point, thence through lighted buoy Number 3 to the mainland, northerly of a line projected from Johnson Point to Dickenson Point, northerly of a line projected from the light at Dofflemeyer Point to Cooper Point, easterly of a line projected from Cooper Point to the southeastern shore of Sanderson Harbor, easterly of a line projected from the northern tip of Steamboat Island to the light at Arcadia to Hungerford Point and southerly of a line projected true east-west through the southern tip of Stretch Island.

(37) **Area 13E** shall include those waters of Puget Sound southerly of a line projected from Johnson Point to Dickenson Point.

(38) **Area 13F** shall include those waters of Puget Sound southerly of a line projected from the light at Dofflemeyer Point to Cooper Point.

(39) **Area 13G** shall include those waters of Puget Sound southerly of a line projected from Cooper Point to the southeastern shore of Sanderson Harbor.

(40) **Area 13H** shall include those waters of Puget Sound southwesterly of a line projected from the northern tip of Steamboat Island to the light at Arcadia and those waters easterly of a line projected 64° true from Kamilche Point to the opposite shore.

(41) **Area 13I** shall include those waters of Puget Sound southwesterly of a line projected 64° true from Kamilche Point to the opposite shore.

(42) **Area 13J** shall include those waters of Puget Sound northwesterly of a line projected from the light at Arcadia to Hungerford Point.

(43) **Area 13K** shall include those waters of Puget Sound northerly of a line projected true east-west through the southern tip of Stretch Island.

**AMENDATORY SECTION** (Amending Order 93-55, filed 6/29/93, effective 7/30/93)

**WAC 220-47-304 Puget Sound—All citizen salmon species seasons.** The following are Puget Sound all citizens salmon species seasons listed by area and species:

AREA	SPECIES	DATE	RANGE
<del>((6D:</del>	<del>COHO</del>	<del>9/19</del>	<del>10/23))</del>
7,7A:	<del>((COHO</del>	<del>9/5</del>	<del>10/2))</del>
	CHUM	<del>((10/3</del>	<del>11/27))</del>
		10/9	11/26
7B:	CHINOOK	<del>((7/11</del>	<del>9/4))</del>
		8/7	9/10
	COHO	<del>((9/5</del>	<del>10/23))</del>
		9/11	10/29
	CHUM	<del>((10/24</del>	<del>12/11))</del>
		10/30	12/17

7C:	CHINOOK	<del>((7/11</del>	<del>10/9))</del>
		8/7	10/15
<del>((7E:</del>	<del>CHINOOK</del>	<del>8/1</del>	<del>9/11))</del>
8:	<del>((PINK</del>	<del>8/22</del>	<del>9/11))</del>
	CHUM	<del>((10/24</del>	<del>11/27))</del>
		10/23	11/26
8A:	<del>((CHINOOK</del>	<del>7/25</del>	<del>9/4))</del>
	COHO	<del>9/5</del>	<del>10/23))</del>
	CHUM	<del>((10/24</del>	<del>11/27))</del>
		10/23	12/3
8D:	<del>((CHINOOK</del>	<del>7/18</del>	<del>9/18))</del>
	COHO	<del>((9/19</del>	<del>11/13))</del>
		9/25	11/12
	CHUM	<del>((11/14</del>	<del>12/14))</del>
		11/13	12/3
9A:	COHO	9/18	11/5
10,11:	<del>((COHO</del>	<del>9/5</del>	<del>10/9))</del>
	CHUM	<del>((10/10</del>	<del>11/27))</del>
		10/16	11/19
12:	<del>((COHO</del>	<del>9/5</del>	<del>10/16))</del>
	CHUM	<del>((10/17</del>	<del>11/20))</del>
		10/16	11/19
<del>((12A:</del>	<del>COHO</del>	<del>9/5</del>	<del>10/9))</del>
	CHUM	<del>10/10</del>	<del>12/18))</del>
12B:	<del>((CHINOOK</del>	<del>7/11</del>	<del>9/4))</del>
	COHO	<del>9/5</del>	<del>10/16))</del>
	CHUM	<del>((10/17</del>	<del>11/20))</del>
		10/23	11/19
12C:	<del>((CHINOOK</del>	<del>7/18</del>	<del>9/4))</del>
	CHUM	<del>((10/31</del>	<del>11/27))</del>
		11/06	11/26

**AMENDATORY SECTION** (Amending Order 92-47, filed 7/20/92, effective 8/20/92)

**WAC 220-47-307 Closed areas—Puget Sound salmon.** It is unlawful at any time, unless otherwise provided, to take, fish for, or possess salmon taken for commercial purposes with any type of gear from the following portions of Puget Sound Salmon Management and Catch Reporting Areas:

Areas 4B, 5, 6, 6B, and 6C - The Strait of Juan de Fuca Preserve as defined in WAC 220-47-266.

Area 6D - That portion within 1,000 feet of each mouth of the Dungeness River.

Area 7 - The San Juan Island Preserve as defined in WAC 220-47-262.

Area 7A - The Drayton Harbor Preserve as defined in WAC 220-47-252.

Area 7B - That portion south and east of a line from William Point on Samish Island to Saddlebag Island to the southeastern tip of Guemes Island, and that portion northerly of the railroad trestle in Chuckanut Bay.

Area 7C - That portion southeasterly of a line projected from the mouth of Oyster Creek 237° true to a fishing boundary marker on Samish Island.

Area 8 - That portion of Skagit Bay easterly of a line projected from Brown Point on Camano Island to a white monument on the easterly point of Ika Island, thence across the Skagit River to the terminus of the jetty with McGlenn Island.

Area 8A - Those waters easterly of a line projected from Mission Point to Buoy C1, excluding the waters of

Area 8D, thence through the green light at the entrance jetty of the Snohomish River and across the mouth of the Snohomish River to landfall on the eastern shore, and those waters northerly of a line from Camano Head to the northern boundary of Area 8D.

Area 9 - Those waters lying inside and westerly of a line projected from the Point No Point light to Sierra Echo buoy thence to Forbes Landing wharf, east of Hansville.

Area 10 - (1) Those waters easterly of a line projected from Meadow Point to West Point.

(2) Those waters of Port Madison northwest of a line from the Agate Pass entrance light to the light on the end of the Indianola dock.

(3) Additional coho seasonal closure: Those waters of Elliott Bay east of a line from Alki Point to the light at Fourmile Rock and those waters northerly of a line projected from Point Wells to "SF" Buoy then west to President's Point.

Area 10E - Those waters of Liberty Bay north of a line projected due east from the southernmost Keyport dock, those waters of Dyes Inlet north of the Manette Bridge, and those waters of Sinclair Inlet southwest of a line projected true east from the Bremerton ferry terminal.

Area 11 - Those waters northerly of a line projected true west from the light at the mouth of Gig Harbor and those waters south of a line from Browns Point to the northernmost point of land on Point Defiance.

Area 12 - Those waters inside and easterly of a line projected from Lone Rock to the navigation light off Big Beef Creek, thence southerly to the tip of the outermost northern headland of Little Beef Creek.

Area 12A - Those waters north of a line projected from Fisherman's Point on the Bolton Peninsula to the boat haven at Quilcene and those waters north of a line projected due east from Broad Spit.

Area 12B - Those waters within 1/4 mile of the mouths of the Dosewallips, Duckabush, and Hamma Hamma rivers and Anderson Creek.

Areas 12, 12A, and 12B - Additional chinook seasonal closure: Those waters north and east of a line projected from Tekiu Point to Triton Head.

Areas 12, 12B and 12C - Additional chum seasonal closure: During 1994 those waters within 1,000 feet of the eastern shore.

Area 12C - (1) Those waters within 1,000 feet of the western shore between the dock at Glen Ayr R.V. Park and the Hoodspout marina dock.

(2) Those waters south of a line projected from the Cushman Powerhouse to the public boat ramp at Union.

(3) Those waters within 1/4 mile of the mouth of the Dewatto River.

Areas 12, 12B, 12C, and 12D - Additional coho and chum seasonal closure: Those waters of Area 12 south and west of a line projected 94 degrees true from Hazel Point to the light on the opposite shore, bounded on the west by the Area 12/12B boundary line, and those waters of Areas 12B, 12C, and 12D south of a line projected from Tekiu Point to Triton Head.

Area 13A - Those waters of Burley Lagoon north of State Route 302, those waters within 1,000 feet of the outer oyster stakes off Minter Creek Bay including all waters of Minter Creek Bay, those waters westerly of a line drawn due

north from Thompson Spit at the mouth of Glen Cove, and those waters within 1/4 mile of Green Point.

AMENDATORY SECTION (Amending Order 93-55, filed 6/29/93, effective 7/30/93)

**WAC 220-47-311 Purse seine—Open periods.** During ((1993)) 1994, it is unlawful to take, fish for or possess salmon taken with purse seine gear for commercial purposes from Puget Sound except in the following designated Puget Sound Salmon Management and Catch Reporting Areas during the periods provided for hereinafter in each respective Management and Catch Reporting Area:

AREA	TIME	DATE	TIME	DATE
7, 7A:	6AM	-	5PM	11/01, 11/02
7B:	6AM	((9/13))	4PM	((10/22))
		9/12		11/12
	<del>6AM</del>	<del>10/25</del>	<del>4PM</del>	<del>10/29</del>
	6AM	11/1	4PM	11/5
8:	6AM	-	5PM	11/01, 11/07
				11/08
	7AM	-	5PM	11/15, 11/16
8A, 8D:	<del>((7AM</del>		<del>6PM</del>	<del>10/26))</del>
	6AM	-	5PM	11/1, ((11/2,
				11/9, 11/10))
				11/07, 11/08
10, 11:	<del>((6AM</del>		<del>8PM</del>	<del>9/21, 9/27</del>
	<del>7AM</del>		<del>7PM</del>	<del>10/5, 10/6,</del>
				<del>10/18))</del>
	7AM	-	6PM	((10/26))
				10/24
	6AM	-	5PM	11/1, ((11/9))
				11/07
12, 12B:	<del>((7AM</del>		<del>7PM</del>	<del>10/18, 10/19</del>
	<del>7AM</del>		<del>6PM</del>	<del>10/26, 10/27)</del>
	6AM	-	5PM	11/1, 11/07,
				11/08

All other saltwater and freshwater areas - closed.

AMENDATORY SECTION (Amending Order 93-55, filed 6/29/93, effective 7/30/93)

**WAC 220-47-401 Reef net open periods.** During ((1993)) 1994, it is unlawful to take, fish for or possess salmon taken with reef net gear for commercial purposes in Puget Sound except in the following designated Puget Sound Salmon Management and Catch Reporting Area, during the periods provided for hereinafter in each respective area:

AREA	TIME	DATE(S)
7, 7A	7AM - 7PM	Daily ((10/10—10/16
	<del>7AM - 7PM</del>	<del>Daily 10/22 - 10/30))</del>
		10/09 - 10/22

It is unlawful to retain coho salmon taken with reef net gear. All other saltwater and freshwater areas - closed.

AMENDATORY SECTION (Amending Order 93-55, filed 6/29/93, effective 7/30/93)

**WAC 220-47-411 Gill net—Open periods.** During ((1992)) 1994, it is unlawful to take, fish for or possess salmon taken with gill net gear for commercial purposes from Puget Sound except in the following designated Puget Sound Salmon Management and Catch Reporting Areas

PERMANENT

during the seasons provided for hereinafter in each respective fishing area:

AREA	TIME	DATE(S)
<del>((6D: 6AM 9/19 through 4PM 10/29</del>		
<del>Skiff fishery only-))</del>		
7,7A:	4PM - 8AM	NIGHTLY 10/31, 11/1
7B:	7PM - 7AM	NIGHTLY 8/8, 8/9, 8/10, <del>((8/11) 8/15, 8/16, ((8/17, 8/18) 8/22, 8/23((8/24))</del>
	6AM <del>((9/5) through 4PM ((10/22) 9/14 11/12</del>	
	<del>((6AM 10/25 through 4PM 10/29</del>	
	<del>6AM 11/1 through 4PM 11/5))</del>	
8:	4PM - 8AM	NIGHTLY 10/31, 11/7, 11/8, 11/14, 11/15
8A, 8D:	<del>((5PM 10/25 through 8AM 10/26</del>	
	<del>4PM - 7AM NIGHTLY 11/1, 11/2))</del>	
	4PM - 8AM	NIGHTLY 10/31, 11/7, 11/8, 11/9, 11/10, 11/14, 11/15, 11/16, 11/17, 11/21, 11/22
9A:	6AM <del>((9/20) through 4PM ((9/24) 9/19 9/23</del>	
	6AM <del>((9/27) through 4PM ((10/1) 9/26 9/30</del>	
	6AM <del>((10/4) through 4PM ((10/8) 10/3 10/7</del>	
	6AM <del>((10/11) through 4PM ((10/15) 10/10 10/14</del>	
	6AM <del>((10/18) through 4PM ((10/22) 10/17 10/21</del>	
	6AM <del>((10/25) through 4PM ((10/29) 10/24 10/28</del>	
	6AM <del>((11/1) through 4PM ((11/5) 10/31 11/4</del>	
10,11:	<del>((6PM 8AM NIGHTLY 9/20, 9/27, 10/4, 10/5, 10/18)</del>	
	5PM <del>((10/25) through 8AM ((10/26) 10/24 10/25</del>	
	<del>((6PM 11/1 through 7AM 11/2</del>	
	<del>4PM 11/8 through 8AM 11/9))</del>	
	4PM - 8AM	NIGHTLY 10/31, 11/07, 11/14
12,12B:	<del>((6PM 8AM NIGHTLY 10/18, 10/19</del>	
	<del>5PM 8AM NIGHTLY 10/25, 10/26</del>	
	<del>4PM 11/1 through 7AM 11/2))</del>	
	4PM - 8AM	NIGHTLY 10/31, 11/7, 11/8, 11/14, 11/15, 11/16
<del>((12A: 6AM - 8PM DAILY 9/7, 9/8, 9/9, 9/10, 9/13, 9/14, 9/15, 9/16, 9/17, 9/20, 9/21, 9/22, 9/23, 9/24</del>		
	<del>7AM - 7PM DAILY 9/27, 9/28, 9/29, 9/30, 10/1, 10/4, 10/5, 10/6, 10/7, 10/8</del>	

Notes: ~~Area 12A Skiff gill net fishing only-))~~

All other saltwater and freshwater areas - closed.  
Nightly openings refer to the start date.

AMENDATORY SECTION (Amending Order 92-47, filed 7/20/92, effective 8/20/92)

**WAC 220-47-412 Drift gill net and skiff gill net—Minimum mesh sizes.** It is unlawful to take, fish for or possess salmon taken with net gear using mesh less than the size hereinafter designated for each species season:

CHINOOK SEASON	7" MINIMUM MESH
COHO SEASON	5" MINIMUM MESH
PINK SEASON	5" MINIMUM MESH
CHUM SEASON	6" MINIMUM MESH
	6.25" MINIMUM MESH for areas 8, 12, 12B and 12C, only, through 12/31/94. Effective 1/1/95, 6.25" MINIMUM MESH

**WSR 94-15-002  
PERMANENT RULES  
DEPARTMENT OF  
SOCIAL AND HEALTH SERVICES**

(Institutions)

[Order 3751—Filed July 7, 1994, 8:58 a.m.]

Date of Adoption: July 7, 1994.

Purpose: Requires juveniles on parole status to refrain from possessing a firearm or using a deadly weapon and refrain from committing new offenses. Allows for the use of electronic monitoring for youths on parole status as a condition of parole.

Citation of Existing Rules Affected by this Order: Amending WAC 275-30-020 Conditions of parole.

Statutory Authority for Adoption: RCW 13.40.210.

Pursuant to notice filed as WSR 94-12-026 on May 24, 1994.

Effective Date of Rule: Thirty-one days after filing,

July 7, 1994

Dewey Brock, Chief  
Office of Vendor Services

AMENDATORY SECTION (Amending Order 3091, filed 11/6/90, effective 12/7/90)

**WAC 275-30-020 Conditions of parole.** (1) Following a juvenile's release from a residential facility, the department may require the juvenile to comply with a parole program ((of parole in his or her)) in the juvenile's community for ((a period no longer than)) not more than eighteen months ((, except that in the case of a juvenile sentenced for rape in the first or second degree, rape of a child in the first or second degree, child molestation in the first degree, or indecent liberties with forcible compulsion,)).

(2) The department shall determine a juvenile's period of parole ((shall be)) as twenty-four months for crimes committed on or after July 1, 1990 when the juvenile is sentenced for:

- (a) Rape in the first or second degree;
- (b) Rape of a child in the first or second degree;
- (c) Child molestation in the first degree; or
- (d) Indecent liberties with forcible compulsion.

(3) The department shall, for the period of a juvenile's parole, require the juvenile to refrain from possessing a firearm, or using a deadly weapon and refrain from commit-

ting new offenses. The department's parole program (~~of parole~~) may require the juvenile to:

- (a) Undergo available medical or psychiatric treatment, including urinalysis;
- (b) Report as directed to a parole officer, by in-person contact, telephone, and electronic monitoring;
- (c) Pursue a course of study or vocational training; and
- (d) Remain within prescribed geographical boundaries and notify the department of any address change(~~and~~);
- ~~(e) Refrain from committing new offenses~~).

~~((2))~~ (4) The juvenile shall sign an order of parole conditions on department forms. When the juvenile refuses to sign an order of parole conditions, a witness, attesting the order of parole conditions has been explained to the juvenile, and the juvenile's parole officer shall sign the order. The department shall provide a copy to the juvenile.

~~((3))~~ (5) The parole officer may modify an order of parole conditions (~~may be modified by the parole officer~~) as long as the officer gives the juvenile (~~is given~~) an opportunity to comment on the proposed modification (~~prior to its taking~~) before the order takes effect.

**WSR 94-15-003**  
**PERMANENT RULES**  
**DEPARTMENT OF**  
**SOCIAL AND HEALTH SERVICES**  
 (Public Assistance)  
 [Order 3750—Filed July 7, 1994, 9:00 a.m.]

Date of Adoption: July 7, 1994.

Purpose: Implements the standard state supplemental amount for SSI ineligible spouses to the minimum required amount as required in 1994 Washington state supplemental budget (ESSB 6244).

Citation of Existing Rules Affected by this Order: Amending WAC 388-250-1700 Standards of assistance—Supplemental security income.

Statutory Authority for Adoption: ESSB 6244, 53rd Legislature, 1994 sp. sess., chapter 6, E 1.

Pursuant to notice filed as WSR 94-12-004 on May 19, 1994.

Effective Date of Rule: Thirty-one days after filing.

July 7, 1994  
 Dewey Brock, Chief  
 Office of Vendor Services

AMENDATORY SECTION (Amending Order 3729, filed 4/6/94, effective 5/7/94)

**WAC 388-250-1700 Standards of assistance—Supplemental security income.** Effective (~~January~~) July 1, 1994, the standards of SSI assistance paid to an eligible individual and couple are:

- (1) Living alone (own household or alternate care, except nursing homes or medical institutions).

	Standard	Federal SSI Benefit	State Supplement
Area I: King, Pierce, Snohomish, Thurston, and Kitsap Counties			
Individual	\$474.00	\$446.00	28.00
Individual with one essential person	691.00	669.00	22.00

Permanent

Couple:			
Both eligible	691.00	669.00	22.00
Includes one essential person	691.00	669.00	22.00
Includes ineligible spouse	<del>((638.00))</del>	446.00	<del>((192.00))</del>
	<u>614.20</u>		<u>168.20</u>

Area II: All Counties Other Than the Above

Individual	\$453.55	\$446.00	7.55
Individual with one essential person	669.00	669.00	0
Couple:			
Both eligible	669.00	669.00	0
Includes one essential person	669.00	669.00	0
Includes ineligible spouse	<del>((606.15))</del>	446.00	<del>((160.15))</del>
	<u>584.25</u>		<u>138.25</u>

Areas I and II:

Eligible individual with more than one essential persons: \$446 for eligible individual plus \$223 for each essential person (no state supplement).

Eligible couple with one or more essential persons: \$669 for eligible couple plus \$223 for each essential person (no state supplement).

(2) Shared living (Supplied shelter): Area I and II

	Standard	Federal SSI Benefit	State Supplement
Individual	\$303.15	\$297.34	\$ 5.81
Individual with one essential person	452.30	446.00	6.30
Couple:			
Both eligible	452.30	446.00	6.30
Includes one essential person	452.30	446.00	6.30
Includes ineligible spouse	<del>((416.97))</del>	297.34	<del>((119.63))</del>
	<u>401.10</u>		<u>103.76</u>

Area I and II:

Eligible individual with more than one essential person: \$297.34 for eligible individual plus \$148.67 for each essential person (no state supplement).

Eligible couple with one or more essential person: \$446 for eligible couple plus \$148.67 for each essential person (no state supplement).

Area I and Area II:  
 Medicaid Institutions

41.62	30.00	11.62
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**WSR 94-15-009**  
**PERMANENT RULES**  
**DEPARTMENT OF**  
**SOCIAL AND HEALTH SERVICES**  
 (Institutions)  
 [Order 3752—Filed July 8, 1994, 8:37 a.m.]

Date of Adoption: July 8, 1994.

Purpose: New chapter 275-47 WAC, Collection of costs of support, treatment, and confinement of juveniles under RCW 13.40.220, authorizes the department to collect from parents, the costs for treatment and confinement of a child when legal custody of that child is vested in the department.

Statutory Authority for Adoption: RCW 13.40.220.

Pursuant to notice filed as WSR 94-12-066 on May 31, 1994.

Changes Other than Editing from Proposed to Adopted Version: WAC 275-47-020, changed first column word "annual" to "monthly." Changed WAC 275-47-040(3) and edited the verbiage into active verb voice sentences. Does not change the intent.

PERMANENT



Effective Date of Rule: Thirty-one days after filing.  
 July 8, 1994  
 Dewey Brock, Chief  
 Office of Vendor Services

**Chapter 275-47 WAC**  
**COLLECTION OF COSTS OF SUPPORT, TREATMENT, AND CONFINEMENT OF JUVENILES UNDER RCW 13.40.220**

NEW SECTION

**WAC 275-47-010 Definitions.** (1) "Juvenile" means juvenile offender sentenced to confinement in the department, other than an offender for whom a parent is approved to receive adoption support under chapter 74.13 RCW.

(2) "Department" means the department of social and health services, state of Washington.

(3) "Gross income" means the total income from all sources, received by the parent, the juvenile, or other

children of the parent remaining in the household, other than a step-child, as determined by the department.

(4) "Parent" means the parent of the juvenile or other person legally-obligated to care for and support the juvenile, not including a stepparent.

(5) "Parents and dependents" means the juvenile's parent or parents, a stepparent living in the home who has no income, any child on whom the parent may claim a federal income tax deduction, not including the juvenile confined to the department, and any stepchild for whom the parent is the sole means of support.

NEW SECTION

**WAC 275-47-020 Cost reimbursement schedule.** A parent shall pay a percentage of gross income to the department for the cost of support, treatment, and confinement of the juvenile in accordance with the reimbursement schedule below:

Monthly Gross Income	Percentage of Gross Income Ordered for Reimbursement of Costs							
	Number of Parents and Dependents Remaining in Household							
	1	2	3	4	5	6	7	8+
AFDC or \$0 - 600	0	0	0	0	0	0	0	0
\$601 - 1000	8%	6%	4%	2%	0	0	0	0
\$1001 - 2000	12%	10%	8%	6%	4%	2%	0	0
\$2001 - 3000	16%	14%	12%	10%	8%	6%	4%	2%
\$3001 - 4000+	18%	16%	14%	12%	10%	8%	6%	4%

(1) Within fifteen days of receipt, a parent shall mail to the department a certified financial statement on forms provided by the department. Based on the statement and on other information available to it, the department shall determine the parent's gross income, the number of parents and dependents, and the reimbursement obligation, and shall serve on the parent a notice and finding of financial responsibility.

(2) If a parent fails to timely provide a financial statement, the reimbursement obligation shall be four hundred dollars per month, and retroactively may be raised if the department determines later that the parent was liable for more than that amount under the reimbursement schedule.

(3) If the juvenile's parents reside in separate households, each parent shall be liable for reimbursement.

(4) The gross income of a parent shall be reduced by the amount the parent pays in spousal maintenance to the juvenile's parent, which is gross income to the receiving parent. The gross income of a parent shall be reduced by the amount of child support paid for any child, pursuant to court order, on whom the parent did not claim as a dependent under the reimbursement schedule.

(5) Reimbursement may not exceed the cost of care as determined by the department.

(6) The reimbursement obligation commences the day the juvenile enters the custody of the department, regardless of when the notice and finding of financial responsibility is received by the parent. A monthly reimbursement obligation

shall be reduced on a pro-rata basis for any days in which the juvenile was not in the custody of the department.

NEW SECTION

**WAC 275-47-030 Hearing.** A parent may request a hearing under RCW 13.40.220(5) to contest a notice and finding of financial responsibility issued by the department. The department shall ensure the hearing is governed by chapter 34.05 RCW and chapter 388-08 WAC. The sole issues at the hearing include whether the:

(1) Person receiving the notice and finding of financial responsibility is a parent of the juvenile; and

(2) Department correctly:

(a) Determined the parent's gross income and the number of parents and dependents; and

(b) Calculated the reimbursement obligation in accordance with the reimbursement schedule as described under WAC 275-47-020.

NEW SECTION

**WAC 275-47-040 Modifications.** (1) A parent may modify the parent's financial statement upon a change in gross income or in the number of persons residing in the household only if the change decreases the reimbursement obligation by one hundred dollars per month or more. A decrease may be granted only from the date on which the request for modification is made, and may not be applied retroactively.

PERMANENT

(2) A parent shall file a financial statement modification if a change in gross income or the number of persons residing in the household increases the reimbursement obligation by one hundred dollars per month or more. An increase may be applied retroactively.

(3) The department will issue a new notice and finding of financial responsibility upon receipt of a modified financial statement as defined in subsections (1) or (2) of this section. The department may also issue a new notice based upon its own review if the conditions of subsection (1) or (2) of this section are met.

**WSR 94-15-041**  
**PERMANENT RULES**  
**DEPARTMENT OF REVENUE**

[Filed July 14, 1994, 4:04 p.m.]

Date of Adoption: July 14, 1994.

Purpose: To implement new statute creating a new exemption from property tax.

Citation of Existing Rules Affected by this Order: New section WAC 458-16-215.

Statutory Authority for Adoption: RCW 84.08.010, 84.08.070.

Pursuant to notice filed as WSR 94-11-099 on May 17, 1994.

Effective Date of Rule: Thirty-one days after filing.

July 14, 1994

Linda Lethlean

Deputy Assistant Director

Property Tax Division

**NEW SECTION**

**WAC 458-16-215 Nonprofit organizations that solicit, collect, and distribute gifts, donations, or grants.**

(1) **Introduction.** This section explains the property tax exemption available under RCW 84.36.550 to nonprofit organizations that solicit or collect gifts, donations, or grants to be distributed to other nonprofit organizations for character-building, benevolent, protective, or rehabilitative social services.

(2) **Definitions.** For purposes of this section, the following definitions apply:

(a) "Benevolent" refers to social services or programs that are directed at persons of all ages, that arise from or are prompted by motives of charity or a sense of benevolence, that are marked by a kindly disposition to promote the happiness and prosperity of others, by generosity in and pleasure at doing good works, or that are organized for the purpose of doing good. For example, a benevolent organization may provide a food bank, a soup kitchen, or counseling services at cost.

(b) "Gifts, donations, or grants" means only amounts that are given or received as outright gifts. Any amount, however designated, that is given or received in return for any goods, services, or other benefits will not be considered a "gift, donation, or grant" for the purposes of this rule. A "gift, donation, or grant" is an amount given or received without conditions, from detached and disinterested generosity, out of affection, respect, charity or like impulses and not

because of any moral or legal duty or from the expectation of anticipated benefits. For example, the purchase of a "raffle ticket" or "bingo card" does not qualify as a "gift, donation, or grant" because the sponsor of the raffle or bingo game is selling a chance to win a prize and the participant is paying a portion of the purchase price of that prize and is receiving the chance to receive the prize or prizes in exchange for his or her payment.

(c) "Nonsectarian purpose" means a purpose that is not associated with or limited to a particular religious group.

(d) "Organization" includes associations and corporations.

(e) "Protective" refers to activities that are meant to cover, to guard, or to shield other persons from injury or destruction or to save others from financial loss. For example, a protective organization may provide housing for battered persons or for the developmentally disabled or may assist persons with behavioral problems by providing encouragement, support, and training.

(f) "Rehabilitative or rehabilitation" refers to activities designed to restore individuals to a former capacity, to a condition of health, or to useful or constructive activity. For example, a rehabilitative organization may assist persons to overcome alcohol or substance abuse, or to overcome the effects of a physical injury, stroke, or heart attack.

(g) "Social service" means programs designed to help people resolve problems, become more self-sufficient, prevent dependency, strengthen family relationships, and/or enhance the functioning of individuals in society. These services include, but are not limited to, programs in the general categories of:

(i) Socialization and development; and

(ii) Therapy, help, rehabilitation, and social protection.

(3) **Exemption.** The real and personal property owned by a nonprofit organization is exempt from taxation if the property is owned by a nonprofit organization and is used to solicit or collect gifts, donations, or grants for distribution to other nonprofit organizations, associations, or corporations organized and conducted for nonsectarian purposes that provide character-building, benevolent, protective, or rehabilitative social services directed at persons of all ages. To qualify for this exemption, the nonprofit organization must meet all of the following conditions:

(a) Organized and conducted for nonsectarian purposes;

(b) Affiliated with a state or national organization that authorizes, approves, or sanctions volunteer charitable fundraising organizations;

(c) Qualified for exemption under section 501 (c)(3) of the federal Internal Revenue Code;

(d) Governed by a volunteer board of directors;

(e) Use the gifts, donations, and grants solicited or collected for character-building, benevolent, protective, or rehabilitative social services directed at persons of all ages or distribute the gifts, donations, or grants in accordance with (f) of this subsection;

(f) Annually distribute gifts, donations, or grants to at least five other nonprofit organizations, associations, or corporations organized and conducted for nonsectarian purposes that provide character-building, benevolent, protective, or rehabilitative social services directed at persons of all ages.

(4) **Examples.**

(a) The United Way solicits and collects gifts, donations, and grants from numerous sources such as government employees, private businesses, and corporate sponsors. The gifts, donations, and grants received by the United Way are, in turn, distributed to other nonprofit organizations, associations, and corporations that provide character-building, benevolent, protective, or rehabilitative social services directed at persons of all ages. The United Way does not necessarily provide these social services itself but it does own property that is used to solicit and collect gifts, donations, and grants. The United Way would be entitled to receive this exemption if, in addition to owning and using the property to solicit and collect gifts, donations, and grants, it meets all of the conditions listed in subsection (3) of this section.

(b) A nonprofit organization owns real and personal property that is used for bingo games, pull-tabs, and food services to raise funds for the organization's charitable activities that are not conducted at this location. Even if the nonprofit organization in this case is organized for nonsectarian purposes, affiliated with a national organization that authorizes, approves, and sanctions volunteer charitable fundraising organizations, classified as a section 501 (c)(3) organization with the Internal Revenue Service, and governed by a volunteer board of directors, the bingo facility would not be entitled to an exemption because this property is not used to solicit or collect gifts, donations, or grants because the purchase of a bingo card is not a "gift, donation, or grant" within the meaning of this rule.

(5) **Additional requirements.** Any organization or association that applies for a property tax exemption under this section must also comply with the provisions of WAC 458-16-165. WAC 458-16-165 sets forth additional conditions and requirements that must be complied with to obtain a property tax exemption pursuant to RCW 84.36.550.

**WSR 94-15-045**  
**PERMANENT RULES**  
**DEPARTMENT OF**  
**SOCIAL AND HEALTH SERVICES**  
(Public Assistance)

[Order 3753—Filed July 15, 1994, 11:32 a.m.]

Date of Adoption: July 15, 1994.

Purpose: Clarifies the remedies available to parents through the conference board process. The revisions spell out grounds for relief and expand the authority of the conference board chair to grant relief tailored to the needs of the family involved. Also clarifies several administrative aspects of the conference board process. For example, the revision requires Support Enforcement Division to provide conference board applicants with a brochure describing the process.

Citation of Existing Rules Affected by this Order:  
Amending WAC 388-14-385 Conference board.

Statutory Authority for Adoption: RCW 74.08.090.

Pursuant to notice filed as WSR 94-11-110 on May 18, 1994.

Changes Other than Editing from Proposed to Adopted Version: Editorial change to subsection (14)(b) changing name to Division of Child Support. The only change to the

published proposal is that reference to SED was replaced with a reference to the office.

Effective Date of Rule: Thirty-one days after filing.

July 15, 1994

Dewey Brock, Chief  
Office of Vendor Services

AMENDATORY SECTION (Amending Order 3512, filed 2/10/93, effective 3/13/93)

**WAC 388-14-385 Conference board.** (1) A conference board may inquire into, determine facts of, and attempt to resolve matters in which a responsible parent, residential parent, payee under a court order, or other person feels aggrieved by an action taken by the office (~~of support enforcement~~) under:

(a) Chapters 26.23, 74.20, 74.20A RCW; or

(b) Title IV-D of the Social Security Act (Title 42 U.S.C.).

(2) The intent and purpose of the conference board is to facilitate the informal speedy resolution of grievances.

(3)(a) The director, (~~revenue division~~) or director's designee may assemble a conference board on application of an aggrieved person or on the director's own motion. The conference board shall dissolve upon issuance of a decision on the matter for which it was appointed.

(b) An applicant for a conference board shall have made a reasonable attempt and have failed to resolve the grievance before a conference board may act to attempt to resolve the issue.

(4) The conference board's jurisdiction shall include, but shall not be limited to, the following areas:

(a) A complaint as to the conduct of an individual staff member while acting within the scope of the staff member's duties. The board shall send a copy of the decision (of the board shall be directed) to the staff member's first line supervisor for action as appropriate;

(b) Review of a denial of an application for or termination of nonassistance support enforcement services;

(c) Review of an allegation of error as to the distribution of support moneys;

(d) Review of a denial to collect support arrears in nonassistance cases under RCW 74.20.040;

(e) Resolution of the amount of arrears claimed due and rate of repayment;

(f) A request to release or refund money taken under RCW (~~74.20A.080 or~~) 26.23.060 or 74.20A.080 to provide for the reasonable necessities of a responsible parent and minor children in the responsible parent's home;

(g) A request for deferral of support enforcement action;

(h) A request for partial or total charge-off of support arrears under RCW 74.20A.220;

(i) A request to waive interest (~~under RCW 74.20A.190~~);

(j) A request to waive or defer the nonassistance support enforcement fee under RCW 74.20.040;

(k) Review of a determination that a support obligation has been satisfied or is no longer legally enforceable;

(l) A specific request for administrative review of cases submitted to the IRS for offset of a tax refund in accordance with federal statutes and regulations;

(m) Any other matter requiring explanation of or application of policy or law to an issue in a specific case or clarification of facts in said case; and

(n) ~~((OSE's))~~ The office's action in reporting a support debt to a consumer reporting agency.

(5) When a person states a grievance or requests a conference board, office staff shall provide a copy of the conference board information form.

(6) When a person requests a conference board, the director or the director's designee may take such action, as deemed appropriate, and may exercise any of the authority provided for in this regulation, when the:

~~((6))~~ (i) Grievance does not involve a factual dispute; or

~~((6))~~ (ii) Disputed fact or facts even if resolved in favor of the person would not provide a basis upon which relief could be granted to the person by a conference board.

~~((6))~~ (7) When a person requests a conference board and the grievance involves an apparent factual dispute:

(a) The director or director's designee shall assemble a conference board composed of the director or director's designee, who shall serve as chair and two staff members, if deemed necessary;

(b) The chair shall mail a notice of conference board to the applicant, the applicant's representative, and any other person or agency who is a party in interest to the proceeding. The notice of conference board shall state that a conference board has been scheduled and inform the parties of the time and place of the conference board;

(c) Where the department is not providing public assistance to the payee under a court order, and the responsible parent timely requests a conference board to contest the debt stated in a notice of support debt, the conference board shall be scheduled for a date at least thirty days after the notice of conference board is issued, and the notice shall ~~((state))~~ include statements that:

(i) The payee has twenty days from the date the notice of conference board was given to request that the grievance be addressed in an adjudicative proceeding under WAC 388-14-435;

(ii) If the payee does not timely request an adjudicative proceeding, the department will deem that the payee has elected to have the grievance heard in a conference board and the:

(A) Conference board decision will become the final agency position on the debt claimed under the notice of support debt; and

(B) A payee's late application for an adjudicative proceeding shall be denied unless the payee shows good cause for the late application; ~~((and))~~

(iii) If the payee does not appear at either a conference board or an adjudicative proceeding, the ~~((resulting))~~ presiding officer's or the board's decision may be adverse to the payee's interest including, but not limited to, a reduction in the support debt stated in the notice of support debt.

(d) If the payee requests an adjudicative proceeding under WAC 388-14-435, ~~((OSE))~~ the office shall inform the:

(i) Responsible parent that the parent's request for conference board is declined, and the responsible parent must appear at the adjudicative proceeding requested by the payee to raise objections to the notice of support debt; and

(ii) Payee that the conference board previously scheduled has been declined due to the payee's application for an adjudicative proceeding.

~~((7))~~ (8) The conference board chair ~~((is authorized to))~~ may issue subpoenas under RCW 74.04.290 and ~~((to))~~ administer oaths, take testimony, and compel the production of such papers, books, records, and documents deemed relevant to the resolution of the grievance under consideration. The conference board chair may take additional evidence by affidavit or other written submission when necessary or practicable together with written or oral argument. The chair may designate persons having specific familiarity with the matter at issue or technical expertise with the subject to advise the board.

~~((8))~~ (9) The conference board chair shall make a written decision stating the facts found, policies applied, and the board's decision.

(a) The board's decision, including a decision to deny a request for a conference board, shall be in accordance with applicable statutes, case law, department rules and regulations, published office ~~((of support enforcement))~~ manuals, support enforcement policy bulletins, and the exercise of reasonable administrative discretion.

(b) The board shall base a decision under RCW 74.-20A.220 to grant partial or total charge-off of arrears owed to the department under RCW 74.20A.030, 74.20A.250, 74.-20.320, 74.20.330, or 42 U.S.C. 602 (a)(26)(A) on the following considerations:

(i) Error in law or bona fide legal defects that materially diminish chances of collection; or

(ii) Substantial hardship to minor children in the household of the responsible parent or other minor children for whom the responsible parent actually provides support ~~((which hardship is to be measured against income standards for public assistance and consideration of all available income, property, and resources of the responsible parent and the necessity to apportion the income and resources of the responsible parent on an equitable basis with the children for whom the arrears accrued))~~; or

(iii) Costs of collection action in the future that are greater than the amount to be charged off; or

(iv) Settlement from lump-sum cash payment that is beneficial to the state considering future costs of collection and likelihood of collection.

(c) If the decision is the result of a conference board, that decision shall represent the decision of a majority of the board. The director shall vacate decisions inconsistent with the standards in this section and remand ~~((them))~~ the application for issuance of a new decision in compliance with the standards.

~~((9))~~ (10) In making a determination of substantial hardship under subsection (9) of this section, the board shall measure the net income and all available assets and resources of the responsible parent against the needs standard for public assistance for the appropriate family size, as stated in WAC 388-250-1250. The board shall consider the necessity to apportion the responsible parent's income and resources on an equitable basis with the child for whom the arrears accrued. When reviewing a claim of substantial hardship, the board may consider the following information including, but not limited to:

(a) The child on whose behalf support is owed is reunited with the responsible parent because the:

(i) Formerly separated parents have reconciled; or

(ii) Child has returned to the responsible parent from foster care, the care of a relative, or the care of a nonrelative custodian.

(b) The responsible parent is aged, blind, or disabled and receiving Supplemental Security Income, Social Security, or other similar benefits;

(c) The mother of the child is seeking charge off of debt accrued on behalf of a child who was conceived as a result of incest or rape, and presents evidence of rape or incest, acceptable under 45 CFR 232.43(c);

(d) Payment on the arrears obligation interferes with the responsible parent's payment of current support to a child living outside the home;

(e) The responsible parent has limited earning potential due to:

(i) Dependence on seasonal employment that is not considered in the child support order;

(ii) Illiteracy;

(iii) Limited English proficiency; or

(iv) Other similar factors limiting employability or earning capacity.

(f) The responsible parent's past efforts to pay support and the extent of the parent's participation in the child's parenting; and

(g) The size of the responsible parent's debt and the prospects for increased income and resources.

(11) The board may find that substantial hardship exists for a responsible parent, without finding hardship to a dependent child.

(a) In making a determination of substantial hardship to an individual without a dependent child, the board shall measure the applicant's income, assets, and resources against the needs standard. In combination with the income test, the board may consider the following factors when reviewing a claim of substantial hardship:

(i) The responsible parent is aged, blind, or disabled and receiving Supplemental Security Income, Social Security, or other similar benefits;

(ii) The mother of a child is seeking relief from debt accrued on behalf of a child who was conceived as a result of incest or rape, and presents evidence of rape or incest, acceptable under 45 CFR 232.43(c); or

(iii) The responsible parent has limited earning potential due to:

(A) Dependence on seasonal employment that is not considered in the child support order;

(B) Illiteracy;

(C) Limited English proficiency; or

(D) Other similar factors limiting employability or earning capacity.

(b) The board may agree to a reduced payment on the support debt, or a conditional reduced payment on the support debt, when there is substantial hardship to the responsible parent but not a hardship to a dependent child. The other remedies for substantial hardship under this section are not available when there is no showing of hardship to a dependent child.

(12) The board may:

(a) Reduce collection on the responsible parent's support debt to an amount that alleviates the hardship without altering the amount of the support to address situations in which substantial hardship exists, but the circumstances creating the hardship are temporary. Temporary hardship situations may include the factors listed under subsection (10) of this section and the applicant's receipt of public assistance on:

(i) Applicant's behalf; or

(ii) Behalf of a child in the applicant's home.

(b) Create incentives to promote payment or family unity by agreeing to a conditional:

(i) Total or partial charge off, if charge off is available under subsection (9) of this section; or

(ii) Reduced payment on the support debt.

(c) Condition reduced payment, or total or partial charge off on:

(i) Continued payment according to a payment schedule imposed by the board; or

(ii) Continued reconciliation; or

(iii) A family remaining off of AFDC.

(13) When creating incentives or providing conditional relief under subsection (12) of this section, the board shall:

(a) Not create a conditional charge off without specifying a period of performance after which the charge off is irrevocable;

(b) Not create a charge off conditioned on the parties remaining reconciled unless the parties have been reconciled for at least six months at the time of the conference board;

(c) Consider whether the conditions would create:

(i) Incentives for abuse or intimidation of the other party to the order;

(ii) Incentives for fraud; or

(iii) Unreasonable reluctance to obtain financial or medical assistance necessary for the health and best interests of the children.

(14) When the responsible parent violates the terms of the conditional charge off or reduced repayment rate imposed by a conference board decision under subsection (12) of this section:

(a) Any amount charged off by the board under the decision prior to the violation shall remain uncollectible;

(b) The office may collect any further amount that would have been charged off under the decision after the date of violation with no further notice to the responsible parent; and

(c) The responsible parent may not reinstate terms of the decision by renewed compliance with the terms of the decision, unless the department agrees in writing to reinstate the conditional charge off or repayment rate.

(15) The board shall distribute a copy of the decision to the applicant, the applicant's representative, other parties in interest, the appropriate ((office of support enforcement)) field office for action consistent with the decision of the board, and the director.

((+0)) (16) A conference board is not an adjudicative proceeding subject to review by the superior court and is not a substitute for any constitutionally or statutorily required hearing. An aggrieved ((parties)) party may be represented before the board by a person of ((their)) the party's choice. The department shall not pay any costs incurred by the aggrieved person in connection with the conference board.

**Reviser's note:** The spelling error in the above section occurred in the copy filed by the agency and appears in the Register pursuant to the requirements of RCW 34.08.040.

**WSR 94-15-046**  
**PERMANENT RULES**  
**DEPARTMENT OF**  
**SOCIAL AND HEALTH SERVICES**  
(Public Assistance)

[Order 3754—Filed July 15, 1994, 11:34 a.m.]

Date of Adoption: July 15, 1994.

Purpose: Amendments state a former custodian of a child may apply to Division of Child Support (DoCS) for the collection of child support arrears, and clarifies that an arrears judgment is not a requirement of eligibility for DoCS services, as a result of 45 CFR 303.106.

Citation of Existing Rules Affected by this Order: Amending WAC 388-14-205 Responsibilities of the office, 388-14-300 Nonassistance support enforcement services—Persons eligible for services, 388-14-310 Nonassistance support enforcement application, and 388-14-390 Adjudicative proceeding when collection action is initiated against a bank account—Exemptions—Burden of proof.

Statutory Authority for Adoption: RCW 74.08.090.

Other Authority: 45 CFR 303.106.

Pursuant to notice filed as WSR 94-11-112 on May 18, 1994.

Effective Date of Rule: Thirty-one days after filing.

July 15, 1994

Dewey Brock, Chief  
Office of Vendor Services

AMENDATORY SECTION (Amending Order 3512, filed 2/10/93, effective 3/13/93)

**WAC 388-14-205 Responsibilities of the office (~~of support enforcement~~)).** (1) The office shall provide services, until such services are terminated under this chapter, when:

(a) The department pays public assistance or provides foster care services;

(b) A former recipient of public assistance is eligible for services under WAC 388-14-300 (2)(~~(d)~~)(c);

(c) An applicant/custodian requests nonassistance support enforcement services under RCW 74.20.040 and WAC 388-14-300;

(d) A support order or wage assignment order under chapter 26.18 RCW directs that the responsible parent make support payments through the Washington state support registry;

(e) A support order under which there is a current support obligation for the dependent children(;) is submitted to the Washington state support registry;

(f) A former custodial parent requests services to collect a support debt (~~that has been reduced to a sum certain judgment by the court or agency of competent jurisdiction~~) accrued under a court or administrative support order while the parent had physical custody of the child; or

(g) A child support enforcement agency in another state or foreign country under reciprocal agreement requests support enforcement services.

(2) When possible and appropriate, the office shall take action under chapters 26.23 and 74.20A RCW to establish, enforce, and collect the child support obligation. The office may refer appropriate cases to the county prosecuting attorney or attorney general's office when judicial action is required.

(3) Except to the extent allowed by WAC (~~388-24-111~~) 388-215-1490(3), in any case for which (~~OSE~~) the office has received notice that the CSO has made a finding of good cause under WAC (~~388-24-111~~) 388-215-1490, the office shall not act to:

(a) Establish paternity on its own initiative or at the request of a putative father applying for services under WAC 388-14-300 (~~(1)(b)~~) (2)(e); or

(b) Secure child support.

(4) The office shall suspend all activities under Title IV-D to establish paternity or secure child support(;) to the extent required by WAC (~~388-24-111~~) 388-215-1490, until the CSO notifies the office of its final determination regarding an applicant or recipient who has claimed good cause. Any agency acting under a cooperative agreement who fails or refuses to comply with a request from (~~OSE~~) the office to suspend activities shall not be entitled to financial participation under the Title IV-D cooperative agreement as to said case or cases upon which the request is made.

(5) A child support obligation shall:

(a) Continue while enforcement (~~and/or~~) or collection action is suspended pending a final determination of good cause; and

(b) Be subject to collection when a decision is made that good cause for refusal to cooperate no longer exists.

(6) The office shall:

(a) Review and comment on the findings and basis for the proposed determination by the CSO; and

(b) Be a party to any hearing requested as a result of an applicant's or recipient's appeal of any agency action under WAC (~~388-24-111~~) 388-215-1410.

(7) The office shall:

(a) Establish, maintain, retain, and dispose of case records in accordance with the department's records management and retention policies and procedures adopted under chapter 40.14 RCW.

(b) Establish, maintain, and monitor support payment records; and

(c) Receive, account for, and distribute child support payments required under superior court and administrative orders for support.

(8) When the office determines that a support obligation, established by order of a superior court of this state, has been satisfied or is no longer legally enforceable, the office shall send a notice of its intent to file a satisfaction of judgment to the last known address of the payee under the order and to the responsible parent. The department shall include the following provisions in the notice:

(a) A statement of the facts the office relied on in making the determination; and

(b) A statement that payee has twenty days from the date of the notice, to:

(i) Object and request a conference board under WAC 388-14-385; or

(ii) Initiate an action to obtain a judgment from the court that entered the order.

(9) If the conference board or the court determines the support obligation or a support debt still exists, the office shall withdraw the notice and shall make reasonable efforts to enforce and collect the remaining support debt. When the conference board or court determines that a debt does not exist, the office shall file a satisfaction of judgment with the clerk of superior court in which the order was entered.

(10) The office shall determine that a support obligation is satisfied or no longer legally enforceable when the obligation to pay current and future support terminates under the order, and:

(a) The responsible parent has paid the support debt owed under the order ~~((has been paid))~~ in full;

(b) The support debt is no longer enforceable due to the operation of the statute of limitations; ~~((or))~~

(c) The office determines the responsible parent has a valid defense to payment of the debt under Washington law; or

(d) Under RCW 74.20A.220, the office determines the debt is uncollectible, grants a total or partial charge-off, or accepts an offer to compromise a disputed debt.

(11) WAC ~~((sections))~~ 388-14-300 and 388-14-310 govern the level of services provided by the department under subsections (1)(b) through (g) of this section.

AMENDATORY SECTION (Amending Order 3403, filed 6/9/92, effective 7/10/92)

**WAC 388-14-300 Nonassistance support enforcement services—Persons eligible for services.** (1) As authorized by RCW 26.23.045 and 74.20.040, the ~~((department's office of support enforcement (OSE)))~~ office shall provide payment processing and records maintenance services to parties to a court order who are not receiving a public assistance grant when:

(a) A Washington superior court order, administrative order, or wage assignment order under chapter 26.18 RCW directs payments through ~~((OSE))~~ the office or the Washington state support registry (WSSR);

(b) The physical custodian of a dependent child or a responsible parent requests payment services only, provided that:

(i) A responsible parent's request for payment services only shall not cause a reduction of service from the level of service provided under subsection (2) of this section, or WAC 388-14-200, 388-14-203, or 388-14-205; and

(ii) The support obligation is set by a Washington superior court, administrative, or wage assignment order, directing payment to ~~((OSE))~~ the office or WSSR.

(2) ~~((OSE))~~ The office shall provide full IV-D support enforcement services to physical custodians or responsible parents who are not receiving a public assistance grant when:

(a) The physical custodian or former physical custodian of a ~~((dependent))~~ child requests support enforcement services;

(b) ~~((A former custodial parent requests services to collect a support debt reduced to a sum certain judgment by the court;~~

~~((e)))~~ A responsible parent submits a support order for inclusion in or support payment to the Washington state

support registry, together with an application for support enforcement services;

~~((d))~~ (c) A public assistance recipient stops receiving a cash grant under the aid to families with dependent children ~~((or family independence programs));~~

~~((e))~~ (d) The department provides Medicaid-only benefits to the physical custodian on behalf of a dependent child, unless the recipient of Medicaid-only benefits declines support enforcement services not related to paternity establishment, medical support establishment or medical support enforcement; or

~~((f))~~ (e) A man requests paternity establishment services alleging he is the dependent child's father.

(3) ~~((OSE))~~ The office shall provide payment processing, records maintenance, paternity establishment, medical support establishment, and medical support enforcement services when a recipient of Medicaid-only benefits declines support enforcement services.

AMENDATORY SECTION (Amending Order 3403, filed 6/9/92, effective 7/10/92)

**WAC 388-14-310 Nonassistance support enforcement application.** (1) To qualify for services~~((s))~~ a person desiring nonassistance services shall:

(a) Submit a written application for support enforcement services except as provided under subsection (2) of this section; and

(b) Have or have had physical custody of the ~~((dependent))~~ child for whom support is sought, or for whom a support debt has accrued except as provided under WAC 388-14-300 (2)(b), ~~((e), and (f))~~ and (e).

(2) The office ~~((of support enforcement (OSE)))~~ shall:

(a) Provide only records maintenance and payment processing services if the payee under a support order fails to submit an application for support enforcement services and the:

(i) Order directs support payments to ~~((OSE))~~ the office or the Washington state support registry; or

(ii) Clerk submitted the order under RCW 26.23.050.

(b) Continue to provide services~~((s))~~ after a:

(i) Public assistance recipient stops receiving a cash grant, under the same conditions regarding the physical custodian's obligation to cooperate with ~~((OSE))~~ the office, as are in effect at the time public assistance terminates, without requiring an application;

(ii) Recipient of Medicaid-only benefits becomes ineligible for Medicaid-only benefits, under the same conditions regarding the physical custodian's obligation to cooperate with ~~((OSE))~~ the office, as are in effect at the time the recipient became ineligible, without an application, unless the recipient~~((s))~~;

(A) Declines support enforcement services while receiving or after termination of Medicaid-only benefits; or

(B) Requests additional services.

(3) The applicant shall:

(a) Give consent to ~~((OSE))~~ the office to take an assignment of earnings from the person owing support;

(b) Agree to remit support money received directly from the person owing support to ~~((OSE))~~ the office within eight days of receipt;



(c) Agree to direct a payor or forwarding agent to remit support money directly to ~~((OSE)) the office;~~

(d) Agree not to hire an attorney or collection agency, or apply to any other states' IV-D agency, to collect the support obligation or support debt without notifying ~~((OSE)) the office;~~

(e) Complete, sign, date, and submit to ~~((OSE)) the office~~ the application form and other required documents;

(f) Supply copies of divorce and dissolution decrees, support orders~~(s;)~~ and modifications thereof, and any allied or related documents reflecting the marital and support status;

(g) Provide a statement of the amount of the support debt owed by the responsible parent; and

(h) Include or attach a list, by date, of the support payments received from the responsible parent during the period the support debt accrued.

(4) If a person other than the applicant has legal custody of the dependent child by order of a court, the applicant shall affirm the legal custodian:

(a) Was not wrongfully deprived of custody by the applicant; and

(b) Is not excused from making support payments under WAC 388-11-065(10).

(5) If ~~((the))~~ an applicant is not a resident of this state:

(a) ~~((OSE))~~ The office may decline the application if:

(i) ~~((OSE))~~ The office has an open case for the applicant, opened at the request of another state; or

(ii) Neither the applicant nor the responsible parent have any contacts with the state of Washington;

(b) The applicant shall state, under oath, that ~~((they do))~~ the applicant does not have an open IV-D case in another state.

(6) ~~((OSE))~~ The office may deny an application which is incomplete, contains unclear or inconsistent statements, or is not supported by necessary documents.

(7) Upon denying an application, ~~((OSE))~~ the office shall send the applicant a written notice of denial by regular mail and shall include a statement:

(a) Of the reasons for the denial; and

(b) The applicant may request an adjudicative proceeding to contest the denial.

**AMENDATORY SECTION** (Amending Order 3005, filed 2/5/90, effective 3/1/90)

**WAC 388-14-390 Adjudicative proceeding when collection action is initiated against a bank account—Exemptions—Burden of proof.**

**(1)** If the department initiates collection action against a bank account, safety deposit box, or other property held by a bank, credit union or savings and loan, the responsible parent or the joint owner of record of the bank account, safety deposit box or other property may contest the action in an adjudicative proceeding.

**(2)** The responsible parent or the joint owner shall file the application ~~((shall be filed))~~ at the office ~~((of support enforcement))~~ by registered or certified mail or personally within twenty days of the date the office mailed a copy of the order to withhold and deliver ~~((was either mailed to or served upon the responsible parent pursuant to RCW 74.20A.080 or a written notice of the collection action was~~

mailed by certified mail to the last known address of the joint owner of record of the account)) to the:

(a) Responsible parent; or

(b) Last known address of the joint owner of record of the account, by certified mail.

**(3)** The ~~((application))~~ responsible parent or joint owner of record shall state in the application the facts supporting the allegation by the responsible parent or the joint owner that the funds ~~((in the account))~~ or property, or a portion of ~~((those))~~ the funds or property, are exempt from satisfaction of the child support obligation of the responsible parent.

**(4)** On the application of the responsible parent, the joint owner of record, or ~~((OSE))~~ the office, ~~((a hearing shall be scheduled))~~ the department shall schedule an adjudicative proceeding solely for the purpose of determining whether or not one of the following exemptions applies to the funds in the bank account, or to the other property attached by the order to withhold and deliver:

~~((1))~~ (a) Pursuant to RCW 26.16.200 and 74.20A.120, the property or funds in the community bank account, joint bank account, or safety deposit box, or a portion of ~~((those))~~ the property or funds which can be identified as the earnings of the spouse not owing a support obligation to the child or children of the responsible parent, are exempt from satisfaction of the child support obligation of the responsible parent.

~~((2))~~ (b) The funds in a bank account, or a portion of those funds which can be identified as AFDC funds, SSI monies, or other kinds of funds having been legally exempted from collection action, are exempt from satisfaction of the child support obligation of the responsible parent~~((-;))~~ or

~~((3))~~ (c) The funds ~~((in a bank account))~~ or property attached by the order to withhold and deliver which can be identified as being solely owned by the joint owner of record of the bank account or safety deposit box not owing a child support obligation to the child or children of the responsible parent, are exempt from satisfaction of the child support obligation of the responsible parent.

**(5)** The responsible parent or joint owner of record shall have the burden of tracing the funds and proving the property or funds in the bank account are exempt from satisfaction of the child support obligation of the responsible parent ~~((is on the responsible parent or the joint owner of record)).~~

~~((If an application is filed, the department shall serve the notice of hearing on the appellant or the appellant's representative by certified mail or another method showing proof of receipt.))~~

**(6)** The office shall hold moneys or property withheld as a result of collection action initiated against a bank account or safety deposit box and delivered to the ~~((office of support enforcement))~~ the office at the time of the granting of an application ~~((shall be held by the office of support enforcement))~~ pending the final adjudicative order or during the pendency of any appeal to the courts.

**(7)** If the final decision of the department or courts on appeal is that the department has caused ~~((funds in a bank account))~~ money or property that ~~((are))~~ is exempt from satisfaction of the child support obligation of the responsible parent to be withheld by the bank or delivered to the department, the office ~~((of support enforcement))~~ shall:

(a) Promptly release the order to withhold and deliver;

or

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(b) Refund the proportionate share of the funds having been identified as being so exempt. (~~No interest shall accrue or be payable by the department~~) The department shall not be liable for any interest accrued on any moneys withheld pursuant to RCW 74.20A.080.

**WSR 94-15-049**  
**PERMANENT RULES**  
**LOTTERY COMMISSION**  
 [Filed July 15, 1994, 1:51 p.m.]

Date of Adoption: July 8, 1994.

Purpose: To establish the game play rules and criteria for determining winners of Instant Game Nos. 127 (7-11-21), 128 (\$2 Big Kahuna), 129 (Beat the Dealer), and 130 (Moolah Moolah); and to amend WAC 315-11A-118, 315-11A-119, and 315-11A-120.

Citation of Existing Rules Affected by this Order: Amending WAC 315-11A-118, 315-11A-119, and 315-11A-120.

Statutory Authority for Adoption: RCW 67.70.040.

Pursuant to notice filed as WSR 94-12-082 on June 1, 1994.

Changes Other than Editing from Proposed to Adopted Version: In WAC 315-11A-129, a "\$70.00" and a "\$7,000" prize symbol were proposed. In the final version, those prize symbols were adopted as "\$60.00" and "\$6,000."

Effective Date of Rule: Thirty-one days after filing.

July 14, 1994  
 Evelyn P. Yenson  
 Director

NEW SECTION

**WAC 315-11A-127 Instant Game Number 127 ("7-11-21"). (1) Definitions for Instant Game Number 127.**

(a) Play symbols: The following are the "play symbols": "2," "3," "4," "5," "6," "7," "9," "11," and "21." One of these play symbols appears in each of the five play spots under the latex covering on the front of the ticket. The latex covered area shall be known as the playfield. One of the five play spots shall be labeled "winning number."

(b) Play symbol captions: The small printed characters appearing below each play symbol which correspond with and verify that play symbol. The caption is a spelling out, in full or abbreviated form of the play symbol. One and only one of these captions appears under each play symbol. The three-digit ticket number shall appear before each play symbol caption. For Instant Game Number 127, the captions which correspond with and verify the play symbols are:

<u>PLAY SYMBOL</u>	<u>CAPTION</u>
2	TWO
3	THR
4	FOR
5	FIV
6	SIX
7	SVN
9	NIN
11	ELV
21	TTN

(c) Prize symbols: The following are the "prize symbols": "\$1.00," "\$2.00," "\$3.00," "\$7.00," "\$10.00," "\$20.00," "\$70.00," and "\$2,100." One of these prize symbols appears below each of the play symbol captions, except that no prize symbol appears below the caption of the play symbol labeled "winning number."

(d) Prize symbol captions: The small printed characters which appear below the prize symbol and verify and correspond with that prize symbol. The prize symbol caption is a spelling out, in full or abbreviated form, of the prize symbol. For Instant Game Number 127, the prize symbol captions which correspond with and verify the prize symbols are:

<u>PRIZE SYMBOL</u>	<u>CAPTION</u>
\$ 1.00	ONE DOL
\$ 2.00	TWO DOL
\$ 3.00	THR DOL
\$ 7.00	SVN DOL
\$ 10.00	TEN DOL
\$ 20.00	TWY DOL
\$ 70.00	\$SVNTY\$
\$ 2,100	TTNHUND

(e) Validation number: The unique nineteen-digit number on the front of the ticket. The number is covered by latex.

(f) Pack-ticket number: The twelve-digit number of the form 12700001-1-000 printed on the back of the ticket. The first three digits are the game identifier. The first eight digits of the pack-ticket number for Instant Game Number 127 constitute the "pack number" which starts at 12700001; the last three digits constitute the "ticket number" which starts at 000 and continues through 199 within each pack of tickets.

(g) Retailer verification codes: Codes consisting of small letters found under the removable covering on the front of the ticket which the lottery retailer uses to verify instant winners of \$600.00 or less. For Instant Game Number 127, the retailer verification code is a three-letter code, with each letter appearing in a varying three of six locations beneath the removable covering and among the play symbols on the front of the ticket. The retailer verification codes are:

<u>VERIFICATION CODE</u>	<u>PRIZE</u>
ONE	\$ 1.00
THR	\$ 3.00 (\$2 AND \$1; \$1, \$1 AND \$1)
SVN	\$ 7.00 (\$3, \$2, \$1 AND \$1; \$7)
ELV	\$ 11.00 (\$3, \$3, \$3 AND \$2; \$10 AND \$1)
TTN	\$ 21.00 (\$10, \$7, \$2 AND \$2; \$20 AND \$1)
SVY	\$ 70.00 (\$20, \$20, \$20 AND \$10; \$70)

(h) Pack: A set of two hundred fanfolded instant game tickets separated by perforations and packaged in plastic shrinkwrapping.

(2) **Criteria for Instant Game Number 127.**

(a) The price of each instant game ticket shall be \$1.00.

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(b) Determination of prize winning tickets: An instant prize winner is determined in the following manner:

(i) When any of the four play symbols matches exactly the play symbol labeled "winning number," the matching play symbol shall be a winning play symbol, and the bearer of the ticket shall win the prize below the winning play symbol.

(ii) The bearer of a ticket which has more than one winning play symbol shall win the total of the prizes below each winning play symbol.

(c) No portion of the display printing nor any extraneous matter whatever shall be usable or playable as a part of the instant game.

(d) The determination of prize winners shall be subject to the general ticket validation requirements of the lottery as set forth in WAC 315-10-070, to the particular ticket validation requirements for Instant Game Number 127 set forth in subsection (3) of this section, to the confidential validation requirements established by the director, and to the requirements stated on the back of each ticket.

(e) Notwithstanding any other provisions of these rules, the director may:

(i) Vary the length of Instant Game Number 127; and/or

(ii) Vary the number of tickets sold in Instant Game Number 127 in a manner that will maintain the estimated average odds of purchasing a winning ticket.

**(3) Ticket validation requirements for Instant Game Number 127.**

(a) In addition to meeting all other requirements in these rules and regulations, to be a valid instant game ticket for Instant Game Number 127 all of the following validation requirements apply:

(i) Exactly one play symbol must appear in each of the five play spots in the playfield on the front of the ticket.

(ii) Each play symbol must have a play symbol caption below it and each must agree with its caption.

(iii) Each of the play symbol captions, except for the "winning number" play symbol caption, shall have a prize symbol below it. Each of the prize symbols shall also have a prize symbol caption below it.

(iv) The display printing and the printed numbers, letters, and symbols on the ticket must be regular in every respect and correspond precisely with the artwork on file with the director. The numbers, letters, and symbols shall be printed as follows:

Play Symbols	Play Symbol Font
Prize Symbols	Prize Symbol Font
Captions	Caption Font
Pack-Ticket Number	Validation Font
Validation Number	Validation Font
Retailer Verification Code	Validation Font

(v) Each of the play symbols and its caption, the validation number, pack-ticket number, and retailer verification code must be printed in black ink.

(vi) Each of the play symbols must be exactly one of those described in subsection (1)(a) of this section and each of the play symbol captions must be exactly one of those described in subsection (1)(b) of this section.

(vii) Each of the prize symbols must be exactly one of those described in subsection (1)(c) of this section and each

of the prize symbol captions must be exactly one of those described in subsection (1)(d) of this section.

(b) Any ticket not passing all the validation requirements in WAC 315-10-070 and in (a) of this subsection is invalid and ineligible for any prize.

NEW SECTION

**WAC 315-11A-128 Instant Game Number 128 ("Big Kahuna"). (1) Definitions for Instant Game Number 128.**

(a) Play symbols: The following are the "play symbols": "2," "3," "4," "5," "6," "7," "8," "9," "10," and "12." One of these play symbols appears in each of the eight play spots under the latex covering on the front of the ticket. The latex covered area shall be known as the playfield. Two of the eight play spots shall be labeled "winning number."

(b) Play symbol captions: The small printed characters appearing below each play symbol which correspond with and verify that play symbol. The caption is a spelling out, in full or abbreviated form of the play symbol. One and only one of these captions appears under each play symbol. The three-digit ticket number shall appear before each play symbol caption. For Instant Game Number 128, the captions which correspond with and verify the play symbols are:

<u>PLAY SYMBOL</u>	<u>CAPTION</u>
2	TWO
3	THR
4	FOR
5	FIV
6	SIX
7	SVN
8	EGT
9	NIN
10	TEN
12	TLV

(c) Prize symbols: The following are the "prize symbols": "\$1.00," "\$2.00," "\$4.00," "\$8.00," "\$16.00," "\$240.00," and "\$10,000." One of these prize symbols appears below each of the play symbol captions, except that no prize symbol appears below the caption of the play symbols labeled "winning number."

(d) Prize symbol captions: The small printed characters which appear below the prize symbol and verify and correspond with that prize symbol. The prize symbol caption is a spelling out, in full or abbreviated form, of the prize symbol. For Instant Game Number 128, the prize symbol captions which correspond with and verify the prize symbols are:

<u>PRIZE SYMBOL</u>	<u>CAPTION</u>
\$ 1.00	ONE DOL
\$ 2.00	TWO DOL
\$ 4.00	FOR DOL
\$ 8.00	EGT DOL
\$ 16.00	SXT DOL
\$ 240.00	TWOFRTY
\$ 10,000	TENTHOU

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(e) Validation number: The unique nineteen-digit number on the front of the ticket. The number is covered by latex.

(f) Pack-ticket number: The twelve-digit number of the form 12800001-1-000 printed on the back of the ticket. The first three digits are the game identifier. The first eight digits of the pack-ticket number for Instant Game Number 128 constitute the "pack number" which starts at 12800001; the last three digits constitute the "ticket number" which starts at 000 and continues through 199 within each pack of tickets.

(g) Retailer verification codes: Codes consisting of small letters found under the removable covering on the front of the ticket which the lottery retailer uses to verify instant winners of \$600.00 or less. For Instant Game Number 128, the retailer verification code is a three-letter code, with each letter appearing in a varying three of six locations beneath the removable covering and among the play symbols on the front of the ticket. The retailer verification codes are:

<u>VERIFICATION CODE</u>	<u>PRIZE</u>	
TWO	\$ 2.00	(\$1 AND \$1)
FOR	\$ 4.00	(\$1, \$1, \$1 AND \$1)
SIX	\$ 6.00	(\$1, \$1, \$1, \$1, \$1 AND \$1; \$2, \$2 AND \$2)
TEN	\$ 10.00	(\$2, \$2, \$2, \$2 AND \$2; \$4, \$2, \$2, \$1 AND \$1)
SXT	\$ 16.00	(\$4, \$4, \$2, \$2, \$2 AND \$2; \$8 AND \$8)
FTE	\$ 48.00	(\$8, \$8, \$8, \$8, \$8 AND \$8; \$16, \$16 AND \$16)
TFR	\$240.00	

(h) Pack: A set of two hundred fanfolded instant game tickets separated by perforations and packaged in plastic shrinkwrapping.

**(2) Criteria for Instant Game Number 128.**

(a) The price of each instant game ticket shall be \$2.00.

(b) Determination of prize winning tickets: An instant prize winner is determined in the following manner:

(i) When any of the six play symbols matches exactly one of the two play symbols labeled "winning number," the matching play symbol shall be a winning play symbol, and the bearer of the ticket shall win the prize below the winning play symbol.

(ii) The bearer of a ticket which has more than one winning play symbol shall win the total of the prizes below each winning play symbol.

(c) No portion of the display printing nor any extraneous matter whatever shall be usable or playable as a part of the instant game.

(d) The determination of prize winners shall be subject to the general ticket validation requirements of the lottery as set forth in WAC 315-10-070, to the particular ticket validation requirements for Instant Game Number 128 set forth in subsection (3) of this section, to the confidential validation requirements established by the director, and to the requirements stated on the back of each ticket.

(e) Notwithstanding any other provisions of these rules, the director may:

(i) Vary the length of Instant Game Number 128; and/or

(ii) Vary the number of tickets sold in Instant Game Number 128 in a manner that will maintain the estimated average odds of purchasing a winning ticket.

**(3) Ticket validation requirements for Instant Game Number 128.**

(a) In addition to meeting all other requirements in these rules and regulations, to be a valid instant game ticket for Instant Game Number 128 all of the following validation requirements apply:

(i) Exactly one play symbol must appear in each of the eight play spots in the playfield on the front of the ticket.

(ii) Each play symbol must have a play symbol caption below it and each must agree with its caption.

(iii) Each of the play symbol captions, except for the "winning number" play symbol captions, shall have a prize symbol below it. Each of the prize symbols shall also have a prize symbol caption below it.

(iv) The display printing and the printed numbers, letters, and symbols on the ticket must be regular in every respect and correspond precisely with the artwork on file with the director. The numbers, letters, and symbols shall be printed as follows:

Play Symbols	Play Symbol Font
Prize Symbols	Prize Symbol Font
Captions	Caption Font
Pack-Ticket Number	Validation Font
Validation Number	Validation Font
Retailer Verification Code	Validation Font

(v) Each of the play symbols and its caption, the validation number, pack-ticket number, and retailer verification code must be printed in black ink.

(vi) Each of the play symbols must be exactly one of those described in subsection (1)(a) of this section and each of the play symbol captions must be exactly one of those described in subsection (1)(b) of this section.

(vii) Each of the prize symbols must be exactly one of those described in subsection (1)(c) of this section and each of the prize symbol captions must be exactly one of those described in subsection (1)(d) of this section.

(b) Any ticket not passing all the validation requirements in WAC 315-10-070 and in (a) of this subsection is invalid and ineligible for any prize.

**NEW SECTION**

**WAC 315-11A-129 Instant Game Number 129 ("Beat the Dealer"). (1) Definitions for Instant Game Number 129.**

(a) Play symbols: The following are the "play symbols": "7"; "8"; "9"; "10"; "J"; "Q"; and "K." One of these play symbols appears in each of the three play spots in the "your card" column and in each of the three play spots in the "dealer's card" column in the playfield on the front of the ticket.

(b) Play symbol captions: The small printed characters appearing below each play symbol which verify and correspond with that play symbol. The caption is a spelling out, in full or abbreviated form of the play symbol. One and only one of these captions appears under each play symbol. The number 1, 2 or 3 precedes each play symbol caption to indicate the location of the play symbol in Game (row) 1,

Game 2 or Game 3. For Instant Game Number 129, the captions which correspond with and verify the play symbols are:

<u>PLAY SYMBOL</u>	<u>CAPTION</u>
7	SVN
8	EGT
9	NIN
10	TEN
J	JCK
Q	QUE
K	KNG

(c) Prize symbols: The following are the "prize symbols": "\$1.00"; "\$2.00"; "\$4.00"; "\$5.00"; "\$8.00"; "\$20.00"; "\$60.00"; and "\$6,000." One of these prize symbols appears for each game in the prize column on the front of the ticket.

(d) Prize symbol captions: The small printed characters appearing below the prize symbol which verify and correspond with that prize symbol. The caption is a spelling out, in full or abbreviated form, of the prize symbol. Only one caption appears under each prize symbol. The number 1, 2 or 3 precedes each prize symbol caption to indicate the location of the prize symbol in Game 1, Game 2 or Game 3. For Instant Game Number 129, the prize symbol captions which correspond with and verify the prize symbols are:

<u>PRIZE SYMBOL</u>	<u>CAPTION</u>
\$ 1.00	ONE DOL
\$ 2.00	TWO DOL
\$ 4.00	FOR DOL
\$ 5.00	FIV DOL
\$ 8.00	EGT DOL
\$ 20.00	TWY DOL
\$ 60.00	\$SIXTY\$
\$ 6,000	SIXTHOU

(e) Validation number: The unique nineteen-digit number on the front of the ticket. The number is covered with latex.

(f) Pack-ticket number: The twelve-digit number of the form 12900001-1-000 printed on the back of the ticket. The first three digits are the game identifier. The first eight digits of the pack-ticket number for Instant Game Number 129 constitute the "pack number" which starts at 12900001; the last three digits constitute the "ticket number" which starts at 000 and continues through 199 within each pack of tickets.

(g) Retailer verification codes: Codes consisting of small letters found under the removable latex covering on the front of the ticket which the lottery retailer uses to verify instant winners of \$600.00 and less. For Instant Game Number 129, the retailer verification codes are three-letter codes, with each letter appearing in a varying three of six locations beneath the removable covering and among the play symbols on the front of the ticket. The retailer verification codes are:

<u>VERIFICATION CODE</u>	<u>PRIZE</u>
ONE	\$ 1.00
TWO	\$ 2.00 (\$1 AND \$1)
FIV	\$ 5.00 (\$2, \$2 AND \$1; \$5)

EGT	\$ 8.00 (\$4, \$2 AND \$2; \$4 AND \$4)
SXT	\$ 16.00 (\$8 AND \$8)
TWY	\$ 20.00 (\$8, \$8 AND \$4; \$20)
SXY	\$ 60.00

(h) Pack: A set of two hundred fanfolded instant game tickets separated by perforations and packaged in plastic shrinkwrapping.

**(2) Criteria for Instant Game Number 129.**

(a) The price of each instant game ticket shall be \$1.00.

(b) Determination of prize winning tickets: An instant prize winner is determined in the following manner: The bearer of a ticket having a play symbol in the "your card" column that is superior to the play symbol in the "dealer's card" column in the same game shall win the prize shown in the prize column for that game. The bearer of a ticket having winning play symbols in more than one game shall win the sum of the prizes in each winning game. Play symbols in different games may not be combined to win a prize.

(c) For purposes of this game, the "K" shall be the play symbol with the highest superiority followed by "Q," "J," "10," "9," "8," and "7" in that order.

(d) No portion of the display printing nor any extraneous matter whatever shall be usable or playable as a part of the instant game.

(e) The determination of prize winners shall be subject to the general ticket validation requirements of the lottery as set forth in WAC 315-10-070, to the particular ticket validation requirements for Instant Game Number 129 set forth in subsection (3) of this section, to the confidential validation requirements established by the director, and to the requirements stated on the back of each ticket.

(f) Notwithstanding any other provisions of these rules, the director may:

(i) Vary the length of Instant Game Number 129; and/or

(ii) Vary the number of tickets sold in Instant Game Number 129 in a manner that will maintain the estimated average odds of purchasing a winning ticket.

**(3) Ticket validation requirements for Instant Game Number 129.**

(a) In addition to meeting all other requirements in these rules and regulations, a valid instant game ticket for Instant Game Number 129 shall comply with all of the following validation requirements.

(i) Exactly one play symbol must appear in each of the three play spots in the "your card" column and in each of the three play spots in the "dealer's card" column under the latex covering on the front of the ticket.

(ii) Each of the six play symbols must have a caption below and each must agree with its caption.

(iii) Exactly one prize symbol for each of the three games must appear under the latex covering in the prize column on the front of the ticket.

(iv) Each of the three prize symbols must have a caption below it and each must agree with its caption.

(v) The display printing and the printed numbers, letters, and symbols on the ticket must be regular in every respect and correspond precisely with the specifications on file with the director. The numbers, letters, and symbols shall be printed as follows:

Play Symbols	Play Symbol Font
Prize Symbols	Prize Symbol Font
Captions	Caption Font
Pack-Ticket Number	Validation Font
Validation Number	Validation Font
Retailer Verification Code	Validation Font

prize symbol. For Instant Game Number 130, the prize symbol captions which correspond with and verify the prize symbols are:

<u>PRIZE SYMBOL</u>	<u>CAPTION</u>
\$ 1.00	ONE DOL
\$ 2.00	TWO DOL
\$ 3.00	THR DOL
\$ 6.00	SIX DOL
\$ 16.00	SXT DOL
\$ 50.00	\$FIFTY\$
\$ 5,000	FIVTHOU

(vi) Each of the play symbols and its caption, prize symbol and its caption, the validation number, pack-ticket number, and the retailer verification code must be printed in black ink.

(vii) Each of the play symbols must be exactly one of those described in subsection (1)(a) of this section and each of the play symbol captions must be exactly one of those described in subsection (1)(b) of this section, each of the prize symbols must be exactly one of those described in subsection (1)(c) of this section and each of the prize symbol captions must be exactly one of those described in subsection (1)(d) of this section.

(b) Any ticket not passing all the validation requirements in WAC 315-10-070 and (a) of this subsection is invalid and ineligible for any prize.

(e) Validation number: The unique nine-digit number on the front of the ticket. The number is covered by latex.

(f) Pack-ticket number: The eleven-digit number of the form 13000001-000 printed on the front of the ticket. The back three digits are the game identifier. The first eight digits of the pack-ticket number for Instant Game Number 130 constitute the "pack number" which starts at 13000001; the last three digits constitute the "ticket number" which starts at 000 and continues through 199 within each pack of tickets.

(g) Retailer verification codes: Codes consisting of small letters found under the removable covering on the front of the ticket which the lottery retailer uses to verify instant winners of \$600.00 or less. For Instant Game Number 130, the retailer verification code is a three-letter code, with each letter appearing in a varying three of six locations beneath the removable covering and among the play symbols on the front of the ticket. The retailer verification codes are:

<u>VERIFICATION CODE</u>	<u>PRIZE</u>
ONE	\$ 1.00
THR	\$ 3.00 (\$1, \$1 AND \$1; \$3)
SIX	\$ 6.00 (\$3 AND \$3; \$2, \$2, \$1 AND \$1)
NIN	\$ 9.00 (\$3, \$3, \$2 AND \$1)
SXT	\$ 16.00 (\$9, \$6 AND \$1; \$16)
FTY	\$ 50.00
ONH	\$100.00 (\$50 AND \$50)

**NEW SECTION**

**WAC 315-11A-130 Instant Game Number 130 ("Moolah Moolah"). (1) Definitions for Instant Game Number 130.**

(a) Play symbols: The following are the "play symbols": "1," "2," "3," "4," "5," "6," "9," and "\$\$." One of these play symbols appears in each of the six play spots under the latex covering on the front of the ticket. The latex covered area shall be known as the playfield. Two of the six play spots shall be labeled "winning number."

(b) Play symbol captions: The small printed characters appearing below each play symbol which correspond with and verify that play symbol. The caption is a spelling out, in full or abbreviated form of the play symbol. One and only one of these captions appears under each play symbol. The three-digit ticket number shall appear before each play symbol caption. For Instant Game Number 130, the captions which correspond with and verify the play symbols are:

<u>PLAY SYMBOL</u>	<u>CAPTION</u>
1	ONE
2	TWO
3	THR
4	FOR
5	FIV
6	SIX
9	NIN
\$\$	DLRS

(c) Prize symbols: The following are the "prize symbols": "\$1.00," "\$2.00," "\$3.00," "\$6.00," "\$16.00," "\$50.00," and "\$5,000." One of these prize symbols appears below each of the play symbol captions, except that no prize symbol appears below the caption of the play symbols labeled "winning number."

(d) Prize symbol captions: The small printed characters which appear below the prize symbol and verify and correspond with that prize symbol. The prize symbol caption is a spelling out, in full or abbreviated form, of the

(h) Pack: A set of two hundred fanfolded instant game tickets separated by perforations and packaged in plastic shrinkwrapping.

**(2) Criteria for Instant Game Number 130.**

(a) The price of each instant game ticket shall be \$1.00.

(b) Determination of prize winning tickets: An instant prize winner is determined in the following manner:

(i) When any of the four play symbols matches exactly one of the play symbols labeled "winning number," the matching play symbol shall be a winning play symbol, and the bearer of the ticket shall win the prize below the winning play symbol.

(ii) The bearer of a ticket which has a "\$\$" play symbol shall be entitled to the prize shown below the "\$\$" play symbol.

(iii) The bearer of a ticket which has more than one winning play symbol shall win the total of the prizes below each winning play symbol.

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(c) No portion of the display printing nor any extraneous matter whatever shall be usable or playable as a part of the instant game.

(d) The determination of prize winners shall be subject to the general ticket validation requirements of the lottery as set forth in WAC 315-10-070, to the particular ticket validation requirements for Instant Game Number 130 set forth in subsection (3) of this section, to the confidential validation requirements established by the director, and to the requirements stated on the back of each ticket.

(e) Notwithstanding any other provisions of these rules, the director may:

(i) Vary the length of Instant Game Number 130; and/or

(ii) Vary the number of tickets sold in Instant Game Number 130 in a manner that will maintain the estimated average odds of purchasing a winning ticket.

**(3) Ticket validation requirements for Instant Game Number 130.**

(a) In addition to meeting all other requirements in these rules and regulations, to be a valid instant game ticket for Instant Game Number 130 all of the following validation requirements apply:

(i) Exactly one play symbol must appear in each of the six play spots in the playfield on the front of the ticket.

(ii) Each play symbol must have a play symbol caption below it and each must agree with its caption.

(iii) Each of the play symbol captions, except for the "winning number" play symbol captions, shall have a prize symbol below it. Each of the prize symbols shall also have a prize symbol caption below it.

(iv) The display printing and the printed numbers, letters, and symbols on the ticket must be regular in every respect and correspond precisely with the artwork on file with the director. The numbers, letters, and symbols shall be printed as follows:

Play Symbols	Play Symbol Font
Prize Symbols	Prize Symbol Font
Captions	Caption Font
Pack-Ticket Number	Validation Font
Validation Number	Validation Font
Retailer Verification Code	Validation Font

(v) Each of the play symbols and its caption, the validation number, pack-ticket number, and retailer verification code must be printed in black ink.

(vi) Each of the play symbols must be exactly one of those described in subsection (1)(a) of this section and each of the play symbol captions must be exactly one of those described in subsection (1)(b) of this section.

(vii) Each of the prize symbols must be exactly one of those described in subsection (1)(c) of this section and each of the prize symbol captions must be exactly one of those described in subsection (1)(d) of this section.

(b) Any ticket not passing all the validation requirements in WAC 315-10-070 and in (a) of this subsection is invalid and ineligible for any prize.

AMENDATORY SECTION (Amending WSR 94-07-029, filed 3/8/94, effective 4/8/94)

**WAC 315-11A-118 Instant Game Number 118 ("Aces Wild"). (1) Definitions for Instant Game Number 118.**

(a) Play symbols: The following are the "play symbols": "8," "9," "10," "J," "Q," "K," and "A." One of these play symbols appears in each of the five play spots under the latex covering on the front of the ticket. The latex covered area shall be known as the playfield. One of the five play spots shall be labeled "winning card."

(b) Play symbol captions: The small printed characters appearing below each play symbol which correspond with and verify that play symbol. The caption is a spelling out, in full or abbreviated form of the play symbol. One and only one of these captions appears under each play symbol. The three-digit ticket number shall appear before each play symbol caption. For Instant Game Number 118, the captions which correspond with and verify the play symbols are:

<u>PLAY SYMBOL</u>	<u>CAPTION</u>
8	EGT
9	NIN
10	TEN
J	((JAE)) JCK
Q	QUE
K	KNG
A	ACE

(c) Prize symbols: The following are the "prize symbols": "\$1.00," "\$2.00," "\$7.00," "\$12.00," "\$21.00," "\$40.00," "\$400.00," and "\$4,000." One of these prize symbols appears below each of the play symbol captions, except that no prize symbol appears below the caption of the play symbol labeled "winning card."

(d) Prize symbol captions: The small printed characters which appear below the prize symbol and verify and correspond with that prize symbol. The prize symbol caption is a spelling out, in full or abbreviated form, of the prize symbol. For Instant Game Number 118, the prize symbol captions which correspond with and verify the prize symbols are:

<u>PRIZE SYMBOL</u>	<u>CAPTION</u>
\$ 1.00	ONE DOL
\$ 2.00	TWO DOL
\$ 7.00	SVN DOL
\$ 12.00	TLV DOL
\$ 21.00	TTN DOL
\$ 40.00	\$FORTY\$
\$ 400.00	FORHUND
\$ 4,000	FORTHOU

(e) Validation number: The unique nineteen-digit number on the front of the ticket. The number is covered by latex.

(f) Pack-ticket number: The twelve-digit number of the form 11800001-1-000 printed on the ((front)) back of the ticket. The first three digits are the game identifier. The first eight digits of the pack-ticket number for Instant Game Number 118 constitute the "pack number" which starts at 11800001; the last three digits constitute the "ticket number"

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which starts at 000 and continues through 199 within each pack of tickets.

(g) Retailer verification codes: Codes consisting of small letters found under the removable covering on the front of the ticket which the lottery retailer uses to verify instant winners of \$600.00 or less. For Instant Game Number 118, the retailer verification code is a three-letter code, with each letter appearing in a varying three of six locations beneath the removable covering and among the play symbols on the front of the ticket. The retailer verification codes are:

VERIFICATION CODE	PRIZE
ONE	\$ 1.00
FOR	\$ 4.00 (\$1, \$1, \$1, AND \$1; \$2, \$1, AND \$1)
SVN	\$ 7.00 (\$2, \$2, \$2, AND \$1; \$7)
TLV	\$ 12.00 (\$7, \$2, \$2, AND \$1; \$12)
TTN	\$ 21.00 (\$12, \$7, AND \$2; \$21)
FRY	\$ 40.00
FRH	\$ 400.00

(h) Pack: A set of two hundred fanfolded instant game tickets separated by perforations and packaged in plastic shrinkwrapping.

**(2) Criteria for Instant Game Number 118.**

(a) The price of each instant game ticket shall be \$1.00.

(b) Determination of prize winning tickets: An instant prize winner is determined in the following manner:

(i) When any of the four play symbols matches exactly the play symbol labeled "winning card," the matching play symbol shall be a winning play symbol, and the bearer of the ticket shall win the prize below the winning play symbol.

(ii) The bearer of a ticket which has an "A" play symbol shall be entitled to the prize shown below the "A".

(iii) The bearer of a ticket which has more than one winning play symbol shall win the total of the prizes below each winning play symbol.

(c) No portion of the display printing nor any extraneous matter whatever shall be usable or playable as a part of the instant game.

(d) The determination of prize winners shall be subject to the general ticket validation requirements of the lottery as set forth in WAC 315-10-070, to the particular ticket validation requirements for Instant Game Number 118 set forth in subsection (3) of this section, to the confidential validation requirements established by the director, and to the requirements stated on the back of each ticket.

(e) Notwithstanding any other provisions of these rules, the director may:

(i) Vary the length of Instant Game Number 118; and/or

(ii) Vary the number of tickets sold in Instant Game Number 118 in a manner that will maintain the estimated average odds of purchasing a winning ticket.

**(3) Ticket validation requirements for Instant Game Number 118.**

(a) In addition to meeting all other requirements in these rules and regulations, to be a valid instant game ticket for Instant Game Number 118 all of the following validation requirements apply:

(i) Exactly one play symbol must appear in each of the five play spots in the playfield on the front of the ticket.

(ii) Each play symbol must have a play symbol caption below it and each must agree with its caption.

(iii) Each of the play symbol captions, except for the "winning card" play symbol caption, shall have a prize symbol below it. Each of the prize symbols shall also have a prize symbol caption below it.

(iv) The display printing and the printed numbers, letters, and symbols on the ticket must be regular in every respect and correspond precisely with the artwork on file with the director. The numbers, letters, and symbols shall be printed as follows:

Play Symbols	Play Symbol Font
Prize Symbols	Prize Symbol Font
Captions	Caption Font
Pack-Ticket Number	Validation Font
Validation Number	Validation Font
Retailer Verification Code	Validation Font

(v) Each of the play symbols and its caption, the validation number, pack-ticket number, and retailer verification code must be printed in black ink.

(vi) Each of the play symbols must be exactly one of those described in subsection (1)(a) of this section and each of the play symbol captions must be exactly one of those described in subsection (1)(b) of this section.

(vii) Each of the prize symbols must be exactly one of those described in subsection (1)(c) of this section and each of the prize symbol captions must be exactly one of those described in subsection (1)(d) of this section.

(b) Any ticket not passing all the validation requirements in WAC 315-10-070 and in (a) of this subsection is invalid and ineligible for any prize.

**AMENDATORY SECTION** (Amending WSR 94-07-029, filed 3/8/94, effective 4/8/94)

**WAC 315-11A-119 Instant Game Number 119** (~~(((**"Big Bucks"**)))~~) (**"Lots of Bucks"**). (1) **Definitions for Instant Game Number 119.**

(a) Play symbols: The following are the "play symbols": "1," "2," "3," "4," "5," "6," "7," "8," and "9." One of these play symbols appears in each of the seven play spots under the latex covering on the front of the ticket. The latex covered area shall be known as the playfield. Two of the seven play spots shall be labeled "winning number."

(b) Play symbol captions: The small printed characters appearing below each play symbol which correspond with and verify that play symbol. The caption is a spelling out, in full or abbreviated form of the play symbol. One and only one of these captions appears under each play symbol. The three-digit ticket number shall appear before each play symbol caption. For Instant Game Number 119, the captions which correspond with and verify the play symbols are:

PLAY SYMBOL	CAPTION
1	ONE
2	TWO
3	THR
4	FOR
5	FIV

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6	SIX
7	SVN
8	EGT
9	NIN

(c) Prize symbols: The following are the "prize symbols": "\$1.00," "\$2.00," "\$3.00," "\$5.00," "\$10.00," "\$20.00," "\$50.00," "\$100.00," and "\$10,000." One of these prize symbols appears below each of the play symbol captions, except that no prize symbol appears below the caption of the play symbols labeled "winning number."

(d) Prize symbol captions: The small printed characters which appear below the prize symbol and verify and correspond with that prize symbol. The prize symbol caption is a spelling out, in full or abbreviated form, of the prize symbol. For Instant Game Number 119, the prize symbol captions which correspond with and verify the prize symbols are:

<u>PRIZE SYMBOL</u>	<u>CAPTION</u>
\$ 1.00	ONE DOL
\$ 2.00	TWO DOL
\$ 3.00	THR DOL
\$ 5.00	FIV DOL
\$ 10.00	TEN DOL
\$ 20.00	TWY DOL
\$ 50.00	\$FIFTY\$
\$ 100.00	ONEHUND
\$ 10,000	TENTHOU

(e) Validation number: The unique nineteen-digit number on the front of the ticket. The number is covered by latex.

(f) Pack-ticket number: The twelve-digit number of the form 11900001-1-000 printed on the ~~(front)~~ back of the ticket. The first three digits are the game identifier. The first eight digits of the pack-ticket number for Instant Game Number 119 constitute the "pack number" which starts at 11900001; the last three digits constitute the "ticket number" which starts at 000 and continues through 199 within each pack of tickets.

(g) Retailer verification codes: Codes consisting of small letters found under the removable covering on the front of the ticket which the lottery retailer uses to verify instant winners of \$600.00 or less. For Instant Game Number 119, the retailer verification code is a three-letter code, with each letter appearing in a varying three of six locations beneath the removable covering and among the play symbols on the front of the ticket. The retailer verification codes are:

<u>VERIFICATION CODE</u>	<u>PRIZE</u>	
TWO	\$ 2.00	(\$1 AND \$1; \$2)
THR	\$ 3.00	(\$1, \$1, AND \$1; \$3)
SIX	\$ 6.00	(\$2, \$2, AND \$2; \$2, \$2, \$1, AND \$1)
TEN	\$ 10.00	(\$2, \$2, \$2, \$2, AND \$2; \$5 AND \$5)
TWY	\$ 20.00	(\$10, \$5, AND \$5; \$10, \$5, \$2, \$2, AND \$1)
FTY	\$ 50.00	
OHN	\$ 100.00	(\$50 AND \$50)

(h) Pack: A set of two hundred fanfolded instant game tickets separated by perforations and packaged in plastic shrinkwrapping.

**(2) Criteria for Instant Game Number 119.**

(a) The price of each instant game ticket shall be \$2.00.

(b) Determination of prize winning tickets: An instant prize winner is determined in the following manner:

(i) When any of the five play symbols matches exactly one of the two play symbols labeled "winning number," the matching play symbol shall be a winning play symbol, and the bearer of the ticket shall win the prize below the winning play symbol.

(ii) The bearer of a ticket which has more than one winning play symbol shall win the total of the prizes below each winning play symbol.

(c) No portion of the display printing nor any extraneous matter whatever shall be usable or playable as a part of the instant game.

(d) The determination of prize winners shall be subject to the general ticket validation requirements of the lottery as set forth in WAC 315-10-070, to the particular ticket validation requirements for Instant Game Number 119 set forth in subsection (3) of this section, to the confidential validation requirements established by the director, and to the requirements stated on the back of each ticket.

(e) Notwithstanding any other provisions of these rules, the director may:

(i) Vary the length of Instant Game Number 119; and/or

(ii) Vary the number of tickets sold in Instant Game Number 119 in a manner that will maintain the estimated average odds of purchasing a winning ticket.

**(3) Ticket validation requirements for Instant Game Number 119.**

(a) In addition to meeting all other requirements in these rules and regulations, to be a valid instant game ticket for Instant Game Number 119 all of the following validation requirements apply:

(i) Exactly one play symbol must appear in each of the seven play spots in the playfield on the front of the ticket.

(ii) Each play symbol must have a play symbol caption below it and each must agree with its caption.

(iii) Each of the play symbol captions, except for the "winning number" play symbol captions, shall have a prize symbol below it. Each of the prize symbols shall also have a prize symbol caption below it.

(iv) The display printing and the printed numbers, letters, and symbols on the ticket must be regular in every respect and correspond precisely with the artwork on file with the director. The numbers, letters, and symbols shall be printed as follows:

Play Symbols	Play Symbol Font
Prize Symbols	Prize Symbol Font
Captions	Caption Font
Pack-Ticket Number	Validation Font
Validation Number	Validation Font
Retailer Verification Code	Validation Font

(v) Each of the play symbols and its caption, the validation number, pack-ticket number, and retailer verification code must be printed in black ink.

(vi) Each of the play symbols must be exactly one of those described in subsection (1)(a) of this section and each

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of the play symbol captions must be exactly one of those described in subsection (1)(b) of this section.

(vii) Each of the prize symbols must be exactly one of those described in subsection (1)(c) of this section and each of the prize symbol captions must be exactly one of those described in subsection (1)(d) of this section.

(b) Any ticket not passing all the validation requirements in WAC 315-10-070 and in (a) of this subsection is invalid and ineligible for any prize.

**AMENDATORY SECTION** (Amending WSR 94-07-029, filed 3/8/94, effective 4/8/94)

**WAC 315-11A-120 Instant Game Number 120 ("Lucky Deal"). (1) Definitions for Instant Game Number 120.**

(a) Play symbols: The following are the "play symbols": "7," "8," "9," "10," "J," "Q," and "K." One of these play symbols appears in each of the six play spots under the latex covering on the front of the ticket. The latex covered area shall be known as the playfield. One of the six play spots shall be labeled "winning card."

(b) Play symbol captions: The small printed characters appearing below each play symbol which correspond with and verify that play symbol. The caption is a spelling out, in full or abbreviated form of the play symbol. One and only one of these captions appears under each play symbol. The three-digit ticket number shall appear before each play symbol caption. For Instant Game Number 120, the captions which correspond with and verify the play symbols are:

<u>PLAY SYMBOL</u>	<u>CAPTION</u>
7	SVN
8	EGT
9	NIN
10	TEN
J	((JAE)) JCK
Q	QUE
K	KNG

(c) Prize symbols: The following are the "prize symbols": "\$1.00," "\$4.00," "\$7.00," "\$14.00," "\$21.00," "\$50.00," "\$500.00," and "\$5,000." One of these prize symbols appears below each of the play symbol captions, except that no prize symbol appears below the caption of the play symbol labeled "winning card."

(d) Prize symbol captions: The small printed characters which appear below the prize symbol and verify and correspond with that prize symbol. The prize symbol caption is a spelling out, in full or abbreviated form, of the prize symbol. For Instant Game Number 120, the prize symbol captions which correspond with and verify the prize symbols are:

<u>PRIZE SYMBOL</u>	<u>CAPTION</u>
\$ 1.00	ONE DOL
\$ 4.00	FOR DOL
\$ 7.00	SVN DOL
\$ 14.00	FRN DOL
\$ 21.00	TTN DOL
\$ 50.00	\$FIFTY\$
\$ 500.00	FIVHUND
\$ 5,000	FIVTHOU

(e) Validation number: The unique nineteen-digit number on the front of the ticket. The number is covered by latex.

(f) Pack-ticket number: The twelve-digit number of the form 12000001-1-000 printed on the ((front)) back of the ticket. The first three digits are the game identifier. The first eight digits of the pack-ticket number for Instant Game Number 120 constitute the "pack number" which starts at 12000001; the last three digits constitute the "ticket number" which starts at 000 and continues through 199 within each pack of tickets.

(g) Retailer verification codes: Codes consisting of small letters found under the removable covering on the front of the ticket which the lottery retailer uses to verify instant winners of \$600.00 or less. For Instant Game Number 120, the retailer verification code is a three-letter code, with each letter appearing in a varying three of six locations beneath the removable covering and among the play symbols on the front of the ticket. The retailer verification codes are:

<u>VERIFICATION CODE</u>	<u>PRIZE</u>
ONE	\$ 1.00
FOR	\$ 4.00 (\$1, \$1, \$1, AND \$1; \$4)
SVN	\$ 7.00 (\$4, \$1, \$1, AND \$1; \$7)
FRN	\$ 14.00 (( <del>\$7 AND \$7; \$14</del> )) (\$7, \$4, \$1, \$1 AND \$1; \$14)
TTN	\$ 21.00 (\$14 AND \$7; \$7, \$7, AND \$7; \$21)
FTY	\$ 50.00
FVH	\$ 500.00

(h) Pack: A set of two hundred fanfolded instant game tickets separated by perforations and packaged in plastic shrinkwrapping.

**(2) Criteria for Instant Game Number 120.**

(a) The price of each instant game ticket shall be \$1.00.

(b) Determination of prize winning tickets: An instant prize winner is determined in the following manner:

(i) When any of the five play symbols matches exactly the play symbol labeled "winning card," the matching play symbol shall be a winning play symbol, and the bearer of the ticket shall win the prize below the winning play symbol.

(ii) The bearer of a ticket which has more than one winning play symbol shall win the total of the prizes below each winning play symbol.

(c) No portion of the display printing nor any extraneous matter whatever shall be usable or playable as a part of the instant game.

(d) The determination of prize winners shall be subject to the general ticket validation requirements of the lottery as set forth in WAC 315-10-070, to the particular ticket validation requirements for Instant Game Number 120 set forth in subsection (3) of this section, to the confidential validation requirements established by the director, and to the requirements stated on the back of each ticket.

(e) Notwithstanding any other provisions of these rules, the director may:

(i) Vary the length of Instant Game Number 120; and/or

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July 15, 1994  
Bonnie Jindra  
Assistant Director

(ii) Vary the number of tickets sold in Instant Game Number 120 in a manner that will maintain the estimated average odds of purchasing a winning ticket.

**(3) Ticket validation requirements for Instant Game Number 120.**

(a) In addition to meeting all other requirements in these rules and regulations, to be a valid instant game ticket for Instant Game Number 120 all of the following validation requirements apply:

(i) Exactly one play symbol must appear in each of the six play spots in the playfield on the front of the ticket.

(ii) Each play symbol must have a play symbol caption below it and each must agree with its caption.

(iii) Each of the play symbol captions, except for the "winning number" play symbol caption, shall have a prize symbol below it. Each of the prize symbols shall also have a prize symbol caption below it.

(iv) The display printing and the printed numbers, letters, and symbols on the ticket must be regular in every respect and correspond precisely with the artwork on file with the director. The numbers, letters, and symbols shall be printed as follows:

Play Symbols	Play Symbol Font
Prize Symbols	Prize Symbol Font
Captions	Caption Font
Pack-Ticket Number	Validation Font
Validation Number	Validation Font
Retailer Verification Code	Validation Font

(v) Each of the play symbols and its caption, the validation number, pack-ticket number, and retailer verification code must be printed in black ink.

(vi) Each of the play symbols must be exactly one of those described in subsection (1)(a) of this section and each of the play symbol captions must be exactly one of those described in subsection (1)(b) of this section.

(vii) Each of the prize symbols must be exactly one of those described in subsection (1)(c) of this section and each of the prize symbol captions must be exactly one of those described in subsection (1)(d) of this section.

(b) Any ticket not passing all the validation requirements in WAC 315-10-070 and in (a) of this subsection is invalid and ineligible for any prize.

**WSR 94-15-052  
PERMANENT RULES  
DEPARTMENT OF  
SERVICES FOR THE BLIND  
[Filed July 15, 1994, 3:40 p.m.]**

Date of Adoption: July 15, 1994.

Purpose: Changes to reflect increased deductible paid by vendors on repair bills, and change in title to more accurately reflect content of the WAC.

Citation of Existing Rules Affected by this Order: Amending WAC 67-35-230.

Statutory Authority for Adoption: Chapter 74.18 RCW. Pursuant to notice filed as WSR 94-12-072 on May 31, 1994.

Effective Date of Rule: Thirty-one days after filing.

**AMENDATORY SECTION** (Amending Order 86-2, filed 3/21/86)

**WAC 67-35-230 Department and vendor responsibility—Maintained facility and equipment.** (1) The department will, within program resources, maintain or cause to be maintained each facility in good repair and attractive condition. The department will, within program resources, or in accordance with terms and conditions of the permit or contract, replace, or cause to be replaced obsolete or worn-out equipment.

(2) Vendors shall pay repair charges for each separate repair job on vending facility equipment of ~~((one))~~ two hundred dollars or ten percent of the cost of repair, whichever is greater. For purposes of this subsection, repair or a repair job shall mean the cost associated with a single visit of a repair technician to a vending facility without respect to the amount of equipment being repaired, or multiple visits, and/or contact relative to the repair of a single item.

(3) When a vendor takes over the operation of a vending facility, the department will within program resources, pay for all repair charges during the first six months and the ~~((one))~~ two hundred dollars or ten percent deduction will not apply.

(4) The remainder of the charges for repair or maintenance of vending facility equipment described in subsections (2) and (3) of this section shall be paid for from set aside funds. If set aside funds are entirely depleted, the vendor shall pay the costs of repair of vending facility equipment at his/her facility.

(5) For purposes of this section, vending facility equipment shall include equipment provided by the department and equipment furnished as a part of the contract or permit for which the department and operator assumes the responsibility of maintenance.

**WSR 94-15-053  
PERMANENT RULES  
HEALTH CARE  
FACILITIES AUTHORITY  
[Filed July 15, 1994, 4:50 p.m.]**

Date of Adoption: July 15, 1994.

Purpose: To identify types of health care facilities and provide other factors to determine whether a facility (including land, structures, systems, machinery, equipment or other property useful for or associated with the delivery of inpatient or outpatient health care services or support) is a health care facility and is eligible for financing assistance from the Washington Health Care Facilities Authority.

Statutory Authority for Adoption: RCW 70.37.050.

Pursuant to notice filed as WSR 94-12-021 on May 24, 1994.

Changes Other than Editing from Proposed to Adopted Version: In response to public comment, listed "free standing ambulatory surgery centers (FASCs)". Under new

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section, WAC 247-04-020 Facilities which are health care facilities.

Effective Date of Rule: Thirty-one days after filing.

July 15, 1994

John H. Van Gorkom

Executive Director

PROPOSED RULES OF WASHINGTON HEALTH CARE  
FACILITIES AUTHORITY  
DEFINING HEALTH CARE FACILITY

NEW SECTION

**WAC 247-04-010 Purpose.** The purpose of this chapter shall be to provide guidance regarding the determination of facilities as health care facilities as defined for purposes of chapter 70.37 RCW, and the resulting eligibility for authority financial assistance. If a facility owned or operated by a participant (as defined in RCW 70.37.020(4)) is determined to be a health care facility, it shall be eligible for financing provided by the authority. If a facility is determined not to be a health care facility, then the authority shall not provide financing for such facility. If a facility is used for both health care and nonhealth care uses, then only those portions of the facility which are determined to be health care facilities shall be eligible for financing provided by the authority.

NEW SECTION

**WAC 247-04-020 Facilities which are health care facilities.** For the purposes of chapter 70.37 RCW, the term health care facility includes the following facilities which are constructed, purchased, acquired, leased, used, owned or operated by a participant (as defined in RCW 70.37.020(4)):

- (1) Hospices licensed under chapter 70.127 RCW;
- (2) Hospitals licensed under chapter 70.41 RCW;
- (3) Rural health facilities as defined in RCW 70.175.020;
- (4) Psychiatric hospitals licensed under chapter 71.12 RCW;
- (5) Nursing homes licensed under chapter 18.51 RCW (excluding any facility maintained by a participant as an independent nursing home);
- (6) Community mental health centers licensed under chapter 71.05 or 71.24 RCW;
- (7) Kidney disease treatment centers licensed under chapter 70.41 RCW;
- (8) Ambulatory diagnostic, treatment or surgical facilities licensed under chapter 70.41 RCW;
- (9) Drug and alcohol treatment facilities licensed under chapter 70.96A RCW;
- (10) Home health agencies licensed under chapter 70.127 RCW;
- (11) Abortion clinics;
- (12) Acupuncture clinics;
- (13) Asthma and allergy clinics;
- (14) Birthing centers;
- (15) Blood banks and blood centers;
- (16) Children's clinics or hospitals;
- (17) Chiropractic clinics;
- (18) Community health clinics or centers;
- (19) Comprehensive cancer centers;

- (20) Comprehensive community health centers;
- (21) Cosmetic surgery clinics;
- (22) Dental clinics;
- (23) Emergency hospitals;
- (24) Evaluation and treatment facilities for mentally ill persons;
- (25) Extended care facilities;
- (26) Eye banks;
- (27) Fertility clinics;
- (28) Foot and ankle clinics;
- (29) Freestanding ambulatory surgery centers;
- (30) Health maintenance organizations;
- (31) Homeopathic clinics;
- (32) Hypnotherapy centers;
- (33) Medical test sites;
- (34) Mental health clinics or centers;
- (35) Naturopathic clinics;
- (36) Optometry clinics;
- (37) Orthopedic clinics;
- (38) Osteopathic clinics;
- (39) Physical therapy clinics or centers;
- (40) Prosthetic and orthotic clinics;
- (41) Psychiatric clinics;
- (42) Skilled nursing facilities;
- (43) Sports medicine clinics; and
- (44) Women's health care clinics.

NEW SECTION

**WAC 247-04-030 Facilities which may be health care facilities.** (1) Upon investigation, at the request of a participant, the authority may determine other facilities (including land, structures, systems, machinery, equipment or other real or personal property or appurtenances useful for or associated with the delivery of inpatient or outpatient health care service or support for such care or any combination thereof) to be health care facilities for purposes of chapter 70.37 RCW, to the extent that the participant intends such health care activities to be a principal use of such facility. Such facilities may include the following, among others:

- (a) Adult day care centers;
- (b) Counseling centers;
- (c) Family planning centers;
- (d) Group care facilities for children with disabilities;
- (e) Juvenile evaluation and treatment facilities;
- (f) Occupational health clinics;
- (g) Rehabilitation centers;
- (h) Speech and hearing clinics; and
- (i) Training centers for persons with developmental disabilities.

(2) A determination that a facility is a health care facility shall be based on both actual and intended use, as expressed by the participant in its request to the authority for such determination and other supporting documentation, including information responsive to the factors described in WAC 247-04-040 below and as may be required by executive director.

NEW SECTION**WAC 247-04-040 Factors to be considered in determining whether health care use is a principal use.**

(1) For purposes of this chapter, a use or intended use of a participant's facility, or portion thereof, shall be a principal use only if it is one that will utilize more than 10% of a facility.

(2) The authority may consider the following factors, among others, in determining whether a health care use is a principal use of a facility:

(a) The relative amounts of land or space in structures or improvements to be utilized for health care and nonhealth care uses;

(b) The relative fair market or rental value of facilities to be utilized for health care and nonhealth care uses; and

(c) The relative amounts of time a particular facility is utilized for health care and nonhealth care uses.

(3) Portions of a mixed-use facility that are common areas (such as hallways, lobby and reception areas and administrative offices) may be allocated between health care and nonhealth care uses on a **pro rata** basis using the same method of allocation used to allocate between health care and nonhealth care uses.

**WSR 94-15-054  
PERMANENT RULES  
HEALTH CARE  
FACILITIES AUTHORITY**

[Filed July 15, 1994, 4:51 p.m.]

Date of Adoption: July 15, 1994.

Purpose: To define "independent nursing home" in the definition of a "health care facility" in RCW 70.37.020(3).

Statutory Authority for Adoption: RCW 70.37.020(3).

Pursuant to notice filed as WSR 94-12-022 on May 24, 1994.

Effective Date of Rule: Thirty-one days after filing.

July 15, 1994

John H. Van Gorkom  
Executive Director

PROPOSED RULES OF WASHINGTON HEALTH CARE  
FACILITIES AUTHORITY REGARDING THE DETERMINATION  
PROCESS AND CRITERIA FOR PROVIDING FINANCING  
ASSISTANCE TO NURSING HOMES

NEW SECTION

**WAC 247-06-010 Purpose.** The purpose of this chapter shall be to provide guidance regarding the circumstances under which a nursing home facility is a health care facility as defined for purposes of chapter 70.37 RCW, and the resulting eligibility for authority financing assistance. If the authority determines that a nursing home facility is an independent nursing home, then the nursing home is not a health care facility and is not eligible for authority financing assistance.

NEW SECTION

**WAC 247-06-020 Determination process.** (1) Upon the request of a participant (as defined in RCW 70.37.020(4)), the executive director, in consultation with the authority's assistant attorney general and authority's bond counsel, shall evaluate whether a nursing home qualifies for financing assistance under the Washington health care facilities authority statute, chapter 70.37 RCW (the act), and shall make a recommendation to the authority board based upon such evaluation. The participant's request shall include information with respect to the participant and the nursing home that is responsive to the criteria and factors described in WAC 247-06-030 below and such other information as the executive director may require.

(2) Upon receipt and consideration of the executive director's recommendation, the board shall determine whether a nursing home is eligible for authority financing assistance.

NEW SECTION

**WAC 247-06-030 Criteria for providing financing assistance to nursing homes.** The criteria which will serve as the basis for the review and evaluation for determining whether a nursing home is not independent and thus qualifies for authority financing assistance shall include, but need not be limited to, the following:

(1) Control by related participant. This criterion relates to the nature of the relationship between the related participant and the nursing home and the level of organizational control the related participant exercises or will exercise over the nursing home. The closer the relationship between the related participant and the nursing home and the greater the level of control the related participant exercises over the nursing home, the more likely it is that a nexus exists between the participant and the nursing home sufficient to support the conclusion that the nursing home is not independent. Factors to consider may include, but need not be limited to, the following:

- (a) Who the legal owner of the nursing home is;
- (b) How the members of the board of trustees/directors of the nursing home and/or the related participant are chosen;
- (c) How the management of the nursing home is chosen;
- (d) How the nursing home budget is approved and whether the related participant has veto authority; and
- (e) What entity holds the license to operate the nursing home.

(2) Physical proximity. This criterion relates to the physical relationship a nursing home facility has to other health care facilities. While physical attachment or connection of a nursing home to a hospital or other health care facility is not required under the act, such attachment or connection may be a strong indicator of the dependence that the nursing home facility may have on the facility to which it is connected. Factors to consider may include, but need not be limited to, the following:

- (a) Whether the nursing home facility is physically attached or connected to a hospital or health care facility (other than another nursing home) and the nature of such attachment or connection; and
- (b) Where the nursing home is located in relation to hospital and other health care facilities and whether it is on:

- (i) a single parcel of property;
- (ii) a municipally recognized multi parcel area; or
- (iii) a campus (i.e., hospital zoning or major institutional zoning).

(3) Integration with a nonnursing home participant. This criterion relates to the operational integration of a nursing home facility with a nonnursing home participant. The more highly integrated the operations of the nonnursing home participant and the nursing home are, the more likely it is that a nexus exists between such participant and the nursing home sufficient to support the conclusion that the nursing home is not independent. Factors to consider may include, but need not be limited to, the following:

- (a) The extent to which the nonnursing home participant and the nursing home have common medical staff;
- (b) Who employs the nursing home personnel;
- (c) The extent to which the nonnursing home participant and the nursing home have a common or integrated admissions/transfer policy; and
- (d) The extent to which the nonnursing home participant and the nursing home have common or integrated administrative staff and/or services.

(4) Coobligation or guaranty by a related nonnursing home participant on authority debt. The final criterion requires that a related nonnursing home participant be obligated on or give a guaranty on any bonds or other obligations to be issued by the authority, the proceeds of which will be used in the nursing home facility.

**WSR 94-15-058**  
**PERMANENT RULES**  
**DEPARTMENT OF LICENSING**  
 [Filed July 18, 1994, 2:14 p.m.]

Date of Adoption: July 18, 1994.

Purpose: To clarify existing language to avoid confusion by applicants and/or licensed and certified appraisers.

Statutory Authority for Adoption: RCW 18.140.030(1).

Pursuant to notice filed as WSR 94-12-041 on May 26, 1994.

Changes Other than Editing from Proposed to Adopted Version: Increased hourly allotments for subsection (2). This change is less restrictive than the proposed subsection (2), and more advantageous to both applicants and current appraisers; and addition of subsection (4). Subsection (4) clarifies the department's position that subsections (1), (2), and (3) are not all inclusive. This new subsection allows consideration of appraisals that are not easily categorized under subsection (1), (2), and (3).

Effective Date of Rule: Thirty-one days after filing.  
 July 18, 1994  
 Kathy Baros Friedt  
 Director

**NEW SECTION**

**WAC 308-125-075 Allowed credits for appraisal experience.** (1) The department shall not grant to state-licensed or state-certified appraisers and applicants experience credits for appraisal experience that exceeds the following hourly allotments for each appraisal:

(a) Single Family Residential (noncomplex)	12 hours
(b) Single Family Residential (complex & 2-4)	20 hours
(c) Single Family Lot (URAR Form)	8 hours
(d) Single Family Lot (Narrative)	10 hours
(e) Large Land Tract (not subdivided)	25 hours
(f) Subdivisions	60 hours
(g) Improved Commercial/Industrial land	25 hours
(h) Commercial (form)	40 hours
(i) Commercial (narrative)	80 hours
(j) Regional Mall/high rise office bldg/Hotel	120 hours
(k) Appraisal Review (single family)	4 hours
(l) Appraisal Review (commercial)	16 hours
(m) Feasibility Study	80 hours
(n) Market Analysis/Consulting (nonresidential)	40 hours
(o) Agricultural	60 hours

(2) The department shall not grant to state-licensed or state-certified appraisers and applicants experience credits for Eminent Domain Appraisals that exceed the following hourly allotments for each appraisal:

(a) Vacant (single family lot)	32 hours
(b) Vacant (large land tract)	40 hours
(c) Single family residential	56 hours
(d) Multi-family residential	80 hours
(e) Agricultural (improved)	96 hours
(f) Industrial (improved)	96 hours
(g) Commercial (improved)	96 hours
(h) Very complex damages or benefits	160 hours
(i) Special Purpose Improved	72 hours

(3) The department shall not grant to state-licensed or state-certified appraisers and applicants experience credits for Eminent Domain Appraisal Reviews that exceed the following hourly allotments for each appraisal:

(a) Vacant (single family lot)	8 hours
(b) Vacant (large land tract)	12 hours
(c) Single family residential	16 hours
(d) Multi-family residential	24 hours
(e) Agricultural (improved)	32 hours
(f) Industrial (improved)	30 hours
(g) Commercial (improved)	30 hours
(h) Very complex damages or benefits	40 hours
(i) Special Purpose Improved	24 hours

(4) Experience credits for appraisal experience not listed in subsections (1), (2), or (3) shall be determined by the department on a case-by-case basis.

**WSR 94-15-064**  
**PERMANENT RULES**  
**DEPARTMENT OF HEALTH**  
 [Filed July 19, 1994, 8:25 a.m.]

Date of Adoption: May 13, 1994.

Purpose: To amend existing rules to change language to conform to procedures of recently accepted examination.

Citation of Existing Rules Affected by this Order: Amending WAC 246-917-100 and 246-917-120.

Statutory Authority for Adoption: RCW 18.71A.020, 18.71.017, 18.71.060, and 18.71.070.

Pursuant to notice filed as WSR 94-08-095 on April 6, 1994.

Effective Date of Rule: Thirty-one days after filing.  
 June 30, 1994  
 Beverly A. Teeter  
 Program Manager



**AMENDATORY SECTION** (Amending WSR 93-21-017, filed 10/11/93, effective 11/11/93)

**WAC 246-917-100 Examination scores.** Examinations given by the Washington state board of medical examiners:

(1) The board adopts the United States Medical Licensing Examination (USMLE) as the examination accepted by the board.

(2) The minimal passing scores for each component of any approved examination combination shall be a score of seventy-five ((percent)) as defined by the examining authority.

~~((3) Applications for examination shall remain valid for two years (four examination cycles). Applicants who do not pass the examination within the two year period must submit a new application and meet the licensure eligibility requirements in effect at the time of the new application.))~~

(3) Applicants who do not pass Step 3 of the USMLE examination after three sittings within seven years after passing the first examination, either Step 1 or Step 2, or acceptable combination, shall demonstrate evidence satisfactory to the board of having completed a remedial or refresher medical course approved by the board prior to being permitted to take the examination again. Applicants who do not pass after the fourth sitting may not take the examination without completing an additional year of postgraduate training or satisfying any other conditions specified by the board.

(4) Only those FLEX candidates who have been approved ~~((prior to))~~ and eligible for the December 1993 FLEX examination and who have passed FLEX Component 2, but not FLEX Component 1, are eligible to take the 1994 special administration of FLEX Component 1.

(5) To be eligible for ~~((NBME Part III or))~~ USMLE Step 3, the applicant must:

- (a) Have obtained the MD degree;
- (b) Have completed successfully FLEX Component 1 or both Parts I and II or Steps 1 and 2 or Part I and Step 2 or Step 1 and Part II;
- (c) Be certified by the ~~((education council of))~~ educational commission for foreign medical graduates (ECFMG) if a graduate of a foreign medical school, or have successfully completed a fifth pathway program; and

(d) Have completed, or be near completion, of at least one post-graduate training year in a program of graduate medical education accredited by the Accreditation Council for Graduate Medical Education.

~~((6) Examination combinations acceptable. Any applicant who has successfully completed Part I (NBME) or Step 1 (USMLE) plus Part II or Step 2 plus Part III or Step 3; or FLEX Component 1 plus Step 3; or Part I or Step 1, plus Part II or Step 2, plus FLEX Component 2 shall be deemed to have successfully completed a medical licensure examination as required by RCW 18.71.070. (For clarification see Table 1.))~~

**AMENDATORY SECTION** (Amending WSR 93-21-017, filed 10/11/93, effective 11/11/93)

**WAC 246-917-120 Examinations accepted for reciprocity or waiver.** (1) The board of medical examiners may accept certain examinations as a basis for reciprocity or

waiver of examination. These include the examinations given by the federation of state licensing boards (FLEX), and those given by other states. The minimum passing score will depend upon the quality of the examination using the FLEX ((F) 1 and ((H) 2 examination as a guide.

(2) An applicant who has satisfactorily passed examinations given by the National Board of Medical Examiners; or the Medical Council of Canada and holds a valid LMCC certificate obtained after 1969, may be granted a license without examination.

(3) Examination combination acceptable. Any applicant who has successfully completed Part I (NBME) or Step 1 (USMLE) plus Part II or Step 2 plus Part III or Step 3; or FLEX Component 1 plus Step 3; or Part I or Step 1, plus Part II or Step 2, plus FLEX Component 2 shall be deemed to have successfully completed a medical licensure examination as required by RCW 18.71.070. (For clarification, see Table 1.)

Examination Combinations Acceptable for Licensure  
Table 1

<u>((Examination sequence</u>	<u>Acceptable combinations</u>
Part I	Part I or Step 1
plus	plus
Part II	Part II or Step II
plus	plus
Part III	Part III or Step 3
<hr/>	
	FLEX Component 1
	plus
FLEX Component 1	Step 3
plus	
FLEX Component 2	or
<hr/>	
	Part I or Step 1
	plus
	Part II or Step 2
	plus
	FLEX Component 2
<hr/>	
Step 1	
plus	
Step 2	
plus	
Step 3))	

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NEW SECTION

**WAC 246-918-105 Disciplinary action of sponsoring or supervising physician.** To the extent that the sponsoring or supervising physician's practice has been limited by disciplinary action under chapter 18.130 RCW, the physician assistant's practice is similarly limited while working under that physician's sponsorship or supervision.

**WSR 94-15-068**  
**PERMANENT RULES**  
**DEPARTMENT OF HEALTH**  
 (Board of Osteopathic Medicine and Surgery)  
 [Filed July 19, 1994, 8:35 a.m.]

Date of Adoption: June 24, 1994.

Purpose: Adds SPEX exam for disciplinary sanctions; changes exam deadlines; adopts model adjudicative rules; changes PA licensure renewal to birthdate.

Citation of Existing Rules Affected by this Order: Amending WAC 246-853-025, 246-853-260, and 246-854-080.

Statutory Authority for Adoption: RCW 18.57.005, 18.130.050.

Pursuant to notice filed as WSR 94-11-093 on May 17, 1994.

Changes Other than Editing from Proposed to Adopted Version: WAC 246-854-030 was withdrawn for further study.

Effective Date of Rule: Thirty-one days after filing.  
 July 18, 1994

Bruce W. Kuhlmann, D.O.  
 Chairman

AMENDATORY SECTION (Amending Order 303B, filed 9/23/92, effective 10/24/92)

**WAC 246-853-025 Special purpose examination.** (1) The board of osteopathic medicine and surgery, upon review of an application for licensure pursuant to RCW 18.57.130 or reinstatement of an inactive license, may require an applicant to pass a special purpose examination, e.g., SPEX, and/or any other examination deemed appropriate. An applicant may be required to take an examination when the board has concerns with the applicant's ability to practice competently for reasons which may include but are not limited to the following:

- (a) Resolved or pending malpractice suits;
- (b) Pending action by another state licensing authority;
- (c) Actions pertaining to privileges at any institution; or
- (d) Not having practiced for an interval of time.

(2) As a result of a determination in a disciplinary proceeding a licensee may be required to pass the SPEX examination.

(3) The minimum passing score on the SPEX examination shall be seventy-five. The passing score for any other examination under this rule shall be determined by the board.

Accepted Examinations taken In Sequence	Other Acceptable Combinations
NBME Part I plus NBME Part II plus NBME Part III	NBME Part I or USMLE Step 1 plus NBME Part II or USMLE Step 2 plus NBME Part III or USMLE Step 3
FLEX Component 1 plus FLEX Component 2	FLEX Component 1 plus USMLE Step 3  or  NBME Part I or USMLE Step 1 plus NBME Part II or USMLE Step 2 plus FLEX Component 2
USMLE Step 1 plus USMLE Step 2 plus USMLE Step 3	

**WSR 94-15-065**  
**PERMANENT RULES**  
**DEPARTMENT OF HEALTH**  
 [Filed July 19, 1994, 8:28 a.m.]

Date of Adoption: May 13, 1994.

Purpose: To clarify the relationship of an alternate sponsoring or supervising physician licensed under chapter 18.57 or 18.71 RCW. To notify the physician assistant the limitations on a relationship of a disciplined sponsoring or supervising physician.

Statutory Authority for Adoption: RCW 18.71A.020, 18.71A.040, and 18.130.186(2).

Pursuant to notice filed as WSR 94-08-094 on April 6, 1994.

Effective Date of Rule: Thirty-one days after filing.  
 June 30, 1994

Beverly A. Teeter  
 Program Manager

NEW SECTION

**WAC 246-918-095 Scope of practice—Osteopathic alternate physician.** The physician assistant licensed under chapter 18.71A RCW practices under the practice plan and prescriptive authority approved by the board whether the alternate sponsoring physician or alternate supervising physician is licensed under chapter 18.57 or 18.71 RCW.

PERMANENT

AMENDATORY SECTION (Amending Order 159B, filed 4/25/91, effective 5/26/91)

**WAC 246-853-260 ((FLEX)) USMLE examination application deadline.** (1) All applications for osteopathic physician and surgeon license by ((FLEX)) USMLE examination in the state of Washington shall be received in the office of the ((professional licensing services)) health professions quality assurance division, department of health, no later than ((August 1)) September 12 for the following December examination and ((February 1)) March 29 for the following June examination.

An applicant with extenuating circumstances for being unable to meet the deadline may petition the board for waiver of the deadline date.

(2) The examination application and fee shall be required to be received in the office of the board's designated testing administration agency no later than September 12 for the following December examination and March 29 for the following June examination.

#### NEW SECTION

**WAC 246-853-500 Adjudicative proceedings.** The board adopts the model procedural rules for adjudicative proceedings as adopted by the department of health and contained in chapter 246-11 WAC, including subsequent amendments.

AMENDATORY SECTION (Amending WSR 93-24-028, filed 11/22/93, effective 12/23/93)

**WAC 246-854-080 Osteopathic physician assistant licensure.** (1) Applications. All applications shall be made to the board on forms supplied by the board.

(2) The application shall detail the education, training, and experience of the osteopathic physician assistant and provide such other information as may be required. The application shall be accompanied by a fee determined by the secretary as provided in RCW 43.70.250. Each applicant shall furnish proof satisfactory to the board of the following:

(a) That the applicant has completed an accredited physician assistant program approved by the board and is eligible to take the National Commission on Certification of Physician Assistants examination;

(b) That the applicant has not committed unprofessional conduct as defined in RCW 18.130.180; and

(c) That the applicant is physically and mentally capable of practicing as an osteopathic physician assistant with reasonable skill and safety.

(3) The license shall be renewed on a periodic basis as determined by the secretary of the department of health under RCW 43.70.280. The renewal shall include a completed renewal application and payment of a fee, in addition to any late penalty fee, determined by the secretary as provided in RCW 43.70.250.

(4) Effective with the July 1, 1995, renewal period, the annual license renewal date for osteopathic physician assistants will be changed to coincide with the licensee's birthdate. Conversion will be accomplished as follows:

(a) Current licensees, as of June 30, 1995, desiring to renew their license will be required to pay the renewal fee plus one-twelfth of that amount for each month, or fraction

thereof, in order to extend their license renewal to expire on their next birth anniversary date following June 30, 1996.

(b) On or after July 1, 1995, all new or initial osteopathic physician assistant licenses issued will expire on the applicant's next anniversary date.

(5) After this conversion to a staggered renewal system, licensees may annually renew their license from birth anniversary date to the next birth anniversary date.

**WSR 94-15-096  
PERMANENT RULES  
DEPARTMENT OF  
LABOR AND INDUSTRIES**

[Order 94-07—Filed July 20, 1994, 10:30 a.m., effective September 20, 1994]

Date of Adoption: July 20, 1994.

Purpose: Chapter 296-24 WAC, General safety and health standards, federal-initiated amendments to chapter 296-24 WAC, published in Federal Register Volume 58, Number 124, dated June 30, 1993, are made to correct the addresses of the National Fire Protection Association and the Compressed Gas Association. Two federal-initiated proposed amendments correct items identified in OSHA letter dated November 18, 1993, to make the standard at least as effective as OSHA standards. One change requires the employer to follow the manufacturer's recommended maximum load requirements. The other deletes a subsection duplicated in the standard. State-initiated amendments to chapter 296-24 WAC replace references to the Division of Industrial Safety and Health, or similar wording, with the Department of Labor and Industries; corrects names and addresses of various associations, societies and councils; corrects references; corrects references to specific gender; rennumbers subsections, subdivisions, and items as required by the code reviser; corrects grammatical errors, and corrects addresses of the department. Other wording changes are made for clarification. The amendments will not establish any additional compliance requirements; chapter 296-27 WAC, Recordkeeping and reporting, state-initiated amendments to chapter 296-27 WAC are made to replace references to specific gender, correct a section title and named references, correct the name of the United States Department of Health, Education, and Welfare to United States Department of Health and Human Services, replace references to the Division of Industrial Safety and Health with the Division of Consultation and Compliance or the department, and corrects addresses of the department; and correct references. Other wording changes are made for clarification. The amendments will not establish any additional compliance requirements; chapter 296-32 WAC, Safety standards for telecommunication, state-initiated amendments to chapter 296-32 WAC are made to replace references to the Division of Industrial Safety and Health, or similar wording with the Department of Labor and Industries; adds "or similar wording" to allow flexibility for wording of "men working" signs, corrects a reference; rennumbers subsections, subdivisions, and items as required by the code reviser; corrects references to specific gender. The amendments will not establish any additional compliance requirements; chapter 296-37 WAC, Safety standards for commercial diving

operations, federal-initiated amendment to chapter 296-37 WAC, published in Federal Register Volume 58, Number 124, dated June 30, 1993, is made to correct the name of the United States Department of Health, Education, and Welfare to United States Department of Health and Human Services. State-initiated amendments are made to correct additional references to the name of the United States Department of Health, Education, and Welfare not identified in the above referenced federal register and to correct and update the address of the Department of Labor and Industries. The amendments will not establish any additional compliance requirements; chapter 296-62 WAC, General occupational health standards, federal-initiated amendments to WAC 296-62-07441, published in Federal Register Volume 57, Number 178, dated September 14, 1992, are made to add the previously omitted medication compound Acetaminophen and to add "g" (gram) in two quantitative calculations for biological monitoring and medical examination results. Other federal-initiated amendments are made to correct references, correct the name of Mining Enforcement and Safety Administration to Mine Safety and Health Administration, and to delete references to the Department of the Interior. State-initiated amendments to chapter 296-62 WAC are made to bring carbon monoxide and formaldehyde levels in line with other references; to correct references to specific gender; to correct chemical numbers by adding hyphens previously omitted; to correct references, to correct an organization name; and to correct grammatical and spelling errors. Other wording changes are made for clarification. The amendments will not establish any additional compliance requirements; chapter 296-155 WAC, Safety standards for construction work, federal-initiated amendment to WAC 296-155-150, published in Federal Register Volume 58, Number 124, dated June 30, 1993, is made to correct the name of the Atomic Energy Commission to Nuclear Regulatory Commission. Other federal-initiated amendments also identified by OSHA in the above referenced federal register add a new section for requirements of air receivers, and incorporate parts of chapter 296-24 WAC, identified as applicable to the construction industry, into chapter 296-155 WAC. State-initiated amendments to chapter 296-155 WAC replace references to the Division of Industrial Safety and Health, or similar wording, with the Department of Labor and Industries; corrects names and addresses of various associations, societies and councils; corrects references to specific gender; renumbers subsections, subdivisions, and items as required by the code reviser; corrects the number of employees of a small business to meet the requirements of RCW 43.31.025, deletes wording duplicated in another section; corrects form numbers, terminology, grammatical errors, and corrects addresses of the department. Other changes are made for clarification and to be consistent with other standards. The amendments will not establish any additional compliance requirements; chapter 296-350 WAC, Reassumption of jurisdiction pursuant to RCW 49.17.140, state-initiated amendment to WAC 296-350-050 is made to allow an additional fifteen working days to issue a redetermination notice for appeals upon agreement of all parties. This amendment is the result of a 1994 legislative change to RCW 49.17.140 and SSB 6282. Other state-initiated proposed amendments to chapter 296-350 WAC are made to correct references to specific gender, correct code and name

references; replace references to the Division of Industrial Safety and Health with the Division of Consultation and Compliance, and corrects addresses. These amendments are made solely to comply with state legislation or are house-keeping in nature and do not add any new compliance requirements; and chapter 296-360 WAC, Discrimination, pursuant to RCW 49.17.160, state-initiated amendments to chapter 296-360 WAC are made to correct references to specific gender, correct code and name references, replace references to the Division of Industrial Safety and Health with the Division of Consultation and Compliance, and corrects an address.

Citation of Existing Rules Affected by this Order: Amending WAC 296-24-001 Forward, 296-24-006 Equipment approval by nonstate agency or organization, 296-24-010 Variance and procedure, 296-24-012 Definitions applicable to all sections of this chapter, 296-24-015 Education and first-aid standards, 296-24-040 Accident prevention programs, 296-24-045 Safety and health committee plan, 296-24-060 First-aid training and certification, 296-24-065 First-aid kit, 296-24-073 Safe place standards, 296-24-088 Occupational foot protection, 296-24-12511 Laundry, handwashing, and bathing facilities, 296-24-14009 Sign wordings, 296-24-14011 Accident prevention tags, 296-24-14507 General, 296-24-14509 Belt terminals, anchors and bolts, 296-24-14513 Anchor installations, 296-24-14515 Reversible and pivot windows, 296-24-14519 Boatswain's chairs, 296-24-15001 Machine guarding, 296-24-15005 Means to prevent slipping, 296-24-16505 Machine controls and equipment, 296-24-16539 Inspection and maintenance of machinery, 296-24-19501 Definitions, 296-24-19507 Safeguarding the point of operation, 296-24-19513 Operation of power presses, 296-24-19517 Presence sensing device initiation (PSDI), 296-24-20003 General requirements, 296-24-20511 Belt, rope, and chain drives, 296-24-20525 Belt shifters, clutches, shippers, poles, perches, and fasteners, 296-24-21515 Conveyors, 296-24-21705 Employee training, 296-24-21711 Safe operating procedure—Multi-piece rim wheels, 296-24-233 Motor vehicle trucks and trailers, 296-24-23503 General requirements, 296-24-23505 Cabs, 296-24-23507 Footwalks and ladders, 296-24-23523 Maintenance, 296-24-23527 Handling the load, 296-24-23529 Operators, 296-24-24005 Load ratings, 296-24-24009 Testing, 296-24-24015 Handling the load, 296-24-24503 General requirements, 296-24-24517 Handling the load, 296-24-260 Helicopters, 296-24-29401 Wire rope, 296-24-29501 Inspection of compressed gas cylinders, 296-24-31501 General, 296-24-32001 Scope, 296-24-33005 Tank storage, 296-24-33009 Container and portable tank storage, 296-24-33011 Industrial plants, 296-24-33013 Bulk plants, 296-24-47507 Cylinder systems, 296-24-47515 LP-gas system installations on commercial vehicles, 296-24-51005 Definitions, 296-24-51099 Appendix C—Availability of reference material, 296-24-55001 Definitions, 296-24-56515 Discharge from exits, 296-24-58501 Definitions applicable to fire protection, 296-24-58513 Protective clothing, 296-24-58515 Respiratory protection devices, 296-24-58517 Appendix A—Fire brigades, 296-24-59215 Appendix A—Portable fire extinguishers, 296-24-63299 Appendix B—National consensus standards, 296-24-63399 Appendix C—Fire protection references for further information, 296-24-63499 Appendix D—Availability of publications incorporated by references

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296-155-650 Scope, application, and definitions applicable to this part, 296-155-675 Scope, application, and definitions applicable to this part, 296-155-680 General provisions, 296-155-682 Requirements for equipment and tools, 296-155-684 Requirements for cast in place concrete, 296-155-691 Precast concrete and tilt-up operations, 296-155-699 Appendix A to Subpart Q—References to Subpart Q of Part 1926, 296-155-700 General requirements, 296-155-715 Bolting, riveting, fitting-up, and plumbing-up, 296-155-730 Tunnels and shafts, 296-155-745 Compressed air, 296-155-74501 Appendix A—Decompression tables, 296-155-775 Preparatory operations, 296-155-785 Chutes, 296-155-800 Manual removal of floors, 296-155-955 Minimum performance criteria for rollover protective structures for designated scrapers, loaders, dozers, graders, and crawler tractors, 296-350-010 Definitions, 296-350-030 Notice of appeal—Filing and service, 296-350-040 Notice of appeal—Contents, 296-350-050 Reassumption of jurisdiction—Time—Notice of reassumption of jurisdiction and informal conference, 296-350-070 Reassumption of jurisdiction—Informal conferences—Procedure—Evidence, 296-350-200 Variances—Foreword, 296-350-210 Types of orders granting a variance, 296-350-230 Effect of variances, 296-350-240 Variance applications—Forms of documents—Subscription, 296-350-250 Order granting a temporary variance—Application, 296-350-255 Order granting a permanent variance—Application, 296-350-260 Interim order—Application—Notice of grant, 296-350-280 Hearings on applications for variances—Temporary and permanent, 296-350-350 Extension of abatement date(s)—Application—Authority, 296-350-35010 Application for extension of abatement date(s), 296-350-35055 Extension of abatement date(s)—Hearings, 296-350-400 Posting of notices—Posting of citation and notice—Availability of act and applicable standards, 296-350-450 Complaints by employees or their representatives, 296-350-460 Complaints—Inspection not warranted—Informal review, 296-350-470 Citation not issued following complaint, 296-350-500 Citation and notice—Copy to employee representative, 296-360-005 Definitions, 296-360-040 Notification of assistant director's determination, 296-360-050 Withdrawal of complaint, 296-360-080 Persons protected by RCW 49.17.160, 296-360-090 Unprotected activities distinguished, and 296-360-140 Discrimination because of exercise of right afforded by WISHA—Walkaround pay.

Statutory Authority for Adoption: Chapter 49.17 RCW.

Pursuant to notice filed as WSR 94-10-010 on April 22, 1994.

**Changes Other than Editing from Proposed to Adopted Version:** The following sections are being withdrawn to allow timely adoption of federal-initiated changes received after filing the CR-102: WAC 296-24-020 Management's responsibility, 296-27-090 Reporting of fatality or multiple hospitalization accidents, 296-155-012 Definitions applicable to all sections of this chapter, 296-155-20301 Definitions, and 296-155-24510 Fall restraint, fall arrest systems. No changes were made to the proposed rules as a result of the public hearing.

Effective Date of Rule: September 20, 1994.

July 20, 1994

Dorette M. Markham  
for Mark O. Brown  
Director

**AMENDATORY SECTION** (Amending Order 73-5, filed 5/9/73 and Order 73-4, filed 5/7/73)

**WAC 296-24-001 Foreword.** This chapter has been compiled with the purpose of consolidating all safety rules of general application into one chapter of the Washington Administrative Code, by the promulgation of the rules contained herein. It is also the intent that the safety rules of the Washington state department of labor and industries, will be at least as effective as those adopted by the U.S. Department of Labor and administered by the Occupational Safety and Health Administration as published in the Code of Federal Regulations. The ~~((division of safety))~~ department is incorporating many of the existing safety rules of general application and adding new rules under this chapter.

**AMENDATORY SECTION** (Amending Order 73-5, filed 5/9/73 and Order 73-4, filed 5/7/73)

**WAC 296-24-006 Equipment approval by nonstate agency or organization.** Whenever a provision of this chapter states that only that equipment or those processes approved by an agency or organization other than the department of labor and industries, such as the Underwriters Laboratories or the ~~((Bureau of Mines))~~ Mine Safety and Health Administration (MSHA) and the National Institute for Occupational Safety and Health (NIOSH), shall be utilized, that provision shall be construed to mean that approval of such equipment or process by the designated agency or group shall be prima facie evidence of compliance with the provision of this chapter.

**AMENDATORY SECTION** (Amending Order 91-07, filed 11/22/91, effective 12/24/91)

**WAC 296-24-010 Variance and procedure.** Conditions may exist in operations that a state standard will not have practical use. The director may issue a variance from the requirements of the standard when another means of providing equal protection is provided.

Applications for variances will be reviewed and investigated by the department. Variances granted shall be limited to the specific case or cases covered in the application and may be revoked for cause. The variance shall remain prominently posted on the premises while in effect.

Variance application forms may be obtained from the department upon request. Requests for variances from safety and health standards shall be made in writing to the director or the assistant director, ~~((Division of Industrial Safety and Health))~~ Department of Labor and Industries, Post Office Box 44600, Olympia, Washington 98504-4600. (Reference RCW 49.17.080 and 49.17.090.)

**AMENDATORY SECTION** (Amending Order 89-03, filed 5/15/89, effective 6/30/89)

**WAC 296-24-012 Definitions applicable to all sections of this chapter.**

Note: Meaning of words. Unless the context indicates otherwise, words used in this chapter shall have the meaning given in this section.

(1) "Approved" means approved by the director of the department of labor and industries or his/her authorized

representative: *Provided, however,* That should a provision of this chapter state that approval by an agency or organization other than the department of labor and industries is required, such as Underwriters' Laboratories or the (~~Bureau of Mines~~) Mine Safety and Health Administration (MSHA) and the National Institute for Occupational Safety and Health (NIOSH), the provisions of WAC 296-24-006 shall apply.

(2) "Authorized person" means a person approved or assigned by the employer to perform a specific type of duty or duties or to be at a specific location or locations at the job site.

(3) "Competent person" means one who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective action to eliminate them.

(4) "Department" means the department of labor and industries.

(5) "Director" means the director of the department of labor and industries, or his/her designated representative.

(6) "Employer" means any person, firm, corporation, partnership, business trust, legal representative, or other business entity which engages in any business, industry, profession, or activity in this state and employs one or more employees or who contracts with one or more persons, the essence of which is the personal labor of such person or persons and includes the state, counties, cities, and all municipal corporations, public corporations, political subdivisions of the state, and charitable organizations: *Provided,* That any person, partnership, or business entity not having employees, and who is covered by the industrial insurance act shall be considered both an employer and an employee.

(7) "First-aid" means, for purposes of this section, the extent of treatment that could be expected to be given by a person trained in basic first-aid, using supplies from a first-aid kit. Tests, such as x-rays, shall not be confused with treatment.

(8) "Hazard" means that condition, potential or inherent, which can cause injury, death, or occupational disease.

(9) "Hospitalization" means to be sent to; to go to; or be admitted to a hospital or an equivalent medical facility and receive medical treatment beyond that which would be considered as first-aid treatment, regardless of the length of stay in the hospital or medical facility.

(10) "Qualified" means one who, by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training, and experience, has successfully demonstrated (~~his~~) the ability to solve or resolve problems relating to the subject matter, the work, or the project.

(11) "Safety factor" means the ratio of the ultimate breaking strength of a member or piece of material or equipment to the actual working stress or safe load when in use.

(12) "Safety and health standard" means a standard which requires the adoption or use of one or more practices, means, methods, operations, or processes reasonably necessary or appropriate to provide safe or healthful employment and places of employment.

(13) "Shall" means mandatory.

(14) "Should" means recommended.

(15) "Standard safeguard" means a device designed and constructed with the object of removing the hazard of accident incidental to the machine, appliance, tool, building, or equipment to which it is attached.

Standard safeguards shall be constructed of either metal or wood or other suitable material or a combination of these. The final determination of the sufficiency of any safeguard rests with the director of the department of labor and industries (~~through the division of safety~~).

(16) "Suitable" means that which fits, or has the qualities or qualifications to meet a given purpose, occasion, condition, function, or circumstance.

(17) "Working day" means a calendar day, except Saturdays, Sundays, and legal holidays as set forth in RCW 1.16.050, as now or hereafter amended, and for the purposes of the computation of time within which an act is to be done under the provisions of this chapter, shall be computed by excluding the first working day and including the last working day.

(18) "Worker," "personnel," "person," "employee," and other terms of like meaning, unless the context of the provision containing such term indicates otherwise, mean an employee of an employer who is employed in the business of his/her employer whether by way of manual labor or otherwise and every person in this state who is engaged in the employment of or who is working under an independent contract the essence of which is his/her personal labor for an employer whether by manual labor or otherwise.

(19) "Work place" means any plant, yard, premises, room, or other place where an employee or employees are employed for the performance of labor or service over which the employer has the right of access or control, and includes, but is not limited to, all work places covered by industrial insurance under Title 51 RCW, as now or hereafter amended.

(20) Abbreviations used in this chapter:

(a) "ANSI" means American National Standards Institute.

(b) "API" means American Petroleum Institute.

(c) "ASA" means American Standards Association.

(d) "ASAE" means American Society of Agricultural Engineers.

(e) "ASHRE" means American Society of Heating and Refrigeration Engineers.

(f) "ASME" means American Society for Mechanical Engineers.

(g) "ASTM" means American Society for Testing and Materials.

(h) "AWS" means American Welding Society.

(i) "BTU" means British thermal unit.

(j) "BTUH" means British thermal unit per hour.

(k) "CFM" means cubic feet per minute.

(l) "CFR" means Code of Federal Register.

(m) "CGA" means Compressed Gas Association.

(n) "CIE" means Commission Internationale de l'Eclairage.

(o) "DOT" means department of transportation.

(p) "FRP" means fiberglass reinforced plastic.

(q) "GPM" means gallons per minute.

(r) "ICC" means Interstate Commerce Commission.

(s) "ID" means inside diameter.

(t) "LPG" means liquefied petroleum gas.



(u) "MCA" means Manufacturing Chemist Association.  
(New name: Chemical Manufacturers Association.)

(v) "NBFU" means National Board of Fire Underwriters.

(w) "NEMA" means National Electrical Manufacturing Association.

(x) "NFPA" means National Fire Protection Association.

(y) "NTP" means normal temperature and pressure.

(z) "OD" means outside diameter.

(aa) "PSI" means pounds per square inch.

(bb) "PSIA" means pounds per square inch atmospheric.

(cc) "PSIG" means pounds per square inch gauge.

(dd) "RMA" means Rubber Manufacturers Association.

(ee) "SAE" means Society of Automotive Engineers.

(ff) "TFI" means The Fertilizer Institute.

(gg) "TSC" means Trailer Standard Code.

(hh) "UL" means Underwriters' Laboratories, Inc.

(ii) "USASI" means United States of America Standards Institute.

(jj) "USC" means United States Code.

(kk) "USCG" means United States Coast Guard.

(ll) "WAC" means Washington Administrative Code.

(mm) "WISHA" means Washington Industrial Safety and Health Act of 1973.

AMENDATORY SECTION (Amending Order 80-21, filed 11/13/80)

**WAC 296-24-015 Education and first-aid standards.**

It shall be the duty of every employer to comply with such standards and systems of education for safety as shall be, from time to time, prescribed for such employer by the director of labor and industries (~~((through the division of safety))~~) or by statute. (Chapter 49.17 RCW.)

AMENDATORY SECTION (Amending Order 78-22, filed 11/13/78)

**WAC 296-24-040 Accident prevention programs.**

Each employer shall develop a formal accident-prevention program, tailored to the needs of the particular plant or operation and to the type of hazards involved. The ~~((division))~~ department may be contacted for assistance in developing appropriate programs.

(1) The following are the minimal program elements for all employers:

(a) A safety orientation program describing the employer's safety program and including:

(i) How and when to report injuries, including instruction as to the location of first-aid facilities.

(ii) How to report unsafe conditions and practices.

(iii) The use and care of required personal protective equipment.

(iv) The proper actions to take in event of emergencies including the routes of exiting from areas during emergencies.

(v) Identification of the hazardous gases, chemicals or materials involved along with the instructions on the safe use and emergency action following accidental exposure.

(vi) A description of the employer's total safety program.

(vii) An on-the-job review of the practices necessary to perform the initial job assignments in a safe manner.

(b) A designated safety and health committee consisting of management and employee representatives with the employee representatives being elected or appointed by fellow employees.

(2) Each accident-prevention program shall be outlined in written format.

AMENDATORY SECTION (Amending Order 80-20, filed 11/13/80)

**WAC 296-24-045 Safety and health committee plan.**

(1) All employers of eleven or more employees, shall have a designated safety committee composed of employer-selected and employee-elected members.

(a) The terms of employee-elected members shall be a maximum of one year. Should a vacancy occur on the committee, a new member shall be elected prior to the next scheduled meeting.

(b) The number of employer-selected members shall not exceed the number of employee-elected members.

(2) The safety committee shall have an elected chairperson.

(3) The safety committee shall be responsible for determining the frequency of committee meetings.

Note: If the committee vote on the frequency of safety meetings is stalemated, the ~~((division's))~~ department's regional safety ~~((educational))~~ consultation representative shall be consulted for recommendations.

(a) The committee shall be responsible for determining the date, hour and location of the meeting.

(b) The length of each meeting shall not exceed one hour except by majority vote of the committee.

(4) Minutes of each committee meeting shall be prepared and filed for a period of at least one year and shall be made available for review by noncompliance personnel, of the ~~((division))~~ department of ~~((industrial safety and health))~~ labor and industries.

(5) Safety and health committee meetings shall address the following:

(a) A review of the safety and health inspection reports to assist in correction of identified unsafe conditions or practices.

(b) An evaluation of the accident investigations conducted since the last meeting to determine if the cause of the unsafe acts or unsafe condition involved was properly identified and corrected.

(c) An evaluation of the accident and illness prevention program with a discussion of recommendations for improvement where indicated.

(d) The attendance shall be documented.

(e) The subject(s) discussed shall be documented.

(6) All employers of ten or less employees and employers of eleven or more employees where the employees are segregated on different shifts or in widely dispersed locations in crews of ten or less employees, may elect to have ~~((foreman))~~ foreperson-crew meetings in lieu of a safety and health committee plan provided:

(a) ~~((Foreman))~~ Foreperson-crew safety meetings shall be held at least once a month, or if conditions require, weekly or biweekly meetings shall be held to discuss safety problems as they arise.

(b) All items under subsection (5) of this section, shall be complied with.

**AMENDATORY SECTION** (Amending Order 81-9, filed 6/17/81)

**WAC 296-24-060 First-aid training and certification.**

The purpose of this section is to assure that all employees of this state can be afforded quick and effective first-aid attention in the event that an injury occurs on the job. The means of achieving this purpose is to assure the presence of personnel trained in first-aid procedures at or near those places where employees are working. Compliance with the provisions of this section may require the presence of more than one first-aid trained person.

(1) In addition to RCW 51.36.030, every employer shall comply with the department's requirements for first-aid training and certification.

(2) There shall be present or available at all times, a person or persons holding a valid certificate of first-aid training. (A valid first-aid certificate is one which is less than three years old.)

(3) Compliance with the requirements of subsection (2) of this section may be achieved as follows:

(a) All ~~((foremen))~~ forepersons, supervisors, or persons in direct charge of crews working in physically dispersed operations, shall have a valid first-aid certificate: *Provided*, That if the duties or work of the ~~((foreman))~~ foreperson, supervisor or person in direct charge of the crew requires an absence from the crew, another person holding a valid first-aid certificate shall be present. For the purposes of this section, a crew shall mean a group of two or more employees working at a work site separate and remote from the main office or fixed work place such as occurs in construction, logging, etc. If there is no ~~((foreman))~~ foreperson, supervisor or person in direct charge assigned to the crew, at least one employee shall have a valid first-aid certificate. In emergencies, ~~((foremen))~~ forepersons, supervisors and persons in direct charge of a crew will be permitted to work up to 30 days without having the required certificate, providing an employee in the crew or another ~~((foreman))~~ foreperson in the immediate work area has the necessary certificate.

(b) In fixed establishments, all ~~((foremen))~~ forepersons, supervisors, or persons in direct charge of a group or groups of employees shall have a valid first-aid certificate: *Provided*, That in fixed establishments where the ~~((foreman))~~ foreperson, supervisor, or person in charge has duties which require ~~((his))~~ their absence from the work site of the group, another person holding a valid first-aid certificate shall be present or available to the group.

Note: ~~((Foremen))~~ Forepersons, supervisors or persons in direct charge of a group or groups of employees will be permitted to work up to 30 days without having the required certificate, providing an employee in the crew or another ~~((foreman))~~ foreperson in the immediate work area has the necessary certificate.

(c) In fixed establishments organized into distinct departments or equivalent organizational units such as department stores, large company offices, etc., a person or persons holding a valid first-aid certificate shall be present or available at all times employees are working within that department or organizational unit.

(d) In small businesses, offices or similar types of fixed workplaces, compliance may be achieved by having a number of such small businesses, offices, etc., combined into a single unit for the purpose of assuring the continued presence or availability of a person or persons holding a valid first-aid training certificate.

A plan for combining a number of small businesses etc., into such a group shall be submitted to the ~~((division of industrial safety and health, safety education section))~~ department, for approval. ~~((That section))~~ The department is also available to assist employers who wish to develop such a plan. Criteria for approval by the ~~((division))~~ department shall include:

(i) The businesses within the group must not be widely dispersed;

(ii) The name(s) of the person or persons holding the first-aid certificates, their usual places of work, their phone numbers, and other appropriate information shall be posted in each establishment which is a member of the group, in a place which can reasonably be expected to give notice to employees of that establishment;

(iii) First-aid kits must be available as required by WAC 296-24-065.

(e) Valid certification shall be achieved by passing a course of first-aid instruction and participation in practical application of the following subject matter.

Bleeding control and bandaging.

Practical methods of artificial respiration, including mouth-to-mouth and mouth-to-nose resuscitation.

Closed chest heart massage.

Poisons.

Shock, unconsciousness, stroke.

Burns, scalds.

Sunstroke, heat exhaustion.

Frostbite, freezing, hypothermia.

Strains, sprains, hernias.

Fractures, dislocations.

Proper transportation of the injured.

Bites, stings.

Subjects covering specific health hazards likely to be encountered by co-workers of first-aid students enrolled in the course.

(4) In physically dispersed operations, at least one member of each crew shall have a valid first-aid certificate. A crew shall mean a group of two or more employees working at a work site separate and remote from the main office or fixed workplace such as occurs in construction, logging, etc.

(5) Names of industrial first-aid course instructors will, upon request, be furnished by the ~~((division of industrial safety and health,))~~ department of labor and industries, either directly or through a program with the community colleges or vocational education.

(6) Employers of employees working in fixed establishments, meeting the following criteria, are exempt from the requirements of this section: *Provided*

(a) They can submit written evidence to the department, upon request, that the worksite of their employees is within a two-minute time frame of response by an aid car, medic

unit or established ambulance service with first-aid trained attendants.

(b) There is a back-up aid car, medic unit or established ambulance service within the two-minute response time; or that a first-aid trained person with readily available transportation is on the site of the posted emergency phone number for immediate dispatch in the event the primary unit is not available.

(c) There are no traffic impediments, such as draw bridges, railroad track; etc., along the normal route of travel of the aid car, medic unit or established ambulance service that would delay arrival beyond the required two minute time frame.

(d) Emergency telephone numbers are posted on all first-aid kits and at all telephones on the worksite.

(e) The above services are available or exist at all times when more than one employee is on the worksite.

Note: A construction site that will be of more than six months duration, such as a large building, shall be considered a fixed establishment for the purposes of this section. Doctor's offices and clinics are not to be considered as alternates due to the fact that very often doctor's schedules require them to be away from their offices.

**AMENDATORY SECTION** (Amending Order 90-18, filed 1/10/91, effective 2/12/91)

**WAC 296-24-065 First-aid kit.** (1) All employers who employ men and women covered by the Washington Industrial Safety and Health Act shall furnish first-aid kits as required by the ~~((division of safety,))~~ department of labor and industries, (RCW 51.36.030).

(2) First-aid supplies shall be readily accessible when required.

(3) In the absence of readily accessible first-aid supplies such as first-aid kits, first-aid stations, first-aid rooms or their equivalent, all crew trucks, power shovels, cranes, locomotives, loaders, dozers, logging trucks, speeders, freight trucks and similar equipment shall be equipped with not less than a ten package first-aid kit.

(4) All crew vehicles used for transporting workers shall be equipped with not less than a ten package first-aid kit. When more than five employees are being transported on any one trip, the kit shall be increased in size to comply with a 16, 24, or 36-package kit depending upon the number of personnel normally being transported.

(5) At least one first-aid kit shall be available on construction jobs, line crews, and other transient or short duration jobs. The size and quantity of first-aid kits, required to be located at any site, shall be determined by the number of personnel normally dependent upon each kit as outlined in the following table:

NUMBER OF PERSONNEL NORMALLY ASSIGNED TO WORKSITE	MINIMUM FIRST-AID SUPPLIES REQUIRED AT WORKSITE
<b>1 - 50 persons</b>	<b>First-Aid Kit</b>
1 - 5	10 package kit
6 - 15	16 package kit
16 - 30	24 package kit
31 - 50	36 package kit

- 51 - 200 persons**
- 51 - 75
- 76 - 100
- 101 - 150
- 151 - 200

- First-Aid Station**
- One 36 and one 10 package kit
- One 36 and one 16 package kit
- One 36 and one 24 package kit
- Two 36 package kits

**Over 200 Persons**

**First-Aid Room**  
Refer to WAC  
296-24-070

(6) Employers shall establish a procedure to assure that first-aid kits and required contents are maintained in a serviceable condition. Unit-type kits have all items in the first-aid kit individually wrapped, sealed, and packaged in comparable sized packages. The commercial or cabinet-type kits do not require all items to be individually wrapped and sealed, but only those which must be kept sterile. Items such as scissors, tweezers, tubes of ointments with caps, or rolls of adhesive tape, need not be individually wrapped, sealed, or disposed of after a single use or application. Individual packaging and sealing shall be required only for those items which must be kept sterile in a first-aid kit.

(7) First-aid kits shall contain at least the following items:

**10 Package Kit**

- 1 Pkg. Adhesive bandages, 1" (16 per pkg.)
- 1 Pkg. Bandage compress, 4" (1 per pkg.)
- 1 Pkg. Scissors\* and tweezers (1 each per pkg.)
- 1 Pkg. Triangular bandage, 40" (1 per pkg.)
- 1 Pkg. Antiseptic soap or pads (3 per pkg.)
- 5 Pkgs. of consulting physician's choice\*\*

**16 Package Kit**

- 1 Pkg. Absorbent gauze, 24" x 72" (1 per pkg.)
- 1 Pkg. Adhesive bandages, 1" (16 per pkg.)
- 2 Pkgs. Bandage compresses, 4" (1 per pkg.)
- 1 Pkg. Eye dressing (1 per pkg.)
- 1 Pkg. Scissors\* and tweezers (1 each per pkg.)
- 2 Pkgs. Triangular bandages, 40" (1 per pkg.)
- 1 Pkg. Antiseptic soap or pads (3 per pkg.)
- 7 Pkgs. of consulting physician's choice\*\*

**24 Package Kit**

- 2 Pkgs. Absorbent gauze, 24" x 72" (1 per pkg.)
- 2 Pkgs. Adhesive bandages, 1" (16 per pkg.)
- 2 Pkgs. Bandage compresses, 4" (1 per pkg.)
- 1 Pkg. Eye dressing (1 per pkg.)
- 1 Pkg. Scissors\* and tweezers (1 each per pkg.)
- 6 Pkgs. Triangular bandages (1 per pkg.)
- 1 Pkg. Antiseptic soap or pads (3 per pkg.)
- 9 Pkgs. of consulting physician's choice\*\*

PERMANENT

**36 Package Kit**

- 4 Pkgs. Absorbent gauze, 24" x 72" (1 per pkg.)
- 2 Pkgs. Adhesive bandages, 1" (16 per pkg.)
- 5 Pkgs. Bandage compresses, 4" (1 per pkg.)
- 2 Pkgs. Eye dressing (1 per pkg.)
- 1 Pkg. Scissors\* and tweezers (1 each per pkg.)
- 8 Pkgs. Triangular bandages, 40" (1 per pkg.)
- 1 Pkg. Antiseptic soap or pads (3 per pkg.)
- 13 Pkgs. of consulting physician's choice\*\*

\*Scissors shall be capable of cutting 2 layers of 15 oz. cotton cloth or its equivalent.

\*\*First-aid kits shall be maintained at the ten, sixteen, twenty-four or thirty-six package level. In the event the consulting physician chooses not to recommend items, the department of labor and industries shall be contacted for recommended items to complete the kit.

(8) Where the eyes or body of any person may be exposed to injurious chemicals and/or materials, suitable facilities for quick drenching or flushing of the eyes and body shall be provided, within the work area, for immediate emergency use.

(9) When practical, a poster shall be fastened and maintained either on or in the cover of each first-aid kit and at or near all phones plainly stating, the phone numbers of available doctors, hospitals, and ambulance services within the district of the worksite.

(10) When required by the department, in addition to the first-aid kit which must be kept on the equipment or at the place of work, there shall be available within the closest practicable distance from the operations (not to exceed 1/2 mile) the following items:

- 1 set of arm and leg splints.
- 2 all wool blankets or blankets equal in strength and fire resistant (properly protected and marked).
- 1 stretcher.

**AMENDATORY SECTION** (Amending Order 84-24, filed 12/11/84)

**WAC 296-24-073 Safe place standards.** (1) Each employer shall furnish to each (~~of his~~) employee(~~s~~) a place of employment free from recognized hazards that are causing or likely to cause serious injury or death to his employees.

(2) Every employer shall furnish and use safety devices and safeguards, and shall adopt and use practices, means, methods, operations, and processes which are reasonably adequate to render such employment and place of employment safe. Every employer shall do every other thing reasonably necessary to protect the life and safety of employees.

(3) No employer shall require any employee to go or be in any employment or place of employment which is not safe.

(4) No employer shall fail or neglect:

(a) To provide and use safety devices and safeguards.

(b) To adopt and use methods and processes reasonably adequate to render the employment and place of employment safe.

(c) To do every other thing reasonably necessary to protect the life and safety of employees.

(5) No employer, owner, or lessee of any real property shall construct or cause to be constructed any place of employment that is not safe.

(6) No person shall do any of the following:

(a) Remove, displace, damage, destroy or carry off any safety device, safeguard, notice, or warning, furnished for use in any employment or place of employment.

(b) Interfere in any way with the use thereof by any other person.

(c) Interfere with the use of any method or process adopted for the protection of any one employee, including (~~himself~~) themselves, in such employment, or place of employment.

(d) Fail or neglect to do every other thing reasonably necessary to protect the life and safety of employees.

(e) Intoxicating beverages and narcotics shall not be permitted in or around work sites except in industries and business engaged in the production, distribution, and sale of intoxicating beverages and drugs. Workers under the influence of alcohol or narcotics shall not be permitted on the work site. This rule does not apply to persons taking prescription drugs and narcotics as directed by a physician or dentist providing such use shall not endanger the worker or others.

**AMENDATORY SECTION** (Amending Order 73-5, filed 5/9/73 and Order 73-4, filed 5/7/73)

**WAC 296-24-088 Occupational foot protection.** (1) Calks or other suitable footwear which will afford reasonable protection from slipping shall be worn while working on logs.

~~((a))~~ (2) Safety-toe footwear for employees shall meet the requirements and specifications in American National Standards Institute for Men's Safety-Toe Footwear, Z41.1-1967.

~~((2) Workmen))~~ (3) Workers who work in areas where there is a possibility of foot injury due to falling or rolling objects shall wear safety type footwear.

**AMENDATORY SECTION** (Amending Order 73-5, filed 5/9/73 and Order 73-4, filed 5/7/73)

**WAC 296-24-12511 Laundry, handwashing, and bathing facilities.** (1) Laundry, handwashing, and bathing facilities shall be provided in the following ratio:

(a) Handwash basin per family shelter or per six persons in shared facilities.

(b) Shower head for every 10 persons.

(c) Laundry tray or tub for every 30 persons.

(d) ~~((Slop))~~ A "deepwell" type sink in each building used for laundry, hand washing, and bathing.

(2) Floors shall be of smooth finish but not slippery materials; they shall be impervious to moisture. Floor drains shall be provided in all shower baths, shower rooms, or laundry rooms to remove waste water and facilitate cleaning. All junctions of the curbing and the floor shall be coved. The walls and partitions of shower rooms shall be smooth and impervious to the height of splash.

(3) An adequate supply of hot and cold running water shall be provided for bathing and laundry purposes. Facilities for heating water shall be provided.

(4) Every service building shall be provided with equipment capable of maintaining a temperature of at least 70°F. during cold weather.

(5) Facilities for drying clothes shall be provided.

(6) All service buildings shall be kept clean.

**AMENDATORY SECTION** (Amending Order 73-5, filed 5/9/73 and Order 73-4, filed 5/7/73)

**WAC 296-24-14009 Sign wordings.** (1) Examples of wordings. The lists in (3) through (7) of this section are intended to serve as a guide for choosing the correct sign design for the message to be displayed.

(2) Nature of wording. The wording of any sign should be easily read and concise. The sign should contain sufficient information to be easily understood. The wording should make a positive, rather than negative suggestion and should be accurate in fact.

(3) Danger signs.

Danger—Keep off, electric current.

Danger—No smoking, matches, or open lights.

Danger—~~((Men working))~~ Workers above.

Danger—Not room enough here to clear men on cars.

Danger—Keep away.

Danger—~~((Men))~~ Workers in boiler.

Danger—Insufficient clearance.

Danger—2,300 volts.

Danger—Keep out.

Danger—Crane overhead.

Danger—Keep off.

(4) Biological hazard signs. The biological hazard warning shall be used to signify the actual or potential presence of a biohazard and to identify equipment, containers, rooms, materials, experimental animals, or combinations thereof, which contain, or are contaminated with, viable hazardous agents. For the purpose of this subdivision the term "biological hazard," or "biohazard," shall include only those infectious agents presenting a risk or potential risk to the well-being of ~~((men))~~ persons. The biohazard symbol shall be designed and proportioned as illustrated in Figure J-9. The symbol design shall be a fluorescent orange or orange-red color. Background color is optional as long as there is sufficient contrast for the symbol to be clearly defined. Appropriate wording may be used in association with the symbol to indicate the nature or identity of the hazard, name of individual responsible for its control, precautionary information, etc., but never should this information be superimposed on the symbol.

(5) Caution signs.

Caution—Do not operate, ~~((men))~~ working on repairs.

Caution—Hands off switch, ~~((men))~~ working on line.

Caution—Working on machines, do not start.

Caution—Goggles must be worn when operating this machine.

Caution—This door must be kept closed.

Caution—Electric trucks, go slow.

Caution—This space must be kept clear at all times.

Caution—Stop machinery to clean, oil, or repair.

Caution—Keep aisles clear.

Caution—Operators of this machine shall wear snug fitting clothing—No gloves.

Caution—Close clearance.

Caution—Watch your step.

Caution—Electric fence.

(6) Safety instruction signs.

Report all injuries to the first-aid room at once.

Walk—Don't run.

Report all injuries no matter how slight.

Think, if safe go ahead.

Make your work place safe before starting the job.

Report all unsafe conditions to your ~~((foreman))~~ supervisor.

Help keep this plant safe and clean.

(7) Directional signs.

This way out (below arrow panel).

This way (inside arrow) out (below arrow panel).

Fire exit (below arrow panel).

Fire (inside arrow) extinguisher (below arrow panel).

To the (inside arrow) fire escape (below arrow panel).

To the (inside arrow) first aid (below arrow panel).

Manway (below arrow panel).

This way to (inside arrow) first-aid room (below arrow panel).

(8) Informational signs.

No trespassing under penalty of the law.

This elevator is for freight only, not for passengers.

No admittance except to employees on duty.

No admittance.

No admittance, apply at office.

No trespassing.

Men.

Women.

For employees only.

Office.

Note: When sign wordings such as those listed in this section are contemplated, care should be taken to be sure that they are suitable for the particular location at which the sign is to be placed and that wording meets the requirements of the intended purpose. When there is a reasonable doubt, a sign of a standard design should be used.

**AMENDATORY SECTION** (Amending Order 87-01, filed 3/12/87)

**WAC 296-24-14011 Accident prevention tags.** (1)

Scope and purpose.

(a) This section applies to all accident prevention tags used to identify hazardous conditions and provide a message to employees with respect to hazardous conditions as set forth in subsection (3) of this section, or to meet the specific requirements of other WAC requirements.

(b) Tags are a temporary means of warning all concerned of a hazardous condition, defective equipment, radiation hazards, etc. The tags are not to be considered as a complete warning method, but should be used until a positive means can be employed to eliminate the hazard; for example, a "do not start" tag on power equipment shall be used for a few moments or a very short time until the switch

in the system can be locked out; a "defective equipment" tag shall be placed on a damaged ladder and immediate arrangements made for the ladder to be taken out of service and sent to the repair shop.

(c) This section does not apply to construction or agriculture.

(2) Definitions.

(a) "Biological hazard" or "**Biohazard**" means those infectious agents presenting a risk of death, injury or illness to employees.

(b) "Major message" means that portion of a tag's inscription that is more specific than the signal word and that indicates the specific hazardous condition or the instruction to be communicated to the employee. Examples include: "High Voltage," "Close Clearance," "Do Not Start," or "Do Not Use" or a corresponding pictograph used with a written text or alone.

(c) "Pictograph" means a pictorial representation used to identify a hazardous condition or to convey a safety instruction.

(d) "Signal word" means that portion of a tag's inscription that contains the word or words that are intended to capture the employee's immediate attention.

(e) "Tag" means a device usually made of card, paper, pasteboard, plastic or other material used to identify a hazardous condition.

(3) Use.

(a) Tags shall be used as a means to prevent accidental injury or illness to employees who are exposed to hazardous or potentially hazardous conditions, equipment or operations which are out of the ordinary, unexpected or not readily apparent.

(b) Tags shall be used until such time as the identified hazard is eliminated or the hazardous operation is completed. Tags need not be used where signs, guarding or other positive means of protection are being used.

(c) Do not start tags shall be placed in a conspicuous location or shall be placed in such a manner that they effectively block the starting mechanism which would cause hazardous conditions should the equipment be energized. See Fig. J-11.

(4) General tag criteria.

(a) All required tags shall meet the following criteria:

(i) Tags shall contain a signal word and a major message.

(ii) The signal word shall be either "Danger," "Caution," or "Biological Hazard," "biohazard," or the biological hazard symbol.

(iii) The major message shall indicate the specific hazardous condition or the instruction to be communicated to the employee.

(b) The signal word shall be readable at a minimum distance of five feet (1.52 m) or such greater distance as warranted by the hazard.

(c) The tag's major message shall be presented in either pictographs, written text or both.

(d) The signal word and the major message shall be understandable to all employees who may be exposed to the identified hazard.

(e) All employees shall be informed as to the meaning of the various tags used throughout the workplace and what special precautions are necessary.

(f) Tags shall be affixed as close as safely possible to their respective hazards by a positive means such as string, wire, or adhesive that prevents their loss or unintentional removal.

(g) The tag and attachment method or device used shall be constructed of such material that they will not be likely to deteriorate in the environment in which the tag is used during the time period of intended use.

(5) Danger tags.

(a) Danger tags shall be used in major hazard situations where an immediate hazard presents a threat of death or serious injury to employees. Danger tags shall be used only in these situations. See Fig. J-11.

(b) All employees should be instructed that danger tags indicate immediate danger and that special precautions are necessary.

(6) Caution tags.

(a) Caution tags shall be used in minor hazard situations where a nonimmediate or potential hazard or unsafe practice presents a lesser threat of employee injury. Caution tags shall be used only in these situations. See Fig. J-12.

(b) All employees should be instructed that caution tags indicate a possible hazard against which proper precautions should be taken.

(7) Warning tags. Warning tags may be used to represent a hazard level between "Caution" and "Danger," instead of the required "Caution" tag, provided that they have a signal word of "Warning," an appropriate major message, and otherwise meet the general tag criteria of subsection (4) of this section.

(8) Out of order tags. Out of order tags should be used only for the specific purpose of indicating that a piece of equipment, machinery, etc., is out of order and to attempt to use it might present a hazard. (See Fig. J-13.)

(9) Radiation tags.

(a) The standard background for radiation tags shall be yellow; the panel shall be reddish purple. Any letters used against the yellow background shall be black. The colors shall be those of opaque glossy samples as specified in Table 1, Fundamental Specification of Safety Colors for CIE Standard Source "C" American National Standards Institute, Safety Color Code for Marking Physical Hazards and the Identification of Certain Equipment, Z53.1-1971.

(b) The method of dimension, design, and orientation of the standard symbol (one blade pointed downward and centered on the vertical axis) shall be executed as illustrated in Figure J-14. The symbol shall be prominently displayed and of a size consistent with the size of the equipment or area in which it is to be used.

(10) Biological hazard tags.

(a) Biological hazard tags shall be used to identify the actual or potential presence of a biological hazard and to identify equipment, containers, rooms, experimental animals, or combinations thereof, that contain or are contaminated with hazardous biological agents.

(b) The symbol design for biological hazard tags shall conform to the design shown in Fig. J-15.

(11) Other tags. Other tags may be used in addition to those required by this section or in other situations where this section does not require tags, provided that they do not detract from the impact or visibility of the signal word and major message of any required tag.



Fig. J-1  
Danger Sign



Fig. J-5

Safety Instruction Signs

(Note: The words "think" and "be careful," given here, are only illustrations. Other wordings may be used.)

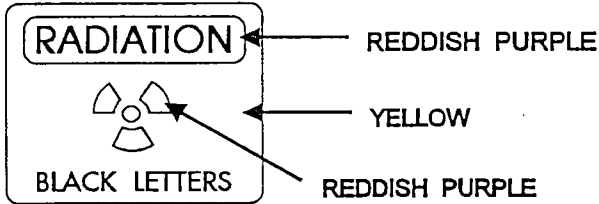


Fig. J-2  
Radiation Warning Sign



Fig. J-6  
Directional Signs

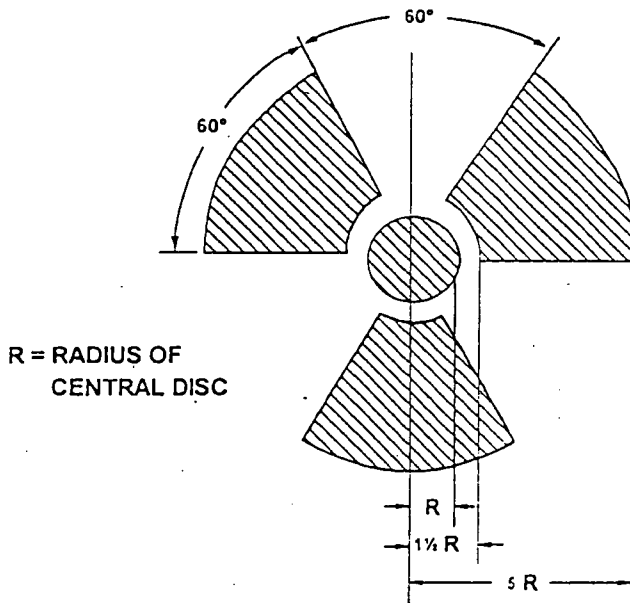


Fig. J-3  
Standard Radiation Symbol

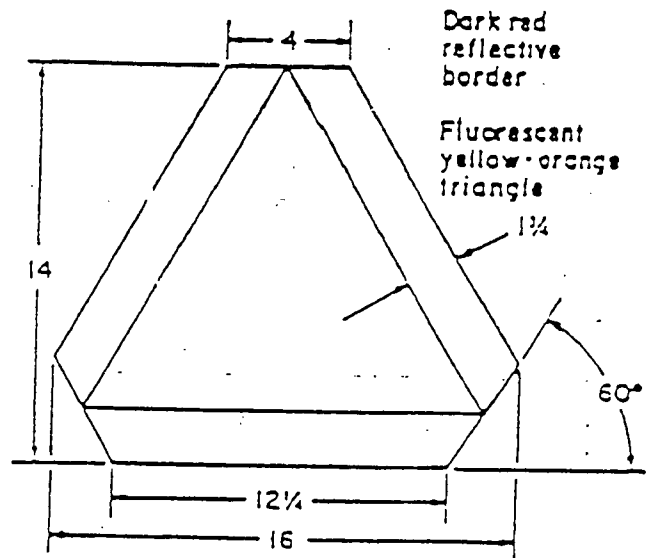


Fig. J-7  
Slow-Moving Vehicle Emblem  
Note: All dimensions are in inches.

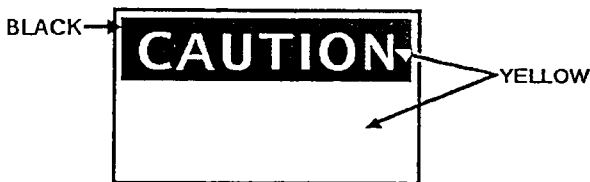


Fig. J-4  
Caution Sign

PERMANENT



POISON:



ELECTRICITY:

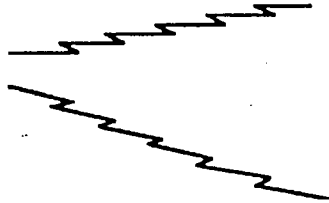
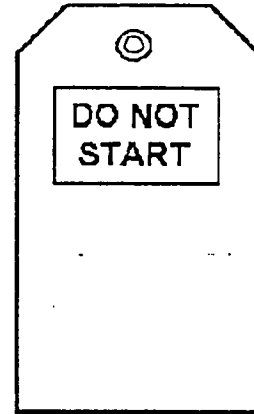


Fig. J-8

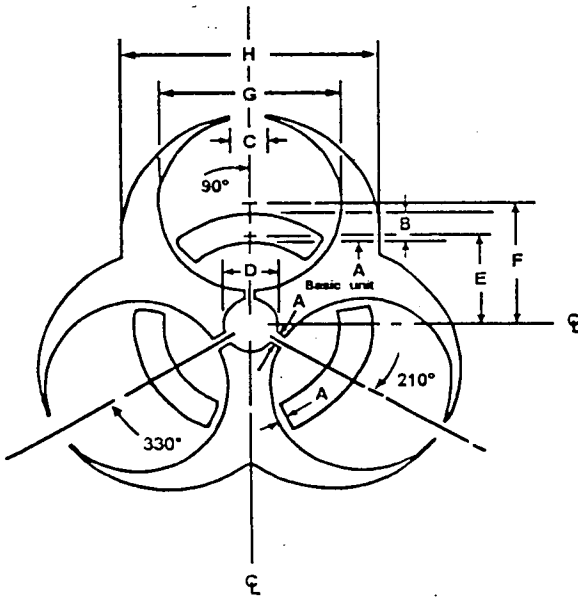
Symbols Used on Signs



White tag  
white letters on  
red square

Fig. J-10

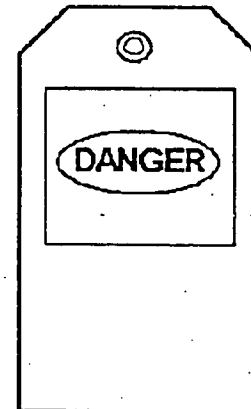
Do Not Start Tag



Dimension	A	B	C	D	E	F	G	H
Units	1	3/4	4	6	11	15	21	30

Fig. J-9

Symbol for Biological Hazard

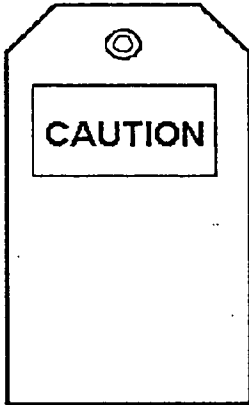


White tag  
white letters on  
red oval with a  
black square

Fig. J-11

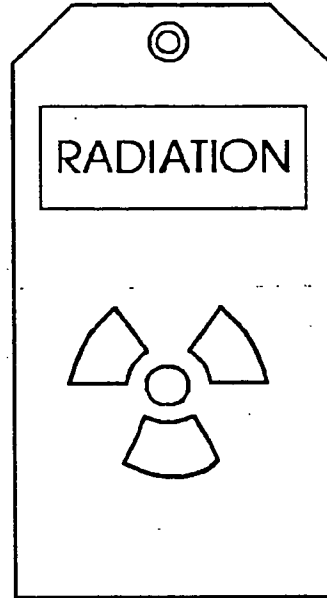
Danger Tag

PERMANENT

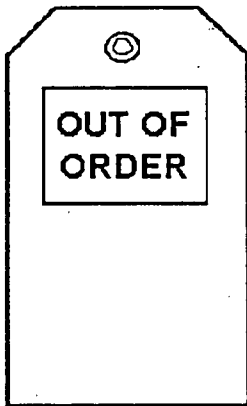


Yellow tag  
yellow letters on a  
black background

**Fig. J-12**  
Caution Tag

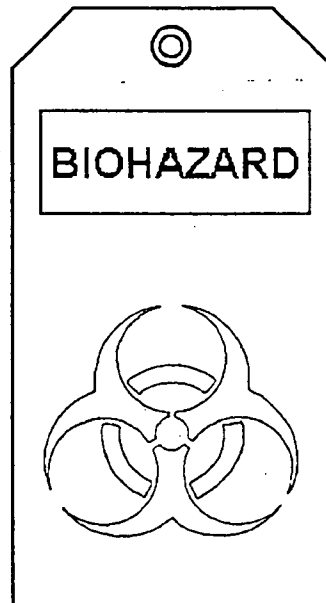


**Fig. J-14**  
Radiation Tag



White tag  
white letters on  
black background

**Fig. J-13**  
Out of Order Tag



**Fig. J-15**  
Biological Hazard Tag

TABLE J-1

STANDARD PROPORTIONS FOR DANGER SIGNS

Sign size, inches Height Width	Black rectangular panel, inches		Red oval, inches		Word danger, height inches	Maximum space available for sign wording, inches
	Height	Width	Height	Width		
HORIZONTAL PATTERN						
7x10	3 1/4 x 9 3/8	2 7/8 x 8 1/2	1 7/16	2 3/4 x 9 3/8		
10x14	4 5/8 x 13 3/8	4 1/8 x 11 7/8	2 1/16	4 1/4 x 13 3/8		
14x20	6 1/2 x 19 3/8	5 3/4 x 17	2 7/8	6 1/4 x 19 3/8		
20x28	9 1/4 x 27 3/8	8 1/4 x 23 7/8	4 1/8	9 1/2 x 27 3/8		
UPRIGHT PATTERN						
10x 7	2 3/8 x 6 3/8	2 1/8 x 5 7/8	1 1/16	6 3/8 x 6 3/8		
14x10	3 1/4 x 9 3/8	2 7/8 x 8 1/2	1 7/16	9 1/2 x 9 3/8		
20x14	4 5/8 x 13 3/8	4 1/8 x 11 7/8	2 1/16	14 x 13 3/8		
28x20	6 1/2 x 19 3/8	5 3/4 x 17	2 7/8	20 1/4 x 19 3/8		

TABLE J-2

STANDARD PROPORTIONS FOR CAUTION SIGNS

Sign size, inches height width	Black rectangular panel, inches		Word "Caution" height of letter, inches	Maximum space available for sign wording below panel inches	
	height	width		height	width
HORIZONTAL PATTERN					
7 x 10	2 1/4 x 9 3/8	1 5/8	3 1/4 x 9 3/8		
10 x 14	3 1/4 x 13 3/8	2 1/4	5 1/2 x 13 3/8		
14 x 20	3 3/4 x 19 3/8	2 3/4	9 x 19 3/8		
20 x 28	4 1/4 x 27 3/8	3 1/4	14 1/2 x 27 3/8		
UPRIGHT PATTERN					
10 x 7	1 5/8 x 6 3/8	1 1/8	7 x 6 3/8		
14 x 10	2 1/4 x 9 3/8	1 5/8	10 1/2 x 9 3/8		
20 x 14	3 1/4 x 13 3/8	2 1/4	15 1/2 x 13 3/8		
28 x 20	3 3/4 x 19 3/8	2 3/4	24 x 19 3/8		

TABLE J-3

STANDARD PROPORTIONS FOR SAFETY INSTRUCTION SIGNS

[TABLE J-3: PART 1—"Think" Safety Sign]

Sign size, inches, height, width	Maximum Green rectangular panel, inches, height, width		Word "Think" height letters, inches	Space available for sign wording below panel, inches height, width
	height	width		
7x10	2 3/4 x 9 3/8	1 5/8	3 1/2 x 9 3/8	
10x14	3 1/4 x 13 3/8	2 1/4	5 1/2 x 13 3/8	
14x20	3 3/4 x 19 3/8	2 3/4	9 x 19 3/8	
20x28	4 1/4 x 27 3/8	3 1/4	14 1/2 x 27 3/8	

[TABLE J-3:PART 2—"Be Careful" Safety Sign]

Sign size, inches height, width	Green panel, inches, height, width	Maximum		
		Word "Be" height of letters, inches	Word "Careful" height of letters, inches	Space available for sign wording below panel, inches, height, width
7x10	3 3/8 x 9 3/8	1 1/4	1 3/16	2 1/2 x 9 3/8
10x14	4 1/4 x 13 3/8	1 3/4	2 3/16	4 x 13 3/8
14x20	6 1/4 x 19 3/8	2 1/2	3 1/8	6 x 19 3/8
20x28	9 1/2 x 27 3/8	3 1/2	4 3/8	9 1/4 x 27 3/8

TABLE J-4

STANDARD PROPORTIONS FOR DIRECTIONAL SIGNS

Sign size inches height	Black rectangular panel, inches height width	White arrow, inches				Maximum space for sign wording below panel height
		Overall length	Arrow head height width	Arrow shaft height	Arrow tail height width	
6 1/2x14	3 1/4 x 13 3/8	12 5/8	2 3/4 x 3	1 1/8	2 3/8 x 3 1/4	2 1/4 x 13 3/8
9x20	4 1/2 x 19 3/8	18 5/8	3 3/4 x 4 1/8	1 5/8	3 1/4 x 4 1/2	3 3/8 x 19 3/8
12x28	6 x 27 3/8	26 5/8	5 1/8 x 5 5/8	2 1/8 6	4 3/8 x 27 3/8	4 3/4 x
15x36	7 1/2 x 35 3/8	34 5/8	6 3/8 x 6 7/8	2 5/8	5 1/2 x 7 1/2	6 1/4 x 35 3/8

Appendix A—Recommended color coding.

While the standard does not specifically mandate colors to be used on accident prevention tags, the following color scheme is recommended by OSHA for meeting the requirements of this section:

"DANGER"—Red, or predominantly red, with lettering or symbols in a contrasting color.

"CAUTION"—Yellow, or predominantly yellow, with lettering or symbols in a contrasting color.

"WARNING"—Orange, or predominantly orange, with lettering or symbols in a contrasting color.

"BIOLOGICAL HAZARD"—Fluorescent orange or orange-red, or predominantly so, with lettering or symbols in a contrasting color.

Appendix B—References for further information.

The following references provide information which can be helpful in understanding the requirements contained in various sections of the standard:

1. Bresnahan, Thomas F., and Bryk, Joseph. "The Hazard Association Values of Accident Prevention Signs", *Journal of American Society of Safety Engineers: January 1975.*

2. Dreyfuss, H., *Symbol Sourcebook*, McGraw Hill: New York, NY, 1972.

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3. Glass, R. A. and others, *Some Criteria for Colors and Signs in Workplaces*, (~~(National Bureau of Standards, Washington D.C.)~~) National Institute of Standards and Technology, Quince Orchard and Clopper Roads, Gaithersburg, MD 20899-0011, 1983.

4. *Graphic Symbols for Public Areas and Occupational Environments*, Treasury Board of Canada, Ottawa, Canada, July 1980.

5. Howett, G. L., *Size of Letters Required for Visibility as a Function of Viewing Distance and Observer Acuity*, (~~(National Bureau of Standards, Washington D.C.)~~) National Institute of Standards and Technology, Quince Orchard and Clopper Roads, Gaithersburg, MD 20899-0011, July 1983.

6. Lerner, N. D., and Collins, B. L., *The Assessment of Safety Symbol Understandability by Different Testing Methods*, (~~(National Bureau of Standards, Washington D.C.)~~) National Institute of Standards and Technology, Quince Orchard and Clopper Roads, Gaithersburg, MD 20899-0011, 1980.

7. Lerner, N. D. and Collins, B. L., *Workplace Safety Symbols*, (~~(National Bureau of Standards, Washington D.C.)~~) National Institute of Standards and Technology, Quince Orchard and Clopper Roads, Gaithersburg, MD 20899-0011, 1980.

8. Modley, R. and Meyers, W. R., *Handbook of Pictorial Symbols*, Dover Publication, New York, NY, 1976.

9. *Product Safety Signs and Labels*, FMC Corporation, Santa Clara, CA, 1978.

10. *Safety Color Coding for Marking Physical Hazards, Z53.1*, (~~(American National Standards Institute, New York, NY)~~) American National Standards Institute, 11 West 42nd Street, New York, NY 10036, 1979.

11. *Signs and Symbols for the Occupational Environment*, Can. 3-Z-321-77, Canadian Standards Association, (~~(Ottawa)~~) Rexdale, Ontario M9W 1R3, September 1977.

12. *Symbols for Industrial Safety*, (~~(National Bureau of Standards, Washington D.C.)~~) National Institute of Standards and Technology, Quince Orchard and Clopper Roads, Gaithersburg, MD 20899-0011, April 1982.

13. *Symbol Signs*, U.S. Department of Transportation, Washington D.C., November 1974.

**AMENDATORY SECTION** (Amending Order 73-5, filed 5/9/73 and Order 73-4, filed 5/7/73)

**WAC 296-24-14507 General.** (1) In every building hereafter erected, having windows so constructed that it is usual and/or practicable for a person to stand on the sill in order to clean said window, there shall be installed window cleaner's safety anchors approved by the American (~~(Standard Association)~~) National Standards Institute.

(2) (~~(When an employee is)~~) Employees sitting on (~~(the)~~) a window sill with (~~(his)~~) their legs inside the room, (~~(he)~~) shall wear a safety belt equipped with a safety line. One end of the line shall be tied to a radiator, or any other substantial anchorage inside the room, unless the window opening is equipped with anchors in which case (~~(he shall attach his)~~) the safety belt (~~(to said)~~) shall be attached to the anchors.

(3) No safety device shall be used in window cleaning operations until it has the approval of the American National Standards (~~(Association)~~) Institute.

(4) The use of lag screws is prohibited in new or replacement installations hereafter made.

(5) Window cleaners shall not pass from one window sill to another window sill on the outside of a building unless one terminal is connected at all times.

(6) No employee who has not been properly trained to handle such equipment shall be assigned to work on scaffolds or boatswains' chairs.

(7) All window cleaning safety devices hereafter approved shall bear identification marks to identify the approval of the American National Standards (~~(Association)~~) Institute.

**AMENDATORY SECTION** (Amending Order 73-5, filed 5/9/73 and Order 73-4, filed 5/7/73)

**WAC 296-24-14509 Belt terminals, anchors and bolts.** (1) All anchors and belt terminals shall be capable of withstanding the following tests:

(a) To withstand an impact test of an iron weight of thirty-two pounds falling free a distance of four feet and striking the head of the anchor without fracture.

(b) A drop test of three hundred fifty pounds dead weight (not sand) falling a distance of four feet without fracture. The connection between the weight and anchor being a standard safety belt or ropes or cables not over six feet long.

(c) To withstand a tension pull of six thousand pounds without fracture. This tension to be applied through a belt terminal and in the direction which the anchor must withstand in service when a (~~(man)~~) person falls.

(2) All metals used in the manufacture of anchors and belt terminals shall have a minimum ultimate tensile strength of fifty-five thousand pounds per square inch, with an elongation of at least twenty-five percent in two inches and shall have a corrosion resistance of sixty percent as compared to copper. The belt terminal may be excepted from the corrosive resistance and elongation requirements of this order if of material and design of obvious superiority.

(3) All anchors installed hereafter shall be double-headed. These heads to be so designed or spaced that it will be impossible to attach the belt terminal to a single head. The (~~(division of safety)~~) department may approve a single-headed anchor upon sufficient tests and proofs.

**AMENDATORY SECTION** (Amending Order 73-5, filed 5/9/73 and Order 73-4, filed 5/7/73)

**WAC 296-24-14513 Anchor installations.** (1) Locations: Anchors shall be attached to the side frames of the window or to the building at a point not less than forty-two inches nor more than fifty-one inches (approximately) above the window sill. Care shall be taken when screwing up anchor fastenings, to prevent producing excess stresses.

(2) Wood—Existing and new buildings: When anchors are attached to wood construction, through bolts of not less than one-half inch diameter, extending at least through the window frame with washers and nuts inside, shall be used as anchor fasteners. Means shall be provided to keep the nut from backing off.

Wall flanges shall be not less than one and one-quarter inches in diameter, or equivalent area.

(3) Concrete—New buildings: Anchors attached to concrete poured in place in buildings hereafter erected, shall be installed while the concrete is being placed. Such anchors shall extend not less than five inches into the concrete and shall have a cross-sectional area of not less than one-quarter of a square inch and shall be provided with a fluke at the end of the anchor not less than one inch in length.

(4) Masonry—New buildings: Anchors attached to masonry, other than concrete poured in place, in buildings hereafter erected, shall be installed while the wall is under construction and shall be shaped to build into the joints between masonry units. Such anchors shall be not less than eight and one-half inches long and shall have a cross-sectional area of not less than one-quarter of a square inch at all unexposed points and shall have a fluke or flukes having a holding surface of not less than one inch in length that shall be firmly imbedded in the masonry.

(5) Masonry and concrete—Existing buildings: Anchors installed on buildings or masonry and concrete construction heretofore erected, shall be attached to the window frames as required in these standards, or by other methods approved by the ~~((division of safety))~~ department.

(6) Hollow metal—Existing and new buildings: Anchors shall be attached to hollow metal construction by one of the following methods:

(a) At least two nickel steel bolts not less than five-sixteenths of an inch in diameter passing through the frame and a steel reinforcing plate five-sixteenths of an inch thick and not less than six inches long, placed on the inside of the frame and secured by means of nuts and lock washers. In cases where it is impracticable to provide nuts and lock washers, the reinforcing plate may be tapped to receive five-sixteenths inch diameter bolts, and the bolts shall extend through the plate.

(b) Where the screw bolt is an integral part of the anchor, it shall be at least one-half inch in diameter and shall be secured by means of a nut and lock washer, or any other method approved by the ~~((division of safety))~~ department.

(c) All anchors and anchor fastenings shall be provided with means to prevent them from turning, backing off or becoming loose.

(7) Solid metal—Existing and new buildings: Anchors shall be attached to solid metal construction by one of the following methods:

(a) At least two nickel steel bolts not less than five-sixteenths of an inch in diameter passing through the frame, and secured by means of nuts and lock washers. In cases where it is impracticable to provide nuts and lock washers, the metal frame shall be reinforced with a five-sixteenths inch thick plate and tapped to receive at least two five-sixteenths inch diameter nickel steel bolts, and the bolts shall extend through the reinforcing plate.

(b) Where the screw bolt is an integral part of the anchor, it shall be at least one-half inch in diameter and shall be secured by means of a nut and lock washer, or any other method approved by the ~~((division of safety))~~ department.

(c) All anchors and anchor fastenings shall be provided with means to prevent them from turning, backing off or becoming loose.

**AMENDATORY SECTION** (Amending Order 73-5, filed 5/9/73 and Order 73-4, filed 5/7/73)

**WAC 296-24-14515 Reversible and pivot windows.**

(1) When it is necessary to clean reversible and pivot windows either of which is prevented from properly operating by obstructions or by the design of said windows, they shall be provided with safety devices of approved design.

(2) Horizontally pivoted sash. Provision shall be made so that the outside of horizontally pivoted windows may be cleaned without necessitating the window washer leaning against or putting ~~((his))~~ weight on the sash.

**AMENDATORY SECTION** (Amending Order 73-5, filed 5/9/73 and Order 73-4, filed 5/7/73)

**WAC 296-24-14519 Boatswain's chairs.** An employee shall be secured in ~~((his))~~ the boatswain's chair with a safety belt or rope, and shall have a short rope with a sliding hitch between ~~((his))~~ the employee's body or the chair and the hoistline.

**AMENDATORY SECTION** (Amending Order 90-18, filed 1/10/91, effective 2/12/91)

**WAC 296-24-15001 Machine guarding.** (1) Types of guarding. One or more methods of machine guarding shall be provided to protect the operator and other employees in the machine area from hazards such as those created by point of operation, ingoing nip points, rotating parts, flying chips and sparks. Examples of guarding methods are—barrier guards, two-hand tripping devices, electronic safety devices, etc.

(2) General requirements for machine guards. Guards shall be affixed to the machine where possible and secured elsewhere if for any reason attachment to the machine is not possible. The guard shall be such that it does not offer an accident hazard in itself.

(3) Point of operation guarding.

(a) Point of operation is the area on a machine where work is actually performed upon the material being processed.

(b) The point of operation of machines whose operation exposes an employee to injury, shall be guarded. The guarding device shall be in conformity with any appropriate standards therefor, or, in the absence of applicable specific standards, shall be so designed and constructed as to prevent the operator from having any part of the employee's body in the danger zone during the operating cycle.

(c) Circular meat cutting saws shall be guarded in one of the following ways:

(i) A suspended counter-balanced circular meat cutting saw that requires two-handed operation shall be deemed adequately guarded if provided with a guard that covers at least twenty-five degrees of the circumference of the blade and it conforms to the requirements of (c)(iv) of this subsection.

(ii) A suspended counter-balanced circular meat cutting saw that requires only one-handed operation shall be deemed adequately guarded if provided with a guard that covers at least ninety degrees of the circumference of the blade and it conforms to the requirements of (c)(iv) of this subsection.

(iii) A nonsuspended circular meat saw, either one-handed or two-handed operation, shall be deemed adequately guarded if provided with a guard that covers at least ninety degrees of the circumference of the blade and it conforms to the requirements of (c)(iv) of this subsection.

(iv) All circular meat cutting saws shall conform to the following:

(A) A "deadman" control shall be required.

(B) The guard protecting the operator from contact with the blade shall be located between the operator and the blade.

(C) The maximum number of degrees of circumferential guarding of the blade shall be provided based on specific applications in meat cutting operations.

(D) A brake that automatically activates upon release of the operating control(s) is required.

(d) Special handtools for placing and removing material shall be such as to permit easy handling of material without the operator placing a hand in the danger zone. Such tools shall not be in lieu of other guarding required by this section, but can only be used to supplement protection provided.

(e) The following are some of the machines which usually require point of operation guarding:

(i) Guillotine cutters.

(ii) Shears.

(iii) Alligator shears.

(iv) Power presses. (Including platen presses.)

(v) Milling machines.

(vi) Power saws.

(vii) Jointers.

(viii) Portable power tools.

(ix) Forming rolls and calenders.

(4) Barrels, containers, and drums. Revolving drums, barrels, and containers shall be guarded by an enclosure which is interlocked with the drive mechanism, so that the barrel, drum, or container cannot revolve unless the guard enclosure is in place.

(5) Exposure of blades. When the periphery of the blades of a fan is less than seven feet above the floor or working level, the blades shall be guarded. The guard shall have openings no larger than one-half inch. Safeguards shall be so constructed that rods, pipes, or like material being handled by workers will not enter same, and come in contact with moving machinery. Fan blade guards of any material are acceptable where the material provides protection to workers and meets the requirements of ((Figure)) Table O-12 of WAC ((296-24-18005(5))) 296-24-20531.

(6) Cams and other machine parts which move in such a manner as to create shearing or crushing hazards shall, if exposed to contact, be guarded with a standard safeguard.

(7) Guarding food waste disposal equipment. "Garb-el" or equipment with similar configuration and operational characteristics, will have the worm screw conveyor completely covered by a properly designed and mounted trimboard cover in place during operation of the mechanism.

(8) Garbage disposal units with feed-openings or charging-throats, large enough to allow body parts to contact points of operation shall be guarded:

(a) WAC 296-24-20531, Table ((Θ)) Q-12 provides mesh size or crossed-metal strip opening and distance of installation from the points of operation which shall be used.

(b) The guard material shall be of sufficient strength that a downward thrust of a body part will not cause the guard to stretch or open larger than two inches.

AMENDATORY SECTION (Amending Order 73-5, filed 5/9/73 and Order 73-4, filed 5/7/73)

**WAC 296-24-15005 Means to prevent slipping.**

Operators of dangerous machinery, such as shapers, jointers, and circular saws, shall be safeguarded against slipping on smooth, oily or otherwise slippery floor, where ((he)) they stand((s)) while at the point of operation of such dangerous machinery, by covering such portion of the floor with a rubber mat, cork, nonslip composition flooring, or some other effective means of preventing slipping.

AMENDATORY SECTION (Amending Order 73-5, filed 5/9/73 and Order 73-4, filed 5/7/73)

**WAC 296-24-16505 Machine controls and equipment.**

(1) A mechanical or electrical power control shall be provided on each machine to make it possible for the operator to cut off the power from each machine without leaving ((his position at the point of operation)) the operating position.

(2) On machines driven by belts and shafting, a locking-type belt shifter or an equivalent positive device shall be used.

(3) On applications where injury to the operator might result if motors were to restart after power failures, provision shall be made to prevent machines from automatically restarting upon restoration of power.

(4) Power controls and operating controls should be located within easy reach of the operator while ((he is)) at ((his)) the regular work location, making it unnecessary ((for him)) to reach over the cutter to make adjustments. This does not apply to constant pressure controls used only for setup purposes.

(5) On each machine operated by electric motors, positive means shall be provided for rendering such controls or devices inoperative while repairs or adjustments are being made to the machines they control.

(6) Each operating treadle shall be protected against unexpected or accidental tripping.

(7) Feeder attachments shall have the feed rolls or other moving parts so covered or guarded as to protect the operator from hazardous points.

AMENDATORY SECTION (Amending Order 83-19, filed 7/13/83, effective 9/12/83)

**WAC 296-24-16539 Inspection and maintenance of machinery.**

(1) Dull, badly set, improperly filed, or improperly tensioned saws shall be immediately removed from service, before they begin to cause the material to stick, jam, or kick back when it is fed to the saw at normal speed. Saws to which gum has adhered on the sides shall be immediately cleaned.

(2) All knives and cutting heads of machines shall be kept sharp, properly adjusted, and firmly secured. Where two or more knives are used in one head, they shall be properly balanced.

(3) Bearings shall be kept free from lost motion and shall be well lubricated.

(4) Arbors of all circular saws shall be free from play.

(5) Sharpening or tensioning of saw blades or cutters shall be done only by persons of demonstrated skill in this kind of work.

(6) Emphasis is placed upon the importance of maintaining cleanliness around machinery, particularly as regards the effective functioning of guards and the prevention of fire hazards in switch enclosures, bearings, and motors.

(7) All cracked saws shall be removed from service.

(8) The practice of inserting wedges between the saw disk and the collar to form what is commonly known as a "wobble saw" shall not be permitted.

(9) Push sticks or push blocks shall be provided at the work place in the several sizes and types suitable for the work to be done.

(10) The knife blade of jointers shall be so installed and adjusted that it does not protrude more than one-eighth inch beyond the cylindrical body of the head. Push sticks or push blocks shall be provided at the work place in the several sizes and types suitable for the work to be done.

(11) Whenever veneer slicers or rotary veneer-cutting-machines have been shutdown for the purpose of inserting logs or to make adjustments, operators shall make sure that machine is clear and other ((workmen)) workers are not in a hazardous position before starting the machine.

(12) Operators shall not ride the carriage of a veneer slicer.

**AMENDATORY SECTION** (Amending Order 88-25, filed 11/14/88)

**WAC 296-24-19501 Definitions.** (1) "Antirepeat" means the part of the clutch/brake control system designed to limit the press to a single stroke if the tripping means is held operated. Antirepeat requires release of all tripping mechanisms before another stroke can be initiated. "Antirepeat" is also called single stroke reset or reset circuit.

(2) "Brake" means the mechanism used on a mechanical power press to stop and/or hold the crankshaft, either directly or through a gear train, when the clutch is disengaged.

(3) "Bolster plate" means the plate attached to the top of the bed of the press having drilled holes or T-slots for attaching the lower die or die shoe.

(4) "Clutch" means the coupling mechanism used on a mechanical power press to couple the flywheel to the crankshaft, either directly or through a gear train.

(5) "Full revolution clutch" means a type of clutch that, when tripped, cannot be disengaged until the crankshaft has completed a full revolution and the press slide a full stroke.

(6) "Part revolution clutch" means a type of clutch that can be disengaged at any point before the crankshaft has completed a full revolution and the press slide a full stroke.

(7) "Direct drive" means the type of driving arrangement wherein no clutch is used; coupling and decoupling of the driving torque is accomplished by energization and deenergization of a motor. Even though not employing a clutch, direct drives match the operational characteristics of "part revolution clutches" because the driving power may be disengaged during the stroke of the press.

(8) "Concurrent" means acting in conjunction, and is used to describe a situation wherein two or more controls exist in an operated condition at the same time.

(9) "Continuous" means uninterrupted multiple strokes of the slide without intervening stops (or other clutch control action) at the end of individual strokes.

(10) "Counterbalance" means the mechanism that is used to balance or support the weight of the connecting rods, slide, and slide attachments.

(11) "Device" means a press control or attachment that:

(a) Restrains the operator from inadvertently reaching into the point of operation, or

(b) Prevents normal press operation if the operator's hands are inadvertently within the point of operation, or

(c) Automatically withdraws the operator's hands if the operator's hands are inadvertently within the point of operation as the dies close, or

(d) Prevents the initiation of a stroke, or stops the stroke in progress, when there is an intrusion through the sensing field by any part of the operator's body or by any other object.

(12) "Presence sensing device" means a device designed, constructed and arranged to create a sensing field or area that signals the clutch/brake control to deactivate the clutch and activate the brake of the press when any part of the operator's body or a hand tool is within such field or area.

(13) "Gate or movable barrier device" means a movable barrier arranged to enclose the point of operation before the press stroke can be started.

(14) "Holdout or restraint device" means a mechanism, including attachments for operator's hands, that when anchored and adjusted prevent the operator's hands from entering the point of operation.

(15) "Pull-out device" means a mechanism attached to the operator's hands and connected to the upper die or slide of the press, that is designed, when properly adjusted, to withdraw the operator's hands as the dies close, if the operator's hands are inadvertently within the point of operation.

(16) "Sweep device" means a single or double arm (rod) attached to the upper die or slide of the press and designed to move the operator's hands to a safe position as the dies close, if the operator's hands are inadvertently within the point of operation.

(17) "Two hand control device" means a two hand trip that further requires concurrent pressure from both hands of the operator during a substantial part of the die-closing portion of the stroke of the press.

(18) "Die" means the tooling used in a press for cutting or forming material. An upper and a lower die make a complete set.

(19) "Die builder" means any person who builds dies for power presses.

(20) "Die set" means a tool holder held in alignment by guide posts and bushings and consisting of a lower shoe, an upper shoe or punch holder, and guide posts and bushings.

(21) "Die setter" means an individual who places or removes dies in or from mechanical power presses, and who, as a part of ((his)) their duties, makes the necessary adjustments to cause the tooling to function properly and safely.

(22) "Die setting" means the process of placing or removing dies in or from a mechanical power press, and the



process of adjusting the dies, other tooling and safeguarding means to cause them to function properly and safely.

(23) "Die shoe" means a plate or block upon which a die holder is mounted. A die shoe functions primarily as a base for the complete die assembly, and, when used, is bolted or clamped to the bolster plate or the face of slide.

(24) "Ejector" means a mechanism for removing work or material from between the dies.

(25) "Face of slide" means the bottom surface of the slide to which the punch or upper die is generally attached.

(26) "Feeding" means the process of placing or removing material within or from the point of operation.

(27) "Automatic feeding" means feeding wherein the material or part being processed is placed within or removed from the point of operation by a method or means not requiring action by an operator on each stroke of the press.

(28) "Semiautomatic feeding" means feeding wherein the material or part being processed is placed within or removed from the point of operation by an auxiliary means controlled by operator on each stroke of the press.

(29) "Manual feeding" means feeding wherein the material or part being processed is handled by the operator on each stroke of the press.

(30) "Foot control" means the foot operated control mechanism designed to be used with a clutch or clutch/brake control system.

(31) "Foot pedal" means the foot operated lever designed to operate the mechanical linkage that trips a full revolution clutch.

(32) "Guard" means a barrier that prevents entry of the operator's hands or fingers into the point of operation.

(33) "Die enclosure guard" means an enclosure attached to the die shoe or stripper, or both, in a fixed position.

(34) "Fixed barrier guard" means a die space barrier attached to the press frame.

(35) "Interlocked press barrier guard" means a barrier attached to the press frame and interlocked so that the press stroke cannot be started normally unless the guard itself, or its hinged or movable sections, enclose the point of operation.

(36) "Adjustable barrier guard" means a barrier requiring adjustment for each job or die setup.

(37) "Guide post" means the pin attached to the upper or lower die shoe, operating within the bushing on the opposing die shoe, to maintain the alignment of the upper and lower dies.

(38) "Hand feeding tool" means any hand held tool designed for placing or removing material or parts to be processed within or from the point of operation.

(39) "Inch" means an intermittent motion imparted to the slide (on machines using part revolution clutches) by momentary operation of the "inch" operating means. Operation of the "inch" operating means engages the driving clutch so that a small portion of one stroke or indefinite stroking can occur, depending upon the length of time the "inch" operating means is held operated. "Inch" is a function used by the die setter for setup of dies and tooling, but is not intended for use during production operations by the operator.

(40) "Jog" means an intermittent motion imparted to the slide by momentary operation of the drive motor, after the clutch is engaged with the flywheel at rest.

(41) "Knockout" means a mechanism for releasing material from either die.

(42) "Liftout" means the mechanism also known as knockout.

(43) "Operator's station" means the complete complement of controls used by or available to an operator on a given operation for stroking the press.

(44) "Pinch point" means any point other than the point of operation at which it is possible for a part of the body to be caught between the moving parts of a press or auxiliary equipment, or between moving and stationary parts of a press or auxiliary equipment or between the material and moving part or parts of the press or auxiliary equipment.

(45) "Point of operation" means the area of the press where material is actually positioned and work is being performed during any process such as shearing, punching, forming, or assembling.

(46) "Press" means a mechanically powered machine that shears, punches, forms or assembles metal or other material by means of cutting, shaping, or combination dies attached to slides. A press consists of a stationary bed or anvil, and a slide (or slides) having a controlled reciprocating motion toward and away from the bed surface, the slide being guided in a definite path by the frame of the press.

(47) "Repeat" means an unintended or unexpected successive stroke of the press resulting from a malfunction.

(48) "Safety block" means a prop that, when inserted between the upper and lower dies or between the bolster plate and the face of the slide, prevents the slide from falling of its own deadweight.

(49) "Single stroke" means one complete stroke of the slide, usually initiated from a full open (or up) position, followed by closing, (or down), and then a return to the full open position.

(50) "Single stroke mechanism" means an arrangement used on a full revolution clutch to limit the travel of the slide to one complete stroke at each engagement of the clutch.

(51) "Slide" means the main reciprocating press member. A slide is also called a ram, plunger, or platen.

(52) "Stop control" means an operator control designed to immediately deactivate the clutch control and activate the brake to stop slide motion.

(53) "Stripper" means a mechanism or die part for removing the parts or material from the punch.

(54) "Stroking selector" means the part of the clutch/brake control that determines the type of stroking when the operating means is actuated. The stroking selector generally includes positions for "off" (clutch control), "inch," "single stroke," and "continuous" (when continuous is furnished).

(55) "Trip or (tripping)" means activation of the clutch to "run" the press.

(56) "Turnover bar" means a bar used in die setting to manually turn the crankshaft of the press.

(57) "Two-hand trip" means a clutch actuating means requiring the concurrent use of both hands of the operator to trip the press.

(58) "Unitized tooling" means a type of die in which the upper and lower members are incorporated into a self-contained unit so arranged as to hold the die members in alignment.

(59) "Control system" means sensors, manual input and mode selection elements, interlocking and decision-making circuitry, and output elements to the press operating mechanism.

(60) "Brake monitor" means a sensor designed, constructed, and arranged to monitor the effectiveness of the press braking system.

(61) "Presence sensing device initiation" means an operating mode of indirect manual initiation of a single stroke by a presence sensing device when it senses that work motions of the operator, related to feeding and/or removing parts, are completed and all parts of the operator's body or hand tools are safely clear of the point of operation.

(62) "Safety system" means the integrated total system, including the pertinent elements of the press, the controls, the safeguarding and any required supplemental safeguarding, and their interfaces with the operator, and the environment, designed, constructed, and arranged to operate together as a unit, such that a single failure or single operating error will not cause injury to personnel due to point of operation hazards.

(63) "Authorized person" means one to whom the authority and responsibility to perform a specific assignment has been given by the employer.

(64) "Certification" or "certify" means, in the case of design certification/validation, that the manufacturer has reviewed and tested the design and manufacture, and in the case of installation certification/validation and annual recertification/revalidation, that the employer has reviewed and tested the installation, and concludes in both cases that the requirements of WAC 296-24-19503 through ~~((296-24-19515))~~ 296-24-19513 and 296-24-20700 have been met. The certifications are made to the validation organization.

(65) "Validation" or "validate" means for PSDI safety systems that a WISHA recognized third-party validation organization:

(a) For design certification/validation has reviewed the manufacturer's certification that the PSDI safety system meets the requirements of WAC 296-24-19503 through ~~((296-24-19515))~~ 296-24-19513 and 296-24-20700 and the underlying tests and analyses performed by the manufacturer, has performed additional tests and analyses which may be required by WAC 296-24-19503 through ~~((296-24-19515))~~ 296-24-19513 and 296-24-20700, and concludes that the requirements of WAC 296-24-19503 through ~~((296-24-19515))~~ 296-24-19513 and 296-24-20700 have been met; and

(b) For installation certification/validation and annual recertification/revalidation has reviewed the employer's certification that the PSDI safety system meets the requirements of WAC 296-24-19503 through ~~((296-24-19515))~~ 296-24-19513 and 296-24-20700 and the underlying tests performed by the employer, has performed additional tests and analyses which may be required by WAC 296-24-19503 through ~~((296-24-19515))~~ 296-24-19513 and 296-24-20700, and concludes that the requirements of WAC 296-24-19503 through ~~((296-24-19515))~~ 296-24-19513 and 296-24-20700 have been met.

(66) "Certification/validation" and "certify/validate" means the combined process of certification and validation.

AMENDATORY SECTION (Amending Order 88-25, filed 11/14/88)

**WAC 296-24-19507 Safeguarding the point of operation.** (1) General requirements.

(a) It shall be the responsibility of the employer to provide and insure the usage of "point of operation guards" or properly applied and adjusted point of operation devices on every operation performed on a mechanical power press. See Table O-10.

(b) The requirement of (a) of this subsection shall not apply when the point of operation opening is one-fourth inch or less. See Table O-10.

TABLE O-10

MAXIMUM OPENINGS UNDER GUARDS

Distance of Opening From Point of Operation Hazard (Inches)	Maximum Openings Under Guard (Inches)
1/2 to 1-1/2	1/4
1-1/2 to 2-1/2	3/8
2-1/2 to 3-1/2	1/2
3-1/2 to 5-1/2	5/8
5-1/2 to 6-1/2	3/4
6-1/2 to 7-1/2	7/8
7-1/2 to 12-1/2	1-1/4
12-1/2 to 15-1/2	1-1/2
15-1/2 to 17-1/2	1-7/8
17-1/2 to 31-1/2	2-1/8

MAXIMUM OPENINGS THROUGH GUARDS

Material	Guard Clearance From Hazard Point	Largest Mesh or Opening (Inches)
Woven Wire, Expanded Metal or Perforated Metal	From 2 to 4	1/2
	4 to 15	2
Wood or Metal Strips (Crossed)	From 2 to 4	3/8
	4 to 15	2
Wood or Metal Strips (Not Crossed)	From 2 to 4	1/2 width of strip
	4 to 15	1 width of strip

Note: The specifications for the materials used for filling barrier, point of operation guards is contained in Table O-12, WAC 296-24-20531. When plastic is used as filling, it shall be 1/4 inch thick (minimum).

(2) Point of operation guards.

(a) Every point of operation guard shall meet the following design, construction, application and adjustment requirements:

(i) It shall prevent entry of hands or fingers into the point of operation by reaching through, over, under or around the guard;

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(ii) It shall conform to the maximum permissible openings of Table O-10;

(iii) It shall, in itself, create no pinch point between the guard and moving machine parts;

(iv) It shall utilize fasteners not readily removable by operator, so as to minimize the possibility of misuse or removal of essential parts;

(v) It shall facilitate its inspection, and

(vi) It shall offer maximum visibility of the point of operation consistent with other requirements.

(b) A die enclosure guard shall be attached to the die shoe or stripper in a fixed position.

(c) A fixed barrier guard shall be attached securely to the frame of the pressor to the bolster plate.

(d) An interlocked press barrier guard shall be attached to the press frame or bolster and shall be interlocked with the press clutch control so that the clutch cannot be activated unless the guard itself, or the hinged or movable sections of the guard are in position to conform to the requirements of Table O-10.

(e) The hinged or movable sections of an interlocked press barrier guard shall not be used for manual feeding. The guard shall prevent opening of the interlocked section and reaching into the point of operation prior to die closure or prior to the cessation of slide motion. See subsection (3)(b) of this section regarding manual feeding through interlocked press barrier devices.

(f) The adjustable barrier guard shall be securely attached to the press bed, bolster plate, or die shoe, and shall be adjusted and operated in conformity with Table O-10 and the requirements of this subsection. Adjustments shall be made only by authorized personnel whose qualifications include a knowledge of the provisions of Table O-10 and this subsection.

(g) A point of operation enclosure which does not meet the requirements of this subsection and Table O-10 shall be used only in conjunction with point of operation devices.

(3) Point of operation devices.

(a) Point of operation devices shall protect the operator by:

(i) Preventing and/or stopping normal stroking of the press if the operator's hands are inadvertently placed in the point of operation; or

(ii) Preventing the operator from inadvertently reaching into the point of operation or withdrawing his/her hands if they are inadvertently located in the point of operation, as the dies close; or

(iii) Preventing the operator from inadvertently reaching into the point of operation at all times; or

(iv) (Reserved.)

(v) Requiring application of both of the operator's hands to machine operating controls and locating such controls at such a safety distance from the point of operation that the slide completes the downward travel or stops before the operator can reach into the point of operation with his/her hands; or

(vi) Enclosing the point of operation before a press stroke can be initiated and maintaining this closed condition until the motion of the slide had ceased; or

(vii) Enclosing the point of operation before a press stroke can be initiated, so as to prevent an operator from reaching into the point of operation prior to die closure or

prior to cessation of slide motion during the downward stroke.

(b) The gate or movable barrier device shall protect the operator as follows:

(i) A Type A gate or movable barrier device shall protect the operator in the manner specified in (a)(vi) of this subsection.

(ii) A Type B gate or movable barrier device shall protect the operator in the manner specified in (a)(vii) of this subsection.

(c) A presence sensing point of operation device shall protect the operator as provided in (a)(i) of this subsection, and shall be interlocked into the control circuit to prevent or stop slide motion if the operator's hand or other part of his/her body is within the sensing field of the device during the downstroke of the press slide.

(i) The device may not be used on machines using full revolution clutches.

(ii) The device may not be used as a tripping means to initiate slide motion, except when used in total conformance with WAC 296-24-19517.

(iii) The device shall be constructed so that a failure within the system does not prevent the normal stopping action from being applied to the press when required, but does prevent the initiation of a successive stroke until the failure is corrected. The failure shall be indicated by the system.

(iv) Muting (bypassing of the protective function) of such device, during the upstroke of the press slide, is permitted for the purpose of parts ejection, circuit checking, and feeding.

(v) The safety distance (Ds) from the sensing field to the point of operation shall be greater than the distance determined by the following formula:

$D_s = 63 \text{ inches/second} \times T_s$  where:

$D_s$  = minimum safety distance (inches);

63 inches/second = hand speed constant; and

$T_s$  = stopping time of the press measured at approximately 90° position of crankshaft rotation (seconds).

(vi) Guards shall be used to protect all areas of entry to the point of operation not protected by the presence sensing device.

(d) The pull-out device shall protect the operator as specified in (a)(ii) of this subsection and shall include attachments for each of the operator's hands.

(i) Attachments shall be connected to and operated only by the press slide or upper die.

(ii) Attachment shall be adjusted to prevent the operator from reaching into the point of operation or to withdraw the operator's hands from the point of operation before the dies close.

(iii) A separate pull-out device shall be provided for each operator if more than one operator is used on a press.

(iv) Each pull-out device in use shall be visually inspected and checked for proper adjustment at the start of each operator shift, following a new die set-up, and when operators are changed. Necessary maintenance or repair or both shall be performed and completed before the press is operated. Records of inspections and maintenance shall be kept in accordance with WAC 296-24-19511.

(e) The sweep device, shall protect the operator as specified in (a)(ii) of this subsection, by removing his/her

hands safely to a safe position if they are inadvertently located in the point of operation, as the dies close or prior to tripping the clutch. Devices operating in this manner shall have a barrier, attached to the sweep arm in such a manner as to prevent the operator from reaching into the point of operation, past the trailing edge of the sweep arm on the downward stroke of the press. This device may not be used for point of operation safeguarding after December 31, 1976.

(i) The sweep device must be activated by the slide or by motion of a foot pedal triprod.

(ii) The sweep device must be designed, installed and operated so as to prevent the operator from reaching into the point of operation before the dies close.

(iii) The sweep device must be installed so that it will not itself create an impact or shear hazard between the sweep arm and the press tie rods, dies, or any other part of the press or barrier.

(iv) Partial enclosure conforming with (e) of this subsection, as to the area of entry which they protect, must be provided on both sides of the point of operation to prevent the operator from reaching around or behind the sweep device and into the point of operation after the dies start to close. Partial enclosures shall not themselves create a pinch point or shear hazard.

(f) A holdout or a restraint device shall protect the operator as specified in (a)(iii) of this subsection and shall include attachments for each of the operator's hands. Such attachments shall be securely anchored and adjusted in such a way that the operator is restrained from reaching into the point of operation. A separate set of restraints shall be provided for each operator if more than one operator is required on a press.

(g) The two hand control device shall protect the operator as specified in (a)(v) of this subsection.

(i) When used in press operations requiring more than one operator, separate two hand controls shall be provided for each operator, and shall be designed to require concurrent application of all operators' controls to activate the slide. The removal of a hand from any control button shall cause the slide to stop.

(ii) Each two hand control shall meet the construction requirements of WAC 296-24-19505 (7)(e).

(iii) The safety distance (Ds) between each two hand control device and the point of operation shall be greater than the distance determined by the following formula:

$D_s = 63 \text{ inches/second} \times T_s$ , where:

$D_s$  = minimum safety distance (inches);

63 inches/second = hand speed constant; and

$T_s$  = stopping time of the press measured at approximately 90° position of crankshaft rotation (seconds).

(iv) Two hand control shall be fixed in position so that only a supervisor or safety engineer is capable of relocating the controls.

(h) The two hand trip device shall protect the operator as specified in (a)(v) of this subsection.

(i) When used in press operations requiring more than one operator, separate two hand trips shall be provided for each operator, and shall be designed to require concurrent application of all operators' controls to activate the slide.

(ii) Each two hand trip shall meet the construction requirements of WAC 296-24-19505(6).

(iii) The safety distance (Dm) between the two hand trip and the point of operation shall be greater than the distance determined by the following formula:

$D_m = 63 \text{ inches/second} \times T_m$ ; where:

$D_m$  = minimum safety distance (inches);

63 inches/second = hand speed constant; and

$T_m$  = the maximum time the press takes for the die closure after it has been tripped (seconds). For full revolution clutch presses with only one engaging point  $T_m$  is equal to the time necessary for one and one-half revolutions of the crankshaft. For full revolution clutch presses with more than one engaging point,  $T_m$  shall be calculated as follows:

$$T_m = \left\{ \frac{1}{2} + \frac{1}{\text{Number of engaging points per revolution}} \right\} \times \text{time necessary to complete one revolution of the crankshaft (seconds)}$$

(iv) Two hand trips shall be fixed in position so that only a supervisor or safety engineer is capable of relocating the controls.

(i) (Reserved.)

(4) Hand feeding tools. Hand feeding tools are intended for placing and removing materials in and from the press. Hand feeding tools are not a point of operation guard or protection device and shall not be used in lieu of the "guards" or devices required in this section.

(5) Additional requirements for safeguarding. Where the operator feeds or removes parts by placing one or both hands in the point of operation, and a two hand control, presence sensing device of Type B gate or movable barrier (on a part revolution clutch) is used for safeguarding:

((+)) (a) The employer shall use a control system and a brake monitor which comply with WAC 296-24-19505 (13) and (14). This requirement shall be complied with by November 1, 1975;

((++)) (b) The exception in WAC 296-24-19505 (7)(e)(iv) for two hand controls manufactured and installed before August 31, 1971, is not applicable under this subsection;

((+++)) (c) The control of air clutch machines shall be designed to prevent a significant increase in the normal stopping time due to a failure within the operating valve mechanism, and to inhibit further operation if such failure does occur, where a part revolution clutch is employed. The exception in WAC 296-24-19505 (7)(k) for controls manufactured and installed before August 31, 1971, is not applicable under this subsection.

AMENDATORY SECTION (Amending Order 76-6, filed 3/1/76)

**WAC 296-24-19513 Operation of power presses.** (1) Employment of minors. The employer shall permit no one under 18 years of age to operate or assist in the operation of machinery covered in this section, except that this section shall not be deemed to prohibit the employment of persons who are 16 or 17 years of age in an apprenticeship training program which meets the requirements contained in chapter 49.04 RCW, apprenticeship.

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(2) Instruction to operators. The employer shall train and instruct the operator in the safe method of work before starting work on any operation covered by this section. The employer shall ~~((insure))~~ ensure by adequate supervision that correct operating procedures are being followed.

(3) Work area. The employer shall provide clearance between machines so that movement of one operator will not interfere with the work of another. Ample room for cleaning machines, handling material, work pieces, and scrap shall also be provided. All surrounding floors shall be kept in good condition and free from obstructions, grease, oil and water.

(4) Overloading. The employer shall operate his presses within the tonnage and attachment weight ratings specified by the manufacturer.

AMENDATORY SECTION (Amending Order 92-06, filed 8/10/92, effective 9/10/92)

**WAC 296-24-19517 Presence sensing device initiation (PSDI).** (1) General.

(a) The requirements of this section shall apply to all part revolution mechanical power presses used in the PSDI mode of operation.

(b) The relevant requirements of WAC 296-24-19503 through ~~((296-24-19515))~~ 296-24-19513 of this part also shall apply to all presses used in the PSDI mode of operation, whether or not cross referenced in this section. Such cross-referencing of specific requirements from WAC 296-24-19503 through ~~((296-24-19515))~~ 296-24-19513 of this part is intended only to enhance convenience and understanding in relating to the new provisions to the existing standard, and is not to be construed as limiting the applicability of other provisions in WAC 296-24-19503 through ~~((296-24-19515))~~ 296-24-19513 of this part.

(c) Full revolution mechanical power presses shall not be used in the PSDI mode of operation.

(d) Mechanical power presses with a configuration which would allow a person to enter, pass through, and become clear of the sensing field into the hazardous portion of the press shall not be used in the PSDI mode of operation.

(e) The PSDI mode of operation shall be used only for normal production operations. Die-setting and maintenance procedures shall comply with WAC 296-24-19503 through ~~((296-24-19515))~~ 296-24-19513 of this part, and shall not be done in the PSDI mode.

(2) Brake and clutch requirements.

(a) Presses with flexible steel band brakes or with mechanical linkage actuated brakes or clutches shall not be used in the PSDI mode.

(b) Brake systems on presses used in the PSDI mode shall have sufficient torque so that each average value of stopping times (Ts) for stops initiated at approximately forty-five degrees, sixty degrees, and ninety degrees, respectively, of crankshaft angular position, shall not be more than one hundred twenty-five percent of the average value of the stopping time at the top crankshaft position. Compliance with this requirement shall be determined by using the heaviest upper die to be used on the press, and operating at the fastest press speed if there is speed selection.

(c) Where brake engagement and clutch release is effected by spring action, such spring(s) shall operate in compression on a rod or within a hole or tube, and shall be of noninterleaving design.

(3) Pneumatic systems.

(a) Air valve and air pressure supply/control.

(i) The requirements of WAC 296-24-19505 (7)(m) and (n), (10), (12) and WAC 296-24-19507 (5)(c) of this part apply to the pneumatic systems of machines used in the PSDI mode.

(ii) The air supply for pneumatic clutch/brake control valves shall incorporate a filter, an air regulator, and, when necessary for proper operation, a lubricator.

(iii) The air pressure supply for clutch/brake valves on machines used in the PSDI mode shall be regulated to pressures less than or equal to the air pressure used when making the stop time measurements required by subsection (2)(b) of this section.

(b) Air counterbalance systems.

(i) Where presses that have slide counterbalance systems are used in the PSDI mode, the counterbalance system shall also meet the requirements of WAC 296-24-19505(9) of this part.

(ii) Counterbalances shall be adjusted in accordance with the press manufacturer's recommendations to assure correct counterbalancing of the slide attachment (upper die) weight for all operations performed on presses used in the PSDI mode. The adjustments shall be made before performing the stopping time measurements required by subsections (2)(b), (5)(c), and (9)(f) of this section.

(4) Flywheels and bearings. Presses whose designs incorporate flywheels running on journals on the crankshaft or back shaft, or bull gears running on journals mounted on the crankshaft, shall be inspected, lubricated, and maintained as provided in subsection (10) of this section to reduce the possibility of unintended and uncontrolled press strokes caused by bearing seizure.

(5) Brake monitoring.

(a) Presses operated in the PSDI mode shall be equipped with a brake monitor that meets the requirements of subsections (13) and (14) of this section. In addition, the brake monitor shall be adjusted during installation certification to prevent successive stroking of the press if increases in stopping time cause an increase in the safety distance above that required by subsection (9)(f) of this section.

(b) Once the PSDI safety system has been certified/validated, adjustment of the brake monitor shall not be done without prior approval of the validation organization for both the brake monitor adjustment and the corresponding adjustment of the safety distance. The validation organization shall in its installation validation, state that in what circumstances, if any, the employer has advance approval for adjustment, when prior oral approval is appropriate and when prior approval must be in writing. The adjustment shall be done under the supervision of an authorized person whose qualifications include knowledge of safety distance requirements and experience with the brake system and its adjustment. When brake wear or other factors extend press stopping time beyond the limit permitted by the brake monitor, adjustment, repair, or maintenance shall be performed on the brake or other press system element that extends the stopping time.

(c) The brake monitor setting shall allow an increase of no more than ten percent of the longest stopping time for the press, or ten milliseconds, whichever is longer, measured at the top of the stroke.

(6) Cycle control and control systems.

(a) The control system on presses used in the PSDI mode shall meet the applicable requirements of WAC 296-24-19503 (7), (8), and (13) and 296-24-19507(5) of this part.

(b) The control system shall incorporate a means of dynamically monitoring for decoupling of the rotary position indicating mechanism drive from the crankshaft. This monitor shall stop slide motion and prevent successive press strokes if decoupling occurs, or if the monitor itself fails.

(c) The mode selection means of WAC 296-24-19503 (7)(c) of this part shall have at least one position for selection of the PSDI mode. Where more than one interruption of the light sensing field is used in the initiation of a stroke, either the mode selection means must have one position for each function, or a separate selection means shall be provided which becomes operable when the PSDI mode is selected. Selection of PSDI mode and the number of interruptions/withdrawals of the light sensing field required to initiate a press cycle shall be by means capable of supervision by the employer.

(d) A PSDI set-up/reset means shall be provided which requires an overt action by the operator, in addition to PSDI mode selection, before operation of the press by means of PSDI can be started.

(e) An indicator visible to the operator and readily seen by the employer shall be provided which shall clearly indicate that the system is set-up for cycling in the PSDI mode.

(f) The control system shall incorporate a timer to deactivate PSDI when the press does not stroke within the period of time set by the timer. The timer shall be manually adjustable, to a maximum time of thirty seconds. For any timer setting greater than fifteen seconds, the adjustment shall be made by the use of a special tool available only to authorized persons. Following a deactivation of PSDI by the timer, the system shall make it necessary to reset the set-up/reset means in order to reactivate the PSDI mode.

(g) Reactivation of PSDI operation following deactivation of the PSDI mode from any other cause, such as activation of the red color stop control required by WAC 296-24-19503 (7)(d) of this part, interruption of the presence sensing field, opening of an interlock, or reselection of the number of sensing field interruptions/withdrawals required to cycle the press, shall require resetting of the set-up/reset means.

(h) The control system shall incorporate an automatic means to prevent initiation or continued operation in the PSDI mode unless the press drive motor is energized in the forward direction of crankshaft rotation.

(i) The control design shall preclude any movement of the slide caused by operation of power on, power off, or selector switches, or from checks for proper operations as required by ~~((subsection))~~ subdivision (m) of this ~~((section))~~ subsection.

(j) All components and subsystems of the control system shall be designed to operate together to provide total control system compliance with the requirements of this section.

(k) Where there is more than one operator of a press used for PSDI, each operator shall be protected by a separate, independently functioning, presence sensing device. The control system shall require that each sensing field be interrupted the selected number of times prior to initiating a stroke. Further, each operator shall be provided with a set-up/reset means that meets the requirements of this subsection, and which must be actuated to initiate operation of the press in the PSDI mode.

(l) The control system shall incorporate interlocks for supplemental guards, if used, which will prevent stroke initiation or will stop a stroke in progress if any supplemental guard fails or is deactivated.

(m) The control system shall perform checks for proper operation of all cycle control logic element switches and contacts at least once each cycle. Control elements shall be checked for correct status after power "on" and before the initial PSDI stroke.

(n) The control system shall have provisions for an "inch" operating means meeting the requirements of WAC ~~((296-24-19503 (7)(b)))~~ 296-24-19505 (7)(d) of this part. Die-setting shall not be done in the PSDI mode. Production shall not be done in the "inch" mode.

(o) The control system shall permit only a single stroke per initiation command.

(p) Controls with internally stored programs (e.g., mechanical, electro-mechanical, or electronic) shall meet the requirements of WAC 296-24-19505(13) of this part, and shall default to a predetermined safe condition in the event of any single failure within the system. Programmable controllers which meet the requirements for controls with internally stored programs stated above shall be permitted only if all logic elements affecting the safety system and point of operation safety are internally stored and protected in such a manner that they cannot be altered or manipulated by the user to an unsafe condition.

(7) Environmental requirements. Control components shall be selected, constructed, and connected together in such a way as to withstand expected operational and environmental stresses, at least including those outlined in WAC 296-24-20700. Such stresses shall not so affect the control system as to cause unsafe operation.

(8) Safety system.

(a) Mechanical power presses used in the PSDI mode shall be operated under the control of a safety system which, in addition to meeting the applicable requirements of WAC 296-24-19505(13) and 296-24-19507(5) and other applicable provisions of this part, shall function such that a single failure or single operating error shall not cause injury to personnel from point of operation hazards.

(b) The safety system shall be designed, constructed, and arranged as an integral total system, including all elements of the press, the controls, the safeguarding and any required supplemental safeguarding, and their interfaces with the operator and that part of the environment which has effect on the protection against point of operation hazards.

(9) Safeguarding the point of operation.

(a) The point of operation of presses operated in the PSDI mode shall be safeguarded in accordance with the requirements of WAC 296-24-19507 of this part, except that the safety distance requirements of (f) of this subsection shall be used for PSDI operation.

(b) PSDI shall be implemented only by use of light curtain (photo-electric) presence sensing devices which meet the requirements of WAC 296-24-19507 (3)(c)(iii) of this part unless the requirements of (c) of this subsection have been met.

(c) Alternatives to photo-electric light curtains may be used for PSDI when the employer can demonstrate, through tests and analysis by the employer or the manufacturer, that the alternative is as safe as the photo-electric light curtain, that the alternative meets the conditions of this section, has the same long-term reliability as light curtains and can be integrated into the entire safety system as provided for in this section. Prior to use, both the employer and manufacturer must certify that these requirements and all the other applicable requirements of this section are met and these certifications must be validated by an OSHA-recognized third-party validation organization to meet these additional requirements and all the other applicable requirements of WAC 296-24-19503 through ((296-24-19515)) 296-24-19513 and 296-24-20700 of this part. Three months prior to the operation of any alternative system, the employer must notify the OSHA Directorate of Safety Standards Programs of the name of the system to be installed, the manufacturer and the OSHA-recognized third-party validation organization immediately. Upon request, the employer must make available to that office all tests and analyses for OSHA review.

(d) Individual sensing fields of presence sensing devices used to initiate strokes in the PSDI mode shall cover only one side of the press.

(e) Light curtains used for PSDI operation shall have minimum object sensitivity not to exceed one and one-fourth inches (31.75 mm). Where light curtain object sensitivity is user-adjustable, either discretely or continuously, design features shall limit the minimum object sensitivity adjustment not to exceed one and one-fourth inches (31.75 mm). Blanking of the sensing field is not permitted.

(f) The safety distance (Ds) from the sensing field of the presence sensing device to the point of operation shall be greater than or equal to the distance determined by the formula:

$$Ds = Hs(Ts + Tp + Tr + 2Tm) + Dp$$

Where:

Ds = Minimum safety distance.

Hs = Hand speed constant of sixty-three inches per second (1.6 m/s).

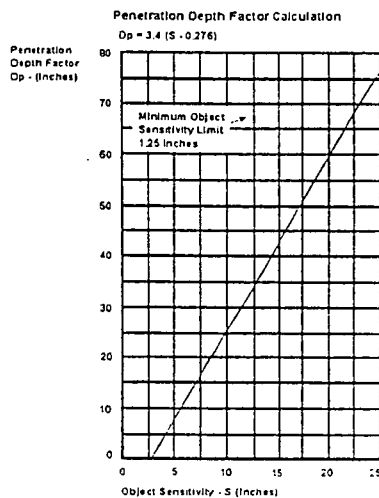
Ts = Longest press stopping time, in seconds, computed by taking averages of multiple measurements at each of three positions (forty-five degrees, sixty degrees, and ninety degrees) of crankshaft angular position; the longest of the three averages is the stopping time to use. (Ts is defined as the sum of the kinetic energy dissipation time plus the pneumatic/magnetic/hydraulic reaction time of the clutch/brake operating mechanism(s).)

Tp = Longest presence sensing device response time, in seconds.

Tr = Longest response time, in seconds, of all interposing control elements between the presence sensing device and the clutch/brake operating mechanism(s).

Tm = Increase in the press stopping time at the top of the stroke, in seconds, allowed by the brake monitor for brake wear. The time increase allowed shall be limited to no more than ten percent of the longest press stopping time measured at the top of the stroke, or ten milliseconds, whichever is longer.

Dp = Penetration depth factor, required to provide for possible penetration through the presence sensing field by fingers or hand before detection occurs. The penetration depth factor shall be determined from Graph A-1 using the minimum object sensitivity size.



(g) The presence sensing device location shall either be set at each tool change and set-up to provide at least the minimum safety distance, or fixed in location to provide a safety distance greater than or equal to the minimum safety distance for all tooling set-ups which are to be used on that press.

(h) Where presence sensing device location is adjustable, adjustment shall require the use of a special tool available only to authorized persons.

(i) Supplemental safeguarding shall be used to protect all areas of access to the point of operation which are unprotected by the PSDI presence sensing device. Such supplemental safeguarding shall consist of either additional light curtain (photo-electric) presence sensing devices or other types of guards which meet the requirements of WAC 296-24-19507 and ((296-24-19515)) 296-24-19513 of this part.

((A)) (i) Presence sensing devices used as supplemental safeguarding shall not initiate a press stroke, and shall conform to the requirements of WAC 296-24-19507 (3)(c) and other applicable provisions of this part, except that the safety distance shall comply with (f) of this subsection.

((B)) (ii) Guards used as supplemental safeguarding shall conform to the design, construction and application requirements of WAC 296-24-19507(2) of this part, and shall be interlocked with the press control to prevent press

PERMANENT



PSDI operation if the guard fails, is removed, or is out of position.

(j) Barriers shall be fixed to the press frame or bolster to prevent personnel from passing completely through the sensing field, where safety distance or press configuration is such that personnel could pass through the PSDI presence sensing field and assume a position where the point of operation could be accessed without detection by the PSDI presence sensing device. As an alternative, supplemental presence sensing devices used only in the safeguard mode may be provided. If used, these devices shall be located so as to detect all operator locations and positions not detected by the PSDI sensing field, and shall prevent stroking or stop a stroke in process when any supplemental sensing field(s) are interrupted.

(k) Hand tools. Where tools are used for feeding, removal of scrap, lubrication of parts, or removal of parts that stick on the die in PSDI operations:

(i) The minimum diameter of the tool handle extension shall be greater than the minimum object sensitivity of the presence sensing device(s) used to initiate press strokes; or

(ii) The length of the hand tool shall be such as to ensure that the operator's hand will be detected for any safety distance required by the press set-ups.

(10) Inspection and maintenance.

(a) Any press equipped with presence sensing devices for use in PSDI, or for supplemental safeguarding on presses used in the PSDI mode, shall be equipped with a test rod of diameter specified by the presence sensing device manufacturer to represent the minimum object sensitivity of the sensing field. Instructions for use of the test rod shall be noted on a label affixed to the presence sensing device.

(b) The following checks shall be made at the beginning of each shift and whenever a die change is made.

(i) A check shall be performed using the test rod according to the presence sensing device manufacturer's instructions to determine that the presence sensing device used for PSDI is operational.

(ii) The safety distance shall be checked for compliance with subsection (9)(f) of this section.

(iii) A check shall be made to determine that all supplemental safeguarding is in place. Where presence sensing devices are used for supplemental safeguarding, a check for proper operation shall be performed using a test rod according to the presence sensing device manufacturer's instructions.

(iv) A check shall be made to assure that the barriers and/or supplemental presence sensing devices required by subsection (9)(j) of this section are operating properly.

(v) A system or visual check shall be made to verify correct counterbalance adjustment for die weight according to the press manufacturer's instructions, when a press is equipped with a slide counterbalance system.

(c) When presses used in the PSDI mode have flywheel or bullgear running on crankshaft mounted journals and bearings, or a flywheel mounted on back shaft journals and bearings, periodic inspections following the press manufacturer's recommendations shall be made to ascertain that bearings are in good working order, and that automatic lubrication systems for these bearings (if automatic lubrication is provided) are supplying proper lubrication. On presses with provision for manual lubrication of flywheel or

bullgear bearings, lubrication shall be provided according to the press manufacturer's recommendations.

(d) Periodic inspections of clutch and brake mechanisms shall be performed to assure they are in proper operating condition. The press manufacturer's recommendations shall be followed.

(e) When any check of the press, including those performed in accordance with the requirements of (b), (c), or (d) of this subsection, reveals a condition of noncompliance, improper adjustment, or failure, the press shall not be operated until the condition has been corrected by adjustment, replacement, or repair.

(f) It shall be the responsibility of the employer to ensure the competence of personnel caring for, inspecting, and maintaining power presses equipped for PSDI operation, through initial and periodic training.

(11) Safety system certification/validation.

(a) Prior to the initial use of any mechanical press in the PSDI mode, two sets of certification and validation are required:

(i) The design of the safety system required for the use of a press in the PSDI mode shall be certified and validated prior to installation. The manufacturer's certification shall be validated by an OSHA-recognized third-party validation organization to meet all applicable requirements of WAC 296-24-19503 through ((296-24-19515)) 296-24-19513 and 296-24-20700 of this part.

(ii) After a press has been equipped with a safety system whose design has been certified and validated in accordance with (a) of this subsection, the safety system installation shall be certified by the employer, and then shall be validated by an OSHA-recognized third-party validation organization to meet all applicable requirements of WAC 296-24-19503 through ((296-24-19515)) 296-24-19513 and 296-24-20700 of this part.

(b) At least annually thereafter, the safety system on a mechanical power press used in the PSDI mode shall be recertified by the employer and revalidated by an OSHA-recognized third-party validation organization to meet all applicable requirements of WAC 296-24-19503 through ((296-24-19515)) 296-24-19513 and 296-24-20700 of this part. Any press whose safety system has not been recertified and revalidated within the preceding twelve months shall be removed from service in the PSDI mode until the safety system is recertified and revalidated.

(c) A label shall be affixed to the press as part of each installation certification/validation and the most recent recertification/revalidation. The label shall indicate the press serial number, the minimum safety distance (Ds) required by subsection (9)(f) of this section, the fulfillment of design certification/validation, the employer's signed certification, the identification of the OSHA-recognized third-party validation organization, its signed validation, and the date the certification/validation and recertification/revalidation are issued.

(d) Records of the installation certification and validation and the most recent recertification and revalidation shall be maintained for each safety system equipped press by the employer as long as the press is in use. The records shall include the manufacture and model number of each component and subsystem, the calculations of the safety distance as required by subsection (9)(f) of this section, and the stopping



time measurements required by subsection (2)(b) of this section. The most recent records shall be made available to OSHA/WISHA upon request.

(e) The employer shall notify the OSHA-recognized third-party validation organization within five days whenever a component or a subsystem of the safety system fails or modifications are made which may affect the safety of the system. The failure of a critical component shall necessitate the removal of the safety system from service until it is recertified and revalidated, except recertification by the employer without revalidation is permitted when a noncritical component or subsystem is replaced by one of the same manufacture and design as the original, or determined by the third-party validation organization to be equivalent by similarity analysis, as set forth in WAC 296-24-20700.

(f) The employer shall notify the OSHA-recognized third-party validation organization within five days of the occurrence of any point of operation injury while a press is used in the PSDI mode. This is in addition to the report of injury required by ~~((WAC 296-24-19515 of this part))~~ chapter 296-27 WAC; however, a copy of that report may be used for this purpose.

(12) Die setting and work set-up.

(a) Die setting on presses used in the PSDI mode shall be performed in accordance with WAC 296-24-19509.

(b) The PSDI mode shall not be used for die setting or set-up. An alternative manual cycle initiation and control means shall be supplied for use in die setting which meets the requirements of WAC 296-24-19505(7).

(c) Following a die change, the safety distance, the proper application of supplemental safeguarding, and the slide counterbalance adjustment (if the press is equipped with a counterbalance) shall be checked and maintained by authorized persons whose qualifications include knowledge of the safety distance, supplemental safeguarding requirements, and the manufacturer's specifications for counterbalance adjustment. Adjustment of the location of the PSDI presence sensing device shall require use of a special tool available only to the authorized persons.

(13) Operator training.

(a) The operator training required by WAC 296-24-19513(2) shall be provided to the employee before the employee initially operates the press and as needed to maintain competence, but not less than annually thereafter. It shall include instruction relative to the following items for presses used in the PSDI mode.

(i) The manufacturer's recommended test procedures for checking operation of the presence sensing device. This shall include the use of the test rod required by subsection (10)(a) of this section.

(ii) The safety distance required.

(iii) The operation, function, and performance of the PSDI mode.

(iv) The requirements for handtools that may be used in the PSDI mode.

(v) The severe consequences that can result if the operator attempts to circumvent or by-pass any of the safeguard or operating functions of the PSDI system.

(b) The employer shall certify that employees have been trained by preparing a certification record which includes the identity of the person trained, the signature of the employer or the person who conducted the training, and the date the

training was completed. The certification record shall be prepared at the completion of training and shall be maintained on file for the duration of the employee's employment. The certification record shall be made available upon request to the Assistant Secretary for Occupational Safety and Health or the designated representative of the director.

AMENDATORY SECTION (Amending Order 76-6, filed 3/1/76)

**WAC 296-24-20003 General requirements.** (1) Use of lead. The safety requirements of this section apply to lead casts or other use of lead in the forge shop or die shop.

(a) Thermostatic control of heating elements shall be provided to maintain proper melting temperature and prevent overheating.

(b) Fixed or permanent lead pot installations shall be exhausted.

(c) Portable units shall be used only in areas where good, general room ventilation is provided as specified in the general occupational health standards, chapter 296-62 WAC.

(d) Personal protective equipment (gloves, goggles, aprons, and other items) shall be worn.

(e) A covered container shall be provided to store dross skimmings.

(f) Equipment shall be kept clean, particularly from accumulations of yellow lead oxide.

(2) Inspection and maintenance. It shall be the responsibility of the employer to maintain all forge shop equipment in a condition which will insure continued safe operation. This responsibility includes:

(a) Establishing periodic and regular maintenance safety checks and keeping records of these inspections.

(b) Scheduling and recording inspection of guards and point of operation protection devices at frequent and regular intervals.

(c) Training personnel for the proper inspection and maintenance of forging machinery and equipment.

(d) All overhead parts shall be fastened or protected in such a manner that they will not fly off or fall in event of failure.

(3) Hammers and presses.

(a) All hammers shall be positioned or installed in such a manner that they remain on or are anchored to foundations sufficient to support them.

(b) All presses shall be installed in such a manner that they remain where they are positioned or they are anchored to foundations sufficient to support them.

(c) Means shall be provided for disconnecting the power to the machine and for locking out or rendering cycling controls inoperable.

(d) The ram shall be blocked when dies are being changed or other work is being done on the hammer. Blocks or wedges shall be made of material the strength and construction of which should meet or exceed the specifications and dimensions shown in Table O-11.

(e) Tongs shall be of sufficient length to clear the body of the worker in case of kickback, and shall not have sharp handle ends. The worker should be instructed in the proper body position when using tongs. Tongs should be checked periodically to see that they remain at the proper hardness level for the job. When rings or equivalent devices for

locking tongs are used they should be inspected periodically to insure safe condition.

(f) Oil swabs, or scale removers, or other devices to remove scale shall be provided. These devices shall be long enough to enable ~~((a man))~~ the employee to reach the full length of the die without placing ~~((his))~~ a hand or arm between the dies.

(g) Material handling equipment shall be of adequate strength, size, and dimension to handle diesetting operations safely.

(h) A scale guard of substantial construction shall be provided at the back of every hammer, so arranged as to stop flying scale.

(i) A scale guard of substantial construction shall be provided at the back of every press, so arranged as to stop flying scale.

**AMENDATORY SECTION** (Amending Order 73-5, filed 5/9/73 and Order 73-4, filed 5/7/73)

**WAC 296-24-20511 Belt, rope, and chain drives.** (1) Horizontal belts and ropes.

(a) Where both runs of horizontal belts are seven feet or less from the floor level, the guard shall extend to at least fifteen inches above the belt or to a standard height (see Table O-12), except that where both runs of a horizontal belt are 42 inches or less from the floor, the belt shall be fully enclosed in accordance with WAC 296-24-20527 and 296-24-20531.

(b) In powerplants or powerdevelopment rooms, a guardrail may be used in lieu of the guard required by (1)(a) of this section.

(2) Overhead horizontal belts.

(a) Overhead horizontal belts, with lower parts seven feet or less from the floor or platform, shall be guarded on sides and bottom in accordance with WAC 296-24-20531(3).

(b) Horizontal overhead belts more than seven feet above floor or platform shall be guarded for their entire length under the following conditions:

(i) If located over passageways or work places and traveling 1,800 feet or more per minute.

(ii) If center to center distance between pulleys is ten feet or more.

(iii) If belt is eight inches or more in width.

(c) Where the upper and lower runs of horizontal belts are so located that passage of persons between them would be possible, the passage shall be either:

(i) Completely barred by a guardrail or other barrier in accordance with WAC 296-24-20527 and 296-24-20531; or

(ii) Where passage is regarded as necessary, there shall be a platform over the lower run guarded on either side by a railing completely filled in with wire mesh or other filler, or by a solid barrier. The upper run shall be so guarded as to prevent contact therewith either by the worker or by objects carried by ~~((him))~~ the worker. In powerplants only the lower run of the belt need be guarded.

(d) Overhead chain and link belt drives are governed by the same rules as overhead horizontal belts and shall be guarded in the same manner as belts.

(e) American or continuous system rope drives so located that the condition of the rope (particularly the splice) cannot be constantly and conveniently observed, shall be

equipped with a telltale device (preferably electric-bell type) that will give warning when rope begins to fray.

(3) Vertical and inclined belts.

(a) Vertical and inclined belts shall be enclosed by a guard conforming to standards in WAC 296-24-20527 and 296-24-20531.

(b) All guards for inclined belts shall be arranged in such a manner that a minimum clearance of seven feet is maintained between belt and floor at any point outside of guard.

(4) Vertical belts. Vertical belts running over a lower pulley more than seven feet above floor or platform shall be guarded at the bottom in the same manner as horizontal overhead belts, if conditions are as stated in (2)(b)(i) and (iii) of this section.

(5) Cone-pulley belts.

(a) The cone belt and pulley shall be equipped with a belt shifter so constructed as to adequately guard the nip point of the belt and pulley. If the frame of the belt shifter does not adequately guard the nip point of the belt and pulley, the nip point shall be further protected by means of a vertical guard placed in front of the pulley and extending at least to the top of the largest step of the cone.

(b) If the belt is of the endless type or laced with rawhide laces, and a belt shifter is not desired, the belt will be considered guarded if the nip point of the belt and pulley is protected by a nip point guard located in front of the cone extending at least to the top of the largest step of the cone, and formed to show the contour of the cone in order to give the nip point of the belt and pulley the maximum protection.

(c) If the cone is located less than 3 feet from the floor or working platform, the cone pulley and belt shall be guarded to a height of 3 feet regardless of whether the belt is endless or laced with rawhide.

(6) Belt tighteners.

(a) Suspended counterbalanced tighteners and all parts thereof shall be of substantial construction and securely fastened; the bearings shall be securely capped. Means must be provided to prevent tightener from falling, in case the belt breaks.

(b) Where suspended counterweights are used and not guarded by location, they shall be so encased as to prevent accident.

(c) Belt tighteners, used for starting and stopping machinery, other than those which are securely held in "off" or "out of service" position by gravity, shall be provided with means or mechanism that will securely hold the belt tightener away from the belt when the machine or part thereof driven by the belt is not in use. Such means or mechanism shall be automatic in its action in gripping, latching or otherwise fastening itself to and holding the belt tightener in "off" or "out of service" position until manually released. (Released by hand.)

(d) Counterbalanced belt tighteners and all parts thereof shall be of substantial construction, and securely fastened. The bearings shall be securely capped. If exposed to contact, means shall be installed to catch the belt tightener, to prevent tightener from falling on any person below, should the belt break or throw the tightener.

AMENDATORY SECTION (Amending Order 76-6, filed 3/1/76)**WAC 296-24-20525 Belt shifters, clutches, shippers, poles, perches, and fasteners.** (1) Belt shifters.

(a) Tight and loose pulleys on all installations made on or after August 27, 1971, shall be equipped with a permanent belt shifter provided with mechanical means to prevent belt from creeping from loose to tight pulley. It is recommended that old installations be changed to conform to this rule.

(b) Belt shifter and clutch handles shall be rounded and be located as far as possible from danger of accidental contact, but within easy reach of the operator. Where belt shifters are not directly located over a machine or bench, the handles shall be cut off six feet six inches above floor level.

(c) All belt and clutch shifters of the same type in each shop should move in the same direction to stop machines, i.e., either all right or all left. This does not apply to friction clutch on countershaft carrying two clutch pulleys with open and crossed belts, respectively. In this case the shifter handle has three positions and the machine is at a standstill when clutch handle is in the neutral or center position.

(2) Belt shippers and shipper poles. The use of belt poles as substitutes for mechanical shifters is not recommended. Where necessity compels their use, they shall be of sufficient size to enable (~~(workmen)~~) workers to grasp them securely. (A two-inch diameter or 1 1/2 by 2 inches cross-section is suggested.) Poles shall be smooth and preferably of straight grain hardwood, such as ash or hickory. The edges of rectangular poles should be rounded. Poles should extend from the top of the pulley to within about forty inches of floor or working platform.

(3) Belt perches. Where loose pulleys or idlers are not practicable, belt perches in form of brackets, rollers, etc., shall be used to keep idle belts away from the shafts. Perches should be substantial and designed for the safe shifting of belts.

(4) Belt fasteners. Belts which of necessity must be shifted by hand and belts within seven feet of the floor or working platform which are not guarded in accordance with WAC 296-24-20527 shall not be fastened with metal in any case, nor with any other fastening which by construction or wear will constitute an accident hazard.

AMENDATORY SECTION (Amending Order 74-27, filed 5/7/74)

**WAC 296-24-21515 Conveyors.** Conveyors shall be constructed operated and maintained in accordance with the provisions of ANSI B 20.1-1957. The following additional provisions shall also apply where applicable.

(1) When the return strand of a conveyor operates within seven feet of the floor there shall be a trough provided of sufficient strength to carry the weight resulting from a broken chain.

(2) If the strands are over a passageway a means shall be provided to catch and support the ends of the chain in the event of a break.

(3) When the working strand of a conveyor crosses within three feet of the floor level in passageways, the trough in which it works shall be bridged the full width of the passageway.

(4) Whenever conveyors pass adjacent to or over working areas or passageways used by personnel, protective guards shall be installed. These guards shall be designed to catch and hold any load or materials which may fall off or become dislodged and injure a worker.

(5) Walking on rolls prohibited. Employees shall not be allowed to walk on the rolls of roller-type conveyors except for emergency.

(6) Guarding shaftway and material entrances of elevator type conveyors. Guards, screens or barricades of sufficient strength and size to prevent material from falling shall be installed on all sides of the shaftway of elevator-type conveyors except at openings where material is loaded or unloaded. Automatic shaftway gates or suitable barriers shall be installed at each floor level where material is loaded or unloaded from the platform.

(7) Emergency conveyor stops. Conveyors shall be provided with an emergency stopping device which can be reached from the conveyor. Such device shall be located near the material entrance to each barker, chipper, saw, or similar type of equipment except where the conveyor leading into such equipment is under constant control of an operator who has full view of the material entrance and is located where (~~(he)~~) the operator cannot possibly fall onto the conveyor.

(8) Safe access to conveyors. Where conveyors are in excess of 7' in height, means shall be provided to safely permit essential inspection and maintenance operations.

(9) Worn parts. Any part showing signs of significant wear shall be inspected carefully and replaced prior to reaching a condition where it may create a hazard.

(10) Replacement of parts. Replacement parts shall be equal to or exceed the manufacturer's specifications.

AMENDATORY SECTION (Amending Order 86-02, filed 1/17/86)

**WAC 296-24-21705 Employee training.** (1) The employer shall provide a program to train all employees who service rim wheels in the hazards involved in servicing those rim wheels and the safety procedures to be followed.

(a) The employer shall assure that no employee services any rim wheel unless the employee has been trained and instructed in correct procedures of servicing the type of wheel being serviced, and in the safe operating procedures described in WAC 296-24-21711 and 296-24-21713.

(b) Information to be used in the training program shall include, at a minimum, the applicable data contained in the charts (rim manuals) and the contents of this standard.

(c) Where an employer knows or has reason to believe that any (~~(of his)~~) employee(~~(s)~~) is unable to read and understand the charts or rim manual, the employer shall assure that the employee is instructed concerning the contents of the charts and rim manual in a manner which the employee is able to understand.

(2) The employer shall assure that each employee demonstrates and maintains the ability to service rim wheels safely, including performance of the following tasks:

(a) Demounting of tires (including deflation);

(b) Inspection and identification of the rim wheel components;

(c) Mounting of tires (including inflation with a restraining device or other safeguard required by this section);

(d) Use of the restraining device or barrier, and other equipment required by this section;

(e) Handling of rim wheels;

(f) Inflation of the tire when a single-piece rim wheel is mounted on a vehicle;

(g) An understanding of the necessity of standing outside the trajectory both during inflation of the tire and during inspection of the rim wheel following inflation; and

(h) Installation and removal of rim wheels.

(3) The employer shall evaluate each employee's ability to perform these tasks and to service rim wheels safely, and shall provide additional training as necessary to assure that each employee maintains his or her proficiency.

**AMENDATORY SECTION** (Amending Order 86-02, filed 1/17/86)

**WAC 296-24-21711 Safe operating procedure—Multi-piece rim wheels.** The employer shall establish a safe operating procedure for servicing multi-piece rim wheels and shall assure that employees are instructed in and follow that procedure. The procedure shall include at least the following elements:

(1) Tires shall be completely deflated before demounting by removal of the valve core.

(2) Tires shall be completely deflated by removing the valve core, before a rim wheel is removed from the axle in either of the following situations:

(a) When the tire has been driven underinflated at eighty percent or less of its recommended pressure, or

(b) When there is obvious or suspected damage to the tire or wheel components.

(3) Rubber lubricant shall be applied to bead and rim mating surfaces during assembly of the wheel and inflation of the tire, unless the tire or wheel manufacturer recommends against it.

(4) If a tire on a vehicle is underinflated but has more than eighty percent of the recommended pressure, the tire may be inflated while the rim wheel is on the vehicle provided remote control inflation equipment is used, and no employees remain in the trajectory during inflation.

(5) Tires shall be inflated outside a restraining device only to a pressure sufficient to force the tire bead onto the rim ledge and create an airtight seal with the tire and bead.

(6) Whenever a rim wheel is in a restraining device the employee shall not rest or lean any part of ~~((his))~~ the body or equipment on or against the restraining device.

(7) After tire inflation, the tire and wheel components shall be inspected while still within the restraining device to make sure that they are properly seated and locked. If further adjustment to the tire or wheel components is necessary, the tire shall be deflated by removal of the valve core before the adjustment is made.

(8) No attempt shall be made to correct the seating of side and lock rings by hammering, striking or forcing the components while the tire is pressurized.

(9) Cracked, broken, bent or otherwise damaged rim components shall not be reworked, welded, brazed, or otherwise heated.

(10) Whenever multi-piece rim wheels are being handled, employees shall stay out of the trajectory unless the employer can demonstrate that performance of the servicing makes the employee's presence in the trajectory necessary.

(11) No heat shall be applied to a multi-piece wheel or wheel component.

**AMENDATORY SECTION** (Amending Order 76-29, filed 9/30/76)

**WAC 296-24-233 Motor vehicle trucks and trailers.**

(1) Only qualified drivers shall be permitted to operate motor vehicle trucks, and shall possess a current motor vehicle operator's license.

(2) Motor vehicle trucks must be equipped with brakes which will safely hold the maximum load on maximum grades.

(3) Trailers must be equipped with good, workable air brakes, or other type of brake equipment approved by the state commission on equipment. Air must be cut into the trailer brake system at the time that the trailer is coupled to the truck.

(4) Brakes on trucks and trailers must be tested before equipment descends a steep grade.

(5) Truck drivers shall at all times operate equipment at a safe speed for roadway conditions.

(6) Safe methods of loading and unloading motor vehicle trucks and trailers shall be observed at all times.

(7) To prevent accidents during the backing of trucks where vision is obstructed, a ~~((signalman))~~ signalperson shall be stationed at a point giving ~~((him))~~ a clear view of the rear of the truck and the operator of the truck at all times.

(8) Truck drivers shall sound their horn before starting to back, and shall sound the horn intermittently during the entire backing operation.

(9) Dump trucks shall have a device installed on the frame which will be of sufficient strength to hold the bed in the raised position when employees are working in an exposed position underneath.

(10) All parts and accessories of trucks and trailers shall be kept in good repair and safe condition. Tires worn beyond the point of safety shall not be used.

(11) All motor vehicle trucks and trailers shall be equipped with standard lights, horn, flags, flares, etc., to conform to the state of Washington motor vehicles laws.

(12) All loads transported on trucks and/or trucks and trailers shall be properly secured and distributed, and limited to a safe operating load for the condition of the roadway, and the capacity of the bridges, trestles, and other structures.

(13) Precautions to be taken while inflating tires. Unmounted split-rim wheels shall be placed in a safety cage or other device shall be used which will prevent a split-rim from striking the worker if it should dislodge while the tire is being inflated.

(14) Trucks parked on an incline shall have the steered wheels turned into the curb and shall have at least one "driver" wheel chocked on each side, independent of the braking system.

(15) Motor vehicles used regularly for transportation of ~~((workmen))~~ workers shall be well equipped, covered against the weather and maintained in good mechanical condition at all times.

(a) Seats, which shall be properly secured, shall be provided in each vehicle to accommodate the total number of workers normally transported. Where it becomes necessary under emergency conditions to transport more workers than the seating capacity of the truck will accommodate, all workers not having seats shall ride within the vehicle. Under no circumstances shall workers ride on fenders or running boards of the vehicle.

(b) No workers shall ride in or on any vehicle with ~~((his))~~ legs hanging over the end or sides. A safety bar should be placed across the rear opening of all ~~((manhaul))~~ trucks carrying workers which are not equipped with tail gates.

(c) Vehicles shall be equipped with compartments or screen of such strength to retain sharp tools which could present a hazard to employees being transported.

(d) All dump-trucks used to transport workers shall be equipped with an adequate safety chain or locking device which will eliminate the possibility of the body of the truck being raised while workers are riding in the truck.

(e) Explosives or highly inflammable materials shall not be carried in or on any vehicle while it is used to transport workers.

(f) Exhaust systems shall be installed and maintained in proper condition, and shall be so designed as to eliminate the exposure of the workers to the exhaust gases and fumes.

(g)(i) The number of persons allowed in the cab of a single bench seat crew truck shall not exceed two in addition to the driver. Crew trucks designed and constructed with additional seating capacity behind the normal driver's seat may carry additional passengers in the seating area behind the driver's seat. Crew trucks with bucket-type seats may carry only the number of passengers for which the bucket seats are provided. In any seating arrangement, the driver must be able to maintain full freedom of motion. Additionally, the number of passengers or seating arrangement shall not obstruct the driver's normal vision.

(ii) When trucks are designed and constructed with larger than normal seating capacity in the front seat, the total number of passengers may be increased provided that the operator's vision and control functions, as required in (15)(g)(i), are maintained.

(h) All enclosed crew trucks shall have an emergency exit in addition to the regular entrance.

(i) Trucks used for hauling gravel shall not be used as crew trucks unless they are equipped as follows:

(i) Steps in proper place or places.

(ii) Wooden floors.

(iii) Seats are securely fastened.

(iv) Truck is properly covered.

(v) All other general regulations covering crew trucks are fully conformed with.

(j) Half-ton vehicles shall haul not more than six persons including driver. Three-quarter-ton vehicles shall haul not more than eight persons including driver.

(k) All vehicles carrying crews shall be equipped with stretchers and fire extinguishers.

(l) No heating units in which there are open fires shall be used in vehicles transporting crews.

AMENDATORY SECTION (Amending Order 74-27, filed 5/7/74)

**WAC 296-24-23503 General requirements.** (1) Application. This section applies to overhead and gantry cranes, including semigantry, cantilever gantry, wall cranes, storage bridge cranes, and others having the same fundamental characteristics. These cranes are grouped because they all have trolleys and similar travel characteristics.

(2) New and existing equipment. All new overhead and gantry cranes constructed and installed on or after the effective date of these standards, shall meet the design specifications of the American National Standards Institute, Safety Code for Overhead and Gantry Cranes, ANSI B30.2.0-1967. Overhead and gantry cranes constructed before the effective date of these standards, should be modified to conform to those design specifications, unless it can be shown that the crane cannot feasibly or economically be altered and that the crane substantially complies with the requirements of this section. (See WAC 296-24-010 variance and procedure.)

(3) Modifications. Cranes may be modified and rerated provided such modifications and the supporting structure are checked thoroughly for the new rated load by a qualified engineer or the equipment manufacturer. The crane shall be tested in accordance with WAC 296-24-23521(2). New rated load shall be displayed in accordance with (5) of this section.

(4) Wind indicators and rail clamps.

(a) Outdoor storage bridges shall be provided with automatic rail clamps. A wind-indicating device shall be provided which will give a visible or audible alarm to the bridge operator at a predetermined wind velocity. If the clamps act on the rail heads, any beads or weld flash on the rail heads shall be ground off.

~~((a))~~ (b) Calculations for wind pressure on outside overhead traveling cranes shall be based on not less than 30 pounds per square foot of exposed surface.

(5) Rated load marking. The rated load of the crane shall be plainly marked on each side of the crane, and if the crane has more than one hoisting unit, each hoist shall have its rated load marked on it or its load block and this marking shall be clearly legible from the ground or floor.

(6) Clearance from obstruction.

(a) Minimum clearance of 3 inches overhead and 2 inches laterally shall be provided and maintained between crane and obstructions in conformity with Specification No. 61 Crane Manufacturers Association of America, Inc., ~~((Thomas Circle NW, Washington, D.C. 20005))~~ 8720 Red Oak Blvd., Suite 201, Charlotte, NC 28217.

(b) Where passageways or walkways are provided obstructions shall not be placed so that safety of personnel will be jeopardized by movements of the crane.

(7) Clearance between parallel cranes. If the runways of two cranes are parallel, and there are no intervening walls or structure, there shall be adequate clearance provided and maintained between the two bridges.

(8) Designated personnel. Only designated personnel shall be permitted to operate a crane covered by this section.

AMENDATORY SECTION (Amending Order 73-5, filed 5/9/73 and Order 73-4, filed 5/7/73)**WAC 296-24-23505 Cabs.** (1) Cab location.

(a) The general arrangement of the cab and the location of control and protective equipment shall be such that all operating handles are within convenient reach of the operator when facing the area to be served by the load hook, or while facing the direction of travel of the cab. The arrangement shall allow the operator a full view of the load hook in all positions.

(b) The cab shall be located to afford a minimum of 3 inches clearance from all fixed structures within its area of possible movement.

(c) The clearance of the cab above the working floor or passageway should be not less than seven feet.

(2) Access to crane. Access to the cab and/or bridge walkway shall be by a conveniently placed fixed ladder, stairs, or platform, requiring no step over any gap exceeding 12 inches. Fixed ladders shall be in conformance with the American National Standards Institute, Safety Code for Fixed Ladders, ANSI A14.3-1956.

(3) Fire extinguisher. A carbon dioxide, dry-chemical, or equivalent hand fire extinguisher should be kept in the cab. Carbon tetrachloride extinguishers shall not be used.

(4) Lighting. Light in the cab shall be sufficient to enable the operator to see clearly enough to perform ~~((his))~~ the work.

AMENDATORY SECTION (Amending Order 73-5, filed 5/9/73 and Order 73-4, filed 5/7/73)**WAC 296-24-23507 Footwalks and ladders.** (1) Location of footwalks.

(a) If sufficient headroom is available on cab-operated cranes, a footwalk shall be provided on the drive side along the entire length of the bridge of all cranes having the trolley running on the top of the girders. To give sufficient access to the opposite side of the trolley, there should be provided either a footwalk mounted on the trolley, a suitable footwalk or platform in the building, or a footwalk on the opposite side of the crane at least twice the length of the trolley.

(b) Footwalks should be located to give a headroom not less than 78 inches. In no case shall less than 48 inches be provided. If 48 inches of headroom cannot be provided, footwalks should be omitted from the crane and a stationary platform or landing stage built for ~~((workmen))~~ workers making repairs.

(2) Construction of footwalks.

(a) Footwalks shall be of rigid construction and designed to sustain a distributed load of at least 50 pounds per square foot.

(b) Footwalks shall have a walking surface of antislip type.

Note: Wood will meet this requirement.

(c) Footwalks should be continuous and permanently secured.

(d) Footwalks should have a clear passageway at least 18 inches wide except opposite the bridge motor, where they should be not less than 15 inches. The inner edge shall extend at least to the line of the outside edge of the lower cover plate or flange of the girder.

(3) Toeboards and handrails for footwalks. Toeboards and handrails shall be in compliance with WAC 296-24-750 through 296-24-75011.

(4) Ladders and stairways.

(a) Gantry cranes shall be provided with ladders or stairways extending from the ground to the footwalk or cab platform.

(b) Stairways shall be equipped with rigid and substantial metal handrails. Walking surfaces shall be of an antislip type.

(c) Ladders shall be permanently and securely fastened in place and shall be constructed in compliance with WAC 296-24-810 through 296-24-81011.

AMENDATORY SECTION (Amending Order 73-5, filed 5/9/73 and Order 73-4, filed 5/7/73)

**WAC 296-24-23523 Maintenance.** (1) Preventive maintenance. A preventive maintenance program based on the crane manufacturer's recommendations shall be established.

(2) Maintenance procedure.

(a) Before adjustments and repairs are started on a crane the following precautions shall be taken:

(i) The crane to be repaired shall be run to a location where it will cause the least interference with other cranes and operations in the area.

(ii) All controllers shall be at the off position.

(iii) The main or emergency switch shall be open and locked in the open position.

(iv) Warning or "out of order" signs shall be placed on the crane, also on the floor beneath or on the hook where visible from the floor.

(v) Where other cranes are in operation on the same runway, rail stops or other suitable means shall be provided to prevent interference with the idle crane.

(vi) Where temporary protective rail stops are not available, or practical, a ~~((signalman))~~ signalperson should be placed at a visual vantage point for observing the approach of an active crane and warning its operator when reaching the limit of safe distance from the idle crane.

(b) After adjustments and repairs have been made the crane shall not be operated until all guards have been reinstalled, safety devices reactivated and maintenance equipment removed.

(3) Adjustments and repairs.

(a) Any unsafe conditions disclosed by the inspection requirements of WAC 296-24-23519 shall be corrected before operation of the crane is resumed. Adjustments and repairs shall be done only by designated personnel.

(b) Adjustments shall be maintained to assure correct functioning of components. The following are examples:

(i) All functional operating mechanisms.

(ii) Limit switches.

(iii) Control systems.

(iv) Brakes.

(v) Power plants.

(c) Repairs or replacements shall be provided promptly as needed for safe operation. The following are examples:

(i) Accessory components, such as hooks, shall be carefully examined periodically and at the time of annual examination and inspection. Cracked or deformed hooks

shall be discarded immediately and not reused on any equipment subject to the provisions of this code.

(ii) Load attachment chains and rope slings showing defects described in WAC 296-24-23519 (2)(d) and (e) respectively.

(iii) All critical parts which are cracked, broken, bent, or excessively worn.

(iv) Pendant control stations shall be kept clean and function labels kept legible.

**AMENDATORY SECTION** (Amending Order 73-5, filed 5/9/73 and Order 73-4, filed 5/7/73)

**WAC 296-24-23527 Handling the load.** (1) Size of load. The crane shall not be loaded beyond its rated load except for test purposes as provided in WAC 296-24-23521.

(2) Attaching the load.

(a) The hoist chain or hoist rope shall be free from kinks or twists and shall not be wrapped around the load.

(b) The load shall be attached to the load block hook by means of slings or other approved devices.

(c) Care shall be taken to make certain that the sling clears all obstacles.

(3) Moving the load.

(a) The load shall be well secured and properly balanced in the sling or lifting device before it is lifted more than a few inches.

(b) Before starting to hoist the following conditions shall be noted:

(i) Hoist rope shall not be kinked.

(ii) Multiple part lines shall not be twisted around each other.

(iii) The hook shall be brought over the load in such a manner as to prevent swinging.

(c) During hoisting care shall be taken that:

(i) There is no sudden acceleration or deceleration of the moving load.

(ii) The load does not contact any obstructions.

(d) Cranes shall not be used for side pulls except when specifically authorized by a responsible person who has determined that the stability of the crane is not thereby endangered and that various parts of the crane will not be overstressed.

(e) While any employee is on the load or hook, there shall be no hoisting, lowering, or traveling.

(f) The employer shall require that the operator avoid carrying loads over people.

(g) The operator shall test the brakes each time a load approaching the rated load is handled. The brakes shall be tested by raising the load a few inches and applying the brakes.

(h) The load shall not be lowered below the point where less than two full wraps of rope remain on the hoisting drum.

(i) When two or more cranes are used to lift a load one qualified responsible person shall be in charge of the operation. ~~((He))~~ The qualified person shall analyze the operation and instruct all personnel involved in the proper positioning, rigging of the load, and the movements to be made.

(j) The employer shall assure that the operator does not leave ~~((his))~~ the control position ~~((at the controls))~~ while the load is suspended.

(k) When starting the bridge and when the load or hook approaches near or over personnel, the warning signal shall be sounded.

(4) Hoist limit switch.

(a) At the beginning of each operator's shift, the upper limit switch of each hoist shall be tried out under no load. Extreme care shall be exercised; the block shall be "inched" into the limit or run in at slow speed. If the switch does not operate properly, the appointed person shall be immediately notified.

(b) The hoist limit switch which controls the upper limit of travel of the load block shall never be used as an operating control.

**AMENDATORY SECTION** (Amending Order 89-03, filed 5/15/89, effective 6/30/89)

**WAC 296-24-23529 Operators.** (1) Cranes shall be operated only by regular crane operators, authorized substitutes who have had adequate experience and training under the supervision of a competent operator, or by crane repairmen or inspectors.

(2) No person should be permitted to operate a crane who cannot speak and read the English language, or who is under eighteen years of age.

(3) No person shall be permitted to operate a crane whose hearing or eye-sight is impaired, or who may be suffering from heart disease or similar ailments. The following physical qualifications shall be minimum requirements for overhead and gantry crane operators and trainees:

(a) They shall have vision of at least 20/30 in one eye, and 20/50 in the other, with or without corrective lenses.

(b) They shall be able to distinguish colors, regardless of position of colors, if color differential is required for operation.

(c) Their hearing, with or without hearing aid, must be adequate for a specific operation.

(d) They shall have sufficient strength, endurance, agility, coordination, and speed of reaction to meet the demands of equipment operation.

(e) They shall have normal depth perception, field of vision, reaction time, manual dexterity, coordination and no tendencies to dizziness or similar undesirable characteristics.

(f) Evidence of physical defects, or emotional instability which could render the operator or trainee a hazard to their self or others, or could interfere with their safe performance may be sufficient cause for disqualification. In such cases, specialized clinical or medical judgments or tests shall be required (which include annual medical certification for recovered heart attack patients).

(g) Evidence that an operator or trainee is subject to seizures or loss of physical control shall be sufficient reason for disqualification. Specialized medical tests shall be required to substantiate these conditions.

(4) Persons who have recovered from a heart attack shall be exempted from the provisions of subsection (3) of this section, as it pertains to their heart condition, provided:

(a) A medical release is obtained from their attending medical doctor.



(b) The release shall state that the operation of a crane will not present a hazard to their self or others.

(c) An examination by a medical doctor, and renewal of the work release certification is required annually.

(5) The operator shall ~~((familiarize himself))~~ be fully familiar with all crane rules and with the crane mechanism and its proper care. ~~((If))~~ Needed adjustments or repairs ~~((are necessary, he))~~ shall ~~((report the same))~~ be reported at once to the proper authority.

(6) The operator shall not eat, smoke or read while actually engaged in the operation of the crane, or operate the crane when ~~((he is))~~ physically unfit.

(7) The operator or someone especially designated shall properly lubricate all working parts of the crane.

(8) Cranes shall be kept clean.

(9) Whenever the operator finds the main or emergency switch open, ~~((he))~~ it shall not ~~((close it))~~ be closed, even when starting on regular duty, until ~~((he has made sure))~~ it is determined that no one is on or about the crane. ~~((He))~~ The crane shall not ~~((oil or repair the crane))~~ be oiled or repaired unless the main switch is open.

(10) If the power goes off, the operator shall immediately throw all controllers to "off" position until the power is again available.

(11) Before closing the main switch the operator shall make sure that all controllers are in "off" position until the power is again available.

(12) The operator shall recognize signals only from the ~~((man))~~ employee who is supervising the lift. Operating signals shall follow an established standard. Whistle signals may be used where one crane only is in operation.

(13) Bumping into runway stops or other cranes shall be avoided. When the operator is ordered to engage with or push other cranes, ~~((he))~~ it shall ~~((do so))~~ be done with special care for the safety of persons on or below cranes.

(14) When lowering a load, the operator shall proceed carefully and make sure ~~((that he has))~~ the load is under safe control.

(15) When leaving the cage the operator shall throw all controllers to "off" position and open the main switch.

(16) If the crane is located out-of-doors the operator shall lock the crane in a secure position to prevent it from being blown along or off the track by a severe wind.

(17) Operators shall not permit anyone to ride on the load or hooks, unless using a lifeline or safety device approved by the department.

AMENDATORY SECTION (Amending Order 79-9, filed 7/31/79)

**WAC 296-24-24005 Load ratings.** (1) Load ratings—Where stability governs lifting performance.

(a) The margin of stability for determination of load ratings, with booms of stipulated lengths at stipulated working radii for the various types of crane mountings is established by taking a percentage of the loads which will produce a condition of tipping or balance with the boom in the least stable direction, relative to the mounting. The load ratings shall not exceed the following percentages for cranes, with the indicated types of mounting under conditions stipulated in (1)(b) and (c) of this section.

Type of crane mounting:	Maximum load ratings (percent of tipping loads)
Locomotive, without outriggers;	
Booms 60 feet or less . . . . .	85
Booms over 60 feet . . . . .	85 <sup>1</sup>
Locomotive, using outriggers fully extended	80
Crawler, without outriggers . . . . .	75
Crawler, using outriggers fully extended . .	85
Truck and wheel mounted without outriggers or using outriggers fully extended . . .	85

<sup>1</sup> Unless this results in less than 30,000 pound-feet net stabilizing moment about the rail, which shall be minimum with such booms.

(b) The following stipulation shall govern the application of the values in (1)(a) of this section for locomotive cranes:

(i) Tipping with or without the use of outriggers occurs when half of the wheels farthest from the load leave the rail.

(ii) The crane shall be standing on track which is level within 1 percent grade.

(iii) Radius of the load is the horizontal distance from a projection of the axis of rotation to the rail support surface, before loading, to the center of vertical hoist line or tackle with load applied.

(iv) Tipping loads from which ratings are determined shall be applied under static conditions only, i.e., without dynamic effect of hoisting, lowering, or swinging.

(v) The weight of all auxiliary handling devices such as hoist blocks, hooks, and slings shall be considered a part of the load rating.

(c) Stipulations governing the application of the values in ~~((+))~~ (1)(a) of this section for crawler, truck, and wheel-mounted cranes shall be in accordance with Crane Load-Stability Test Code. Society of Automotive Engineers (SAE) J765.

Note: The effectiveness of these preceding stability factors will be influenced by such additional factors as freely suspended loads, track, wind, or ground conditions, condition and inflation of rubber tires, boom lengths, proper operating speeds for existing conditions, and, in general, careful and competent operation. All of these shall be taken into account by the user.

(2) Rated capacity chart. A chart indicating the manufacturer's rated capacity at all operating radii for all permissible boom lengths and jib lengths with alternate ratings for optional equipment affecting such ratings shall be posted in all mobile type cranes and shall be readily visible to the operator in ~~((his))~~ the normal operating position.

(3) Inspection classification. ~~((+))~~ Initial inspection. Prior to initial use all new and altered cranes shall be inspected to insure compliance with provisions of these standards.

(4) All hooks shall be of the safety latch-type or the hook shall be moused.

PERMANENT



**AMENDATORY SECTION** (Amending Order 73-5, filed 5/9/73 and Order 73-4, filed 5/7/73)**WAC 296-24-24009 Testing.** (1) Operational tests.

(a) In addition to prototype tests and quality-control measures, the user of each new production crane shall require that it be tested and related data supplied by the manufacturer to the extent necessary to assure compliance with the operational requirements of this ~~((paragraph))~~ subsection including functions such as the following:

- (i) Load hoisting and lowering mechanisms
- (ii) Boom hoisting and lower mechanisms
- (iii) Swinging mechanism
- (iv) Travel mechanism
- (v) Safety devices

(b) Where the complete production crane is not supplied by one manufacturer such tests shall be conducted at final assembly.

(c) Certified production-crane test results shall be made available.

**(2) Rated load test.**

(a) Written reports shall be available showing test procedures and confirming the adequacy of repairs or alterations.

(b) Test loads shall not exceed 110 percent of the rated load at any selected working radius.

(c) Where rerating is necessary:

(i) Crawler, truck, and wheel-mounted cranes shall be tested in accordance with SAE Recommended Practice, Crane Load Stability Test Code J765 (April 1961).

(ii) Locomotive cranes shall be tested in accordance with WAC 296-24-24005 (1)(a) and (b).

(iii) Rerating test report shall be readily available.

(d) No cranes shall be rerated in excess of the original load ratings unless such rating changes are approved by the crane manufacturer or final assembler.

**AMENDATORY SECTION** (Amending Order 73-5, filed 5/9/73 and Order 73-4, filed 5/7/73)**WAC 296-24-24015 Handling the load.** (1) Size of load.

(a) No crane shall be loaded beyond the rated load, except for test purposes as provided in WAC 296-24-24009.

(b) When loads which are limited by structural competence rather than by stability are to be handled, it shall be ascertained that the weight of the load has been determined within plus or minus 10 percent before it is lifted.

**(2) Attaching the load.**

(a) The hoist rope shall not be wrapped around the load.

(b) The load shall be attached to the hook by means of slings or other approved devices.

**(3) Moving the load.**

(a) The employer shall assure that:

(i) The crane is level and where necessary blocked properly.

(ii) The load is well secured and properly balanced in the sling or lifting device before it is lifted more than a few inches.

(b) Before starting to hoist, the following conditions shall be noted:

(i) Hoist rope shall not be kinked.

(ii) Multiple part lines shall not be twisted around ~~((around))~~ each other.

(iii) The hook shall be brought over the load in such a manner as to prevent swinging.

(iv) If there is a slack rope condition, it should be determined that the rope is properly seated on the drum and in the sheaves.

(c) During hoisting care shall be taken that:

(i) There is no sudden acceleration or deceleration of the moving load.

(ii) The load does not contact any obstructions.

(d) Side loading of booms shall be limited to freely suspended loads. Cranes shall not be used for dragging loads sideways.

(e) No hoisting, lowering, swinging, or traveling shall be done while anyone is on the load or hook.

(f) The operator should avoid carrying loads over people.

(g) On truck mounted cranes, no loads shall be lifted over the front area except as approved by the crane manufacturer.

(h) The operator shall test the brakes each time a load approaching the rated load is handled by raising it a few inches and applying the brakes.

(i) Outriggers shall be used when the load to be handled at that particular radius exceeds the rated load without outriggers as given by the manufacturer for that crane. Where floats are used they shall be securely attached to the outriggers. Wood blocks used to support outriggers shall:

(i) Be strong enough to prevent crushing.

(ii) Be free from defects.

(iii) Be of sufficient width and length to prevent shifting or toppling under load.

(j) Neither the load nor the boom shall be lowered below the point where less than two full wraps of rope remain on their respective drums.

(k) Before lifting loads with locomotive cranes without using outriggers, means shall be applied to prevent the load from being carried by the truck springs.

(l) When two or more cranes are used to lift one load, one designated person shall be responsible for the operation. ~~((He))~~ They shall be required to analyze the operation and instruct all personnel involved in the proper positioning, rigging of the load, and the movements to be made.

(m) In transit the following additional precautions shall be exercised.

(i) The boom shall be carried in line with the direction of motion.

(ii) The superstructure shall be secured against rotation, except when negotiating turns when there is an operator in the cab or the boom is supported on a dolly.

(iii) The empty hook shall be lashed or otherwise restrained so that it cannot swing freely.

(n) Before traveling a crane with load, a designated person shall be responsible for determining and controlling safety. Decisions such as position of load, boom location, ground support, travel route, and speed of movement shall be in accord with ~~((his))~~ their determinations.

(o) A crane with or without load shall not be traveled with the boom so high that it may bounce back over the cab.

(p) When rotating the crane, sudden starts and stops shall be avoided. Rotational speed shall be such that the

load does not swing out beyond the radii at which it can be controlled. A tag or restraint line shall be used when rotation of the load is hazardous.

(q) When a crane is to be operated at a fixed radius, the boom-hoist pawl or other positive locking device shall be engaged.

(r) Ropes shall not be handled on a winch head without the knowledge of the operator.

(s) While a winch head is being used, the operator shall be within convenient reach of the power unit control lever.

(4) Holding the load.

(a) The operator shall not be permitted to leave ~~((his))~~ the control position ~~((at the controls))~~ while the load is suspended.

(b) No person should be permitted to stand or pass under a load on the hook.

(c) If the load must remain suspended for any considerable length of time, the operator shall hold the drum from rotating in the lowering direction by activating the positive controllable means of the operator's station.

#### AMENDATORY SECTION (Amending Order 76-6, filed 3/1/76)

**WAC 296-24-24503 General requirements.** (1) Application. This section applies to guy, stiffleg, basket, breast, gin pole, Chicago boom and A-frame derricks of the stationary type, capable of handling loads at variable reaches and powered by hoists through systems of rope reeving, used to perform lifting hook work, single or multiple line bucket work, grab, grapple, and magnet work. Derricks may be permanently installed for temporary use as in construction work. The requirements of this section also apply to any modification of these types which retain their fundamental features, except for floating derricks.

(2) New and existing equipment. All new derricks constructed and installed on or after the effective date of these standards shall meet the design specifications of the "American National Standards Institute, Safety Code for Derricks, ANSI B30.6-1969." Derricks constructed prior to the effective date of these standards should be modified to conform to these design specifications by December 31, 1973 unless it can be shown that the derrick cannot feasibly or economically be altered and that the derrick substantially complies with the requirements of this section.

(a) Operating controls shall be marked or an explanation of the controls shall be posted in full view of the operator.

(b) Cranes or derricks having a movable working boom shall have a radius or boom angle indicator installed. This shall be located where the operator can readily read it ~~((while in his))~~ from the normal operating position.

(c) Top of boom painted. The top six feet of the boom or jib shall be painted bright yellow.

(3) Designated personnel. Only designated personnel shall be permitted to operate a derrick covered by this section.

#### AMENDATORY SECTION (Amending Order 73-5, filed 5/9/73 and Order 73-4, filed 5/7/73)

**WAC 296-24-24517 Handling the load.** (1) Size of load.

(a) No derrick shall be loaded beyond the rated load.

(b) When loads approach the maximum rating of the derrick, it shall be ascertained that the weight of the load has been determined within plus or minus 10 percent before it is lifted.

(2) Attaching the load.

(a) The hoist rope shall not be wrapped around the load.

(b) The load shall be attached to the hook by means of slings or other suitable devices.

(3) Moving the load.

(a) The load shall be well secured and properly balanced in the sling or lifting device before it is lifted more than a few inches.

(b) Before starting to hoist, the following conditions shall be noted:

(i) Hoist rope shall not be kinked.

(ii) Multiple part lines shall not be twisted around each other.

(iii) The hook shall be brought over the load in such a manner as to prevent swinging.

(iv) If there is a slack rope condition, it should be determined that the rope is properly seated on the drum and in the sheaves.

(c) During hoisting, care shall be taken that:

(i) There is no sudden acceleration or deceleration of the moving load.

(ii) Load does not contact any obstructions.

(d) A derrick shall not be used for side loading except when specifically authorized by a responsible person who has determined that the various structural components will not be overstressed.

(e) No hoisting, lowering, or swinging shall be done while anyone is on the load or hook.

(f) The operator shall avoid carrying loads over people.

(g) The operator shall test the brakes each time a load approaching the rated load is handled by raising it a few inches and applying the brakes.

(h) Neither the load nor boom shall be lowered below the point where less than two full wraps of rope remain on their respective drums.

(i) When rotating a derrick, sudden starts and stops shall be avoided. Rotational speed shall be such that the load does not swing out beyond the radius at which it can be controlled.

(j) Boom and hoisting rope systems shall not be twisted.

(4) Holding the load.

(a) The operator shall not be allowed to leave ~~((his))~~ the control position ~~((at the controls))~~ while the load is suspended.

(b) People should not be permitted to stand or pass under a load on the hook.

(c) If the load must remain suspended for any considerable length of time, a dog, or pawl and ratchet, or other equivalent means, rather than the brake alone, shall be used to hold the load.

(5) Use of winch heads.

(a) Ropes shall not be handled on a winch head without the knowledge of the operator.

(b) While a winch head is being used, the operator shall be within convenient reach of the power unit control lever.

(6) Securing boom. Dogs, pawls, or other positive holding mechanism on the hoist shall be engaged. When not in use, the derrick boom shall:

- (a) Be laid down;
- (b) Be secured to a stationary member, as nearly under the head as possible, by attachment of a sling to the load block; or
- (c) Be hoisted to a vertical position and secured to the mast.

**AMENDATORY SECTION** (Amending Order 89-03, filed 5/15/89, effective 6/30/89)

**WAC 296-24-260 Helicopters.** (1) Helicopter regulations. Helicopter cranes shall be expected to comply with any applicable regulations of the Federal Aviation Administration.

(2) Briefing. Prior to each day's operation, a briefing shall be conducted. This briefing shall set forth the plan of operation for the pilot and ground personnel.

(3) Slings and tag lines. Load shall be properly slung. Tag lines shall be of a length that will not permit their being drawn up into rotors. Pressed sleeve, swedged eyes, or equivalent means shall be used for all freely suspended loads to prevent hand splices from spinning open or cable clamps from loosening.

(4) Cargo hooks. All electrically operated cargo hooks shall have the electrical activating device so designed and installed as to prevent inadvertent operation. In addition, these cargo hooks shall be equipped with an emergency mechanical control for releasing the load. The hooks shall be tested prior to each day's operation to determine that the release functions properly, both electrically and mechanically.

(5) Personal protective equipment.

(a) Personal protective equipment for employees receiving the load shall consist of complete eye protection and hard hats secured by chin straps.

(b) Loose-fitting clothing likely to flap in the downwash and thus be snagged on hoist line shall not be worn.

(6) Loose gear and objects. Every practical precaution shall be taken to provide for the protection of the employees from flying objects in the rotor downwash. All loose gear within one hundred feet of the place of lifting the load, depositing the load, and all other areas susceptible to rotor downwash shall be secured or removed.

(7) Housekeeping. Good housekeeping shall be maintained in all helicopter loading and unloading areas.

(8) Operator responsibility. The helicopter operator shall be responsible for size, weight, and manner in which loads are connected to the helicopter. If, for any reason, the helicopter operator believes the lift cannot be made safely, the lift shall not be made.

(9) Hooking and unhooking loads. Employees shall not perform work under hovering craft except for that limited period of time necessary to guide, secure and unhook loads, or to hook loads. Regardless of whether the hooking or unhooking of a load takes place on the ground or a flat roof, or other location in an elevated work position in structural members, a safe means of access and egress, to include an unprogrammed emergency escape route or routes, shall be provided for the employees who are hooking or unhooking loads.

(10) Static charge. Static charge on the suspended load shall be dissipated with a grounding device before ground

personnel touch the suspended load, or protective rubber gloves shall be worn by all ground personnel touching the suspended load.

(11) Weight limitation. The weight of an external load shall not exceed the manufacturer's rating.

(12) Ground lines. Hoist wires or other gear, except for pulling lines or conductors that are allowed to "pay out" from a container or roll off a reel, shall not be attached to any fixed ground structure, or allowed to foul on any fixed structure.

(13) Visibility. When visibility is reduced by dust or other conditions, ground personnel shall exercise special caution to keep clear of main and stabilizing rotors. Precautions shall also be taken by the employer to eliminate as far as practical reduced visibility.

(14) Signal systems. Signal systems between aircrew and ground personnel shall be understood and checked in advance of hoisting the load. This applies to either radio or hand signal systems. Handsignals shall be as shown in Figure L-1.

(15) Approach distance. No unauthorized person shall be allowed to approach within fifty feet of the helicopter when the rotor blades are turning.

(16) Approaching helicopter. Whenever approaching or leaving a helicopter with blades rotating, all employees shall remain in full view of the pilot and keep in a crouched position. Employees shall avoid the area from the cockpit or cabin rearward unless authorized by the helicopter operator to work there.

(17) Personnel. Sufficient ground personnel shall be provided when required for safe helicopter loading and unloading operations.

(18) Communications. There shall be constant reliable communication between the pilot, and a designated employee of the ground crew who acts as a ~~((signalman))~~ signalperson during the period of loading and unloading. This ~~((signalman))~~ signalperson shall be distinctly recognizable from other ground personnel.

(19) Fires. Open fires shall not be permitted in an area that could result in such fires being spread by the rotor downwash.

(20) Under no circumstances shall the refueling of any type helicopter with either aviation gasoline or Jet B (Turbine) type fuel be permitted while the engines are running.

(21) Helicopters using Jet A (Turbine-Kerosene) type fuel may be refueled with engines running provided the following criteria is met:

(a) No unauthorized persons shall be allowed within fifty feet of the refueling operation or fueling equipment.

(b) A minimum of one thirty-pound fire extinguisher, or a combination of same, good for Class A, B and C fires, shall be provided within one hundred feet on the upwind side of the refueling operation.

(c) All fueling personnel shall be thoroughly trained in the refueling operation and in the use of the available fire extinguishing equipment they may be expected to utilize.

(d) There shall be no smoking, open flames, exposed flame heaters, flare pots, or open flame lights within fifty feet of the refueling area or fueling equipment. All entrances to the refueling area shall be posted with "NO SMOKING" signs.

(e) Due to the numerous causes of static electricity, it shall be considered present at all times. Prior to starting refueling operations, the fueling equipment and the helicopter shall be grounded and the fueling nozzle shall be electrically bonded to the helicopter. The use of conductive hose shall not be accepted to accomplish this bonding. All grounding and bonding connections shall be electrically and mechanically firm, to clean unpainted metal parts.

(f) To control spills, fuel shall be pumped either by hand or power. Pouring or gravity flow shall not be permitted. Self-closing nozzles or deadman controls shall be used and shall not be blocked open. Nozzles shall not be dragged along the ground.

(g) In case of a spill, the fueling operation shall be immediately stopped until such time as the person-in-charge determines that it is safe to resume the refueling operation.

(h) When ambient temperatures have been in the one hundred degrees Fahrenheit range for an extended period of time, all refueling of helicopters with the engines running shall be suspended until such time as conditions become suitable to resume refueling with the engines running.

(22) Helicopters with their engines stopped being refueled with aviation gasoline or Jet B (Turbine) type fuel, shall also comply with subsection (21)(a) through (g) of this section.

**AMENDATORY SECTION** (Amending Order 76-29, filed 9/30/76)

**WAC 296-24-29401 Wire rope.** (1) Safe loads. Whenever used in connection with work, employment, occupations or uses to which these standards are applicable, wire rope shall not be subjected to loads in excess of one-fifth the breaking load as given in the schedule of the cable manufacturer. Except as required in standard for material hoists.

(2) Condemned. When cables deteriorate through rust, wear, broken wires, undue strain or other conditions to the extent of fifteen percent of their original strength, use of cables shall be discontinued.

(3) Straps and ribbons. The strap or steel ribbon type of cable shall not be used in the suspension of scaffolding.

(4) Inspections. There shall be not less than monthly inspection of all wire rope in use, and all wire rope must be inspected before put into use.

(5) Fastening. The following methods of fastening and attaching wire rope shall be adhered to:

(a) Sockets. The end of wire rope to be set into socket fittings held securely with molten ~~((babbitt))~~ babbitt or zinc (not lead). The wires of the cable shall be frayed out and each wire bent toward the outside of socket, so that the end of each wire projects well into the depth of the socket. This method of fastening cables should be left in the hands of an experienced ~~((workman))~~ workers in this kind of work.

(b) Wrapping. Thimbles spliced into rope and the splice securely wrapped.

(c) Bolted. Thimbles inserted and held in place by at least a three bolt clamp or three U-bolt clips. Clamps shall be of standard size for the sizes of the cable in use.

(d) Lashing. For temporary work, by-passing rope at least twice around large object such as a post, avoiding sharp

points and carrying the end back several feet and securing it by clamps, clips or lashing to the cable.

**AMENDATORY SECTION** (Amending Order 73-5, filed 5/9/73 and Order 73-4, filed 5/7/73)

**WAC 296-24-29501 Inspection of compressed gas cylinders.** Each employer shall determine that compressed gas cylinders under ~~((his))~~ the employer's control are in a safe condition to the extent that this can be determined by visual inspection. Visual and other inspections shall be conducted as prescribed in the hazardous materials regulations of the department of transportation (49 CFR Parts 171-179 and 14 CFR Part 103). Where those regulations are not applicable, visual and other inspections shall be conducted in accordance with Compressed Gas Association Pamphlets C-6-1968 and C-8-1962.

**AMENDATORY SECTION** (Amending Order 88-25, filed 11/14/88)

**WAC 296-24-31501 General.** (1) Definitions as used in this section.

(a) Gaseous hydrogen system is one in which the hydrogen is delivered, stored and discharged in the gaseous form to consumer's piping. The system includes stationary or movable containers, pressure regulators, safety relief devices, manifolds, interconnecting piping and controls. The system terminates at the point where hydrogen at service pressure first enters the consumer's distribution piping.

(b) Approved—Means unless otherwise indicated, listed or approved by a nationally recognized testing laboratory. Refer to federal regulation 29 CFR 1910.7 for definition of nationally recognized testing laboratory.

(c) Listed—See "approved."

(d) ASME—American Society of Mechanical Engineers.

(e) DOT specifications—Regulations of the department of transportation published in 49 CFR Chapter I.

(f) DOT regulations—See WAC 296-24-315.

(2) Scope.

(a) Gaseous hydrogen systems.

(i) WAC 296-24-31503 applies to the installation of gaseous hydrogen systems on consumer premises where the hydrogen supply to the consumer premises originates outside the consumer premises and is delivered by mobile equipment.

(ii) WAC 296-24-31503 does not apply to gaseous hydrogen systems having a total hydrogen content of less than four hundred cubic feet, nor to hydrogen manufacturing plants or other establishments operated by the hydrogen supplier or ~~((his))~~ their agent for the purpose of storing hydrogen and refilling portable containers, trailers, mobile supply trucks, or tank cars.

(b) Liquefied hydrogen systems.

(i) WAC 296-24-31505 applies to the installation of liquefied hydrogen systems on consumer premises.

(ii) WAC 296-24-31505 does not apply to liquefied hydrogen portable containers of less than one hundred fifty liters (39.63 gallons) capacity; nor to liquefied hydrogen manufacturing plants or other establishments operated by the hydrogen supplier or ~~((his))~~ supplier's agent for the sole purpose of storing liquefied hydrogen and refilling portable containers, trailers, mobile supply trucks or tank cars.

**AMENDATORY SECTION** (Amending Order 73-5, filed 5/9/73 and Order 73-4, filed 5/7/73)

**WAC 296-24-32001 Scope.** This section applies to the installation of bulk oxygen systems on industrial and institutional consumer premises. This section does not apply to oxygen manufacturing plants or other establishments operated by the oxygen supplier or ((his)) supplier's agent for the purpose of storing oxygen and refilling portable containers, trailers, mobile supply trucks, or tank cars, nor to systems having capacities less than those stated in WAC 296-24-32003(1).

**AMENDATORY SECTION** (Amending Order 88-25, filed 11/14/88)

**WAC 296-24-33005 Tank storage.** (1) Design and construction of tanks.

(a) Materials.

(i) Tanks shall be built of steel except as provided in (1)(a)(ii) through (v) of this section.

(ii) Tanks may be built of materials other than steel for installation underground or if required by the properties of the liquid stored. Tanks located above ground or inside buildings shall be of noncombustible construction.

(iii) Tanks built of materials other than steel shall be designed to specifications embodying principles recognized as good engineering design for the material used.

(iv) Unlined concrete tanks may be used for storing flammable or combustible liquids having a gravity of 40°API or heavier. Concrete tanks with special lining may be used for other services provided the design is in accordance with sound engineering practice.

(v) Tanks may have combustible or noncombustible linings.

(vi) Special engineering consideration shall be required if the specific gravity of the liquid to be stored exceeds that of water or if the tanks are designed to contain flammable or combustible liquids at a liquid temperature below 0°F.

(b) Fabrication.

(i) Tanks may be of any shape or type consistent with sound engineering design.

(ii) Metal tanks shall be welded, riveted, and caulked, brazed, or bolted, or constructed by use of a combination of these methods. Filler metal used in brazing shall be nonferrous metal or an alloy having a melting point above 1000°F and below that of the metal joined.

(c) Atmospheric tanks.

(i) Atmospheric tanks shall be built in accordance with acceptable good standards of design. Atmospheric tanks may be built in accordance with:

(A) Underwriters' Laboratories, Inc., Subjects No. 142, Standard for Steel Aboveground Tanks for Flammable and Combustible Liquids, 1968; No. 58, Standards for Steel Underground Tanks for Flammable and COMBUSTIBLE Liquids, Fifth Edition, December 1961; or No. 80, Standard for Steel Inside Tanks for Oil-Burner Fuel, September 1963.

(B) American Petroleum Institute Standards No. 12A, Specification for Oil Storage Tanks with Riveted Shells, Seventh Edition, September 1951, or No. 650, Welded Steel Tanks for Oil Storage, Third Edition, 1966.

(C) American Petroleum Institute Standards No. 12B, Specification for Bolted Production Tanks, Eleventh Edition,

May 1958, and Supplement 1, March 1962; No. 12D, Specification for Large Welded Production Tanks, Seventh Edition, August 1957; or No. 12F, Specification for Small Welded Production Tanks, Fifth Edition, March 1961. Tanks built in accordance with these standards shall be used only as production tanks for storage of crude petroleum in oil-producing areas.

(ii) Tanks designed for underground service not exceeding 2,500 gallons capacity may be used aboveground.

(iii) Low-pressure tanks and pressure vessels may be used as atmospheric tanks.

(iv) Atmospheric tanks shall not be used for the storage of a flammable or combustible liquid at a temperature at or above its boiling point.

(d) Low pressure tanks.

(i) The normal operating pressure of the tank shall not exceed the design pressure of the tank.

(ii) Low-pressure tanks shall be built in accordance with acceptable standards of design. Low-pressure tanks may be built in accordance with:

(A) American Petroleum Institute Standard No. 620, Recommended Rules for the Design and Construction of Large, Welded, Low-Pressure Storage Tanks, Third Edition, 1966.

(B) The principles of the Code for Unfired Pressure Vessels, Section VIII of the ASME Boiler and Pressure Vessels Code, 1968.

(iii) Atmospheric tanks built according to the Underwriters' Laboratories, Inc., requirements in (1)(c)(i) of this section may be used for operating pressures not exceeding 1 p.s.i.g. and shall be limited to 2.5 p.s.i.g. under emergency venting conditions. Pressure vessels may be used as low-pressure tanks.

(e) Pressure vessels.

(i) The normal operating pressure of the vessel shall not exceed the design pressure of the vessel.

(ii) Pressure vessels shall be built in accordance with the Code for Unfired Pressure Vessels, Section VIII of the ASME Boiler and Pressure Vessel Code, 1968.

(f) Provisions for internal corrosion. When tanks are not designed in accordance with the American Petroleum Institute, American Society of Mechanical Engineers, or the Underwriters' Laboratories, Inc.'s standards, or if corrosion is anticipated beyond that provided for in the design formulas used, additional metal thickness or suitable protective coatings or linings shall be provided to compensate for the corrosion loss expected during the design life of the tank.

(2) Installation of outside aboveground tanks.

(a) Location with respect to property lines and public ways.

(i) Every aboveground tank for the storage of flammable or combustible liquids, except those liquids with boil-over characteristics and unstable liquids, operating at pressures not in excess of 2.5 p.s.i.g. and equipped with emergency venting which will not permit pressures to exceed 2.5 p.s.i.g. shall be located in accordance with Table H-5.

(ii) Every aboveground tank for the storage of flammable or combustible liquids, except those liquids with boil-over characteristics and unstable flammable or combustible liquids, operating at pressures exceeding 2.5 p.s.i.g. or equipped with emergency venting which will permit press-

tures to exceed 2.5 p.s.i.g. shall be located in accordance with Table H-6.

(iii) Every aboveground tank for the storage of flammable or combustible liquids with boil-over characteristics shall be located in accordance with Table H-7.

(iv) Every aboveground tank for the storage of unstable liquids shall be located in accordance with Table H-8.

(v) Reference minimum distances for use in Tables H-5 to H-8 inclusive.

(vi) Where end failure or horizontal pressure tanks and vessels may expose property, the tank shall be placed with the longitudinal axis parallel to the nearest important exposure.

TABLE H-5

Type of tank	Protection	Minimum distance in feet from property line which may be built upon, including the opposite side of a public way.	Minimum distance in feet from nearest side of any public way or from nearest important building and shall be not less than 5 feet.
Floating roof	Protection for exposures.	1/2 times diameter of tank but need not exceed 90 ft.	1/6 times diameter of tank but need not exceed 30 ft.
	None	Diameter of tank but need not exceed 175 ft.	1/6 times diameter of tank but need not exceed 30 ft.
Vertical with weak roof to shell seam	Approved foam or inerting system on the tank.	1/2 times diameter of tank but need not exceed 90 ft. and shall not be less than 5 ft.	1/6 times diameter of tank but need not exceed 30 ft.
	Protection for exposures.	Diameter of tank but, need not exceed 175 ft.	1/3 times diameter of tank but need not exceed 60 ft.
	None	2 times diameter of tank but need not exceed 350 ft.	1/3 times diameter of tank but need not exceed 60 ft.
Horizontal and vertical, with emergency relief venting to limit pressures to 2.5 p.s.i.g.	Approved inerting system on the tank or approved foam system on vertical tanks.	1/2 times Table H-9 but shall not be less than 5 ft.	1/2 times Table H-9.
	Protection for exposures.	Table H-9	Table H-9
	None	2 times table	Table H-9

TABLE H-6

Type of tank	Protection	Minimum distance in feet from property line which may be built upon, including the opposite side of a public way.	Minimum distance in feet from nearest side of any public way or from nearest important building.
Any type	Protection for exposures.	1 1/2 times Table H-9 but shall not be less than 25 ft.	1 1/2 times Table H-9 but shall not be less than 25 ft.

None ————— 3 times Table H-9 but shall not be less than 50 ft. 1 1/2 times Table H-9 but shall not be less than 25 ft.

~~((iii) Every aboveground tank for the storage of flammable or combustible liquids with boil-over characteristics shall be located in accordance with Table H-7.))~~

TABLE H-7

Type of tank	Protection	Minimum distance in feet from property line which may be built upon, including the opposite side of a public way.	Minimum distance in feet from nearest side of any public way or from nearest important building.
Floating roof	Protection for exposures.	Diameter of tank but need not exceed 175 ft.	1/3 times diameter of tank but need not exceed 60 ft.
	None	2 times diameter of tank but need not exceed 350 ft.	1/3 times diameter of tank but need not exceed 60 ft.
Fixed roof	Approved foam or inerting system.	Diameter of tank but need not exceed 175 ft.	1/3 times diameter of tank but need not exceed 60 ft.
	Protection for exposures.	2 times diameter of tank but need not exceed 350 ft.	2/3 times diameter of tank but need not exceed 120 ft.
	None	4 times diameter of tank but need not exceed 350 ft.	2/3 times diameter of tank but need not exceed 120 ft.

~~((iv) Every aboveground tank for the storage of unstable liquids shall be located in accordance with Table H-8.))~~

TABLE H-8

Type of tank	Protection	Minimum distance in feet from property line which may be built upon, including the opposite side of a public way.	Minimum distance in feet from nearest side of any public way or from nearest important building.
Horizontal and vertical tanks with emergency relief venting to permit pressure not in excess of 2.5 p.s.i.g.	Tank protected with any of the following: Approved water spray, approved inerting, approved insulation and refrigeration, approved barricade.	See Table H-9, but the distance may be not less than 25 ft.	Not less than 25 ft.
	Protection for exposures.	2 1/2 times Table H-9 but not less than 50 ft.	Not less than 50 ft.
	None	5 times Table H-9 but not less than 100 ft.	Not less than 100 ft.

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Horizontal and vertical tanks with emergency relief venting to permit pressure over 2.5 p.s.i.g.	Tank protected with any one of the following: Approved water spray, approved inerting, approved insulation and refrigeration, approved barricade.	2 times Table H-9 but not less than 50 ft.	Not less than 50 ft.
	Protection for exposures.	4 times Table H-9 but not less than 100 ft.	Not less than 100 ft.
	None	8 times Table H-9 but not less than 150 ft.	Not less than 150 ft.

~~((v) Reference minimum distances for use in Tables H-5 to H-8 inclusive.))~~

TABLE H-9

Capacity tank gallons	Minimum distance in feet from property line which may be built upon, including the opposite side of a public way.	Minimum distance in feet from nearest side of any public way or from nearest important building.
275 or less	5	5
276 to 750	10	5
751 to 12,000	15	5
12,001 to 30,000	20	5
30,001 to 50,000	30	10
50,001 to 100,000	50	15
100,001 to 500,000	80	25
500,001 to 1,000,000	100	35
1,000,001 to 2,000,000	135	45
2,000,001 to 3,000,000	165	55
3,000,001 or more	175	60

~~((vi) Where end failure or horizontal pressure tanks and vessels may expose property, the tank shall be placed with the longitudinal axis parallel to the nearest important exposure.))~~

(b) Spacing (shell-to-shell) between aboveground tanks.

(i) The distance between any two flammable or combustible liquid storage tanks shall not be less than 3 feet.

(ii) Except as provided in (2)(b)(iii) of this section, the distance between any two adjacent tanks shall not be less than one-sixth the sum of their diameters. When the diameter of one tank is less than one-half the diameter of the adjacent tank, the distance between the two tanks shall not be less than one-half the diameter of the smaller tank.

(iii) Where crude petroleum in conjunction with production facilities are located in noncongested areas and have capacities not exceeding 126,000 gallons (3,000 barrels), the distance between such tanks shall not be less than 3 feet.

(iv) Where unstable flammable or combustible liquids are stored, the distance between such tanks shall not be less than one-half the sum of their diameters.

(v) When tanks are compacted in three or more rows or in an irregular pattern, greater spacing or other means shall

be provided so that inside tanks are accessible for fire fighting purposes.

(vi) The minimum separation between a liquefied petroleum gas container and a flammable or combustible liquid storage tank shall be 20 feet, except in the case of flammable or combustible liquid tanks operating at pressures exceeding 2.5 p.s.i.g. or equipped with emergency venting which will permit pressures to exceed 2.5 p.s.i.g. in which case the provisions of (2)(b)(i) and (ii) of this section shall apply. Suitable means shall be taken to prevent the accumulation of flammable or combustible liquids under adjacent liquefied petroleum gas containers such as by diversion curbs or grading. When flammable or combustible liquid storage tanks are within a diked area, the liquefied petroleum gas containers shall be outside the diked area and at least 10 feet away from the centerline of the wall of the diked area. The foregoing provisions shall not apply when liquefied petroleum gas containers of 125 gallons or less capacity are installed adjacent to fuel oil supply tanks of 550 gallons or less capacity.

(c) Location of outside aboveground tanks with respect to important buildings on same property. Every outside aboveground tank shall be separated from important buildings on the same property by distances not less than those specified in (2)(a)(i), (ii), (iii) and (iv) of this section, whichever is applicable. The appropriate distance column in Tables H-5, H-6, H-7, H-8, or H-9, that shall be used shall be the one reading: "Minimum distance in feet from nearest side of any public way or from nearest important building."

(d) Normal venting for aboveground tanks. (i) Atmospheric storage tanks shall be adequately vented to prevent the development of vacuum or pressure sufficient to distort the roof of a cone roof tank or exceed the design pressure in the case of other atmospheric tanks, as a result of filling or emptying, and atmospheric temperature changes.

(ii) Normal vents shall be sized either in accordance with: (A) The American Petroleum Institute Standard 2000 (1968), Venting Atmospheric and Low-Pressure Storage Tanks; or (B), other accepted standard; or (C) shall be at least as large as the filling or withdrawal connection, whichever is larger but in no case less than 1 1/4 inch nominal inside diameter.

(iii) Low-pressure tanks and pressure vessels shall be adequately vented to prevent development of pressure or vacuum, as a result of filling or emptying and atmospheric temperature changes, from exceeding the design pressure of the tank or vessel. Protection shall also be provided to prevent over-pressure from any pump discharging into the tank or vessel when the pump discharge pressure can exceed the design pressure of the tank or vessel.

(iv) If any tank or pressure vessel has more than one fill or withdrawal connection and simultaneous filling or withdrawal can be made, the vent size shall be based on the maximum anticipated simultaneous flow.

(v) Unless the vent is designed to limit the internal pressure 2.5 p.s.i. or less, the outlet of vents and vent drains shall be arranged to discharge in such a manner as to prevent localized overheating of any part of the tank in the event vapors from such vents are ignited.

(vi) Tanks and pressure vessels storing Class IA liquids shall be equipped with venting devices which shall be normally closed except when venting to pressures or vacuum

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conditions. Tanks and pressure vessels storing Class IB and IC liquids shall be equipped with venting devices which shall be normally closed except when venting under pressure or vacuum conditions, or with approved flame arresters.

120	126,000	900	493,000	over
140	147,000	1,000	524,000	
160	168,000			
180	190,000			
200	211,000			

Exemption: Tanks of 3,000 bbls. capacity or less containing crude petroleum in crude-producing areas; and, outside above-ground atmospheric tanks under 1,000 gallons capacity containing other than Class IA flammable liquids may have open vents. (See (2)(f)(ii) of this section.)

(vii) Flame arresters or venting devices required in (2)(e)(vi) of this section may be omitted for Class IB and IC liquids where conditions are such that their use may, in case of obstruction, result in tank damage.

(e) Emergency relief venting for fire exposure for aboveground tanks.

(i) Every aboveground storage tank shall have some form of construction or device that will relieve excessive internal pressure caused by exposure fires.

(ii) In a vertical tank the construction referred to in (2)(e)(i) of this section may take the form of a floating roof, lifter roof, a weak roof-to-shell seam, or other approved pressure relieving construction. The weak roof-to-shell seam shall be constructed to fail preferential to any other seam.

(iii) Where entire dependence for emergency relief is placed upon pressure relieving devices, the total venting capacity of both normal and emergency vents shall be enough to prevent rupture of the shell or bottom of the tank if vertical, or of the shell or heads if horizontal. If unstable liquids are stored, the effects of heat or gas resulting from polymerization, decomposition, condensation, or self-reactivity shall be taken into account. The total capacity of both normal and emergency venting devices shall be not less than that derived from Table H-10 except as provided in (2)(e)(v) and (vi) of this section. Such device may be a self-closing manhole cover, or one using long bolts that permit the cover to lift under internal pressure, or an additional or larger relief valve or valves. The wetted area of the tank shall be calculated on the basis of 55 percent of the total exposed area of a sphere or ~~((spheroid-spheroid))~~ spheroid, 75 percent of the total exposed area of a horizontal tank and the first 30 feet above grade of the exposed shell area of a vertical tank.

(iv) For tanks and storage vessels designed for pressure over 1 p.s.i.g., the total rate of venting shall be determined in accordance with Table H-10, except that when the exposed wetted area of the surface is greater than 2,800 square feet, the total rate of venting shall be calculated by the following formula:

$$CFH = 1,107A^{0.82}$$

Where:

CFH = Venting requirement, in cubic feet of free air per hour.

A = Exposed wetted surface, in square feet.

Note: The foregoing formula is based on Q = 21,000A<sup>0.82</sup>.

(v) The total emergency relief venting capacity for any specific stable liquid may be determined by the following formula:

Cubic feet of free air per hour = V

$$V = \frac{1337}{L M}$$

V = Cubic feet of free air per hour from Table H-10.

L = Latent heat of vaporization of specific liquid in B.t.u. per pound.

M = Molecular weight of specific liquids.

(vi) The required airflow rate of (2)(e)(iii) or (v) of this section may be multiplied by the appropriate factor listed in the following schedule when protection is provided as indicated. Only one factor may be used for any one tank.

0.5 for drainage in accordance with (2)(g)(ii) of this section for tanks over 200 square feet of wetted area.

0.3 for approved water spray.

0.3 for approved insulation.

0.15 for approved water spray with approved insulation.

(vii) The outlet of all vents and vent drains on tanks equipped with emergency venting to permit pressures exceeding 2.5 p.s.i.g. shall be arranged to discharge in such a way as to prevent localized overheating of any part of the tank, in the event vapors from such vents are ignited.

(viii) Each commercial tank venting device shall have stamped on it the opening pressure, the pressure at which the valve reaches the full open position, and the flow capacity at the latter pressure, expressed in cubic feet per hour of air at 60°F and at a pressure of 14.7 p.s.i.a.

(ix) The flow capacity of tank venting devices 12 inches and smaller in nominal pipe size shall be determined by actual test of each type and size of vent. These flow tests may be conducted by the manufacturer if certified by a qualified impartial observer, or may be conducted by an outside agency. The flow capacity of tank venting devices larger than 12 inches nominal pipe size, including manhole covers with long bolts or equivalent, may be calculated provided that the opening pressure is actually measured, the

TABLE 10

WETTED AREA VERSUS CUBIC FEET FREE AIR PER HOUR (14.7 psia and 60°F)

Square feet	CFH	Square feet	CFH	Square feet	CFH
20	21,100	200	211,000	1,000	524,000
30	31,600	250	239,000	1,200	557,000
40	42,100	300	265,000	1,400	587,000
50	52,700	350	288,000	1,600	614,000
60	63,200	400	312,000	1,800	639,000
70	73,700	500	354,000	2,000	662,000
80	84,200	600	392,000	2,400	704,000
90	94,800	700	428,000	2,800	742,000
100	105,000	800	462,000	and	

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rating pressure and corresponding free orifice area are stated, the word "calculated" appears on the nameplate, and the computation is based on a flow coefficient of 0.5 applied to the rated orifice area.

(f) Vent piping for aboveground tanks.

(i) Vent piping shall be constructed in accordance with WAC 296-24-33007 of this section.

(ii) Where vent pipe outlets for tanks storing Class I liquids are adjacent to buildings or public ways, they shall be located so that the vapors are released at a safe point outside of buildings and not less than 12 feet above the adjacent ground level. In order to aid their dispersion, vapors shall be discharged upward or horizontally away from closely adjacent walls. Vent outlets shall be located so that flammable vapors will not be trapped by eaves or other obstructions and shall be at least five feet from building openings.

(iii) When tank vent piping is manifolded, pipe sizes shall be such as to discharge within the pressure limitations of the system, the vapors they may be required to handle when manifolded tanks are subject to the same fire exposure.

(g) Drainage, dikes, and walls for aboveground tanks.

(i) Drainage and diked areas. The area surrounding a tank or a group of tanks shall be provided with drainage as in (2)(g)(ii) of this section, or shall be diked as provided in (2)(g)(iii), to prevent accidental discharge of liquid from endangering adjoining property or reaching waterways.

(ii) Drainage. Where protection of adjoining property or waterways is by means of a natural or manmade drainage system, such systems shall comply with the following:

(A) A slope of not less than 1 percent away from the tank toward the drainage system shall be provided.

(B) The drainage system shall terminate in vacant land or other area or in an impounding basin having a capacity not smaller than that of the largest tank served. This termination area and the route of the drainage system shall be so located that, if the flammable or combustible liquids in the drainage system are ignited, the fire will not seriously expose tanks or adjoining property.

(C) The drainage system, including automatic drainage pumps, shall not discharge to adjoining property, natural water courses, public sewers, or public drains unless the discharge of flammable or combustible liquids would not constitute a hazard, or the system is so designed that it will not permit flammable or combustible liquids to be released.

(iii) Diked areas. Where protection of adjoining property or waterways is accomplished by retaining the liquid around the tank by means of a dike, the volume of the diked area shall comply with the following requirements:

(A) Except as provided in (2)(g)(iii)(B) of this section, the volumetric capacity of the diked area shall not be less than the greatest amount of liquid that can be released from the largest tank within the diked area, assuming a full tank. The capacity of the diked area enclosing more than one tank shall be calculated by deducting the volume of the tanks other than the largest tank below the height of the dike.

(B) For a tank or group of tanks with fixed roofs containing crude petroleum with boilover characteristics, the volumetric capacity of the diked area shall be not less than the capacity of the largest tank served by the enclosure, assuming a full tank. The capacity of the diked enclosure shall be calculated by deducting the volume below the height of the dike of all tanks within the enclosure.

(C) Walls of the diked area shall be of earth, steel, concrete or solid masonry designed to be liquidtight and to withstand a full hydrostatic head. Earthen walls 3 feet or more in height shall have a flat section at the top not less than 2 feet wide. The slope of an earthen wall shall be consistent with the angle of repose of the material of which the wall is constructed.

(D) The walls of the diked area shall be restricted to an average height of 6 feet above interior grade.

(E) Where provision is made for draining water from diked areas, drainage shall be provided at a uniform slope of not less than 1 percent away from tanks toward a sump, drainbox, or other safe means of disposal located at the greatest practical distance from the tank. Such drains shall normally be controlled in a manner so as to prevent flammable or combustible liquids from entering natural water courses, public sewers, or public drains, if their presence would constitute a hazard. Control of drainage shall be accessible under fire conditions.

(F) No loose combustible material, empty or full drum or barrel, shall be permitted within the diked area.

(G) Each diked area containing two or more tanks shall be subdivided preferably by drainage channels or at least by intermediate curbs in order to prevent spills from endangering adjacent tanks within the diked area as follows:

(I) When storing normally stable liquids in vertical cone roof tanks constructed with weak roof-to-shell seam or approved floating roof tanks or when storing crude petroleum in producing areas in any type of tank, one subdivision for each tank in excess of 10,000 bbls. and one subdivision for each group of tanks (no tank exceeding 10,000 bbls. capacity) having an aggregate capacity not exceeding 15,000 bbls.

(II) When storing normally stable flammable or combustible liquids in tanks not covered in (g)(iii)(G)(I) of this subsection, one subdivision for each tank in excess of 100,000 gallons (2,500 bbls.) and one subdivision for each group of tanks (no tank exceeding 100,000 gallons capacity) having an aggregate capacity not exceeding 150,000 gallons (3,570 bbls.).

(III) When storing unstable liquids in any type of tank, one subdivision for each tank except that tanks installed in accordance with the drainage requirements of NFPA 15-1969, Standard for Water Spray Fixed Systems for Fire Protection shall require no additional subdivision.

(IV) The drainage channels or intermediate curbs shall be located between tanks so as to take full advantage of the available space with due regard for the individual tank capacities. Intermediate curbs, where used, shall be not less than 18 inches in height.

(h) Tank openings other than vents for aboveground tanks.

(i) Connections for all tank openings shall be vaportight and liquid tight. Vents are covered in (2)(d) through (f) of this section.

(ii) Each connection to an aboveground tank through which liquid can normally flow shall be provided with an internal or an external valve located as close as practical to the shell of the tank. Such valves, when external, and their connections to the tank shall be of steel except when the chemical characteristics of the liquid stored are incompatible with steel. When materials other than steel are necessary,

they shall be suitable for the pressures, structural stresses, and temperatures involved, including fire exposures.

(iii) Each connection below the liquid level through which liquid does not normally flow shall be provided with a liquid tight closure. This may be a valve, plug, or blind, or a combination of these.

(iv) Openings for gaging shall be provided with a vapor tight cap or cover.

(v) For Class IB and Class IC liquids other than crude oils, gasolines, and asphalts, the fill pipe shall be so designed and installed as to minimize the possibility of generating static electricity. A fill pipe entering the top of a tank shall terminate within 6 inches of the bottom of the tank and shall be installed to avoid excessive vibration.

(vi) Filling and emptying connections which are made and broken shall be located outside of buildings at a location free from any source of ignition and not less than 5 feet away from any building opening. Such connection shall be closed and liquidtight when not in use. The connection shall be properly identified.

(3) Installation of underground tanks.

(a) Location. Excavation for underground storage tanks shall be made with due care to avoid undermining of foundations of existing structures. Underground tanks or tanks under buildings shall be so located with respect to existing building foundations and supports that the loads carried by the latter cannot be transmitted to the tank. The distance from any part of a tank storing Class I liquids to the nearest wall of any basement or pit shall be not less than 1 foot, and to any property line that may be built upon, not less than 3 feet. The distance from any part of a tank storing Class II or Class III liquids to the nearest wall of any basement, pit or property line shall not be less than 1 foot.

(b) Depth and cover. Underground tanks shall be set on firm foundations and surrounded with at least 6 inches of noncorrosive, inert materials such as clean sand, earth, or gravel well tamped in place. The tank shall be placed in the hole with care since dropping or rolling the tank into the hole can break a weld, puncture or damage the tank, or scrape off the protective coating of coated tanks. Tanks shall be covered with a minimum of 2 feet of earth or shall be covered with not less than 1 foot of earth, on top of which shall be placed a slab of reinforced concrete not less than 4 inches thick. When underground tanks are, or are likely to be, subject to traffic, they shall be protected against damage from vehicles passing over them by at least 3 feet of earth cover, or 18 inches of well-tamped earth, plus 6 inches of reinforced concrete or 8 inches of asphaltic concrete. When asphaltic or reinforced concrete paving is used as part of the protection, it shall extend at least 1 foot horizontally beyond the outline of the tank in all directions.

(c) Corrosion protection. Corrosion protection for the tank and its piping shall be provided by one or more of the following methods:

- (i) Use of protective coatings or wrappings;
  - (ii) Cathodic protection; or,
  - (iii) Corrosion resistant materials of construction.
- (d) Vents.

(i) Location and arrangement of vents for Class I liquids. Vent pipes from tanks storing Class I liquids shall be so located that the discharge point is outside of buildings, higher than the fill pipe opening, and not less than 12 feet

above the adjacent ground level. Vent pipes shall discharge only upward in order to disperse vapors. Vent pipes 2 inches or less in nominal inside diameter shall not be obstructed by devices that will cause excessive back pressure. Vent pipe outlets shall be so located that flammable vapors will not enter building openings, or be trapped under eaves or other obstructions. If the vent pipe is less than 10 feet in length, or greater than 2 inches in nominal inside diameter, the outlet shall be provided with a vacuum and pressure relief device or there shall be an approved flame arrester located in the vent line at the outlet or within the approved distance from the outlet.

(ii) Size of vents. Each tank shall be vented through piping adequate in size to prevent blow-back of vapor or liquid at the fill opening while the tank is being filled. Vent pipes shall be not less than 1 1/4 inch nominal inside diameter.

TABLE H-11  
VENT LINE DIAMETERS

Maximum flow GPM	Pipe length*		
	50 feet	100 feet	200 feet
	Inches	Inches	Inches
100	1 1/4	1 1/4	1 1/4
200	1 1/4	1 1/4	1 1/4
300	1 1/4	1 1/4	1 1/2
400	1 1/4	1 1/2	2
500	1 1/2	1 1/2	2
600	1 1/2	2	2
700	2	2	2
800	2	2	3
900	2	2	3
1,000	2	2	3

\*Vent lines of 50 ft., 100 ft., and 200 ft. of pipe plus 7 ells.

(iii) Location and arrangement of vents for Class II or Class III liquids. Vent pipes from tanks storing Class II or Class III flammable liquids shall terminate outside of the building and higher than the fill pipe opening. Vent outlets shall be above normal snow level. They may be fitted with return bends, coarse screens or other devices to minimize ingress of foreign material.

(iv) Vent piping shall be constructed in accordance with WAC 296-24-33007. Vent pipes shall be so laid as to drain toward the tank without sags or traps in which liquid can collect. They shall be located so that they will not be subjected to physical damage. The tank end of the vent pipe shall enter the tank through the top.

(v) When tank vent piping is manifolded, pipe sizes shall be such as to discharge, within the pressure limitations of the system, the vapors they may be required to handle when manifolded tanks are filled simultaneously.

(e) Tank openings other than vents.

(i) Connections for all tank openings shall be vapor or liquid tight.

(ii) Openings for manual gaging, if independent of the fill pipe, shall be provided with a liquid-tight cap or cover. If inside a building, each such opening shall be protected against liquid overflow and possible vapor release by means of a spring-loaded check valve or other approved device.

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(iii) Fill and discharge lines shall enter tanks only through the top. Fill lines shall be sloped toward the tank.

(iv) For Class IB and Class IC liquids other than crude oils, gasolines, and asphalts, the fill pipe shall be so designed and installed as to minimize the possibility of generating static electricity by terminating within 6 inches of the bottom of the tank.

(v) Filling and emptying connections which are made and broken shall be located outside of buildings at a location free from any source of ignition and not less than 5 feet away from any building opening. Such connection shall be closed and liquid-tight when not in use. The connection shall be properly identified.

(4) Installation of tanks inside of buildings.

(a) Location. Tanks shall not be permitted inside of buildings except as provided in WAC 296-24-33011 and 296-24-33015 through 296-24-33019.

(b) Vents. Vents for tanks inside of buildings shall be as provided in (2)(d), (e), (f)(ii) and (3)(d) of this section, except that emergency venting by the use of weak roof seams on tanks shall not be permitted. Vents shall discharge vapors outside the buildings.

(c) Vent piping. Vent piping shall be constructed in accordance with WAC 296-24-33007.

(d) Tank openings other than vents.

(i) Connections for all tank openings shall be vapor or liquidtight. Vents are covered in (4)(b) of this section.

(ii) Each connection to a tank inside of buildings through which liquid can normally flow shall be provided with an internal or an external valve located as close as practical to the shell of the tank. Such valves, when external, and their connections to the tank shall be of steel except when the chemical characteristics of the liquid stored are incompatible with steel. When materials other than steel are necessary, they shall be suitable for the pressures, structural stresses, and temperatures involved, including fire exposures.

(iii) Flammable or combustible liquid tanks located inside of buildings, except in one-story buildings designed and protected for flammable or combustible liquid storage, shall be provided with an automatic-closing heat-actuated valve on each withdrawal connection below the liquid level, except for connections used for emergency disposal, to prevent continued flow in the event of fire in the vicinity of the tank. This function may be incorporated in the valve required in (4)(d)(ii) of this section, and if a separate valve, shall be located adjacent to the valve required in (4)(d)(ii) of this section.

(iv) Openings for manual gaging, if independent of the fill pipe (see (4)(d)(vi) of this section), shall be provided with a vaportight cap or cover. Each such opening shall be protected against liquid overflow and possible vapor release by means of a spring loaded check valve or other approved device.

(v) For Class IB and Class IC liquids other than crude oils, gasolines, and asphalts, the fill pipe shall be so designed and installed as to minimize the possibility of generating static electricity by terminating within 6 inches of the bottom of the tank.

(vi) The fill pipe inside of the tank shall be installed to avoid excessive vibration of the pipe.

(vii) The inlet of the fill pipe shall be located outside of buildings at a location free from any source of ignition and not less than 5 feet away from any building opening. The inlet of the fill pipe shall be closed and liquidtight when not in use. The fill connection shall be properly identified.

(viii) Tanks inside buildings shall be equipped with a device, or other means shall be provided, to prevent overflow into the building.

(5) Supports, foundations, and anchorage for all tank locations.

(a) General. Tank supports shall be installed on firm foundations. Tank supports shall be of concrete, masonry, or protected steel. Single wood timber supports (not cribbing) laid horizontally may be used for outside above-ground tanks if not more than 12 inches high at their lowest point.

(b) Fire resistance. Steel supports or exposed piling shall be protected by materials having a fire resistance rating of not less than 2 hours, except that steel saddles need not be protected if less than 12 inches high at their lowest point. Water spray protection or its equivalent may be used in lieu of fire-resistive materials to protect supports.

(c) Spheres. The design of the supporting structure for tanks such as spheres shall receive special engineering consideration.

(d) Load distribution. Every tank shall be so supported as to prevent the excessive concentration of loads on the supporting portion of the shell.

(e) Foundations. Tanks shall rest on the ground or on foundations made of concrete, masonry, piling, or steel. Tank foundations shall be designed to minimize the possibility of uneven settling of the tank and to minimize corrosion in any part of the tank resting on the foundation.

(f) Flood areas. Where a tank is located in an area that may be subjected to flooding, the applicable precautions outlined in (5)(f) of this section shall be observed.

(i) No aboveground vertical storage tank containing a flammable or combustible liquid shall be located so that the allowable liquid level within the tank is below the established maximum flood stage, unless the tank is provided with a guiding structure such as described in (5)(f)(xiii), (xiv) and (xv) of this section.

(ii) Independent water supply facilities shall be provided at locations where there is no ample and dependable public water supply available for loading partially empty tanks with water.

(iii) In addition to the preceding requirements, each tank so located that more than 70 percent, but less than 100 percent, of its allowable liquid storage capacity will be submerged at the established maximum flood stage, shall be safeguarded by one of the following methods: Tank shall be raised, or its height shall be increased, until its top extends above the maximum flood stage a distance equivalent to 30 percent or more of its allowable liquid storage capacity: *Provided, however,* That the submerged part of the tank shall not exceed two and one-half times the diameter. Or, as an alternative to the foregoing, adequate noncombustible structural guides, designed to permit the tank to float vertically without loss of product, shall be provided.

(iv) Each horizontal tank so located that more than 70 percent of its storage capacity will be submerged at the established flood stage, shall be anchored, attached to a

foundation of concrete or of steel and concrete, of sufficient weight to provide adequate load for the tank when filled with flammable or combustible liquid and submerged by flood waters to the established flood stage, or adequately secured by other means.

(v) Spherical and spheroidal tanks shall be protected by applicable methods as specified for either vertical or horizontal tanks.

(vi) At locations where there is no ample and dependable water supply, or where filling of underground tanks with liquid is impracticable because of the character of their contents, their use, or for other reasons, each tank shall be safeguarded against movement when empty and submerged by high ground water or flood waters by anchoring, weighting with concrete or other approved solid loading material, or securing by other means. Each such tank shall be so constructed and installed that it will safely resist external pressures due to high ground water or flood waters.

(vii) At locations where there is an ample and dependable water supply available, underground tanks containing flammable or combustible liquids, so installed that more than 70 percent of their storage capacity will be submerged at the maximum flood stage, shall be so anchored, weighted, or secured by other means, as to prevent movement of such tanks when filled with flammable or combustible liquids, and submerged by flood waters to the established flood stage.

(viii) Pipe connections below the allowable liquid level in a tank shall be provided with valves or cocks located as closely as practicable to the tank shell. Such valves and their connections to tanks shall be of steel or other material suitable for use with the liquid being stored. Cast iron shall not be used.

(ix) At locations where an independent water supply is required, it shall be entirely independent of public power and water supply. Independent source of water shall be available when flood waters reach a level not less than 10 feet below the bottom of the lowest tank on a property.

(x) The self-contained power and pumping unit shall be so located or so designed that pumping into tanks may be carried on continuously throughout the rise in flood waters from a level 10 feet below the lowest tank to the level of the potential flood stage.

(xi) Capacity of the pumping unit shall be such that the rate of rise of water in all tanks shall be equivalent to the established potential average rate of rise of flood waters at any stage.

(xii) Each independent pumping unit shall be tested periodically to insure that it is in satisfactory operating condition.

(xiii) Structural guides for holding floating tanks above their foundations shall be so designed that there will be no resistance to the free rise of a tank, and shall be constructed of noncombustible material.

(xiv) The strength of the structure shall be adequate to resist lateral movement of a tank subject to a horizontal force in any direction equivalent to not less than 25 pounds per square foot acting on the projected vertical cross-sectional area of the tank.

(xv) Where tanks are situated on exposed points or bends in a shoreline where swift currents in flood waters will be present, the structures shall be designed to withstand a unit force of not less than 50 pounds per square foot.

(xvi) The filling of a tank to be protected by water loading shall be started as soon as flood waters reach a dangerous flood stage. The rate of filling shall be at least equal to the rate of rise of the floodwaters (or the established average potential rate of rise).

(xvii) Sufficient fuel to operate the water pumps shall be available at all times to insure adequate power to fill all tankage with water.

(xviii) All valves on connecting pipelines shall be closed and locked in closed position when water loading has been completed.

(xix) Where structural guides are provided for the protection of floating tanks, all rigid connections between tanks and pipelines shall be disconnected and blanked off or banded before the floodwaters reach the bottom of the tank, unless control valves and their connections to the tank are of a type designed to prevent breakage between the valve and the tank shell.

(xx) All valves attached to tanks other than those used in connection with water loading operations shall be closed and locked.

(xxi) If a tank is equipped with a swing line, the swing pipe shall be raised to and secured at its highest position.

(xxii) Inspections. The director or his/her designated representative shall make periodic inspections of all plants where the storage of flammable or combustible liquids is such as to require compliance with the foregoing requirements, in order to assure the following:

(A) That all flammable or combustible liquid storage tanks are in compliance with these requirements and so maintained.

(B) That detailed printed instructions of what to do in flood emergencies are properly posted.

(C) That station operators and other employees dependent upon to carry out such instructions are thoroughly informed as to the location and operation of such valves and other equipment necessary to effect these requirements.

(g) Earthquake areas. In areas subject to earthquakes, the tank supports and connections shall be designed to resist damage as a result of such shocks.

(6) Sources of ignition. In locations where flammable vapors may be present, precautions shall be taken to prevent ignition by eliminating or controlling sources of ignition. Sources of ignition may include open flames, lightning, smoking, cutting and welding, hot surfaces, frictional heat, sparks (static, electrical, and mechanical), spontaneous ignition, chemical and physical-chemical reactions, and radiant heat.

(7) Testing.

(a) General. All tanks, whether shop built or field erected, shall be strength tested before they are placed in service in accordance with the applicable sections of the code under which they were built. The American Society of Mechanical Engineers (ASME) code stamp, American Petroleum Institute (API) monogram, or the label of the Underwriters' Laboratories, Inc., on a tank shall be evidence of compliance with this strength test. Tanks not marked in accordance with the above codes shall be strength tested before they are placed in service in accordance with good engineering principles and reference shall be made to the sections on testing in the codes listed in (l)(c)(i), (d)(ii) or (e)(ii) of this section.

(b) Strength. When the vertical length of the fill and vent pipes is such that when filled with liquid the static head imposed upon the bottom of the tank exceeds 10 pounds per square inch, the tank and related piping shall be tested hydrostatically to a pressure equal to the static head thus imposed.

(c) Tightness. In addition to the strength test called for in (7)(a) and (b), all tanks and connections shall be tested for tightness. Except for underground tanks, this tightness test shall be made at operating pressure with air, inert gas, or water prior to placing the tank in service. In the case of field-erected tanks the strength test may be considered to be the test for tank tightness. Underground tanks and piping, before being covered, enclosed, or placed in use, shall be tested for tightness hydrostatically, or with air pressure at not less than 3 pounds per square inch and not more than 5 pounds per square inch.

(d) Repairs. All leaks or deformations shall be corrected in an acceptable manner before the tank is placed in service. Mechanical caulking is not permitted for correcting leaks in welded tanks except pinhole leaks in the roof.

(e) Derated operations. Tanks to be operated at pressures below their design pressure may be tested by the applicable provisions of (7)(a) or (b) based upon the pressure developed under full emergency venting of the tank.

**AMENDATORY SECTION** (Amending Order 91-07, filed 11/22/91, effective 12/24/91)

**WAC 296-24-33009 Container and portable tank storage.** (1) Scope.

(a) General. This section shall apply only to the storage of flammable or combustible liquids in drums or other containers (including flammable aerosols) not exceeding 60 gallons individual capacity and those portable tanks not exceeding 660 gallons individual capacity.

(b) Exceptions. This section shall not apply to the following:

- (i) Storage of containers in bulk plants, service stations, refineries, chemical plants, and distilleries;
- (ii) Class I or Class II liquids in the fuel tanks of a motor vehicle, aircraft, boat, or portable or stationary engine;
- (iii) Flammable or combustible paints, oils, varnishes, and similar mixtures used for painting or maintenance when not kept for a period in excess of 30 days;
- (iv) Beverages when packaged in individual containers not exceeding 1 gallon in size.

(2) Design, construction, and capacity of containers.

(a) General. Only approved containers and portable tanks shall be used. Metal containers and portable tanks meeting the requirements of and containing products authorized by Chapter I, Title 49 of the Code of Federal Regulations - October 1, 1972, (regulations issued by the hazardous materials regulations board, department of transportation), shall be deemed to be acceptable.

(b) Emergency venting. Each portable tank shall be provided with one or more devices installed in the top with sufficient emergency venting capacity to limit internal pressure under fire exposure conditions to 10 p.s.i.g., or 30 percent of the bursting pressure of the tank, whichever is greater. The total venting capacity shall be not less than that specified in WAC 296-24-33005 (2)(e)(iii) or (v). At least

one pressure-actuated vent having a minimum capacity of 6,000 cubic feet of free air (14.7 p.s.i.a. and 60°F) shall be used. It shall be set to open at not less than 5 p.s.i.g. If fusible vents are used, they shall be actuated by elements that operate at a temperature not exceeding 300°F.

**TABLE H-12**  
MAXIMUM ALLOWABLE SIZE OF  
CONTAINERS AND PORTABLE TANKS

Container Type	Flammable liquids			Combustible Liquids	
	Class IA	Class IB	Class IC	Class II &	Class III
Glass or approved plastic	1 pt.	1 qu.	1 gal.	1 gal.	1 gal.
Metal (other than DOT drums)	1 gal.	5 gal.	5 gal.	5 gal.	5 gal.
Safety cans	2 gal.	5 gal.	5 gal.	5 gal.	5 gal.
Metal drums (DOT spec.)	60 gal.	60 gal.	60 gal.	60 gal.	60 gal.
Approved portable tanks	660 gal.	660 gal.	660 gal.	660 gal.	660 gal.

Container exemptions:

(i) Medicines, beverages, foodstuffs, cosmetics and other common consumer items, when packaged according to commonly accepted practices, shall be exempt from the requirements of (4)(a) and (b) of this section.

(c) Size. Flammable and combustible liquid containers shall be in accordance with Table H-12, except that glass or plastic containers of no more than 1-gallon capacity may be used for a Class IA or IB flammable liquid if:

(i) Such liquid either would be rendered unfit for its intended use by contact with metal or would excessively corrode a metal container so as to create a leakage hazard; and

(ii) The user's process either would require more than 1 pint of Class IA liquid or more than 1 quart of a Class IB liquid of a single assay lot to be used at one time, or would require the maintenance of an analytical standard liquid of a quality which is not met by the specified standards of liquids available, and the quantity of the analytical standard liquid required to be used in any one control process exceeds one-sixteenth the capacity of the container allowed under Table H-12 for the class of liquid; or

(iii) The containers are intended for direct export outside the United States.

(3) Design, construction, and capacity of storage cabinets.

(a) Maximum capacity. Not more than 60 gallons of Class I or Class II liquids, nor more than 120 gallons of Class III liquids may be stored in a storage cabinet.

(b) Fire resistance. Storage cabinets shall be designed and constructed to limit the internal temperature to not more than 325°F when subjected to a 10-minute fire test using the standard time-temperature curve as set forth in Standard Methods of Fire Tests of Building Construction and Materials, NFPA 251-1969. All joints and seams shall remain tight and the door shall remain securely closed during the fire test. Cabinets shall be labeled "Flammable—Keep fire away," to meet specifications set forth in WAC 296-24-140.

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(i) Metal cabinets constructed in the following manner shall be deemed to be in compliance. The bottom, top, door, and sides of cabinet shall be at least No. 18 gage sheet iron and double walled with 1 1/2-inch air space. Joints shall be riveted, welded or made tight by some equally effective means. The door shall be provided with a three-point lock, and the door sill shall be raised at least 2 inches above the bottom of the cabinet.

(ii) Wooden cabinets constructed in the following manner shall be deemed in compliance. The bottom, sides, and top shall be constructed of an approved grade of plywood at least 1 inch in thickness, which shall not break down or delaminate under fire conditions. All joints shall be rabbetted and shall be fastened in two directions with flathead woodscrews. When more than one door is used, there shall be a rabbetted overlap of not less than 1 inch. Hinges shall be mounted in such a manner as not to lose their holding capacity due to loosening or burning out of the screws when subjected to the fire test.

(4) Design and construction of inside storage rooms.

(a) Construction. Inside storage rooms shall be constructed to meet the required fire-resistive rating for their use. Such construction shall comply with the test specifications set forth in Standard Methods of Fire Tests of Building Construction and Materials, NFPA 251-1969. Where an automatic sprinkler system is provided, the system shall be designed and installed in an acceptable manner. Openings to other rooms or buildings shall be provided with noncombustible liquid-tight raised sills or ramps at least 4 inches in height, or the floor in the storage area shall be at least 4 inches below the surrounding floor. Openings shall be provided with approved self-closing fire doors. The room shall be liquid tight where the walls join the floor. A permissible alternate to the sill or ramp is an open-grated trench inside of the room which drains to a safe location. Where other portions of the building or other properties are exposed, windows shall be protected as set forth in the Standard for Fire Doors and Windows, NFPA No. 80-1968, for Class E or F openings. Wood at least 1 inch nominal thickness may be used for shelving, racks, dunnage, scuff boards, floor overlay, and similar installations.

(b) Rating and capacity. Storage in inside storage rooms shall comply with Table H-13.

TABLE H-13  
STORAGE IN INSIDE ROOMS

Fire protection* provided	Fire resistance	Maximum size	Total allowable quantities (gals./sq. ft./floor area)
Yes	2 hours	500 sq.ft.	10
No	2 hours	500 sq.ft.	4
Yes	1 hour	150 sq.ft.	5
No	1 hour	150 sq.ft.	2

\* Fire protection system shall be sprinkler, water spray, carbon dioxide, or other system.

(c) Wiring. Electrical wiring and equipment within inside storage rooms used to store Class I liquids shall

comply with the provisions of chapter 296-24 WAC Part L for Class I, Division 2 locations. For inside storage rooms used to store Class II and III liquids the pertinent provisions chapter 296-24 WAC Part L apply.

(d) Ventilation. Every inside storage room shall be provided with either a gravity or a mechanical exhaust ventilation system. Such system shall be designed to provide for a complete change of air within the room at least six times per hour. If a mechanical exhaust system is used, it shall be controlled by a switch located outside of the door. The ventilating equipment and any lighting fixtures shall be operated by the same switch. A pilot light shall be installed adjacent to the switch if Class I flammable liquids are dispensed within the room. Where gravity ventilation is provided, the fresh air intake, as well as the exhaust outlet from the room, shall be on the exterior of the building in which the room is located.

(e) Storage in inside storage rooms. In every inside storage room there shall be maintained one clear aisle at least 3 feet wide. Containers over 30 gallons capacity shall not be stacked one upon the other. Dispensing shall be by approved pump or self-closing faucet only.

(5) Storage inside building.

(a) Egress. Flammable or combustible liquids, including stock for sale, shall not be stored so as to limit use of exits, stairways, or areas normally used for the safe egress of people.

(b) Containers. The storage of flammable or combustible liquids in containers or portable tanks shall comply with (4)(c) through (e) of this section.

(c) Office occupancies. Storage shall be prohibited except that which is required for maintenance and operation of building and operation of equipment. Such storage shall be kept in closed metal containers stored in a storage cabinet or in safety cans or in an inside storage room not having a door that opens into that portion of the building used by the public.

(d) Mercantile occupancies and other retail stores.

(i) In rooms or areas accessible to the public, storage shall be limited to quantities needed for display and normal merchandising purposes but shall not exceed 2 gallons per square foot of gross floor area. The gross floor area used for computing the maximum quantity permitted shall be considered as that portion of the store actually being used for merchandising flammable and combustible liquids.

(ii) Where the aggregate quantity of additional stock exceeds 60 gallons of Class IA, or 120 gallons of Class IB, or 180 gallons of Class IC, or 240 gallons of Class II, or 500 gallons of Class III liquids, or any combination of Class I and Class II liquids exceeding 240 gallons, it shall be stored in a room or portion of the building that complies with the construction provisions for an inside storage room as prescribed in (4) of this section. For water miscible liquids, these quantities may be doubled.

(iii) Containers in a display area shall not be stacked more than 3 feet or two containers high, whichever is the greater, unless the stacking is done on fixed shelving or is otherwise satisfactorily secured.

(iv) Shelving shall be of stable construction, of sufficient depth and arrangement such that containers displayed thereon shall not be easily displaced.

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(v) Leaking containers shall be removed to a storage room or taken to a safe location outside the building and the contents transferred to an undamaged container.

(e) General purpose public warehouses. Storage shall be in accordance with Table H-14 or H-15 and in buildings or in portions of such buildings cut off by standard firewalls. Material creating no fire exposure hazard to the flammable or combustible liquids may be stored in the same area.

**TABLE H-14**  
INDOOR CONTAINER STORAGE

Class liquid	Storage level	Protected storage maximum per pile		Unprotected storage maximum per pile	
		Gal.	Ht.	Gal.	Ht.
IA	Ground and upper floors	2,750 (50)	3 ft. (1)	660 (12)	3 ft. (1)
	Basement	Not permitted		Not permitted	
IB	Ground and upper floors	5,500 (100)	6 ft. (2)	1,375 (25)	3 ft. (1)
	Basement	Not permitted		Not permitted	
IC	Ground and upper floors	16,500 (300)	6 ft. (2)	4,125 (75)	3 ft. (1)
	Basement	Not permitted		Not permitted	
II	Ground and upper floors	16,500 (300)	9 ft. (3)	4,125 (75)	9 ft. (3)
	Basement	5,500 (100)	9 ft. (3)	Not permitted	
III	Ground and upper floors	55,000 (1,000)	15 ft. (5)	13,750 (250)	12 ft. (4)
	Basement	8,250 (450)	9 ft. (3)	Not permitted	

Note 1: When 2 or more classes of materials are stored in a single pile, the maximum gallonage permitted in that pile shall be the smallest of the 2 or more separate maximum gallonages.

Note 2: Aisles shall be provided so that no container is more than 12 ft. from an aisle. Main aisles shall be at least 8 ft. wide and side aisles at least 4 ft. wide.

(Numbers in parentheses indicate corresponding number of 55-gal. drums.)

Note 3: Each pile shall be separated from each other by at least 4 ft.

**TABLE H-15**  
INDOOR PORTABLE TANK STORAGE

Class liquid	Storage level	Protected storage maximum per pile		Unprotected storage maximum per pile	
		Gals.	Ht.	Gals.	Ht.
IA	Ground and upper floors	Not permitted		Not permitted	
	Basement	Not permitted		Not permitted	

IB	Ground and upper floors	20,000	7 ft.	2,000	7 ft.
	Basement	Not permitted		Not permitted	
IC	Ground and upper floors	40,000	14 ft.	5,500	7 ft.
	Basement	Not permitted		Not permitted	
II	Ground and upper floors	40,000	14 ft.	5,500	7 ft.
	Basement	20,000	7 ft.	Not permitted	
III	Ground and upper floors	60,000	14 ft.	22,000	7 ft.
	Basement	20,000	7 ft.	Not permitted	

Note 1: When 2 or more classes of materials are stored in a single pile, the maximum gallonage permitted in that pile shall be the smallest of the 2 or more separate maximum gallonages.

Note 2: Aisles shall be provided so that no portable tank is more than 12 ft. from an aisle. Main aisles shall be at least 8 ft. wide and side aisles at least 4 ft. wide.

Note 3: Each pile shall be separated from each other by at least 4 ft.

(f) Flammable and combustible liquid warehouses or storage buildings.

(i) If the storage building is located 50 feet or less from a building or line of adjoining property that may be built upon, the exposing wall shall be a blank wall having a fire-resistance rating of at least 2 hours.

(ii) The total quantity of liquids within a building shall not be restricted, but the arrangement of storage shall comply with Table H-14 or H-15.

(iii) Containers in piles shall be separated by pallets or dunnage where necessary to provide stability and to prevent excessive stress on container walls.

(iv) Portable tanks stored over one tier high shall be designed to nest securely, without dunnage and adequate materials handling equipment shall be available to handle tanks safely at the upper tier level.

(v) No pile shall be closer than 3 feet to the nearest beam, chord, girder, or other obstruction, and shall be 3 feet below sprinkler deflectors or discharge orifices of water spray, or other overhead fire protection systems.

(vi) Aisles of at least 3 feet wide shall be provided where necessary for reasons of access to doors, windows or standpipe connections.

(6) Storage outside buildings.

(a) General. Storage outside buildings shall be in accordance with Table H-16 or H-17, and (6)(b) and (d) of this section.

**TABLE H-16**  
OUTDOOR CONTAINER STORAGE

Class	1 Maximum per pile (see note 1)	2 Distance between piles (see note 2)	3 Distance to property line that can be built upon (see notes 3 & 4)	4 Distance to street, alley, public way (see note 4)	5
IA	1,100	5	20	10	
IB	2,200	5	20	10	
IC	4,400	5	20	10	

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II _____	8,800	5	10	5
III _____	22,000	5	10	5

- Note 1: When 2 or more classes of materials are stored in a single pile, the maximum gallonage in that pile shall be the smallest of the 2 or more separate gallonages.
- Note 2: Within 200 ft. of each container, there shall be 12-ft. wide access way to permit approach of fire control apparatus.
- Note 3: The distances listed apply to properties that have protection for exposures as defined. If there are exposures, and such protection for exposures does not exist, the distances in column 4 shall be doubled.
- Note 4: When total quantity stored does not exceed 50 percent of maximum per pile, the distances in columns 4 and 5 may be reduced 50 percent, but not less than 3 ft.

(b) Maximum storage. A maximum of 1,100 gallons of flammable or combustible liquids may be located adjacent to buildings located on the same premises and under the same management provided the provisions of (6)(b)(i) and (ii) are complied with.

(i) The building shall be a one-story building devoted principally to the handling and storing of flammable or combustible liquids or the building shall have 2 hour fire-resistive exterior walls having no opening within 10 feet of such storage.

(ii) Where quantity stored exceeds 1,100 gallons, or provisions of (6)(b)(i) cannot be met, a minimum distance of 10 feet between buildings and nearest container of flammable or combustible liquid shall be maintained.

TABLE H-17

OUTDOOR PORTABLE TANK STORAGE

1 Class	2 Maximum per pile	3 Distance between piles	4 Distance to property line that can be built upon	5 Distance to street, alley, public way
	gal.	ft.	ft.	ft.
IA _____	2,200	5	20	10
IB _____	4,400	5	20	10
IC _____	8,800	5	20	10
II _____	17,600	5	10	5
III _____	44,000	5	10	5

- Note 1: When 2 or more classes of materials are stored in a single pile, the maximum gallonage in that pile shall be the smallest of the 2 or more separate gallonages.
- Note 2: Within 200 ft. of each portable tank, there shall be a 12-ft. wide access way to permit approach of fire control apparatus.
- Note 3: The distances listed apply to properties that have protection for exposures as defined. If there are exposures, and such protection for exposures does not exist, the distances in column 4 shall be doubled.
- Note 4: When total quantity stored does not exceed 50 percent of maximum per pile, the distances in columns 4 and 5 may be reduced 50 percent, but not less than 3 ft.

(c) Spill containment. The storage area shall be graded in a manner to divert possible spills away from buildings or other exposures or shall be surrounded by a curb at least 6 inches high. When curbs are used, provisions shall be made for draining of accumulations of ground or rain water or spills of flammable or combustible liquids. Drains shall

terminate at a safe location and shall be accessible to operation under fire conditions.

(d) Security. The storage area shall be protected against tampering or trespassers where necessary and shall be kept free of weeds, debris and other combustible material not necessary to the storage.

(7) Fire control.

(a) Extinguishers. Suitable fire control devices, such as small hose or portable fire extinguishers, shall be available at locations where flammable or combustible liquids are stored.

(i) At least one portable fire extinguisher having a rating of not less than 12-B units shall be located outside of, but not more than 10 feet from, the door opening into any room used for storage.

(ii) At least one portable fire extinguisher having a rating of not less than 12-B units must be located not less than 10 feet, nor more than 25 feet, from any Class I or Class II liquid storage area located outside of a storage room but inside a building.

(b) Sprinklers. When sprinklers are provided, they shall be installed in accordance with ((WAC 296-24-605 through 296-24-60509)) chapter 296-24 WAC, Part G-3.

(c) Open flames and smoking. Open flames and smoking shall not be permitted in flammable or combustible liquid storage areas.

(d) Water reactive materials. Materials which will react with water shall not be stored in the same room with flammable or combustible liquids.

**AMENDATORY SECTION** (Amending Order 91-07, filed 11/22/91, effective 12/24/91)

**WAC 296-24-33011 Industrial plants.** (1) Scope.

(a) Application. This ((paragraph)) section shall apply to those industrial plants where:

(i) The use of flammable or combustible liquids is incidental to the principal business, or

(ii) Where flammable or combustible liquids are handled or used only in unit physical operations such as mixing, drying, evaporating, filtering, distillation, and similar operations which do not involve chemical reaction. This section shall not apply to chemical plants, refineries or distilleries.

(b) Exceptions. Where portions of such plants involve chemical reactions such as oxidation, reduction, halogenation, hydrogenation, alkylation, polymerization, and other chemical processes, those portions of the plant shall be in accordance with WAC 296-24-33017.

(2) Incidental storage or use of flammable and combustible liquids.

(a) Application. This shall be applicable to those portions of an industrial plant where the use and handling of flammable or combustible liquids is only incidental to the principal business, such as automobile assembly, construction of electronic equipment, furniture manufacturing, or other similar activities.

(b) Containers. Flammable or combustible liquids shall be stored in tanks or closed containers.

(i) Except as provided in (b)(ii) and (iii) of this subsection all storage shall comply with WAC 296-24-33009 (3) or (4).

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(A) When the only operation involved is the storage of flammables in containers or tanks that are closed and remain closed throughout the storage, WAC 296-24-33009(5) and tables H-14 and H-15 will apply.

(B) When the procedure involved is mixing, transferring, or other exposure of liquids to vaporization through operational procedures in which containers or tanks do not remain closed in the storage area, WAC 296-24-33009(4) and table H-13 shall be used to determine permissible quantities.

(ii) The quantity of liquid that may be located outside of an inside storage room or storage cabinet in a building or in any one fire area of a building shall not exceed:

(A) Twenty-five gallons of Class IA liquids in containers.

(B) One hundred twenty gallons of Class IB, IC, II, or III liquids in containers.

(C) Six hundred sixty gallons of Class IB, IC, II, or III liquids in a single portable tank.

(iii) Where large quantities of flammable or combustible liquids are necessary, storage may be in tanks which shall comply with the applicable requirements of WAC 296-24-33005.

(c) Separation and protection. Areas in which flammable or combustible liquids are transferred from one tank or container to another container shall be separated from other operations in the building by adequate distance or by construction having adequate fire resistance. Drainage or other means shall be provided to control spills. Adequate natural or mechanical ventilation shall be provided.

(d) Handling liquids at point of final use.

(i) Flammable liquids shall be kept in covered containers when not actually in use.

(ii) Where flammable or combustible liquids are used or handled, except in closed containers, means shall be provided to dispose promptly and safely of leakage or spills.

(iii) Class I liquids may be used only where there are no open flames or other sources of ignition within the possible path of vapor travel.

(iv) Flammable or combustible liquids shall be drawn from or transferred into vessels, containers, or portable tanks within a building only through a closed piping system, from safety cans, by means of a device drawing through the top, or from a container or portable tanks by gravity through an approved self-closing valve. Transferring by means of air pressure on the container or portable tanks shall be prohibited.

(3) Unit physical operations.

(a) Application. This subsection (3) shall be applicable in those portions of industrial plants where flammable or combustible liquids are handled or used in unit physical operations such as mixing, drying, evaporating, filtering, distillation, and similar operations which do not involve chemical change. Examples are plants compounding cosmetics, pharmaceuticals, solvents, cleaning fluids, insecticides, and similar types of activities.

(b) Location. Industrial plants shall be located so that each building or unit of equipment is accessible from at least one side for fire fighting and fire control purposes. Buildings shall be located with respect to lines of adjoining property which may be built upon as set forth in WAC 296-24-33017 (2)(a) and (b) except that the blank wall referred

to in WAC 296-24-33017 (2)(b) shall have a fire resistance rating of at least two hours.

(c) Chemical processes. Areas where unstable liquids are handled or small scale unit chemical processes are carried on shall be separated from the remainder of the plant by a fire wall of two-hour minimum fire resistance rating.

(d) Drainage.

(i) Emergency drainage systems shall be provided to direct flammable or combustible liquid leakage and fire protection water to a safe location. This may require curbs, scuppers, or special drainage systems to control the spread of fire; see WAC 296-24-33005 (2)(g)(ii).

(ii) Emergency drainage systems, if connected to public sewers or discharged into public waterways, shall be equipped with traps or separators.

(iii) The industrial plant shall be designed and operated to prevent the normal discharge of flammable or combustible liquids into public waterways, public sewers, or adjoining property.

(e) Ventilation.

(i) Areas as defined in subsection (1)(a) of this section using Class I liquids shall be ventilated at a rate of not less than one cubic foot per minute per square foot of solid floor area. This shall be accomplished by natural or mechanical ventilation with discharge or exhaust to a safe location outside of the building. Provision shall be made for introduction of makeup air in such a manner as not to short circuit the ventilation. Ventilation shall be arranged to include all floor areas or pits where flammable vapors may collect.

(ii) Equipment used in a building and the ventilation of the building shall be designed so as to limit flammable vapor-air mixtures under normal operating conditions to the interior of equipment, and to not more than five feet from equipment which exposes Class I liquids to the air. Examples of such equipment are dispensing stations, open centrifuges, plate and frame filters, open vacuum filters, and surfaces of open equipment.

(f) Storage and handling. The storage, transfer, and handling of liquid shall comply with WAC 296-24-33017(4) ~~((of this section))~~.

(4) Tank vehicle and tank car loading and unloading.

Tank vehicle and tank car loading or unloading facilities shall be separated from aboveground tanks, warehouses, other plant buildings or nearest line of adjoining property which may be built upon by a distance of twenty-five feet for Class I liquids and fifteen feet for Class II and Class III liquids measured from the nearest position of any fill stem. Buildings for pumps or shelters for personnel may be a part of the facility. Operations of the facility shall comply with the appropriate portions of WAC 296-24-33013(3).

(5) Fire control.

(a) Portable and special equipment. Portable fire extinguishment and control equipment shall be provided in such quantities and types as are needed for the special hazards of operation and storage.

(b) Water supply. Water shall be available in volume and at adequate pressure to supply water hose streams, foam-producing equipment, automatic sprinklers, or water spray systems as the need is indicated by the special hazards of operation, dispensing and storage.

(c) Special extinguishers. Special extinguishing equipment such as that utilizing foam, inert gas, or dry chemical shall be provided as the need is indicated by the special hazards of operation dispensing and storage.

(d) Special hazards. Where the need is indicated by special hazards of operation, flammable or combustible liquid processing equipment, major piping, and supporting steel shall be protected by approved water spray systems, deluge systems, approved fire-resistant coatings, insulation, or any combination of these.

(e) Maintenance. All plant fire protection facilities shall be adequately maintained and periodically inspected and tested to make sure they are always in satisfactory operating condition, and they will serve their purpose in time of emergency.

(6) Sources of ignition.

(a) General. Adequate precautions shall be taken to prevent the ignition of flammable vapors. Sources of ignition include but are not limited to open flames; lightning; smoking; cutting and welding; hot surfaces; frictional heat; static, electrical and mechanical sparks; spontaneous ignition, including heat-producing chemical reactions; and radiant heat.

(b) Grounding. Class I liquids shall not be dispensed into containers unless the nozzle and container are electrically interconnected. Where the metallic floorplate on which the container stands while filling is electrically connected to the fill stem or where the fill stem is bonded to the container during filling operations by means of a bond wire, the provisions of these standards shall be deemed to have been complied with.

(7) Electrical.

(a) All electrical wiring and equipment shall be installed according to chapter 296-24 WAC Part L.

(b) Locations where flammable vapor-air mixtures may exist under normal operations shall be classified Class I, Division 1 according to the requirements of chapter 296-24 WAC Part L. For those pieces of equipment installed in accordance with the requirements of subsection (3)(e)(ii) of this section, the Division 1 area shall extend five feet in all directions from all points of vapor liberation. All areas within pits shall be classified Division 1 if any part of the pit is within a Division 1 or 2 classified area, unless the pit is provided with mechanical ventilation.

(c) Locations where flammable vapor-air mixtures may exist under abnormal conditions and for a distance beyond Division 1 locations shall be classified Division 2 according to the requirements of chapter 296-24 WAC Part L. These locations include an area within twenty feet horizontally, three feet vertically beyond a Division 1 area, and up to three feet above floor or grade level within twenty-five feet, if indoors, or ten feet if outdoors, from any pump, bleeder, withdrawal fitting, meter, or similar device handling Class I liquids. Pits provided with adequate mechanical ventilation within a Division 1 or 2 area shall be classified Division 2. If Class II or Class III liquids only are handled, then ordinary electrical equipment is satisfactory though care shall be used in locating electrical apparatus to prevent hot metal from falling into open equipment.

(d) Where the provisions of (a), (b), and (c) of this subsection require the installation of electrical equipment suitable for Class I, Division 1 or Division 2 locations,

ordinary electrical equipment including switchgear may be used if installed in a room or enclosure which is maintained under positive pressure with respect to the hazardous area. Ventilation makeup air shall be uncontaminated by flammable vapors.

(8) Repairs to equipment. Hot work, such as welding or cutting operations, use of spark-producing power tools, and chipping operations shall be permitted only under supervision of an individual in responsible charge. The individual in responsible charge shall make an inspection of the area to be sure that it is safe for the work to be done and that safe procedures will be followed for the work specified.

(9) Housekeeping.

(a) General. Maintenance and operating practices shall be in accordance with established procedures which will tend to control leakage and prevent the accidental escape of flammable or combustible liquids. Spills shall be cleaned up promptly.

(b) Access. Adequate aisles shall be maintained for unobstructed movement of personnel and so that fire protection equipment can be brought to bear on any part of flammable or combustible liquid storage, use, or any unit physical operation.

(c) Waste and residue. Combustible waste material and residues in a building or unit operating area shall be kept to a minimum, stored in covered metal receptacles and disposed of daily.

(d) Clear zone. Ground area around buildings and unit operating areas shall be kept free of weeds, trash, or other unnecessary combustible materials.

**AMENDATORY SECTION** (Amending Order 91-07, filed 11/22/91, effective 12/24/91)

**WAC 296-24-33013 Bulk plants.** (1) Storage.

(a) Class I liquids. Class I liquids shall be stored in closed containers, or in storage tanks above ground outside of buildings, or underground in accordance with WAC 296-24-33005.

(b) Class II and III liquids. Class II and Class III liquids shall be stored in containers, or in tanks within buildings or above ground outside of buildings, or underground in accordance with WAC 296-24-33005.

(c) Piling containers. Containers of flammable or combustible liquids when piled one upon the other shall be separated by dunnage sufficient to provide stability and to prevent excessive stress on container walls. The height of the pile shall be consistent with the stability and strength of containers.

(2) Buildings.

(a) Exits. Rooms in which flammable or combustible liquids are stored or handled by pumps shall have exit facilities arranged to prevent occupants from being trapped in the event of fire.

(b) Heating. Rooms in which Class I liquids are stored or handled shall be heated only by means not constituting a source of ignition, such as steam or hot water. Rooms containing heating appliances involving sources of ignition shall be located and arranged to prevent entry of flammable vapors.

(c) Ventilation.

(i) Ventilation shall be provided for all rooms, buildings, or enclosures in which Class I liquids are pumped or dispensed. Design of ventilation systems shall take into account the relatively high specific gravity of the vapors. Ventilation may be provided by adequate openings in outside walls at floor level unobstructed except by louvers or coarse screens. Where natural ventilation is inadequate, mechanical ventilation shall be provided.

(ii) Class I liquids shall not be stored or handled within a building having a basement or pit into which flammable vapors may travel, unless such area is provided with ventilation designed to prevent the accumulation of flammable vapors therein.

(iii) Containers of Class I liquids shall not be drawn from or filled within buildings unless provision is made to prevent the accumulation of flammable vapors in hazardous concentrations. Where mechanical ventilation is required, it shall be kept in operation while flammable liquids are being handled.

(3) Loading and unloading facilities.

(a) Separation. Tank vehicle and tank car loading or unloading facilities shall be separated from aboveground tanks, warehouses, other plant buildings or nearest line of adjoining property that may be built upon by a distance of 25 feet for Class I liquids and 15 feet for Class II and Class III liquids measured from the nearest position of any fill spout. Buildings for pumps or shelters for personnel may be a part of the facility.

(b) Class restriction. Equipment such as piping, pumps, and meters used for the transfer of Class I liquids between storage tanks and the fill stem of the loading rack shall not be used for the transfer of Class II or Class III liquids.

(c) Valves. Valves used for the final control for filling tank vehicles shall be of the self-closing type and manually held open except where automatic means are provided for shutting off the flow when the vehicle is full or after filling of a preset amount.

(d) Static protection.

(i) Bonding facilities for protection against static sparks during the loading of tank vehicles through open domes shall be provided:

(A) Where Class I liquids are loaded, or

(B) Where Class II or Class III liquids are loaded into vehicles which may contain vapors from previous cargoes of Class I liquids.

(ii) Protection as required in (3)(d)(i) of this section shall consist of a metallic bond wire permanently electrically connected to the fill stem or to some part of the rack structure in electrical contact with the fill stem. The free end of such wire shall be provided with a clamp or equivalent device for convenient attachment to some metallic part in electrical contact with the cargo tank of the tank vehicle.

(iii) Such bonding connection shall be made fast to the vehicle or tank before dome covers are raised and shall remain in place until filling is completed and all dome covers have been closed and secured.

(iv) Bonding as specified in (3)(d)(i), (ii) and (iii) of this section is not required:

(A) Where vehicles are loaded exclusively with products not having a static accumulating tendency, such as asphalt, most crude oils, residual oils, and water soluble liquids;

(B) Where no Class I liquids are handled at the loading facility and the tank vehicles loaded are used exclusively for Class II and Class III liquids; and

(C) Where vehicles are loaded or unloaded through closed bottom or top connections.

(v) Filling through open domes into the tanks of tank vehicles or tank cars, that contain vapor-air mixtures within the flammable range or where the liquid being filled can form such a mixture, shall be by means of a downspout which extends near the bottom of the tank. This precaution is not required when loading liquids which are nonaccumulators of static charges.

(e) Stray currents. Tank car loading facilities where Class I liquids are loaded through open domes shall be protected against stray currents by bonding the pipe to at least one rail and to the rack structure if of metal. Multiple lines entering the rack area shall be electrically bonded together. In addition, in areas where excessive stray currents are known to exist, all pipe entering the rack area shall be provided with insulating sections to electrically isolate the rack piping from the pipelines. No bonding between the tank car and the rack or piping is required during either loading or unloading of Class II or III liquids.

(f) Container filling facilities. Class I liquids shall not be dispensed into containers unless the nozzle and container are electrically interconnected. Where the metallic floorplate on which the container stands while filling is electrically connected to the fill stem or where the fill stem is bonded to the container during filling operations by means of a bond wire, the provisions of these standards shall be deemed to have been complied with.

(4) Wharves.

(a) Definition, application. The term wharf shall mean any wharf, pier, bulkhead, or other structure over or contiguous to navigable water used in conjunction with a bulk plant, the primary function of which is the transfer of flammable or combustible liquid cargo in bulk between the bulk plant and any tank vessel, ship, barge, lighter boat, or other mobile floating craft; and this subparagraph shall apply to all such installations except marine service stations as covered in WAC 296-24-33015.

(b) Package cargo. Package cargo of flammable and combustible liquids, including full and empty drums, bulk fuel, and stores may be handled over a wharf and at such times and places as may be agreed upon by the wharf superintendent and the senior deck officer on duty.

(c) Location. Wharves at which flammable or combustible liquid cargoes are to be transferred in bulk quantities to or from tank vessels shall be at least 100 feet from any bridge over a navigable waterway, or from an entrance to or superstructure of any vehicular or railroad tunnel under a waterway. The termination of the wharf loading or unloading fixed piping shall be at least 200 feet from a bridge or from an entrance to or superstructure of a tunnel.

(d) Design and construction. Substructure and deck shall be substantially designed for the use intended. Deck may employ any material which will afford the desired combination of flexibility, resistance to shock, durability, strength, and fire resistance. Heavy timber construction is acceptable.

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(e) Tanks. Tanks used exclusively for ballast water or Class II or Class III liquids may be installed on suitably designed wharves.

(f) Pumps. Loading pumps capable of building up pressures in excess of the safe working pressure of cargo hose or loading arms shall be provided with bypasses, relief valves, or other arrangement to protect the loading facilities against excessive pressure. Relief devices shall be tested at not more than yearly intervals to determine that they function satisfactorily at the pressure at which they are set.

(g) Hoses and couplings. All pressure hoses and couplings shall be inspected at intervals appropriate to the service. The hose and couplings shall be tested with the hose extended and using the "inservice maximum operating pressures." Any hose showing material deteriorations, signs of leakage, or weakness in its carcass or at the couplings shall be withdrawn from service and repaired or discarded.

(h) Piping and fittings. Piping, valves, and fittings shall be in accordance with WAC 296-24-33007 with the following exceptions and additions:

(i) Flexibility of piping shall be assured by appropriate layout and arrangement of piping supports so that motion of the wharf structure resulting from wave action, currents, tides, or the mooring of vessels will not subject the pipe to repeated strain beyond the elastic limit.

(ii) Pipe joints depending upon the friction characteristics of combustible materials or grooving of pipe ends for mechanical continuity of piping shall not be used.

(iii) Swivel joints may be used in piping to which hoses are connected, and for articulated swivel-joint transfer systems, provided that the design is such that the mechanical strength of joint will not be impaired if the packing material should fail, as by exposure to fire.

(iv) Piping systems shall contain a sufficient number of valves to operate the system properly and to control the flow of liquid in normal operation and in the event of physical damage.

(v) In addition to the requirements of (4)(h)(iv), each line conveying flammable liquids leading to a wharf shall be provided with a readily accessible block valve located on shore near the approach to the wharf and outside of any diked area. Where more than one line is involved, the valves shall be grouped in one location.

(vi) Means of easy access shall be provided for cargo line valves located below the wharf deck.

(vii) Pipelines on flammable or combustible liquids wharves shall be adequately bonded and grounded. If excessive stray currents are encountered, insulating points shall be installed. Bonding and grounding connections on all pipelines shall be located on wharfside of hose-riser insulating flanges, if used, and shall be accessible for inspection.

(viii) Hose or articulated swivel-joint pipe connections used for cargo transfer shall be capable of accommodating the combined effects of change in draft and maximum tidal range, and mooring lines shall be kept adjusted to prevent the surge of the vessel from placing stress on the cargo transfer system.

(ix) Hose shall be supported so as to avoid kinking and damage from chafing.

(i) Fire protection. Suitable portable fire extinguishers with a rating of not less than 12-BC shall be located with 75

feet of those portions of the facility where fires are likely to occur, such as hose connections, pumps, and separator tanks.

(i) Where piped water is available, ready-connected fire hose in size appropriate for the water supply shall be provided so that manifolds where connections are made and broken can be reached by at least one hose stream.

(ii) Material shall not be placed on wharves in such a manner as to obstruct access to fire fighting equipment, or important pipeline control valves.

(iii) Where the wharf is accessible to vehicle traffic, an unobstructed roadway to the shore end of the wharf shall be maintained for access of fire fighting apparatus.

(j) Operations control. Loading or discharging shall not commence until the wharf superintendent and officer in charge of the tank vessel agree that the tank vessel is properly moored and all connections are properly made. Mechanical work shall not be performed on the wharf during cargo transfer, except under special authorization by a delegated person or ~~(his)~~ the delegated persons authorized representative based on a review of the area involved, methods to be employed, and precaution necessary.

(5) Electrical equipment.

(a) Application. This subsection shall apply to areas where Class I liquids are stored or handled. For areas where Class II or Class III liquids only are stored or handled, the electrical equipment may be installed according to chapter 296-24 WAC Part L for ordinary locations.

(b) Conformance. All electrical equipment and wiring shall be of a type specified by and shall be installed according to chapter 296-24 WAC Part L.

(c) Classification. So far as it applies Table H-18 shall be used to delineate and classify hazardous areas for the purpose of installation of electrical equipment under normal circumstances. In Table H-18 a classified area shall not extend beyond an unpierced wall, roof, or other solid partition. The area classifications listed shall be based on the premise that the installation meets the applicable requirements of this section in all respects.

TABLE H-18  
ELECTRICAL EQUIPMENT HAZARDOUS  
AREAS—BULK PLANTS

Location	Class I Group D division	Extent of classified area
Tank vehicle and tank car: <sup>1</sup> Loading through open dome	1	Within 3 feet of edge of dome, extending in all directions.
	2	Area between 3 feet and 5 feet from edge of dome, extending in all directions.
Loading through bottom connections with atmospheric venting	1	Within 3 feet of point of venting to atmosphere, extending in all directions.

	2	Area between 3 feet and 5 feet from point of venting to atmosphere, extending in all directions. Also up to 18 inches above grade within a horizontal radius of 10 feet from point of loading connection.		2	Area between 5 feet and 10 feet from open end of vent, extending in all directions.
Loading through closed dome with atmospheric venting _____	1	Within 3 feet of open end of vent, extending in all directions.	Floating roof _____	1	Area above the roof and within the shell.
	2	Area between 3 feet and 5 feet from open end of vent, extending in all directions. Also within 3 feet of edge of dome, extending in all directions.	Pits: Without mechanical ventilation _____	1	Entire area within pit if any part is within a Division 1 or 2 classified area.
Loading through closed dome with vapor recovery _____	2	Within 3 feet of point of connection of both fill and vapor lines, extending in all directions.	With mechanical ventilation _____	2	Entire area within pit if any part is within a Division 1 or 2 classified area.
Bottom loading with vapor recovery or any bottom unloading _____	2	Within 3 feet of point of connections extending in all directions. Also up to 18 inches above grade within a horizontal radius of 10 feet from point of connection.	Containing valves, fittings or piping, and not within a Division 1 or 2 classified area _____	2	Entire pit.
Drum and container filling: Outdoors, or indoors with adequate ventilation _____	1	Within 3 feet of vent and fill opening, extending in all directions.	Pumps, bleeders, withdrawal fittings, meters and similar devices: Indoors _____	2	Within 5 feet of any edge of such devices, extending in all directions. Also up to 3 feet above floor or grade level within 25 feet horizontally from any edge of such devices.
	2	Area between 3 feet and 5 feet from vent or fill opening, extending in all directions. Also up to 18 inches above floor or grade level within a horizontal radius of 10 feet from vent or fill opening.	Outdoors _____	2	Within 3 feet of any edge of such devices, extending in all directions. Also up to 18 inches above grade level within 10 feet horizontally from any edge of such devices.
Outdoors, or indoors with adequate ventilation _____	1	Within 3 feet of vent and fill opening, extending in all directions.	Storage and repair garage for tank vehicles _____	1	All pits or spaces below floor level.
	2	Area between 3 feet and 5 feet from vent or fill opening, extending in all directions. Also up to 18 inches above floor or grade level within a horizontal radius of 10 feet from vent or fill opening.		2	Area up to 18 inches above floor or grade level for entire storage or repair garage.
			Drainage ditches, separators, impounding basins _____	2	Area up to 18 inches above ditch, separator or basin. Also up to 18 inches above grade within 15 feet horizontally from any edge.
			Garages for other than tank vehicles _____	Ordinary	If there is any opening to these rooms within the extent of an outdoor classified area, the entire room shall be classified the same as the area classification at the point of the opening.
Tank—Aboveground: Shell, ends, or roof and dike area _____	2	Within 10 feet from shell, ends, or roof of tank, area inside dikes to level of top of dike.	Outdoor drum storage _____	Ordinary	
Vent _____	1	Within 5 feet of open end of vent, extending in all directions.			

Indoor warehousing where there is no flammable liquid transfer	_____	Ordinary If there is any opening to these rooms within the extent of an indoor classified area, the room shall be classified the same as if the wall, curb or partition did not exist.
Office and rest rooms	_____	Ordinary

<sup>1</sup>When classifying the extent of the area, consideration shall be given to the fact that tank cars or tank vehicles may be spotted at varying points. Therefore, the extremities of the loading or unloading positions shall be used.

(6) Sources of ignition. Class I liquids shall not be handled, drawn, or dispensed where flammable vapors may reach a source of ignition. Smoking shall be prohibited except in designated localities. "No smoking" signs shall be conspicuously posted where hazard from flammable liquid vapors is normally present.

(7) Drainage and waste disposal. Provision shall be made to prevent flammable or combustible liquids which may be spilled at loading or unloading points from entering public sewers and drainage systems, or natural waterways. Connection to such sewers, drains, or waterways by which flammable or combustible liquids might enter shall be provided with separator boxes or other approved means whereby such entry is precluded. Crankcase drainings and flammable or combustible liquids shall not be dumped into sewers, but shall be stored in tanks or tight drums outside of any building until removed from the premises.

(8) Fire control. Suitable fire-control devices, such as small hose or portable fire extinguishers, shall be available to locations where fires are likely to occur. Additional fire-control equipment may be required where a tank of more than 50,000 gallons individual capacity contains Class I liquids and where an unusual exposure hazard exists from surrounding property. Such additional fire-control equipment shall be sufficient to extinguish a fire in the largest tank. The design and amount of such equipment shall be in accordance with approved engineering standards.

**AMENDATORY SECTION** (Amending Order 88-25, filed 11/14/88)

**WAC 296-24-47507 Cylinder systems.** (1) Application. This section applies specifically to systems utilizing containers constructed in accordance with DOT specifications. All requirements of WAC 296-24-47505 apply to this section unless otherwise noted in WAC 296-24-47505.

(2) Marking of containers.

(a) Containers shall be marked in accordance with DOT regulations. Additional markings not in conflict with DOT regulations may be used.

(b) Except as provided in (c) of this subsection each container shall be marked with its water capacity in pounds or other identified unit of weight.

(c) If a container is filled and maintained only by the owner or ~~(his)~~ the owners representative and if the water capacity of each container is identified by a code, compliance with (b) of this subsection is not required.

(d) Each container shall be marked with its tare weight in pounds or other identified unit of weight including all permanently attached fittings but not the cap.

(3) Description of a system. A system shall include the container base or bracket, containers, container valves, connectors, manifold valve assembly, regulators, and relief valves.

(4) Containers and regulating equipment installed outside of buildings or structures.

(a) Containers shall not be buried below ground. However, this shall not prohibit the installation in a compartment or recess below grade level, such as a niche in a slope or terrace wall which is used for no other purpose, providing that the container and regulating equipment are not in contact with the ground and the compartment or recess is drained and ventilated horizontally to the outside air from its lowest level, with the outlet at least three feet away from any building opening which is below the level of such outlet.

Except as provided in WAC 296-24-47505 (10)(n), the discharge from safety relief devices shall be located not less than three feet horizontally away from any building opening which is below the level of such discharge and shall not terminate beneath any building unless such space is well ventilated to the outside and is not enclosed on more than two sides.

(b) Containers shall be set upon firm foundation or otherwise firmly secured; the possible effect on the outlet piping of settling shall be guarded against by a flexible connection or special fitting.

(5) Containers and equipment used inside of buildings or structures.

(a) When operational requirements make portable use of containers necessary and their location outside of buildings or structures is impracticable, containers and equipment are permitted to be used inside of buildings or structures in accordance with (a)(i) through (xii) of this subsection, and, in addition, such other provisions of this section as are applicable to the particular use or occupancy.

(i) Containers in use shall mean connected for use.

(ii) Systems utilizing containers having a water capacity greater than two and one-half pounds (nominal one pound LP-gas capacity) shall be equipped with excess flow valves. Such excess flow valves shall be either integral with the container valves or in the connections to the container valve outlets. In either case, an excess flow valve shall be installed in such a manner that any undue strain beyond the excess flow valve will not cause breakage between the container and the excess flow valve. The installation of excess flow valves shall take into account the type of valve protection provided.

(iii) Regulators, if used, shall be either directly connected to the container valves or to manifolds connected to the container valves. The regulator shall be suitable for use with LP-gas. Manifolds and fittings connecting containers to pressure regulator inlets shall be designed for at least 250 p.s.i.g. service pressure.

(iv) Valves on containers having a water capacity greater than fifty pounds (nominal twenty pounds LP-gas capacity) shall be protected while in use.

(v) Containers shall be marked in accordance with WAC 296-24-47505 (5)(c) and subsection (2) of this section.

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(vi) Pipe or tubing shall conform to WAC 296-24-47505(8) except that aluminum pipe or tubing shall not be used.

(vii) Hose shall be designed for a working pressure of at least 250 p.s.i.g. Hose and hose connections shall have their correctness as to design, construction and performance determined by listing by a nationally recognized testing laboratory.

(A) The hose length may exceed the length specified in WAC 296-24-47505 (9)(g)(ii), but shall be as short as practicable. Refer to federal regulation 29 CFR 1910.7 for definition of nationally recognized testing laboratory.

(B) Hose shall be long enough to permit compliance with spacing provisions of this section without kinking or straining or causing hose to be so close to a burner as to be damaged by heat.

(viii) Portable heaters, including salamanders, shall be equipped with an approved automatic device to shut off the flow of gas to the main burner, and pilot if used, in the event of flame extinguishment. Such heaters having inputs above 50,000 B.t.u. manufactured on or after May 17, 1967, and such heaters having inputs above 100,000 B.t.u. manufactured before May 17, 1967, shall be equipped with either:

(A) A pilot which must be lighted and proved before the main burner can be turned on; or

(B) An electric ignition system. The provisions of (a)(viii) of this subsection do not apply to tar kettle burners, torches, melting pots, nor do they apply to portable heaters under 7,500 B.t.u.h. input when used with containers having a maximum water capacity of two and one-half pounds. Container valves, connectors, regulators, manifolds, piping, and tubing shall not be used as structural supports for heaters.

(ix) Containers, regulating equipment, manifolds, pipe, tubing, and hose shall be located so as to minimize exposure to abnormally high temperatures (such as may result from exposure to convection or radiation from heating equipment or installation in confined spaces), physical damage, or tampering by unauthorized persons.

(x) Heat producing equipment shall be located and used so as to minimize the possibility of ignition of combustibles.

(xi) Containers having water capacity greater than two and one-half pounds (nominal one pound LP-gas capacity) connected for use, shall stand on a firm and substantially level surface and, when necessary, shall be secured in an upright position.

(xii) Containers, including the valve protective devices, shall be installed so as to minimize the probability of impingement of discharge of safety relief devices upon containers.

(b) Containers having a maximum water capacity of two and one-half pounds (nominal one pound LP-gas capacity) are permitted to be used inside of buildings as part of approved self-contained hand torch assemblies or similar appliances.

(c) Containers having a maximum water capacity of twelve pounds (nominal five pounds LP-gas capacity) are permitted to be used temporarily inside of buildings for public exhibition or demonstration purposes, including use for classroom demonstrations.

(d) When buildings frequented by the public are open to the public, containers are permitted to be used for repair or minor renovation as follows:

(i) The maximum water capacity of individual containers shall be fifty pounds (nominal twenty pounds LP-gas capacity).

(ii) The number of LP-gas containers shall not exceed the number of (~~workmen~~) workers assigned to using the LP-gas.

(iii) Containers having a water capacity of greater than two and one-half pounds (nominal one pound LP-gas capacity[]) shall not be left unattended in such buildings.

(e) When buildings frequented by the public are not open to the public, containers are permitted to be used for repair or minor renovations, as follows:

The provisions of (f) of this subsection shall apply except that containers having a water capacity greater than two and one-half pounds (nominal one pound LP-gas capacity) shall not be left unattended in such buildings.

(f) Containers are permitted to be used in buildings or structures under construction or undergoing major renovation when such buildings or structures are not occupied by the public, as follows:

(i) The maximum water capacity of individual containers shall be two hundred forty-five pounds (nominal one hundred pounds LP-gas capacity).

(ii) For temporary heating such as curing concrete, drying plaster and similar applications, heaters (other than integral heater-container units) shall be located at least six feet from any LP-gas container. This shall not prohibit the use of heaters specifically designed for attachment to the container or to a supporting standard, provided they are designed and installed so as to prevent direct or radiant heat application from the heater onto the container. Blower and radiant type heater shall not be directed toward any LP-gas container within twenty feet.

(iii) If two or more heater-container units, of either the integral or nonintegral type, are located in an unpartitioned area on the same floor, the container or containers of each unit shall be separated from the container or containers of any other unit by at least twenty feet.

(iv) When heaters are connected to containers for use in an unpartitioned area on the same floor, the total water capacity of containers manifolded together for connection to a heater or heaters shall not be greater than seven hundred thirty-five pounds (nominal three hundred pounds LP-gas capacity). Such manifolds shall be separated by at least twenty feet.

(v) On floors on which heaters are not connected for use, containers are permitted to be manifolded together for connection to a heater or heaters on another floor, provided:

(A) The total water capacity of containers connected to any one manifold is not greater than two thousand four hundred fifty pounds (nominal one thousand pounds LP-gas capacity) and;

(B) Where more than one manifold having a total water capacity greater than seven hundred thirty-five pounds (nominal three hundred pounds LP-gas capacity) are located in the same unpartitioned area, they shall be separated by at least fifty feet.

(vi) Storage of containers awaiting use shall be in accordance with WAC 296-24-47513.

(g) Containers are permitted to be used in industrial occupancies for processing, research, or experimental purposes as follows:

(i) The maximum water capacity of individual containers shall be two hundred forty-five pounds (nominal one hundred pounds LP-gas capacity).

(ii) Containers connected to a manifold shall have a total water capacity not greater than seven hundred thirty-five pounds (nominal three hundred pounds LP-gas capacity) and not more than one such manifold may be located in the same room unless separated at least twenty feet from a similar unit.

(iii) The amount of LP-gas in containers for research and experimental use shall be limited to the smallest practical quantity.

(h) Containers are permitted to be used in industrial occupancies with essentially noncombustible contents where portable equipment for space heating is essential and where a permanent heating installation is not practical, as follows: Containers and heaters shall comply with and be used in accordance with (f) of this subsection.

(i) Containers are permitted to be used in buildings for temporary emergency heating purposes, if necessary to prevent damage to the buildings or contents, when the permanent heating system is temporarily out of service, as follows:

(i) Containers and heaters shall comply with and be used in accordance with (f) of this subsection.

(ii) The temporary heating equipment shall not be left unattended.

(j) Containers are permitted to be used temporarily in buildings for training purposes related in installation and use of LP-gas systems, as follows:

(i) The maximum water capacity of individual containers shall be two hundred forty-five pounds (nominal one hundred pounds LP-gas capacity), but the maximum quantity of LP-gas that may be placed in each container shall be twenty pounds.

(ii) If more than one such container is located in the same room, the containers shall be separated by at least twenty feet.

(iii) Containers shall be removed from the building when the training class has terminated.

(6) Container valves and accessories.

(a) Valves in the assembly of multiple container systems shall be arranged so that replacement of containers can be made without shutting off the flow of gas in the system.

Note: This provision is not to be construed as requiring an automatic changeover device.

(b) Regulators and low-pressure relief devices shall be rigidly attached to the cylinder valves, cylinders, supporting standards, the building walls or otherwise rigidly secured and shall be so installed or protected that the elements (sleet, snow, or ice) will not affect their operation.

(c) Valves and connections to the containers shall be protected while in transit, in storage, and while being moved into final utilization, as follows:

(i) By setting into the recess of the container to prevent the possibility of their being struck if the container is dropped upon a flat surface, or

(ii) By ventilated cap or collar, fastened to the container capable of withstanding a blow from any direction equivalent to that of a thirty-pound weight dropped four feet. Construction must be such that a blow will not be transmitted to the valve or other connection.

(d) When containers are not connected to the system, the outlet valves shall be kept tightly closed or plugged, even though containers are considered empty.

(e) Containers having a water capacity in excess of fifty pounds (approximately twenty-one pounds LP-gas capacity), recharged at the installation, shall be provided with excess flow or backflow check valves to prevent the discharge of container contents in case of failure of the filling or equalizing connection.

(7) Safety devices.

(a) Containers shall be provided with safety devices as required by DOT regulations.

(b) A final stage regulator of an LP-gas system (excluding any appliance regulator) shall be equipped on the low-pressure side with a relief valve which is set to start to discharge within the limits specified in Table H-30.

TABLE H-30

Regulator delivery pressure	Relief valve start to discharge pressure setting (percent of regulator deliver pressure)	
	Minimum	Maximum
1 p.s.i.g. or less	200	300
Above 1 p.s.i.g. but not over 3 p.s.i.g.	140	200
Above 3 p.s.i.g.	125	200

(c) When a regulator or pressure relief valve is used inside a building for other than purposes specified in WAC 296-24-47505 (6)(a)(i) through (vi), the relief valve and the space above the regulator and relief valve diaphragms shall be vented to the outside air with the discharge outlet located not less than three feet horizontally away from any building opening which is below such discharge. These provisions do not apply to individual appliance regulators when protection is otherwise provided nor to subsection (5) of this section and WAC 296-24-47505 (10)(n). In buildings devoted exclusively to gas distribution purposes, the space above the diaphragm need not be vented to the outside.

(8) Reinstallation of containers. Containers shall not be reinstalled unless they are requalified in accordance with DOT regulations.

Permissible product. A product shall not be placed in a container marked with a service pressure less than four-fifths of the maximum vapor pressure of product at 130°F.

AMENDATORY SECTION (Amending Order 76-6, filed 3/1/76)

**WAC 296-24-47515 LP-gas system installations on commercial vehicles.** (1) Application. This ~~(paragraph)~~ section applies to LP-gas-system installations on vehicles (whether self-propelled or of the trailer or semitrailer type)

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used for commercial, construction, or public service purposes such as mobile libraries and clinics; to all exchangeable container systems with container capacities greater than 105 pounds water capacity (approximately 45 pounds LP-gas capacity) and to systems using containers permanently mounted on vehicles. It does not apply to LP-gas motor fuel systems covered by WAC 296-24-47511. WAC 296-24-47505 applies to this section unless otherwise noted. When such a vehicle is permanently parked, and LP-gas is supplied from a system not mounted on and secured to the unit, WAC 296-24-47507 and 296-24-47509 shall apply.

(2) Construction and marking of containers. Containers shall be constructed in accordance with WAC 296-24-47505(3), and marked in accordance with the applicable requirements of WAC 296-24-47505(5), and shall also meet the following:

(a) Containers designed for use as portable cylinders shall be constructed in accordance with DOT specifications, and in accordance with WAC 296-24-47505 (2)(e); where applicable.

(b) All other containers whether designed for permanent mounting, or for portable or semiportable use (such as skid tanks), shall be constructed as provided for by WAC 296-24-47505 (2)(d) and (3)(a). Mounting, securing, and protection of such containers shall be as in (2)(c) and (d) of this section.

(c) Permanently installed containers shall meet the requirements of (2)(c)(i) and (ii) of this section with regard to container valves and accessories, and (2)(c)(iii) through (vi) of this section as to mounting.

(i) Nonrecessed container fittings and appurtenances shall be protected against damage by either:

(A) Their location.

(B) The vehicle frame or bumper, or

(C) Protective housing. The protective housing, if used, shall comply with the requirements under which the tanks are fabricated with respect to design and construction and shall be designed to withstand static loadings in any direction equal to twice the weight of the tank and attachments when filled with the lading using a safety factor of not less than four, based on the ultimate strength of the material to be used. The housing shall be provided with a weather cover if necessary to insure proper operation of valves and safety devices.

(ii) Manually operated shutoff valves, except as covered in WAC 296-24-47511 (2)(a), or self-closing internal valves shall be closed except during transfer operations.

(iii) Tank motor vehicles with frames not made integral with the tank, as by welding, shall be provided with turn-buckles or similar positive devices for drawing the tank down tight on the frame. In addition, suitable stops or anchors shall be attached to the frame and/or the tank to prevent relative motion between them due to starting, stopping, and turning. The stops and anchors shall be so installed as to be readily accessible for inspection and maintenance.

(iv) Any tank motor vehicle designed and constructed so that the cargo tank constitutes in whole or in part the stress member used in lieu of a frame shall be supported by external cradles subtending at least 120 degrees of the shell circumference. The design calculations shall include beam stress, shear stress, torsion stress, bending moment, and

acceleration stress for the cargo tank as a whole using a factor of safety of four, based on the ultimate tensile strength of the material. Maximum concentrated stresses which might be created at pads and cradles due to shear, bending, and torsion shall also be calculated in accordance with Appendix G of the American Society of Mechanical Engineers, Unfired Pressure Vessel Code, 1968. Fully loaded vehicles shall be assumed to be operating under highway conditions equal to two "g" loading. The effects of fatigue shall be taken into consideration. Cargo tanks mounted on frames may be supported by longitudinal members attached to pads providing the above-stated factors are taken into account.

(v) Where any tank support is attached to any part of a tank head, the stresses imposed upon the head shall be provided for as required in (2)(c)(iv) of this section.

(vi) Tank supports, stops, anchors, and bumpers shall not be welded directly to the tank but shall be attached by means of pads of the same material as the tank. The pad thickness shall be not less than one-fourth inch, or the thickness of the shell material if less, and no greater than the shell material. Each pad shall extend at least four times its thickness, in each direction, beyond the weld attaching the support, bumper, stop, or anchor. Each pad shall be preformed to an inside radius no greater than the outside radius of the tank at the place of attachment. Each pad corner shall be rounded to a radius at least one-fourth the width of the pad, and no greater than one-half the width of the pad. Weepholes and tell-tale holes, if used, shall be drilled or punched before the pads are attached to the tank. Each pad shall be attached to the tank by continuous fillet welding using filler material having properties conforming to the recommendations of the maker of the shell and head material.

(d) Portable or semiportable containers (skid tanks as covered by WAC 296-24-47509 (7)(g)) shall meet the applicable requirements of (2)(d)(i) to (vi) of this section inclusive with regard to container valves and accessories and WAC 296-24-47511 (4)(c) as to mounting. Containers designed for permanent installation as part of systems under WAC 296-24-47509 shall not be used.

(i) Nonrecessed container fittings and appurtenances shall be protected against damage by either—

(A) Their location.

(B) The vehicle frame or bumper, or

(C) A protective housing. The protective housing, if used, shall comply with the requirements under which the tanks are fabricated with respect to design and construction and shall be designed to withstand static loadings in any direction equal to twice the weight of the tank and attachments when filled with the lading using a safety factor of not less than four, based on the ultimate strength of the material to be used. The housing shall be provided with a weather cover if necessary to insure proper operation of valves and safety devices.

(ii) Filling connections shall be provided with approved automatic back pressure check valves, excess flow check valves or quick closing internal valves to prevent excessive escape of gas in case the filling connection is broken, except that where the filling and discharge connect on a common opening in the container shell, and that opening is fitted with a quick-closing internal valve as specified in (2)(d)(iii) of

this section, the automatic valve shall not be required. In addition every inlet and outlet connection shall be equipped with a manually or automatically operated shutoff valve. Liquid discharge openings, except those for engine fuel lines, on tanks built after September 1, 1965, shall be fitted with a remotely controlled internal shutoff valve. Such valve shall conform to the following requirements:

(A) The seat of the valve shall be inside the tank, or in the opening nozzle or flange, or in a companion flange bolted to the nozzle or flange.

(B) All parts of the valve inside the tank, nozzle, or companion flange shall be made of material not subject to corrosion or other deterioration in the presence of the lading.

(C) The arrangement of parts shall be such that damage to parts exterior to the tank will not prevent effective seating of the valve.

(D) The valve may be operated normally by mechanical means, by hydraulic means, or by air, or gas pressure.

(E) The valve shall be provided with remote means of automatic closure, both mechanical and thermal, in at least two places for tanks over 3,500 gallons water capacity. These remote control stations shall be located at each end of the tank and diagonally opposite each other. The thermal control mechanism shall have a fusible element with a melting point not over 220°F or less than 208°F. At least one remote control station shall be provided for tanks of 3,500 gallons water capacity or less, and such actuating means may be mechanical.

(iii) All other connections to containers, except those used for gaging devices, thermometer wells, safety relief devices, and plugged openings, shall be provided with suitable automatic excess flow valves, or in lieu thereof may be fitted with quick-closing internal valves.

The control mechanism for the internal valve shall be provided with a secondary control, remote from the fill or discharge connections (for use in the event of accidents or fire during delivery operations), and such control mechanism shall have a fusible element with a melting point not over 220°F or less than 208°F.

(iv) Manually operated shutoff valves, except as covered in WAC 296-24-47511 (2)(a), or self-closing internal valves shall be closed except during transfer operations.

(v) Excess flow valves shall close automatically at the rated flow of vapor or liquid as specified by the valve manufacturers. The flow rating of the piping beyond the excess flow valve shall be greater than that of the excess flow valve and such rating shall include valves, fittings, and hose, except, when branching or necessary restrictions are incorporated in such a piping system so that flow ratings are less than that of the excess flow valve and the tank, then additional excess flow valves shall be installed in the piping where such flow rate is reduced.

(vi) Container inlets and outlets, except those used for safety relief valves, liquid-level gaging devices, and pressure gages, shall be labeled to designate whether they communicate with vapor or liquid space when the container is filled to maximum permitted filling density. (Labels may be on valves.)

(3) Capacity of a system. No single fuel container used on passenger carrying vehicles shall exceed 200 gallons water capacity.

(4) Description of a system. A system consists of an assembly of equipment installed on a commercial vehicle.

(5) Location of containers and systems.

(a) Containers shall not be installed, transported, or stored (even temporarily) inside any vehicle covered by these standards except as provided by the applicable regulations of DOT.

(b) Containers, control valves, and regulating equipment comprising a complete system shall be suitably protected against damage and weather. Systems may be installed in a recess vaportight to the inside of the vehicle and accessible from and vented to the outside.

(c) Systems installed outside of mobile units shall be so located that discharge from safety relief devices shall be not less than 3 feet horizontally away from any opening into the unit below the level of such discharge. When the system is located in a recess vaportight to the inside, vent openings in such recess shall be not less than 3 feet horizontally away from any opening into the mobile unit below the level of these vents.

(d) There shall be no fuel connection between tractor and trailer or other vehicle units.

(e) The container or container carrier shall be secured in place by fastenings designed and constructed with a minimum safety factor of four to withstand loading in any direction equal to twice the weight of the container when filled to normal capacity with LP-gas.

(6) Container valves and accessories. Container valves and accessories shall be provided, protected and mounted as follows:

(a) Systems utilizing DOT cylinders in accordance with WAC 296-24-47507(6).

(b) All other systems in accordance with WAC 296-24-47509 (3)(b) through (g).

(c) Portable, semiportable and permanently mounted containers shall be mounted and protected as provided under (2)(b) through (d) of this section.

(7) Safety-relief devices.

(a) DOT containers shall be provided with safety-relief devices as required by the regulations of DOT.

(b) ASME containers and API-ASME containers shall be provided with safety-relief devices as required by WAC 296-24-47505(10).

(c) A final stage regulator of an LP-gas system (excluding any appliance regulator) shall be equipped on the low-pressure side with a relief valve which is set to start to discharge within the limits specified in Table H-30. (See WAC 296-24-47509.)

~~((+))~~ (d) The relief valve and space above the regulator and relief valve diaphragms shall be vented to the outside air and terminate at a position to minimize the possibility of vapors accumulating at sources of ignition.

~~((+))~~ (e) Whenever equipment such as a cargo heater or cooler on commercial vehicles is a type designed to be in operation while in transit, suitable means to stop the flow such as an excess flow valve or other device, shall be installed. This device will be actuated to stop the flow in the event of the break in the fuel supply line. All excess flow valves shall comply with WAC 296-24-47505 (7)(c).

(8) System design and line pressure. Systems may be of either vapor withdrawal or liquid withdrawal type and

shall comply with the applicable requirements for the type of usage involved.

(9) System enclosure and mounting.

(a) Housing or enclosures shall be designed to provide proper ventilation.

(b) Hoods, domes, or removable portions of cabinets shall be provided with means to keep them firmly in place during transit.

(c) Provision shall be incorporated in the assembly to hold the containers firmly in position and prevent their movement during transit in accordance with WAC 296-24-47511 (4)(c).

(d) Containers shall be mounted on a substantial support or base secured firmly to the vehicle chassis. Neither the container nor its support shall extend below the frame.

(10) Piping—Including pipe, tubing, and fittings.

(a) Regulators shall be connected directly to the container valve outlet or mounted securely by means of support bracket and connected to the container valve or valves with a listed high pressure flexible connector.

(b) Provision shall be made between the regulator outlet and the gas service lines by either a flexible connector or a tubing loop to provide for expansion, contraction, jarring, and vibration.

(c) Pipe, tubing, and fittings shall conform to WAC 296-24-47505(8) except that the use of aluminum alloy piping is prohibited. Steel tubing shall have a minimum wall thickness of 0.049 inch. Steel piping or tubing shall be adequately protected against exterior corrosion.

(d) Approved gas tubing fittings shall be employed for making tubing connections.

(e) The fuel line shall be firmly fastened in a protected location and where under the vehicle and outside and below any insulation or false bottom, fastenings shall be such as to prevent abrasion or damage to the gas line due to vibration. Where the fuel line passes through structural members or floors, a rubber grommet or equivalent shall be installed to prevent chafing.

(f) The fuel line shall be installed to enter the vehicle through the floor directly beneath or adjacent to the appliance which it serves. When a branch line is required the tee connection shall be in the main fuel line and located under the floor and outside the vehicle.

(g) All parts of the system assembly shall be so designed and secured as to preclude such parts working loose during transit.

(11) Appliances.

(a) LP-gas appliances shall be approved for use on commercial vehicles.

(b) In the case of vehicles not intended for human occupancy and where the gas-fired heating appliance is used to protect the cargo, such heater may be of the unvented type but provision shall be made to dispose of the products of combustion to the outside.

(c) In the case of vehicles intended for human occupancy, all gas-fired heating appliances, including water heaters, shall be designed or installed to provide for complete separation of the combustion system from the atmosphere of the living space. Such appliances shall be installed with the combustion air inlet assembly furnished as a component of the appliance and, also, with either—

(i) The flue gas outlet assembly furnished as a component of the appliance, or

(ii) A listed roof jack if the appliance is listed for such use.

The combustion air inlet assembly, flue gas outlet assembly, and roof jack shall extend to the outside atmosphere.

(d) Provision shall be made to insure an adequate supply of outside air for combustion.

(e) All gas-fired heating appliances and water heaters shall be equipped with an approved automatic device designed to shut off the flow of gas to the main burner and to the pilot in the event the pilot flame is extinguished.

(f) Gas-fired appliances installed in the cargo space shall be located so they are readily accessible.

(g) Appliances shall be constructed or protected to reduce to a minimum possible damage or impaired operation resulting from cargo shifting or handling.

(h) Appliances inside the vehicle shall be located so that a fire at an appliance will not block egress of persons therefrom.

(12) General precautions.

(a) DOT containers shall be marked, maintained, and requalified for use in accordance with the regulations of DOT.

(b) Containers which have not been requalified as required by DOT regulations shall be removed from service. Requalified containers shall be stamped with the date of requalification. When DOT cylinders are requalified by retesting, such retest shall be made in accordance with DOT regulations.

(c) Containers shall not be charged with fuel unless they bear the proper markings of the code or specifications under which they were constructed, and in addition, with their water capacity. In the case of cylinders or portable containers filled by weight, the container shall be marked with its tareweight.

(d) DOT containers which have been involved in a fire shall not be recharged until they have been requalified for service according to DOT regulations.

(e) American Petroleum Institute-American Society of Mechanical Engineers (API-ASME) containers or ASME containers which have been involved in a fire shall not be recharged until they have been retested in accordance with the requirements for their original hydrostatic test and found to be suitable for continued service.

(f) Containers shall not be charged without the consent of the owner.

(g) A permanent caution plate shall be provided on the appliance or adjacent to the container outside of any enclosure. It shall include the word "caution" and following instructions, or instructions embodying substantially similar language.

(i) Be sure all appliance valves are closed before opening container valve.

(ii) Connections at appliances, regulators, and containers must be checked periodically for leaks with soapy water or its equivalent.

(iii) A match or flame shall not be used to check for leaks.

(iv) Container valves shall be closed when the equipment is not in use.

(13) Charging of containers. Containers shall be charged as provided in WAC 296-24-47505(12).

(14) Fire extinguisher. Mobile cook-units shall be provided with at least one approved portable fire extinguisher having a minimum rating of 8-B, C.

**AMENDATORY SECTION** (Amending Order 74-27, filed 5/7/74)

**WAC 296-24-51005 Definitions.** The following definitions are applicable to all sections of this chapter which include WAC 296-24-510 in the section number and shall be construed to have the meanings below.

(1) "Approved" as used in these standards means:  
 (a) Listed by a recognized testing laboratory, or  
 (b) Recommended by the manufacturer as suitable for use with anhydrous ammonia and so marked, or  
 (c) Accepted by the authority having jurisdiction.  
 (2) "Appurtenance" refers to all devices such as pumps, compressors, safety relief devices, liquid-level gaging devices, valves and pressure gages.

(3) "Capacity" refers to the total volume of the container measured in U.S. gallons, unless otherwise specified.

(4) "Cylinder" means a container of 1000 pounds water capacity or less constructed in accordance with United States Department of Transportation Specifications.

(5) The "code" refers to the Unfired Pressure Vessel Code of the American Society of Mechanical Engineers (Section VIII of the ASME Boiler Construction Code), 1952, 1956, 1959, 1962, 1965, 1968 and 1971 editions, the joint code of the American Petroleum Institute and the American Society of Mechanical Engineers (API-ASME Code) 1951 edition, and subsequent amendments to or later editions of the same, as adopted.

(6) "Container" includes all vessels, tanks, cylinders or spheres used for transportation, storage or application of anhydrous ammonia.

(7) "Design pressure" is identical to the term "maximum allowable working pressure" used in the code.

(8) An "implement of husbandry" is a farm wagon-type tank vehicle of not over 3000 gallons capacity, used as a field storage "nurse tank" supplying the fertilizer to a field applicator and moved on highways only for bringing the fertilizer from a local source of supply to farms or fields or from one farm or field to another.

(9) "Filling density" means the per cent ratio of the weight of the gas in a container to the weight of water at 60°F that the container will hold. One lb. H<sub>2</sub>O = 27.737 cu. in. at 60°F. For determining the weight capacity of the tank in pounds, the weight of a gallon (231 cubic inches) of water at 60°F in air shall be 8.32828 pounds.

(10) "Gas" refers to anhydrous ammonia in either the gaseous or liquefied state.

(11) "Gas mask" refers to gas masks approved by the ~~((Bureau of Mines))~~ Mine Safety and Health Administration (MSHA) and the National Institute for Occupational Safety and Health (NIOSH). See American National Standards Institute for Respiratory Protection, Z88.2. (See Appendix C for availability.)

(12) "DOT regulations" refer to hazardous materials regulations of the department of transportation (Title 49—

Transportation, Code of Federal Regulations, Parts 171 to 190), including Specifications for Shipping Containers.

(13) "Systems" as used in these standards refers to an assembly of equipment consisting essentially of the container or containers, appurtenances, pumps, compressors, and interconnecting piping.

(14) The abbreviations "psig" and "psia" refer to pounds per square inch gage and pounds per square inch absolute, respectively.

(15) The terms "charging" and "filling" are used interchangeably and have the same meaning.

(16) "Trailer" as used in these standards refers to every vehicle designed for carrying ~~((persons or))~~ property and for being drawn by a motor vehicle and so constructed that no part of its weight except the towing device rests upon the towing vehicle.

(17) "Tank motor vehicle" means any motor vehicle designed or used for the transportation of anhydrous ammonia in any tank designed to be permanently attached to any motor vehicle or any container not permanently attached to any motor vehicle which by reason of its size, construction or attachment to any motor vehicle must be loaded and/or unloaded without being removed from the motor vehicle.

(18) "Semitrailer" refers to every vehicle designed for carrying ~~((persons or))~~ property and for being drawn by a motor vehicle and so constructed that some part of its weight and that of its load rests upon or is carried by another vehicle.

(19) "Safety relief valve" refers to an automatic spring loaded or equivalent type pressure activated device for gas or vapor service characterized by pop action upon opening, sometimes referred to as a pop valve. (Refer to American National Standards Institute, Terminology for Pressure Relief Devices, B95.1.)

(20) "Hydrostatic relief valve" refers to an automatic pressure activated valve for liquid service characterized by throttle or slow weep opening (nonpop action). (Refer to American National Standards Institute, Terminology for Pressure Relief Devices, B95.1.)

**AMENDATORY SECTION** (Amending Order 76-6, filed 3/1/76)

**WAC 296-24-51099 Appendix C—Availability of reference material.**

**APPENDIX C**

AVAILABILITY OF REFERENCE MATERIAL

American National Standards Institute, Inc. (ANSI)  
 [formerly United States of America Standards  
 Institute (USASI) formerly American Standards  
 Association (ASA)]

~~((1430 Broadway))~~  
11 West 42nd Street  
 New York, New York ~~((10018))~~ 10036

American Petroleum Institute (API)  
~~((1801 "K" Street, N.W.))~~  
1220 L Street Northwest  
 Washington, D.C. ~~((20006))~~ 20005

American Society of Mechanical Engineers (ASME)  
345 East 47th Street  
New York, New York 10017

American Society for Testing and Materials (ASTM)  
1916 Race Street  
Philadelphia, Pennsylvania 19103-1187

Bureau of Explosives\*  
~~((4920 "L"))~~ 50 "F" Street, N.W.  
Washington, D.C. ~~((20036))~~ 20001

Compressed Gas Association, Incorporated (CGA)  
~~((500 Fifth Avenue~~  
~~New York, New York 10036))~~  
1725 Jefferson Davis Highway  
Arlington, Virginia 22202

The Fertilizer Institute (TFI) (formerly Agricultural  
Nitrogen Institute—National Plant Food Institute)  
~~((1015—18th Street N.W.))~~  
501 2nd Street Northeast  
Washington, D.C. ~~((20036))~~ 20002

~~((Manufacturing Chemists' Association (MCA) Univer-~~  
~~sal Building~~  
~~1825 Connecticut Ave., N.W.))~~  
Chemical Manufacturers Association (CMA)  
2501 "M" Street Northwest  
Washington, D.C. ~~((20009))~~ 20037

National Fire Protection Association (NFPA)  
~~((60))~~ Batterymarch ((Street)) Park  
~~((Boston))~~ Quincy, Massachusetts ((02140)) 02269  
~~((Bureau of Mines U.S. Department of the Interior~~  
~~4800 Forbes Avenue~~  
~~Pittsburgh, Pennsylvania 15213))~~  
Mine Safety and Health Administration  
4015 Wilson Blvd.  
Boston Towers, Number 3  
Arlington, Virginia 22203

~~((Superintendent of Documents\*))~~  
U.S. Government Printing Office\*  
North Capitol & "H" Streets Northwest  
Washington, D.C. ~~((20402))~~ 20401

\*DOT regulations available at nominal cost.

Reviser's note: The brackets and enclosed material in the text of the above section occurred in the copy filed by the agency and appear in the Register pursuant to the requirements of RCW 34.08.040.

AMENDATORY SECTION (Amending Order 88-25, filed 11/14/88)

**WAC 296-24-55001 Definitions.** (1) Means of egress. A means of egress is a continuous and unobstructed way of exit travel from any point in a building or structure to a public way and consists of three separate and distinct parts: The way of exit access, the exit, and the way of exit discharge. A means of egress comprises the vertical and horizontal ways of travel and shall include intervening room spaces, doorways, hallways, corridors, passageways, balconies, ramps, stairs, enclosures, lobbies, escalators, horizontal exits, courts, and yards.

(2) Exit access. Exit access is that portion of a means of egress which leads to an entrance to an exit.

(3) Exit. Exit is that portion of a means of egress which is separated from all other spaces of the building or structure by construction or equipment as required in these standards to provide a protected way of travel to the exit of discharge.

(4) Exit discharge. Exit discharge is that portion of a means of egress between the termination of an exit and a public way.

(5) Low hazard contents. Low hazard contents shall be classified as those of such low combustibility that no self-propagating fire therein can occur and that consequently the only probable danger requiring the use of emergency exits will be from panic, fumes, or smoke, or fire from some external source.

(6) High-hazard contents. High-hazard contents shall be classified as those which are liable to burn with extreme rapidity or from which poisonous fumes or explosions are to be feared in the event of fire.

(7) Ordinary hazard contents. Ordinary hazard contents shall be classified as those which are liable to burn with moderate rapidity and to give off a considerable volume of smoke but from which neither poisonous fumes nor explosions are to be feared in case of fire.

(8) Approved. For the purposes of ~~((WAC 296-24-550 through 296-24-56701, Part G-1, WAC 296-24-585 through 296-24-58517, Part G-2, and WAC 296-24-590 through 296-24-63599, Part G-3))~~ chapter 296-24 WAC, Parts G-1, G-2 and G-3, approved shall mean listed or approved equipment by a nationally recognized testing laboratory. Refer to WAC ~~((296-24-58501(19)))~~ 296-24-58503 (3)(c)(iv)(A) for definition of listed, and federal regulation 29 CFR 1910.7 for nationally recognized testing laboratory.

(9) Emergency action plan. A plan for a workplace, or parts thereof, describing what procedures the employer and employees must take to ensure employee safety from fire or other emergencies.

(10) Emergency escape route. The route that employees are directed to follow in the event they are required to evacuate the workplace or seek a designated refuge area.

AMENDATORY SECTION (Amending Order 73-5, filed 5/9/73 and Order 73-4, filed 5/7/73)

**WAC 296-24-56515 Discharge from exits.** (1) All exits shall discharge directly to the street, or to a yard, court, or other open space that gives safe access to a public way. The streets to which the exits discharge shall be of width adequate to accommodate all persons leaving the building. Yards, courts, or other open spaces to which exits discharge shall also be of adequate width and size to provide all persons leaving the building with ready access to the street.

(2) Stairs and other exits shall be so arranged as to make clear the direction of egress to the street. Exit stairs that continue beyond the floor of discharge shall be interrupted at the floor of discharge by partitions, doors, or other effective means.

(3) Where a doorway or corner of a building is located near a railroad or trolley track so that a ~~((workman))~~ worker is liable to walk upon the track in front of an approaching

engine or cars a standard safeguard shall be installed with a warning sign.

**AMENDATORY SECTION** (Amending Order 74-27, filed 5/7/74)

**WAC 296-24-58501 Definitions applicable to fire protection.** (1) "Class A fires" are fires in ordinary combustible materials, such as wood, cloth, paper, and rubber.

(2) "Class B fires" are fires in flammable liquids, gases, and greases.

(3) "Class C fires" are fires which involve energized electrical equipment where the electrical nonconductivity of the extinguishing media is of importance. (When electrical equipment is deenergized, extinguisher for Class A or B fires may be used safely.)

(4) "Class D fires" are fires in combustible metals, such as magnesium, titanium, zirconium, sodium, and potassium.

(5) Classification of portable fire extinguishers: "Portable fire extinguishers" are classified for use on certain classes of fires and rated for relative extinguishing effectiveness at a temperature of plus 70°F by nationally recognized testing laboratories. This is based upon the preceding classification of fires and the fire extinguishment potentials as determined by fire tests.

Note: The classification and rating system described in this section is that used by Underwriters' Laboratories, Inc. and Underwriters' Laboratories of Canada and is based on extinguishing pre-planned fires of determined size and description as follows:

(a) Class A rating—Wood and excelsior fires excluding deep-seated conditions.

(b) Class B rating—Two-inch depth gasoline fires in square pans.

(c) Class C rating—No fire test. Agent must be a nonconductor of electricity.

(d) Class D rating—Special tests on specific combustible metal fires.

(6) A "light hazard" is a situation where the amount of combustibles or flammable liquids present is such that fires of small size may be expected. These may include offices, schoolrooms, churches, assembly halls, telephone exchanges, etc.

(7) An "ordinary hazard" is a situation where the amount of combustibles or flammable liquids present is such that fires of moderate size may be expected. These may include mercantile storage and display, auto showrooms, parking garages, light manufacturing, warehouses not classified as extra hazard, school shop areas, etc.

(8) An "extra hazard" is a situation where the amount of combustibles or flammable liquids present is such that fires of severe magnitude may be expected. These may include woodworking, auto repair, aircraft servicing, warehouses with high-piled (14 feet or higher) combustibles, and processes such as flammable liquid handling, painting, dipping, etc.

(9) Sprinkler system: A "sprinkler system," for fire protection purposes, is an integrated system of underground and overhead piping designed in accordance with fire protection engineering standards. The system includes a suitable water supply, such as a gravity tank, fire pump, reservoir, or pressure tank and/or connection by underground piping to a city main. The portion of the sprinkler system

above ground is a network of specially sized or hydraulically designed piping installed in a building, structure or area, generally overhead, and to which sprinklers are connected in a systematic pattern. The system includes a controlling valve and a device for actuating an alarm when the system is in operation. The system is usually activated by heat from a fire and discharges water over the fire area.

Note: The design and installation of water supply facilities such as gravity tanks, fire pumps, reservoirs, or pressure tanks, and underground piping are covered by NFPA Standards No. 22-1970, Water Tanks for Private Fire Protection; No. 20-1970, Installation of Centrifugal Fire Pumps and No. 24-1970, Outside Protection.

(10) Sprinkler alarms: A "sprinkler alarm" unit is an assembly of apparatus approved for the service and so constructed and installed that any flow of water from a sprinkler system equal to or greater than that from a single automatic sprinkler will result in an audible alarm signal on the premises.

(11) Class of service—Standpipe systems: "Standpipe systems" are grouped into three general classes of service for the intended use in the extinguishment of fire.

(a) Class I: For use by fire departments and those trained in handling heavy fire streams (2 1/2-inch hose).

(b) Class II: For use primarily by the building occupants until the arrival of the fire department (small hose).

(c) Class III: For use by either fire departments and those trained in handling heavy hose streams or by the building occupants.

(12) Class I service: "Class I service" is a standpipe system capable of furnishing the effective fire streams required during the more advanced stages of fire on the inside of buildings or for exposure fire.

(13) Class II service: "Class II service" is a standpipe system which affords a ready means for the control of incipient fires by the occupants of buildings during working hours and by (~~watchmen~~) watchperson and those present during the night time and holidays.

(14) Class III service: "Class III service" is a standpipe system capable of furnishing the effective fire streams required during the more advanced stages of fire on the inside of buildings as well as providing a ready means for the control of fires by the occupants of the building.

(15) Standpipe system: "Standpipe systems" are usually of the following types:

(a) A wet standpipe system having a supply valve open and water pressure maintained at all times.

(b) A standpipe system so arranged through the use of approved devices as to admit water to the system automatically by opening a hose valve.

(c) A standpipe system arranged to admit water to the system through manual operation of approved remote control devices located at each hose station.

(d) Dry standpipe having no permanent water supply. See also (11) of this section.

(16) Type I storage: "Type I storage" is that in which combustible commodities or noncombustible commodities involving combustible packaging or storage aids are stored over 15 feet but not more than 21 feet high in solid piles or over 12 feet but not more than 21 feet high in piles that contain horizontal channels. Minor quantities of commodi-

ties of hazard greater than ordinary combustibles may be included without affecting this general classification.

(17) Type II storage: "Type II storage" is that in which combustible commodities or noncombustible commodities involving combustible packaging or storage aids are stored not over 15 feet high in solid piles or not over 12 feet high in piles that contain horizontal channels. Minor quantities of commodities of hazard greater than ordinary combustibles may be included without affecting this general classification.

(18) Type III storage: "Type III storage" is that in which the stored commodities, packaging, and storage aids are noncombustible or contain only a small concentration of combustibles which are incapable of producing a fire that would cause appreciable damage to the commodities stored or to noncombustible wall, floor or roof construction. Ordinary combustible commodities in completely sealed noncombustible containers may qualify in this classification. General commodity storage that is subject to frequent changing and storage of combustible packaging and storage aids is excluded from this category.

(19) Approved: "Approved" means listed or approved by: (a) At least one of the following nationally recognized testing laboratories: Factory Mutual Engineering Corp.; Underwriters' Laboratories, Inc., or (b) federal agencies such as ((Bureau of Mines, Department of the Interior)) Mine Safety and Health Administration (MSHA); the National Institute for Occupational Safety and Health (NIOSH); Department of Transportation; or U.S. Coast Guard, which issue approvals for such equipment.

AMENDATORY SECTION (Amending Order 92-13, filed 11/10/92, effective 12/18/92)

**WAC 296-24-58513 Protective clothing.** The following requirements apply to those employees who perform interior structural fire fighting. The requirements do not apply to employees who use fire extinguishers or standpipe systems to control or extinguish fires only in the incipient stage.

(1) General.

(a) The employer shall provide at no cost to the employee and assure the use of protective clothing which complies with the requirements of this section. The employer shall assure that protective clothing ordered or purchased after January 1, 1982, meets the requirements contained in this section. As the new equipment is provided, the employer shall assure that all fire brigade members wear the equipment when performing interior structural fire fighting. After July 1, 1985, the employer shall assure that all fire brigade members wear protective clothing meeting the requirements of this section when performing interior structural fire fighting.

(b) The employer shall assure that protective clothing protects the head, body, and extremities, and consists of at least the following components: Foot and leg protection; hand protection; body protection; eye, face and head protection.

(2) Foot and leg protection.

(a) Foot and leg protection shall meet the requirements of (b) and (c) of this subsection, and may be achieved by either of the following methods:

(i) Fully extended boots which provide protection for the legs; or

(ii) Protective shoes or boots worn in combination with protective trousers that meet the requirements of subsection (3) of this section.

(b) Protective footwear shall meet the requirements of WAC 296-24-088 for Class 75 footwear. In addition, protective footwear shall be water-resistant for at least five inches (12.7 cm) above the bottom of the heel and shall be equipped with slip-resistant outer soles.

(c) Protective footwear shall be tested in accordance with ((~~paragraph (1)~~)) WAC 296-24-63599(1) Appendix E, and shall provide protection against penetration of the midsole by a size 8D common nail when at least 300 pounds (1330 N) of static force is applied to the nail.

(3) Body protection.

(a) Body protection shall be coordinated with foot and leg protection to ensure full body protection for the wearer. This shall be achieved by one of the following methods:

(i) Wearing of a fire-resistive coat meeting the requirements of (b) of this subsection, in combination with fully extended boots meeting the requirements of subsection (2)(b) and (c) of this section; or

(ii) Wearing of fire-resistive coat in combination with protective trousers both of which meet the requirements of (b) of this subsection.

(b) The performance, construction, and testing of fire-resistive coats and protective trousers shall be at least equivalent to the requirements of the National Fire Protection Association (NFPA) standard NFPA No. 1971-1975, "Protective Clothing for Structural Fire Fighting," (see WAC 296-24-63499, Appendix D) with the following permissible variations from those requirements:

(i) Tearing strength of the outer shell shall be a minimum of eight pounds (35.6 N) in any direction when tested in accordance with ((~~paragraph (2) of~~)) WAC 296-24-63599(2), Appendix E; and

(ii) The outer shell may discolor but shall not separate or melt when placed in a forced air laboratory oven at a temperature of 500°F (260°C) for a period of five minutes. After cooling to ambient temperature and using the test method specified in ((~~paragraph (3) of~~)) WAC 296-24-63599(3) Appendix E, char length shall not exceed 4.0 inches (10.2 cm) and after-flame shall not exceed 2.0 seconds.

(4) Hand protection.

(a) Hand protection shall consist of protective gloves or glove system which will provide protection against cut, puncture, and heat penetration. Gloves or glove system shall be tested in accordance with the test methods contained in the National Institute for Occupational Safety and Health (NIOSH) 1976 publication, "The Development of Criteria for Fire Fighter's Gloves; Vol. II, Part II: Test Methods," (see WAC 296-24-63499, Appendix D—Availability of publications incorporated by references in WAC 296-24-58505—Fire brigades) and shall meet the following criteria for cut, puncture, and heat penetration:

(i) Materials used for gloves shall resist surface cut by a blade with an edge having a 60 degree included angle and a .001 inch (.0025 cm.) radius, under an applied force of 16 lbf (72N) and at a slicing velocity of greater or equal to 60 in/min. (2.5 cm/sec);



(ii) Materials used for the palm and palm side of the fingers shall resist puncture by a penetrometer (simulating a 4d lath nail), under an applied force of 13.2 lbf (60N) and at a velocity greater or equal to 20 in/min. (.85 cm/sec); and

(iii) The temperature inside the palm and gripping surface of the fingers of gloves shall not exceed 135°F (57°C) when gloves or glove system are exposed to 932°F (500°C) for five seconds at 4 psi (28 kPa) pressure.

(b) Exterior materials of gloves shall be flame resistant and shall be tested in accordance with ~~((paragraph (3) of))~~ WAC 296-24-63599(3) Appendix E. Maximum allowable after-flame shall be 2.0 seconds, and the maximum char length shall be 4.0 inches (10.2 cm).

(c) When design of the fire-resistive coat does not otherwise provide protection for the wrists, protective gloves shall have wristlets of at least 4.0 inches (10.2 cm) in length to protect the wrist area when the arms are extended upward and outward from the body.

(5) Head, eye and face protection.

(a) Head protection shall consist of a protective head device with ear flaps and chin strap which meet the performance, construction, and testing requirements of the National Fire Safety and Research Office of the National Fire Prevention and Control Administration, United States Department of Commerce (now known as the United States Fire Administration), which are contained in, "Model Performance Criteria for Structural Fire Fighters' Helmets," (August 1977) (see WAC 296-24-63499, Appendix D).

(b) Protective eye and face devices which comply with WAC 296-24-078 shall be used by fire brigade members when performing operations where the hazards of flying or falling materials which may cause eye and face injuries are present. Protective eye and face devices provided as accessories to protective head devices (face shields) are permitted when such devices meet the requirements of WAC 296-24-078.

(c) Full facepieces, helmets, or hoods of breathing apparatus which meet the requirements of WAC 296-62-071 and 296-24-58515, shall be acceptable as meeting the eye and face protection requirements of (b) of this subsection.

AMENDATORY SECTION (Amending Order 81-32, filed 12/24/81)

**WAC 296-24-58515 Respiratory protection devices.**

(1) General requirements.

(a) The employer shall provide at no cost to the employee and assure the use of respirators which comply with the requirements of this ~~((paragraph))~~ section. The employer shall assure that respiratory protective devices worn by brigade members meet the requirements contained in WAC 296-62-071, and the requirements contained in this ~~((paragraph))~~ section, and are certified under 30 CFR Part II.

(b) Approved self-contained breathing apparatus with full-facepiece, or with approved helmet or hood configuration, shall be provided to and worn by fire brigade members while working inside buildings or confined spaces where toxic products of combustion or an oxygen deficiency may be present. Such apparatus shall also be worn during emergency situations involving toxic substances.

(c) Approved self-contained breathing apparatus may be equipped with either a "buddy-breathing" device or a quick

disconnect valve, even if these devices are not certified by NIOSH. If these accessories are used, they shall not cause damage to the apparatus, or restrict the air flow of the apparatus, or obstruct the normal operation of the apparatus.

(d) Approved self-contained compressed air breathing apparatus may be used with approved cylinders from other approved self-contained compressed air breathing apparatus provided that such cylinders are of the same capacity and pressure rating. All compressed air cylinders used with self-contained breathing apparatus shall meet DOT and NIOSH criteria.

(e) Self-contained breathing apparatus shall have a minimum service life rating of thirty minutes in accordance with the methods and requirements of the mine safety and health administration (MSHA) and NIOSH, except for escape self-contained breathing apparatus (ESCBAs) used only for emergency escape purposes.

(f) Self-contained breathing apparatus shall be provided with an indicator which automatically sounds an audible alarm when the remaining service life of the apparatus is reduced to within a range of twenty to twenty-five percent of its rated service time.

(2) Positive-pressure breathing apparatus.

(a) The employer shall assure that self-contained breathing apparatus ordered or purchased after January 1, 1982, for use by fire brigade members performing interior structural fire fighting operations, are of the pressure-demand or other positive-pressure type. Effective July 1, 1983, only pressure-demand or other positive-pressure self-contained breathing apparatus shall be worn by fire brigade members performing interior structural fire fighting.

(b) This section does not prohibit the use of a self-contained breathing apparatus where the apparatus can be switched from a demand to a positive-pressure mode. However, such apparatus shall be in the positive-pressure mode when fire brigade members are performing interior structural fire fighting operations.

(c) Negative-pressure self-contained breathing apparatus with a rated service life of more than two hours and which have a minimum protection factor of 5,000, as determined by an acceptable quantitative fit test performed on each individual, is acceptable for use only during those interior structural fire fighting situations for which the employer demonstrates that long duration breathing apparatus is necessary. Quantitative fit test procedures shall be available for inspection by the director or authorized representative. Such negative-pressure breathing apparatus will continue to be acceptable for eighteen months after a positive-pressure breathing apparatus with the same or longer rated service life is certified by NIOSH. After this eighteen-month period, all self-contained breathing apparatus used for these long duration situations shall be of the positive-pressure type.

AMENDATORY SECTION (Amending Order 81-32, filed 12/24/81)

**WAC 296-24-58517 Appendix A—Fire brigades.** (1) Scope. This section does not require an employer to organize a fire brigade. However, if an employer does decide to organize a fire brigade, the requirements of this section apply.



(2) Prefire planning. It is suggested that prefire planning be conducted by the local fire department and/or the workplace fire brigade in order for them to be familiar with the workplace and process hazards. Involvement with the local fire department or fire prevention bureau is encouraged to facilitate coordination and cooperation between members of the fire brigade and those who might be called upon for assistance during a fire emergency.

(3) Organizational statement. In addition to the information required in the organizational statement, WAC 296-24-58507(1), it is suggested that the organizational statement also contain the following information: A description of the duties that the fire brigade members are expected to perform; the line authority of each fire brigade officer; the number of the fire brigade officers and number of training instructors; and a list and description of the types of awards or recognition that brigade members may be eligible to receive.

(4) Physical capability. The physical capability requirement applies only to those fire brigade members who perform interior structural fire fighting. Employees who cannot meet the physical capability requirement may still be members of the fire brigade as long as such employees do not perform interior structural fire fighting. It is suggested that fire brigade members who are unable to perform interior structural fire fighting be assigned less stressful and physically demanding fire brigade duties, e.g., certain types of training, recordkeeping, fire prevention inspection and maintenance, and fire pump operations.

Physically capable can be defined as being able to perform those duties specified in the training requirements of WAC 296-24-58509. Physically capable can also be determined by physical performance tests or by a physical examination when the examining physician is aware of the duties that the fire brigade member is expected to perform.

It is also recommended that fire brigade members participate in a physical fitness program. There are many benefits which can be attributed to being physically fit. It is believed that physical fitness may help to reduce the number of sprain and strain injuries as well as contributing to the improvement of the cardiovascular system.

(5) Training and education. The ~~((paragraph))~~ section on training and education does not contain specific training and education requirements because the type, amount, and frequency of training and education will be as varied as are the purposes for which fire brigades are organized. However, the ~~((paragraph))~~ section does require that training and education be commensurate with those functions that the fire brigade is expected to perform; i.e., those functions specified in the organizational statement. Such a performance requirement provides the necessary flexibility to design a training program which meets the needs of individual fire brigades.

At a minimum, hands-on training is required to be conducted annually for all fire brigade members. However, for those fire brigade members who are expected to perform interior structural fire fighting, some type of training or education session must be provided at least quarterly.

In addition to the required hands-on training, it is strongly recommended that fire brigade members receive other types of training and education such as: Classroom instruction, review of emergency action procedures, prefire

planning, review of special hazards in the workplace, and practice in the use of self-contained breathing apparatus.

It is not necessary for the employer to duplicate the same training or education that a fire brigade member receives as a member of a community volunteer fire department, rescue squad, or similar organization. However, such training or education must have been provided to the fire brigade member within the past year and it must be documented that the fire brigade member has received the training or education. For example: There is no need for a fire brigade member to receive another training class in the use of positive-pressure self-contained breathing apparatus if the fire brigade member has recently completed such training as a member of a community fire department. Instead, the fire brigade member should receive training or education covering other important equipment or duties of the fire brigade as they relate to the workplace hazards, facilities and processes.

It is generally recognized that the effectiveness of fire brigade training and education depends upon the expertise of those providing the training and education as well as the motivation of the fire brigade members. Fire brigade training instructors must receive a higher level of training and education than the fire brigade members they will be teaching. This includes being more knowledgeable about the functions to be performed by the fire brigade and the hazards involved. The instructors should be qualified to train fire brigade members and demonstrate skills in communication, methods of teaching, and motivation. It is important for instructors and fire brigade members alike to be motivated toward the goal of the fire brigade and be aware of the importance of the service that they are providing for the protection of other employees and the workplace.

It is suggested that publications from the International Fire Service Training Association, the National Fire Protection Association (NFPA-1041), the International Society of Fire Service Instructors and other fire training sources be consulted for recommended qualifications of fire brigade training instructors.

In order to be effective, fire brigades must have competent leadership and supervision. It is important for those who supervise the fire brigade during emergency situations, e.g., fire brigade chiefs, leaders, etc., to receive the necessary training and education for supervising fire brigade activities during these hazardous and stressful situations. These fire brigade members with leadership responsibilities should demonstrate skills in strategy and tactics, fire suppression and prevention techniques, leadership principles, prefire planning, and safety practices. It is again suggested that fire service training sources be consulted for determining the kinds of training and education which are necessary for those with fire brigade leadership responsibilities.

It is further suggested that fire brigade leaders and fire brigade instructors receive more formalized training and education on a continuing basis by attending classes provided by such training sources as universities and university fire extension services.

The following recommendations should not be considered to be all of the necessary elements of a complete comprehensive training program, but the information may be helpful as a guide in developing a fire brigade training program.

All fire brigade members should be familiar with exit facilities and their location, emergency escape routes for handicapped workers, and the workplace "emergency action plan."

In addition, fire brigade members who are expected to control and extinguish fires in the incipient stage should, at a minimum, be trained in the use of fire extinguishers, standpipes, and other fire equipment they are assigned to use. They should also be aware of first aid medical procedures and procedures for dealing with special hazards to which they may be exposed. Training and education should include both classroom instruction and actual operation of the equipment under simulated emergency conditions. Hands-on type training must be conducted at least annually but some functions should be reviewed more often.

In addition to the above training, fire brigade members who are expected to perform emergency rescue and interior structural fire fighting should, at a minimum, be familiar with the proper techniques in rescue and fire suppression procedures. Training and education should include fire protection courses, classroom training, simulated fire situations including "wet drills" and, when feasible, extinguishment of actual mock fires. Frequency of training or education must be at least quarterly, but some drills or classroom training should be conducted as often as monthly or even weekly to maintain the proficiency of fire brigade members.

There are many excellent sources of training and education that the employer may want to use in developing a training program for the workplace fire brigade. These sources include publications, seminars, and courses offered by universities.

There are also excellent fire school courses by such facilities as Texas A and M University, Delaware State Fire School, Lamar University, and Reno Fire School, that deal with those unique hazards which may be encountered by fire brigades in the oil and chemical industry. These schools, and others, also offer excellent training courses which would be beneficial to fire brigades in other types of industries. These courses should be a continuing part of the training program, and employers are strongly encouraged to take advantage of these excellent resources.

It is also important that fire brigade members be informed about special hazards to which they may be exposed during fire and other emergencies. Such hazards as storage and use areas of flammable liquids and gases, toxic chemicals, water-reactive substances, etc., can pose difficult problems. There must be written procedures developed that describe the actions to be taken in situations involving special hazards. Fire brigade members must be trained in handling these special hazards as well as keeping abreast of any changes that occur in relation to these special hazards.

(6) Fire fighting equipment. It is important that fire fighting equipment that is in damaged or unserviceable condition be removed from service and replaced. This will prevent fire brigade members from using unsafe equipment by mistake.

Fire fighting equipment, except portable fire extinguishers and respirators, must be inspected at least annually. Portable fire extinguishers and respirators are required to be inspected at least monthly.

(7) Protective clothing.

(a) General. WAC 296-24-58513 does not require all fire brigade members to wear protective clothing. It is not the intention of these standards to require employers to provide a full ensemble of protective clothing for every fire brigade member without consideration given to the types of hazardous environments to which the fire brigade member might be exposed. It is the intention of these standards to require adequate protection for those fire brigade members who might be exposed to fires in an advanced stage, smoke, toxic gases, and high temperatures. Therefore, the protective clothing requirements only apply to those fire brigade members who perform interior structural fire fighting operations.

Additionally, the protective clothing requirements do not apply to the protective clothing worn during outside fire fighting operations (brush and forest fires, crash crew operations) or other special fire fighting activities. It is important that the protective clothing to be worn during these types of fire fighting operations reflect the hazards which are expected to be encountered by fire brigade members.

(b) Foot and leg protection. WAC ((296-24-58505)) 296-24-58513 permits an option to achieve foot and leg protection.

The section recognizes the interdependence of protective clothing to cover one or more parts of the body. Therefore, an option is given so that fire brigade members may meet the foot and leg requirements by either wearing long fire-resistant coats in combination with fully extended boots, or by wearing shorter fire-resistant coats in combination with protective trousers and protective shoes or shorter boots.

(c) Body protection. WAC 296-24-58513(3) provides an option for fire brigade members to achieve body protection. Fire brigade members may wear a fire-resistant coat in combination with fully extended boots, or they may wear a fire-resistant coat in combination with protective trousers.

Fire-resistant coats and protective trousers meeting all of the requirements contained in NFPA 1971-1975, "Protective Clothing for Structural Fire Fighters," are acceptable as meeting the requirements of this standard.

The lining is required to be permanently attached to the outer shell. However, it is permissible to attach the lining to the outer shell material by stitching in one area such as at the neck. Fastener tape or snap fasteners may be used to secure the rest of the lining to the outer shell to facilitate cleaning. Reference to permanent lining does not refer to a winter liner which is a detachable extra lining used to give added protection to the wearer against the effects of cold weather and wind.

(d) Hand protection. The requirements of ((subsection (4) of this section)) WAC 296-24-58513(4) on hand protection may be met by protective gloves or a glove system. A glove system consists of a combination of different gloves. The usual components of a glove system consist of a pair of gloves, which provide thermal insulation to the hand, worn in combination with a second pair of gloves which provide protection against flame, cut and puncture.

It is suggested that protective gloves provide dexterity and a sense of feel for objects. Criteria and test methods for dexterity are contained in the NIOSH publications, "The Development of Criteria for Firefighters' Gloves; Vol. I: Glove Requirements," and "Vol. II: Glove Criteria and Test

Methods." These NIOSH publications also contain a permissible modified version of Federal Test Method 191, Method 5903, ((~~paragraph (3) of~~) WAC 296-24-63599(3) Appendix E) for flame resistance when gloves, rather than glove material, are tested for flame resistance.

(e) Head, eye and face protection. Head protective devices which meet the requirements contained in NFPA No. 1972 are acceptable as meeting the requirements of this standard for head protection.

Head protective devices are required to be provided with ear flaps so that the ear flaps will be available if needed. It is recommended that ear protection always be used while fighting interior structural fires.

Many head protective devices are equipped with face shields to protect the eyes and face. These face shields are permissible as meeting the eye and face protection requirements of this (~~paragraph~~) section as long as such face shields meet the requirements of WAC 296-24-078 of the general safety and health standards.

Additionally, full facepieces, helmets or hoods of approved breathing apparatus which meet the requirements of WAC 296-62-071 and 296-24-58515 are also acceptable as meeting the eye and face protection requirements.

It is recommended that a flame resistant protective head covering such as a hood or snood, which will not adversely affect the seal of a respirator facepiece, be worn during interior structural fire fighting operations to protect the sides of the face and hair.

(8) Respiratory protective devices. Respiratory protection is required to be worn by fire brigade members while working inside buildings or confined spaces where toxic products of combustion or an oxygen deficiency is likely to be present; respirators are also to be worn during emergency situations involving toxic substances. When fire brigade members respond to emergency situations, they may be exposed to unknown contaminants in unknown concentrations. Therefore, it is imperative that fire brigade members wear proper respiratory protective devices during these situations. Additionally, there are many instances where toxic products of combustion are still present during mop-up and overhaul operations. Therefore, fire brigade members should continue to wear respirators during these types of operations.

Self-contained breathing apparatus are not required to be equipped with either buddy-breathing device or a quick disconnect valve. However, these accessories may be very useful and are acceptable as long as such accessories do not cause damage to the apparatus, restrict the air flow of the apparatus, or obstruct the normal operation of the apparatus.

Buddy-breathing devices are useful for emergency situations where a victim or another fire brigade member can share the same air supply with the wearer of the apparatus for emergency escape purposes.

The employer is encouraged to provide fire brigade members with an alternative means of respiratory protection to be used only for emergency escape purposes if the self-contained breathing apparatus becomes inoperative. Such alternative means of respiratory protection may be either a buddy-breathing device or an escape self-contained breathing apparatus (ESCBA). The ESCBA is a short-duration respiratory protective device which is approved for only emergency escape purposes. It is suggested that if ESCBA

units are used, that they be of at least five minutes service life.

Quick disconnect valves are devices which start the flow of air by insertion of the hose (which leads to the facepiece) into the regulator of self-contained breathing apparatus, and stop the flow of air by disconnecting the hose from the regulator. These devices are particularly useful for those positive-pressure self-contained breathing apparatus which do not have the capability of being switched from the demand to the positive-pressure mode.

The use of a self-contained breathing apparatus where the apparatus can be switched from a demand to a positive-pressure mode is acceptable as long as the apparatus is in the positive-pressure mode when performing interior structural fire fighting operations. Also acceptable are approved respiratory protective devices which have been converted to the positive-pressure type when such modification is accomplished by trained and experienced persons using kits or parts approved by NIOSH and provided by the manufacturer and by following the manufacturer's instructions.

There are situations which require the use of respirators which have a duration of two hours or more. Presently, there are no approved positive-pressure apparatus with a rated service life of more than two hours. Consequently, negative-pressure self-contained breathing apparatus with a rated service life of more than two hours and which have a minimum protection factor of 5,000 as determined by an acceptable quantitative fit test performed on each individual, will be acceptable for use during situations which require long duration apparatus. Long duration apparatus may be needed in such instances as working in tunnels, subway systems, etc. Such negative-pressure breathing apparatus will continue to be acceptable for a maximum of eighteen months after a positive-pressure apparatus with the same or longer rated service life of more than two hours is certified by NIOSH/MSHA. After this eighteen-month phase-in period, all self-contained breathing apparatus used for these long duration situations will have to be of the positive-pressure type.

Protection factor (sometimes called fit factor) is defined as the ratio of the contaminant concentrations outside of the respirator to the contaminant concentrations inside the facepiece of the respirator.

$$PF = \frac{\text{Concentration outside respirator}}{\text{Concentration inside facepiece}}$$

Protection factors are determined by quantitative fit tests. An acceptable quantitative fit test should include the following elements:

(a) A fire brigade member who is physically and medically capable of wearing respirators, and who is trained in the use of respirators, dons a self-contained breathing apparatus equipped with a device that will monitor the concentration of a contaminant inside the facepiece.

(b) The fire brigade member then performs a qualitative fit test to assure the best face-to-facepiece seal as possible. A qualitative fit test can consist of a negative-pressure test, positive-pressure test, isoamyl acetate vapor (banana oil) test, or an irritant smoke test. For more details on respirator fitting see the NIOSH booklet entitled, "A Guide to Industri-

al Respiratory Protection," June 1976, and ((HEW)) HHS publication No. (NIOSH) 76-189.

(c) The wearer should then perform physical activity which reflects the level of work activity which would be expected during fire fighting activities. The physical activity should include simulated fire-ground work activity or physical exercise such as running-in-place, a step test, etc.

(d) Without readjusting the apparatus, the wearer is placed in a test atmosphere containing a nontoxic contaminant with a known, constant concentration.

The protection factor is then determined by dividing the known concentration of the contaminant in the test atmosphere by the concentration of the contaminant inside the facepiece when the following exercises are performed:

(i) Normal breathing with head motionless for one minute;

(ii) Deep breathing with head motionless for thirty seconds;

(iii) Turning head slowly from side to side while breathing normally, pausing for at least two breaths before changing direction. Continue for at least one minute;

(iv) Moving head slowly up and down while breathing normally, pausing for at least two breaths before changing direction. Continue for at least two minutes;

(v) Reading from a prepared text, slowly and clearly, and loudly enough to be heard and understood. Continue for one minute; and

(vi) Normal breathing with head motionless for at least one minute.

The protection factor which is determined must be at least 5,000. The quantitative fit test should be conducted at least three times. It is acceptable to conduct all three tests on the same day. However, there should be at least one hour between tests to reflect the protection afforded by the apparatus during different times of the day.

The above elements are not meant to be a comprehensive, technical description of a quantitative fit test protocol. However, quantitative fit test procedures which include these elements are acceptable for determining protection factors. Procedures for a quantitative fit test are required to be available for inspection by the director or authorized representative.

Organizations such as Los Alamos ((Scientific)) National Laboratory, Lawrence Livermore Laboratory, NIOSH, and American National Standards Institute (ANSI) are excellent sources for additional information concerning qualitative and quantitative fit testing.

**AMENDATORY SECTION** (Amending Order 81-32, filed 12/24/81)

**WAC 296-24-59215 Appendix A—Portable fire extinguishers.** (1) Scope and application. The scope and application of this section is written to apply to three basic types of workplaces. First, there are those workplaces where the employer has chosen to evacuate all employees from the workplace at the time of a fire emergency. Second, there are those workplaces where the employer has chosen to permit certain employees to fight fires and to evacuate all other nonessential employees at the time of a fire emergency. Third, there are those workplaces where the employer

has chosen to permit all employees in the workplace to use portable fire extinguishers to fight fires.

The section also addresses two kinds of work areas. The entire workplace can be divided into outside (exterior) work areas and inside (interior) work areas. This division of the workplace into two areas is done in recognition of the different types of hazards employees may be exposed to during fire fighting operations. Fires in interior workplaces, pose a greater hazard to employees; they can produce greater exposure to quantities of smoke, toxic gases, and heat because of the capability of a building or structure to contain or entrap these products of combustion until the building can be ventilated. Exterior work areas, normally open to the environment, are somewhat less hazardous, because the products of combustion are generally carried away by the thermal column of the fire. Employees also have a greater selection of evacuation routes if it is necessary to abandon fire fighting efforts.

In recognition of the degree of hazard present in the two types of work areas, the standards for exterior work areas are somewhat less restrictive in regards to extinguisher distribution. WAC 296-24-59201 explains this by specifying which ((paragraphs in the)) sections apply.

(2) Portable fire extinguisher exemptions. In recognition of the three options given to employers in regard to the amount of employee evacuation to be carried out, the standards permit certain exemptions based on the number of employees expected to use fire extinguishers.

Where the employer has chosen to totally evacuate the workplace at the time of a fire emergency and when fire extinguishers are not provided, the requirements of this section do not apply to that workplace.

Where the employer has chosen to partially evacuate the workplace or the effected area at the time of a fire emergency and has permitted certain designated employees to remain behind to operate critical plant operations or to fight fires with extinguishers, then the employer is exempt from the distribution requirements of this section. Employees who will be remaining behind to perform incipient fire fighting or members of a fire brigade must be trained in their duties. The training must result in the employees becoming familiar with the locations of fire extinguishers. Therefore, the employer must locate the extinguishers in convenient locations where the employees know they can be found. For example, they could be mounted in the fire truck or cart that the fire brigade uses when it responds to a fire emergency. They can also be distributed as set forth in the National Fire Protection Association's Standard No. 10, "Portable Fire Extinguishers."

Where the employer has decided to permit all employees in the workplace to use fire extinguishers, then the entire WISHA standard applies.

(3) Portable fire extinguisher mounting. Previous standards for mounting fire extinguishers have been criticized for requiring specific mounting locations. In recognition of this criticism, the standard has been rewritten to permit as much flexibility in extinguisher mounting as is acceptable to assure that fire extinguishers are available when needed and that employees are not subjected to injury hazards when they try to obtain an extinguisher.

It is the intent of WISHA to permit the mounting of extinguishers in any location that is accessible to employees

without the use of portable devices such as a ladder. This limitation is necessary because portable devices can be moved or taken from the place where they are needed and, therefore, might not be available at the time of an emergency.

Employers are given as much flexibility as possible to assure that employees can obtain extinguishers as fast as possible. For example, an acceptable method of mounting extinguishers in areas where fork lift trucks or tow-motors are used is to mount the units on retractable board which, by means of counterweighting, can be raised above the level where they could be struck by vehicular traffic. When needed, they can be lowered quickly for use. This method of mounting can also reduce vandalism and unauthorized use of extinguishers. The extinguishers may also be mounted as outlined in the National Fire Protection Association's Standard No. 10, "Portable Fire Extinguishers."

(4) Selection and distribution. The employer is responsible for the proper selection and distribution of fire extinguishers and the determination of the necessary degree of protection. The selection and distribution of fire extinguishers must reflect the type and class of fire hazards associated with a particular workplace.

Extinguishers for protecting Class A hazards may be selected from the following types: Water, foam, loaded stream, or multipurpose dry chemical. Extinguishers for protecting Class B hazards may be selected from the following types: Halon 1301, Halon 1211, carbon dioxide, dry chemicals, foam, or loaded stream. Extinguishers for Class C hazards may be selected from the following types: Halon 1301, Halon 1211, carbon dioxide, or dry chemical.

Combustible metal (Class D hazards) fires pose a different type of fire problem in the workplace. Extinguishers using water, gas, or certain dry chemicals cannot extinguish or control this type of fire. Therefore, certain metals have specific dry powder extinguishing agents which can extinguish or control this type of fire. Those agents which have been specifically approved for use on certain metal fires provide the best protection; however, there are also some "universal" type agents which can be used effectively on a variety of combustible metal fires if necessary. The "universal" type agents include: Foundry flux, Lith-X powder, TMB liquid, pyromet powder, TEC powder, dry talc, dry graphite powder, dry sand, dry sodium chloride, dry soda ash, lithium chloride, zirconium silicate, and dry dolomite.

Water is not generally accepted as an effective extinguishing agent for metal fires. When applied to hot burning metal, water will break down into its basic atoms of oxygen and hydrogen. This chemical breakdown contributes to the combustion of the metal. However, water is also a good universal coolant and can be used on some combustible metals, but only under proper conditions and application, to reduce the temperature of the burning metal below the ignition point. For example, automatic deluge systems in magnesium plants can discharge such large quantities of water on burning magnesium that the fire will be extinguished. The National Fire Protection Association has specific standards for this type of automatic sprinkler system. Further information on the control of metal fires with water can be found in the National Fire Protection Association's *Fire Protection Handbook*.

An excellent source of selection and distribution criteria is found in the National Fire Protection Association's Standard No. 10. Other sources of information include the National Safety Council and the employer's fire insurance carrier.

(5) Substitution of standpipe systems for portable fire extinguishers. The employer is permitted to substitute acceptable standpipe systems for portable fire extinguishers under certain circumstances. It is necessary to assure that any substitution will provide the same coverage that portable units provide. This means that fire hoses, because of their limited portability, must be spaced throughout the protected area so that they can reach around obstructions such as columns, machinery, etc., and so that they can reach into closets and other enclosed areas.

(6) Inspection, maintenance and testing. The ultimate responsibility for the inspection, maintenance and testing of portable fire extinguishers lies with the employer. The actual inspection, maintenance, and testing may, however, be conducted by outside contractors with whom the employer has arranged to do the work. When contracting for such work, the employer should assure that the contractor is capable of performing the work that is needed to comply with this standard.

If the employer should elect to perform the inspection, maintenance, and testing requirements of this section in-house, then the employer must make sure that those persons doing the work have been trained to do the work and to recognize problem areas which could cause an extinguisher to be inoperable. The National Fire Protection Association provides excellent guidelines in its standard for portable fire extinguishers. The employer may also check with the manufacturer of the unit that has been purchased and obtain guidelines on inspection, maintenance, and testing. Hydrostatic testing is a process that should be left to contractors or individuals using suitable facilities and having the training necessary to perform the work.

Any time the employer has removed an extinguisher from service to be checked or repaired, alternate equivalent protection must be provided. Alternate equivalent protection could include replacing the extinguisher with one or more units having equivalent or equal ratings, posting a fire watch, restricting the unprotected area from employee exposure, or providing a hose system ready to operate.

(7) Hydrostatic testing. As stated before, the employer may contract for hydrostatic testing. However, if the employer wishes to provide the testing service, certain equipment and facilities must be available. Employees should be made aware of the hazards associated with hydrostatic testing and the importance of using proper guards and water pressures. Severe injury can result if extinguisher shells fail violently under hydrostatic pressure.

Employers are encouraged to use contractors who can perform adequate and reliable service. Firms which have been certified by the Materials Transportation Board (MTB) of the United States Department of Transportation (DOT), or state licensed extinguisher servicing firms, or recognized by the National Association of Fire Equipment Distributors in Chicago, Illinois, are generally acceptable for performing this service.

(8) Training and education. This part of the standard is of the utmost importance to employers and employees if the

risk of injury or death due to extinguisher use is to be reduced. If an employer is going to permit an employee to fight a workplace fire of any size, the employer must make sure that the employee knows everything necessary to assure the employee's safety.

Training and education can be obtained through many channels. Often, local fire departments in larger cities have fire prevention bureaus or similar organizations which can provide basic fire prevention training programs. Fire insurance companies will have data and information available. The National Fire Protection Association and the National Safety Council will provide, at a small cost, publications that can be used in a fire prevention program.

Actual fire fighting training can be obtained from various sources in the country. The Texas A and M University, the University of Maryland's Fire and Rescue Institute, West Virginia University's Fire Service Extension, Iowa State University's Fire Service Extension and other state training schools and land grant colleges have fire fighting programs directed to industrial applications. Some manufacturers of extinguishers, such as the Ansul Company and Safety First, conduct fire schools for customers in the proper use of extinguishers. Several large corporations have taken time to develop their own on-site training programs which expose employees to the actual "feeling" of fire fighting. Simulated fires for training of employees in the proper use of extinguishers are also an acceptable part of a training program.

In meeting the requirements of this section, the employer may also provide educational materials, without classroom instruction, through the use of employee notice campaigns using instruction sheets or flyers or similar types of informal programs. The employer must make sure that employees are trained and educated to recognize not only what type of fire is being fought and how to fight it, but also when it is time to get away from it and leave fire suppression to more experienced fire fighters.

**AMENDATORY SECTION** (Amending Order 81-32, filed 12/24/81)

**WAC 296-24-63299 Appendix B—National consensus standards.** The following table contains a cross-reference listing of those current national consensus standards which contains information and guidelines that would be considered acceptable in complying with requirements in the specific sections.

Section	National Consensus Standard
WAC 296-24-58505	ANSI/NFPA No. 1972, Structural Fire Fighter's Helmets. ANSI Z88.5 American National Standard, Practice for Respirator Protection for the Fire Service. ANSI/NFPA No. 1971, Protective Clothing for Structural Fire Fighters. NFPA No. 1041, Fire Service Instructor Professional Qualifications.
WAC 296-24-592	ANSI/NFPA No. 10, Portable Fire Extinguishers.
WAC 296-24-602	ANSI/NFPA No. 18, Wetting Agents. ANSI/NFPA No. 20, Centrifugal Fire Pumps. NFPA No. 21, Steam Fire Pumps. ANSI/NFPA No. 22, Water Tanks. NFPA No. 24, Outside Protection. NFPA No. 26, Supervision of Valves.

	NFPA No. 13E, Fire Department Operations in Properties Protected by Sprinkler, Standpipe Systems. ANSI/NFPA No. 194, Fire Hose Connections. NFPA No. 197, Initial Fire Attack, Training for. NFPA No. 1231, Water Supplies for Suburban and Rural Fire Fighting.
WAC 296-24-607	ANSI/NFPA No. 13, Sprinkler Systems. NFPA No. 13A, Sprinkler Systems, Maintenance. ANSI/NFPA No. 18, Wetting Agents. ANSI/NFPA No. 20, Centrifugal Fire Pumps. ANSI/NFPA No. 22, Water Tanks. NFPA No. 24, Outside Protection. NFPA No. 26, Supervision of Valves. ANSI/NFPA No. 72B, Auxiliary Signaling Systems. NFPA No. 1231, Water Supplies for Suburban and Rural Fire Fighting.
WAC 296-24-617	ANSI/NFPA No. 11, Foam Systems. ANSI/NFPA No. 11A, High Expansion Foam Extinguishing Systems. ANSI/NFPA No. 11B, Synthetic Foam and Combined Agent Systems. ANSI/NFPA No. 12, Carbon Dioxide Systems. ANSI/NFPA No. 12A, Halon 1301 Systems. ANSI/NFPA No. 12B, Halon 1211 Systems. ANSI/NFPA No. 15, Water Spray Systems. ANSI/NFPA No. 16, Foam-Water Spray Systems. ANSI/NFPA No. 17, Dry Chemical Systems. ANSI/NFPA No. 69, Explosion Suppression Systems.
WAC 296-24-622	ANSI/NFPA No. 11B, Synthetic Foam and Combined Agent Systems. ANSI/NFPA No. 17, Dry Chemical Systems.
WAC 296-24-623	ANSI/NFPA No. 12, Carbon Dioxide Systems. ANSI/NFPA No. 12A, Halon 1211 Systems. ANSI/NFPA No. 12B, Halon 1301 Systems. ANSI/NFPA No. 69, Explosion Suppression Systems.
WAC 296-24-627	ANSI/NFPA No. 11, Foam Extinguishing Systems. ANSI/NFPA No. 11A, High Expansion Foam Extinguishing Systems. ANSI/NFPA No. 11B, Synthetic Foam and Combined Agent Systems. ANSI/NFPA No. 15, Water Spray Fixed Systems. ANSI/NFPA No. 16, Foam-Water Spray Systems. ANSI/NFPA No. 18, Wetting Agents. NFPA No. 26, Supervision of Valves.
WAC 296-24-629	ANSI/NFPA No. 71, Central Station Signaling Systems. ANSI/NFPA No. 72A, Local Protective Signaling Systems. ANSI/NFPA No. 72B, Auxiliary Signaling Systems. ANSI/NFPA No. 72D, Proprietary Protective Signaling Systems. ANSI/NFPA No. 72E, Automatic Fire Detectors. ANSI/NFPA No. 101, Life Safety Code.
WAC 296-24-631	ANSI/NFPA No. 71, Central Station Signaling Systems. ANSI/NFPA No. 72A, Local Protective Signaling Systems. ANSI/NFPA No. 72B, Auxiliary Protective Signaling Systems. ANSI/NFPA No. 72C, Remote Station Protective Signaling Systems. ANSI/NFPA No. 72D, Proprietary Protective Signaling Systems. ANSI/NFPA No. 101, Life Safety Code.

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Metric Conversion . . . ANSI/ASTM NSo. E380, American National Standard for Metric Practice.

NFPA standards are available from the National Fire Protection Association; (~~(470 Atlantic Avenue, Boston)~~) Batterymarch Park, Quincy, MA ((02210)) 02269-9101.

ANSI Standards are available from the American National Standards Institute; (~~(1430 Broadway)~~) 11 West 42nd Street; New York, NY ((10018)) 10036.

**AMENDATORY SECTION** (Amending Order 92-13, filed 11/10/92, effective 12/18/92)

**WAC 296-24-63399 Appendix C—Fire protection references for further information.** (1) Appendix general references. The following references provide information which can be helpful in understanding the requirements contained in all of the sections of Part G:

(a) Fire Protection Handbook, National Fire Protection Association, (~~(470 Atlantic Avenue, Boston)~~) Batterymarch Park, Quincy, MA ((02210)) 02269-9101.

(b) Accident Prevention Manual for Industrial Operations, National Safety Council, (~~(425)~~) 444 North Michigan Avenue, Chicago, IL 60611.

(c) Various associations also publish information which may be useful in understanding these standards. Examples of these associations are: Fire Equipment Manufacturers Association (FEMA) of (~~(Arlington, VA 22204)~~) Cleveland, OH 44115-2851, and the National Association of Fire Equipment Distributors (NAFED) of Chicago, IL (~~(60604)~~) 60611-4267.

(2) Appendix references applicable to individual sections. The following references are grouped according to individual sections contained in Part G. These references provide information which may be helpful in understanding and implementing the standards of each section of Part G.

(a) WAC 296-24-58505 - Fire brigades:

(i) Private Fire Brigades, NFPA 27; National Fire Protection Association, (~~(470 Atlantic Avenue, Boston)~~) Batterymarch Park, Quincy, MA ((02210)) 02269-9101.

(ii) Initial Fire Attack, Training Standard On, NFPA 197; National Fire Protection Association, (~~(470 Atlantic Avenue, Boston)~~) Batterymarch Park, Quincy, MA ((02210)) 02269-9101.

(iii) Fire Fighter Professional Qualifications, NFPA 1001; National Fire Protection Association, (~~(470 Atlantic Avenue, Boston)~~) Batterymarch Park, Quincy, MA ((02210)) 02269-9101.

(iv) Organization for Fire Services, NFPA 1201; National Fire Protection Association, (~~(470 Atlantic Avenue, Boston)~~) Batterymarch Park, Quincy, MA ((02210)) 02269-9101.

(v) Organization of a Fire Department, NFPA 1202; National Fire Protection Association, (~~(470 Atlantic Avenue, Boston)~~) Batterymarch Park, Quincy, MA ((02210)) 02269-9101.

(vi) Protective Clothing for Structural Fire Fighting, ANSI/NFPA 1971; National Fire Protection Association, (~~(470 Atlantic Avenue, Boston)~~) Batterymarch Park, Quincy, MA ((02210)) 02269-9101.

(vii) American National Standards Institute for Men's Safety-Toe Footwear, ANSI Z41.1; American National Standards Institute, New York, NY (~~(10018)~~) 10036.

(viii) American National Standards Institute for Occupational and Educational Eye and Face Protection, ANSI Z87.1; American National Standards Institute, New York, NY (~~(10018)~~) 10036.

(ix) American National Standards Institute, Safety Requirements for Industrial Head Protection, ANSI Z89.1; American National Standards Institute, New York, NY (~~(10018)~~) 10036.

(x) Specifications for Protective Headgear for Vehicular Users, ANSI Z90.1; American National Standards Institute, New York, NY (~~(10018)~~) 10036.

(xi) Testing Physical Fitness; Davis and Santa Maria, Fire Command, April 1975.

(xii) Development of a Job-Related Physical Performance Examination for Fire Fighters; Dotson and Others. A summary report for the National Fire Prevention and Control Administration, Washington, D.C., March 1977.

(xiii) Proposed Sample Standards for Fire Fighters' Protective Clothing and Equipment; International Association of Fire Fighters, Washington, D.C. 20006-5395.

(xiv) A Study of Facepiece Leakage of Self-Contained Breathing Apparatus by DOP Man Tests; Los Alamos (~~(Scientific)~~) National Laboratory, Los Alamos, N.M.

(xv) The Development of Criteria for Fire Fighters' Gloves; Vol. II: Glove Criteria and Test Methods; National Institute for Occupational Safety and Health, Cincinnati, Ohio, 1976.

(xvi) Model Performance Criteria for Structural Fire Fighters' Helmets; National Fire Prevention and Control Administration, Washington, D.C., 1977.

(xvii) Fire Fighters; Job Safety and Health Magazine, Occupational Safety and Health Administration, Washington, D.C., June 1978.

(xviii) Eating Smoke—The Dispensable Diet; Utech, H.P. The Fire Independent, 1975.

(xix) Project Monoxide—A Medical Study of an Occupational Hazard of Fire Fighters; International Association of Fire Fighters, Washington, D.C. 20006-5395.

(xx) Occupational Exposures to Carbon Monoxide in Baltimore Fire Fighters; Radford Baltimore, MD. Journal of Occupational Medicine, September, 1976.

(xxi) Fire Brigades; National Safety Council, Chicago, IL 60611, 1966.

(xxii) American National Standards Institute, Practice for Respiratory Protection for the Fire Service, ANSI Z88.5; American National Standards Institute, New York, NY (~~(10018)~~) 10036.

(xxiii) Respirator Studies for the Nuclear Regulatory Commission; October 1, 1977—September 30, 1978. Evaluation and Performance of Open-Circuit Breathing Apparatus. NUREG/CR-1235. Los Alamos (~~(Scientific)~~) National Laboratory; Los Alamos, NM 87545, January, 1980.

(b) WAC 296-24-592 - Portable fire extinguishers:

(i) Standard for Portable Fire Extinguishers, ANSI/NFPA 10; National Fire Protection Association, (~~(470 Atlantic Avenue, Boston)~~) Batterymarch Park, Quincy, MA ((02210)) 02269.



(ii) Methods for Hydrostatic Testing of Compressed-Gas Cylinders, C-1; Compressed Gas Association, (~~(500 Fifth Avenue, New York, NY 10036)~~) 1725 Jefferson Davis Highway, Arlington, VA 22202-4100.

(iii) Recommendations for the Disposition of Unserviceable Compressed-Gas Cylinders, C-2; Compressed Gas Association, (~~(500 Fifth Avenue, New York, NY 10036)~~) 1725 Jefferson Davis Highway, Arlington, VA 22202-4100.

(iv) Standard for Visual Inspection of Compressed-Gas Cylinders, C-6; Compressed Gas Association, (~~(500 Fifth Avenue, New York, NY 10036)~~) 1725 Jefferson Davis Highway, Arlington, VA 22202-4100.

(v) Portable Fire Extinguisher Selection Guide, National Association of Fire Equipment Distributors(~~(; 111 East Wacker Drive)~~), 401 North Michigan Avenue Chicago, IL ((60604)) 60611-4267.

(c) WAC 296-24-602 - Standpipe and hose systems:

(i) Standard for the Installation of Sprinkler Systems, ANSI/NFPA 13; National Fire Protection Association, (~~(470 Atlantic Avenue, Boston)~~) Batterymarch Park, Quincy, MA ((02210)) 02269-9101.

(ii) Standard of the Installation of Standpipe and Hose Systems, ANSI/NFPA 14; National Fire Protection Association, (~~(470 Atlantic Avenue, Boston)~~) Batterymarch Park, Quincy, MA ((02210)) 02269-9101.

(iii) Standard for the Installation of Centrifugal Fire Pumps, ANSI/NFPA 20; National Fire Protection Association, (~~(470 Atlantic Avenue, Boston)~~) Batterymarch Park, Quincy, MA ((02210)) 02269-9101.

(iv) Standard for Water Tanks for Private Fire Protection, ANSI/NFPA 22; National Fire Protection Association, (~~(470 Atlantic Avenue, Boston)~~) Batterymarch Park, Quincy, MA ((02210)) 02269-9101.

(v) Standard for Screw Threads and Gaskets for Fire Hose Connections, ANSI/NFPA 194; National Fire Protection Association, (~~(470 Atlantic Avenue, Boston)~~) Batterymarch Park, Quincy, MA ((02210)) 02269-9101.

(vi) Standard for Fire Hose, NFPA 196; National Fire Protection Association, (~~(470 Atlantic Avenue, Boston)~~) Batterymarch Park, Quincy, MA ((02210)) 02269-9101.

(vii) Standard for the Care of Fire Hose, NFPA 198; National Fire Protection Association, (~~(470 Atlantic Avenue, Boston)~~) Batterymarch Park, Quincy, MA ((02210)) 02269-9101.

(d) WAC 296-24-607 - Automatic sprinkler systems:

(i) Standard of the Installation of Sprinkler Systems, ANSI/NFPA 13; National Fire Protection Association, (~~(470 Atlantic Avenue, Boston)~~) Batterymarch Park, Quincy, MA ((02210)) 02269-9101.

(ii) Standard for the Care and Maintenance of Sprinkler Systems, ANSI/NFPA 13A; National Fire Protection Association, (~~(470 Atlantic Avenue, Boston)~~) Batterymarch Park, Quincy, MA ((02210)) 02269-9101.

(iii) Standard for the Installation of Standpipe and Hose Systems, ANSI/NFPA 14; National Fire Protection Association, (~~(470 Atlantic Avenue, Boston)~~) Batterymarch Park, Quincy, MA ((02210)) 02269-9101.

(iv) Standard for the Installation of Centrifugal Fire Pumps, ANSI/NFPA 20; National Fire Protection Association, (~~(470 Atlantic Avenue, Boston)~~) Batterymarch Park, Quincy, MA ((02210)) 02269-9101.

(v) Standard for Water Tanks for Private Fire Protection, ANSI/NFPA 22; National Fire Protection Association, (~~(470 Atlantic Avenue, Boston)~~) Batterymarch Park, Quincy, MA ((02210)) 02269-9101.

(vi) Standard for Indoor General Storage, ANSI/NFPA 231; National Fire Protection Association, (~~(470 Atlantic Avenue, Boston)~~) Batterymarch Park, Quincy, MA ((02210)) 02269-9101.

(vii) Standard for Rack Storage of Materials, ANSI/NFPA 231C; National Fire Protection Association, (~~(470 Atlantic Avenue, Boston)~~) Batterymarch Park, Quincy, MA ((02210)) 02269-9101.

(e) WAC 296-24-617 - Fixed extinguishing systems, general information:

(i) Standard for Foam Extinguishing Systems, ANSI/NFPA 11; National Fire Protection Association, (~~(470 Atlantic Avenue, Boston)~~) Batterymarch Park, Quincy, MA ((02210)) 02269-9101.

(ii) Standard for Hi-Expansion Foam Systems, ANSI/NFPA 11A; National Fire Protection Association, (~~(470 Atlantic Avenue, Boston)~~) Batterymarch Park, Quincy, MA ((02210)) 02269-9101.

(iii) Standard on Synthetic Foam and Combined Agent Systems, ANSI/NFPA 11B; National Fire Protection Association, (~~(470 Atlantic Avenue, Boston)~~) Batterymarch Park, Quincy, MA ((02210)) 02269-9101.

(iv) Standard on Carbon Dioxide Extinguishing Systems, ANSI/NFPA 12; National Fire Protection Association, (~~(470 Atlantic Avenue, Boston)~~) Batterymarch Park, Quincy, MA ((02210)) 02269-9101.

(v) Standard on Halon 1301, ANSI/NFPA 12A; National Fire Protection Association, (~~(470 Atlantic Avenue, Boston)~~) Batterymarch Park, Quincy, MA ((02210)) 02269-9101.

(vi) Standard on Halon 1211, ANSI/NFPA 12B; National Fire Protection Association, (~~(470 Atlantic Avenue, Boston)~~) Batterymarch Park, Quincy, MA ((02210)) 02269-9101.

(vii) Standard for Water Spray Systems, ANSI/NFPA 15; National Fire Protection Association, (~~(470 Atlantic Avenue, Boston)~~) Batterymarch Park, Quincy, MA ((02210)) 02269-9101.

(viii) Standard for Foam-Water Sprinkler Systems and Foam-Water Spray Systems, ANSI/NFPA 16; National Fire Protection Association, (~~(470 Atlantic Avenue, Boston)~~) Batterymarch Park, Quincy, MA ((02210)) 02269-9101.

(ix) Standard for Dry Chemical Extinguishing Systems, ANSI/NFPA 17; National Fire Protection Association, (~~(470 Atlantic Avenue, Boston)~~) Batterymarch Park, Quincy, MA ((02210)) 02269-9101.

(f) WAC 296-24-622 - Fixed extinguishing systems, dry chemical:

(i) Standard for Dry Chemical Extinguishing Systems, ANSI/NFPA 17; National Fire Protection Association, (~~(470 Atlantic Avenue, Boston)~~) Batterymarch Park, Quincy, MA ((02210)) 02269-9101.

(ii) National Electrical Code, ANSI/NFPA 70; National Fire Protection Association, (~~(470 Atlantic Avenue, Boston)~~) Batterymarch Park, Quincy, MA ((02210)) 02269-9101.

(iii) Standard for the Installation of Equipment for the Removal of Smoke and Grease-Laden Vapor from Commercial Cooling Equipment, NFPA 96; National Fire Protection



Association, (~~(470 Atlantic Avenue, Boston)~~) Batterymarch Park, Quincy, MA ((02210)) 02269-9101.

(g) WAC 296-24-623 - Fixed extinguishing systems, gaseous agents:

(i) Standard on Carbon Dioxide Extinguishing Systems, ANSI/NFPA 12; National Fire Protection Association, (~~(470 Atlantic Avenue, Boston)~~) Batterymarch Park, Quincy, MA ((02210)) 02269-9101.

(ii) Standard on Halon 1301, ANSI/NFPA 12B; National Fire Protection Association, (~~(470 Atlantic Avenue, Boston)~~) Batterymarch Park, Quincy, MA ((02210)) 02269-9101.

(iii) Standard on Halon 1211, ANSI/NFPA 12B; National Fire Protection Association, (~~(470 Atlantic Avenue, Boston)~~) Batterymarch Park, Quincy, MA ((02210)) 02269-9101.

(iv) Standard on Explosion Prevention Systems, ANSI/NFPA 69; National Fire Protection Association, (~~(470 Atlantic Avenue, Boston)~~) Batterymarch Park, Quincy, MA ((02210)) 02269-9101.

(v) National Electrical Code, ANSI/NFPA 70; National Fire Protection Association, (~~(470 Atlantic Avenue, Boston)~~) Batterymarch Park, Quincy, MA ((02210)) 02269-9101.

(vi) Standard on Automatic Fire Detectors, ANSI/NFPA 72E; National Fire Protection Association, (~~(470 Atlantic Avenue, Boston)~~) Batterymarch Park, Quincy, MA ((02210)) 02269-9101.

(vii) Determination of Halon 1301/1211 Threshold Extinguishing Concentrations Using the Cup Burner Method, Riley and Olson, Ansul Report AL-530-A.

(h) WAC 296-24-627 - Fixed extinguishing systems, water spray and foam agents:

(i) Standard for Foam Extinguisher Systems, ANSI/NFPA 11; National Fire Protection Association, (~~(470 Atlantic Avenue, Boston)~~) Batterymarch Park, Quincy, MA ((02210)) 02269-9101.

(ii) Standard for High-Expansion Foam Systems, ANSI/NFPA 11A; National Fire Protection Association, (~~(470 Atlantic Avenue, Boston)~~) Batterymarch Park, Quincy, MA ((02210)) 02269-9101.

(iii) Standard for Water Spray Fixed Systems for Fire Protection, ANSI/NFPA 15; National Fire Protection Association, (~~(470 Atlantic Avenue, Boston)~~) Batterymarch Park, Quincy, MA ((02210)) 02269-9101.

(iv) Standard for the Installation of Foam-Water Sprinkler Systems and Foam-Water Spray Systems, ANSI/NFPA 16; National Fire Protection Association, (~~(470 Atlantic Avenue, Boston)~~) Batterymarch Park, Quincy, MA ((02210)) 02269-9101.

(i) WAC 296-24-629 - Fire detection systems:

(i) National Electrical Code, ANSI/NFPA 70; National Fire Protection Association, (~~(470 Atlantic Avenue, Boston)~~) Batterymarch Park, Quincy, MA ((02210)) 02269-9101.

(ii) Standard for Central Station Signaling Systems, ANSI/NFPA 71; National Fire Protection Association, (~~(470 Atlantic Avenue, Boston)~~) Batterymarch Park, Quincy, MA ((02210)) 02269-9101.

(iii) Standard on Automatic Fire Detectors, ANSI/NFPA 72E; National Fire Protection Association, (~~(470 Atlantic Avenue, Boston)~~) Batterymarch Park, Quincy, MA ((02210)) 02269-9101.

(j) WAC 296-24-631 - Employee alarm systems:

(i) National Electrical Code, ANSI/NFPA 70; National Fire Protection Association, (~~(470 Atlantic Avenue, Boston)~~) Batterymarch Park, Quincy, MA ((02210)) 02269-9101.

(ii) Standard for Central Station Signaling Systems, ANSI/NFPA 71; National Fire Protection Association, (~~(470 Atlantic Avenue, Boston)~~) Batterymarch Park, Quincy, MA ((02210)) 02269-9101.

(iii) Standard for Local Protective Signaling Systems, ANSI/NFPA 72A; National Fire Protection Association, (~~(470 Atlantic Avenue, Boston)~~) Batterymarch Park, Quincy, MA ((02210)) 02269-9101.

(iv) Standard for Auxiliary Protective Signaling Systems, ANSI/NFPA 72B; National Fire Protection Association, (~~(470 Atlantic Avenue, Boston)~~) Batterymarch Park, Quincy, MA ((02210)) 02269-9101.

(v) Standard for Remote Station Protective Signaling Systems, ANSI/NFPA 72C; National Fire Protection Association, (~~(470 Atlantic Avenue, Boston)~~) Batterymarch Park, Quincy, MA ((02210)) 02269-9101.

(vi) Standard for Proprietary Protective Signaling Systems, ANSI/NFPA 72D; National Fire Protection Association, (~~(470 Atlantic Avenue, Boston)~~) Batterymarch Park, Quincy, MA ((02210)) 02269-9101.

(vii) Vocal Emergency Alarms in Hospitals and Nursing Facilities: Practice and Potential, (~~(National Bureau of Standards, Washington, D.C.)~~) National Institute of Standards and Technology, Quince Orchard and Clopper Roads, Gaithersburg, MD 20899-0011, July, 1977.

(viii) Fire Alarm and Communication Systems, (~~(National Bureau of Standards, Washington, D.C.)~~) National Institute of Standards and Technology, Quince Orchard and Clopper Roads, Gaithersburg, MD 20899-0011, April, 1976.

AMENDATORY SECTION (Amending Order 81-32, filed 12/24/81)

**WAC 296-24-63499 Appendix D—Availability of publications incorporated by references in WAC 296-24-58505—Fire brigades.** The final standard for fire brigades, WAC (~~(296-24-58505)~~) 296-24-585, contains provisions which incorporate certain publications by reference. The publications provide criteria and test methods for protective clothing worn by those fire brigade members who are expected to perform interior structural fire fighting. The standard references the publications as the chief sources of information for determining if the protective clothing affords the required level of protection.

It is appropriate to note that the final standard does not require employers to purchase a copy of the referenced publications. Instead, employers can specify (in purchase orders to the manufacturers) that the protective clothing meet the criteria and test methods contained in the referenced publications and can rely on the manufacturers assurances of compliance. Employers, however, may desire to obtain a copy of the referenced publications for their own information.

The (~~(paragraph)~~) section designation of the standard where the referenced publications appear, the title of the publications, and the availability of the publications are as follows:

<del>((Paragraph))</del> Section Designation	Referenced Publication	Available From
WAC 296-24-58513 (3)(b)	"Protective Clothing for Structural Fire Fighting." NFPA No. 1971 (1975).	National Fire Protection Association, <del>((470 Atlantic Avenue, Boston, MA 02210-))</del> <u>Batterymarch Park, Quincy, MA 02269-9101.</u>
WAC 296-24-58513 (4)(a)	"Development of Criteria for Fire Fighter's Gloves; Vol. II, Part II: Test Methods" (1976)	U.S. Government Printing Office, Washington, D.C. <del>((20402))</del> <u>20401.</u> Stock No. for Vol. II is: 071-033-021-1.
WAC 296-24-58513 (5)(a)	"Model Performance Criteria for Structural Fire fighter's Helmets" (1977)	U.S. Fire Administration, National Fire Safety and Research Office, <del>((Washington, D.C. 20230))</del> <u>16825 South Seton Avenue, Emmitsburg, Maryland 21727.</u>

The referenced publications (or a microfiche of the publications) are available for review at many universities and public libraries throughout the country. These publications may also be examined at the OSHA Technical Data Center, Room N2439-Rear, United States Department of Labor, 200 Constitution Avenue Northwest, Washington, D.C. 20210 (202-523-9700), or at any OSHA Regional Office (see telephone directories under United States Government-Labor Department).

**AMENDATORY SECTION** (Amending Order 91-07, filed 11/22/91, effective 12/24/91)

**WAC 296-24-65501 Portable powered tools.** (1) Portable circular saws.

(a) All portable, power-driven circular saws having a blade diameter greater than 2 in. shall be equipped with guards above and below the base plate or shoe. The upper guard shall cover the saw to the depth of the teeth, except for the minimum arc required to permit the base to be tilted for bevel cuts. The lower guard shall cover the saw to the depth of the teeth, except for the minimum arc required to allow proper retraction and contact with the work. When the tool is withdrawn from the work, the lower guard shall automatically and instantly return to covering position.

(b) (1)(a) of this section does not apply to circular saws used in the meat industry for meat cutting purposes.

(2) Switches and controls.

(a) All hand-held powered circular saws having a blade diameter-greater than 2 inches, electric, hydraulic or pneumatic chain saws, and percussion tools without positive accessory holding means shall be equipped with a constant pressure switch or control that will shut off the power when the pressure is released. All hand-held gasoline powered chain saws shall be equipped with a constant pressure throttle control that will shut off the power to the saw chain when the pressure is released.

(b) All hand-held powered drills, tappers, fastener drivers, horizontal, vertical, and angle grinders with wheels greater than 2 inches in diameter, disc sanders with discs greater than 2 inches in diameter, belt sanders, reciprocating saws, saber, scroll, and jig saws with blade shanks greater than a nominal one-fourth inch, and other similarly operating powered tools shall be equipped with a constant pressure switch or control and may have a lock-on control provided that turnoff can be accomplished by a single motion of the same finger or fingers that turn it on.

(c) All other hand-held powered tools, such as, but not limited to, platen sanders, grinders with wheels 2 inches in diameter or less, disc sanders with discs 2 inches in diameter or less, routers, planers, laminate trimmers, nibblers, shears, saber, scroll, and jig saws with blade shanks a nominal one-fourth of an inch wide or less, may be equipped with either a positive "on-off" control, or other controls as described by (2)(a) and (b) of this section.

(i) Saber, scroll, and jig saws with nonstandard blade holders may use blades with shanks which are nonuniform in width, provided the narrowest portion of the blade shank is an integral part in mounting the blade.

(ii) Blade shank width shall be measured at the narrowest portion of the blade shank when saber, scroll, and jig saws have nonstandard blade holders.

(iii) "Nominal" in this section means +0.05 inch.

(d) The operating control on hand-held power tools shall be so located as to minimize the possibility of its accidental operation, if such accidental operation would constitute a hazard to employees.

(e) This ~~((paragraph))~~ subdivision does not apply to concrete vibrators, concrete breakers, powered tampers, jack hammers, rock drills, garden appliances, household and kitchen appliances, personal care appliances, medical or dental equipment, or to fixed machinery.

(3) Portable belt sanding machines. Belt sanding machines shall be provided with guards at each nip point where the sanding belt runs onto a pulley. These guards shall effectively prevent the hands or fingers of the operator from coming in contact with the nip points. The unused run of the sanding belt shall be guarded against accidental contact.

(4) Cracked saws. All cracked saws shall be removed from service.

(5) Grounding. Portable electric powered tools shall meet the electrical requirements of chapter 296-24 WAC Part L.

**AMENDATORY SECTION** (Amending Order 79-9, filed 7/31/79)

**WAC 296-24-66305 Definitions applicable to this section.** (1) Angle control - a safety feature designed to prevent a tool from operating when tilted beyond a predetermined angle.

(2) Approved - meeting the requirements of this standard and acceptable to the department of labor and industries ~~((-division of industrial safety and health))~~.

(3) Cased power load - a power load with the propellant contained in a closed case.

(4) Caseless power load - a power load with the propellant in solid form not requiring containment.

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(5) Chamber (noun) - the location in the tool into which the power load is placed and in which it is actuated.

(6) Chamber (verb) - to fit the chamber according to manufacturer's specifications.

(7) Fasteners - any pins (unthreaded heads) or studs (threaded heads) driven by powder actuated tools.

(8) Fixture - a special shield that provides equivalent protection where the standard shield cannot be used.

(9) Head - that portion of a fastener that extends above the work surface after being properly driven.

(10) Misfire - a condition in which the power load fails to ignite after the tool has been operated.

(11) Powder actuated fastening system - a method comprising the use of a powder actuated tool, a power load, and a fastener.

(12) Powder actuated tool (also known as tool) - a tool that utilizes the expanding gases from a power load to drive a fastener.

(13) Power load - the energy source used in powder actuated tools.

(14) Qualified operator - a person who meets the requirements of WAC 296-24-66321 (1) and (2).

(15) Shield - a device, attached to the muzzle end of a tool, which is designed to confine flying particles.

(16) Spalled area - a damaged and nonuniform concrete or masonry surface.

(17) Test velocity - the measurement of fastener velocity performed in accordance with WAC 296-24-66307 (1)(m).

(18) Tools - tools can be divided into two types: Direct acting and indirect acting; and three classes: Low velocity, medium velocity, and high velocity.

(a) Direct-acting tool - a tool in which the expanding gas of the power load acts directly on the fastener to be driven.

(b) Indirect-acting tool - a tool in which the expanding gas of the power load acts on a captive piston, which in turn drives the fastener.

(c) Low-velocity tool - a tool whose test velocity has been measured ten times while utilizing the highest velocity combination of:

(i) The lightest commercially available fastener designed for that specific tool;

(ii) The strongest commercially available power load that will properly chamber in the tool;

(iii) The piston designed for that tool and appropriate for that fastener; that will produce an average test velocity from the ten tests not in excess of 100 meters per second (328 feet per second) with no single test having a velocity of over 108 m/s (354 ft/s).

(d) Medium-velocity tool - a tool whose test velocity has been measured ten times while utilizing the highest velocity combination of:

(i) The lightest commercially available fastener designed for the tool;

(ii) The strongest commercially available power load that will properly chamber in the tool;

(iii) The piston designed for that tool and appropriate for that fastener; that will produce an average test velocity from ten tests in excess of 100 m/s (328 ft/s) but not in excess of 150 m/s (492 ft/s) with no single test having a velocity of 160 m/s (525 ft/s).

(e) High-velocity tool - a tool whose test velocity has been measured ten times while utilizing the combination of:

(i) The lightest commercially available fastener designed for the tool;

(ii) The strongest commercially available power load which will properly chamber in the tool; that will produce an average velocity from the ten tests in excess of 150 m/s (492 ft/s).

**AMENDATORY SECTION** (Amending Order 79-9, filed 7/31/79)

**WAC 296-24-66319 Authorized instructor.** (1) Only persons trained and authorized by the tool manufacturer or by an authorized representative of the tool manufacturer shall be qualified to instruct and qualify operators for the manufacturer's powder actuated tools.

(2) All authorized instructors shall have read and be familiar with this standard, and shall be capable of:

(a) Disassembling, servicing, and reassembling the tool.

(b) Recognizing any worn or damaged parts or defective operation.

(c) Recognizing and clearly identifying the colors used to identify power load levels.

(d) Using the tool correctly within the limitations of its use.

(e) Training and testing operators prior to issuing a qualified operator's card.

(3) All authorized instructors shall have in their possession a valid authorized instructor's card issued and signed by an authorized representative of the manufacturer. The card shall be wallet size of approximately 6 x 9 cm (2-1/2 x 3-1/2 in), and the face of the card shall bear text similar to that shown in Figure P-1.

(4) A list of all instructors authorized by the manufacturer to instruct and qualify operators shall be maintained by the tool manufacturer and be made available to the department of labor and industries(~~(-division of industrial safety and health,)~~) upon request.

(5) An instructor's card may be revoked by the authorizing agent or the department of labor and industries, (~~(division of industrial safety and health,)~~) if ~~((he is))~~ they are known to have issued a qualified operator's card in violation of any regulation contained in this standard. When an instructor is no longer authorized to issue qualified operator's cards, ~~((he))~~ they shall surrender ~~((his))~~ their card to the authorizing agent or the department of labor and industries(~~(-division of industrial safety and health,)~~).

AUTHORIZED INSTRUCTOR

..... Powder Actuated Tools      Date .....

(MAKE)

Card No. .... Social Security No. ....

This certifies that .....

(NAME OF INSTRUCTOR)

has received the prescribed training in the operation and maintenance of powder actuated tools manufactured by

..... and is qualified

(NAME OF MANUFACTURER)

to train and certify operators of .....

(MAKE)

powder actuated tools.

PERMANENT

Model(s) . . . . .  
 Authorized by . . . . .  
 I have received instruction by the manufacturer's authorized representative in the training of operators of the above tools and agree to conform to all rules and regulations governing the instruction of tool operators.  
 Date of Birth . . . . .  
 . . . . .  
 (SIGNATURE)

**Figure P-1**  
 Sample of Authorized Instructor's Card

AMENDATORY SECTION (Amending Order 79-9, filed 7/31/79)

**WAC 296-24-66321 Qualified operator.** (1) The operator shall be trained by an authorized instructor to be familiar with the provisions of this standard and the instructions provided by the manufacturer for operation and maintenance. The operator shall also be capable of:

- (a) Reading and understanding the manufacturer's instruction manual.
- (b) Cleaning the tool correctly.
- (c) Recognizing any worn or damaged parts or defective operation.

(d) Recognizing the number-color code system used in this standard to identify power load levels. In the event the operator is unable to distinguish the colors used, ~~((he))~~ the operator shall be given special instruction ~~((to))~~ which will enable ~~((him))~~ the operator to avoid error.

(e) Using ~~((the))~~ a tool correctly within the limitations of its use and ~~((demonstrating his))~~ demonstrate competence by operating the tool in the presence of the instructor.

(2) After training, the operator shall, ~~((to))~~ substantiate ~~((his))~~ competency, by satisfactorily ~~((complete))~~ completing a written examination provided by the manufacturer of the tool.

(a) The operator's written examination shall consist of questions to establish the operator's competence with respect to:

- (i) The requirements of this standard;
- (ii) The powder actuated fastening system; and
- (iii) The specific details of operation and maintenance of the tool(s) involved.

(b) The examination shall provide a statement, attested to by the instructor, that the applicant can (or cannot) readily distinguish the colors used to identify power load levels (see WAC 296-24-66309).

(3) Each applicant who meets the requirements as set forth in subsections (1) and (2) of this section shall receive a qualified operator's card, issued and signed by both the instructor and applicant. While using the tool, the operator shall ~~((have))~~ carry this card ~~((in his possession))~~.

(4) The qualified operator's card supplied by the manufacturer shall be wallet size of approximately 6 x 9 cm (2-1/2 x 3-1/2 in), and the face of the card shall bear text similar to that shown in Figure P-2.

(5) There shall be printed on the card a notation reading:

"Revocation of card - failure to comply with any of the rules and regulations for safe operation of powder actuated

fastening tools shall be cause for the immediate revocation of this card."

QUALIFIED OPERATOR  
 . . . . . Powder Actuated Tools Date . . . . .  
 (MAKE)  
 Card No. . . . . Social Security No. . . . .  
 This certifies that . . . . .  
 (NAME OF OPERATOR)

has received the prescribed training in the operation of powder actuated tools manufactured by . . . . .  
 (NAME OF MANUFACTURER)

Model(s) . . . . .  
 Trained and issued by . . . . .  
 . . . . .  
 (SIGNATURE OF AUTHORIZED INSTRUCTOR)

I have received instruction in the safe operation and maintenance of powder actuated fastening tools of the makes and models specified and agree to conform to all rules and regulations governing that use  
 Date of Birth . . . . .  
 . . . . .  
 (SIGNATURE)

**Figure P-2**  
 Sample of Qualified Operator's Card

AMENDATORY SECTION (Amending Order 73-5, filed 5/9/73 and Order 73-4, filed 5/7/73)

**WAC 296-24-67005 Operation and maintenance.** (1) In the absence of a firm foundation, the base of the jack shall be blocked. If there is a possibility of slippage of the cap, a block shall be placed in between the cap and the load.

(2) The operator shall watch the stop indicator, which shall be kept clean, in order to determine the limit of travel. The indicated limit shall not be overrun.

(3) After the load has been raised, it shall immediately be cribbed, blocked, or otherwise secured.

(4) Hydraulic jacks exposed to freezing temperatures shall be supplied with an adequate antifreeze liquid.

(5) All jacks shall be properly lubricated at regular intervals. The lubricating instructions of the manufacturer should be followed, and only lubricants recommended by ~~((him))~~ the manufacturer should be used.

(6) Each jack shall be thoroughly inspected at times which depend upon the service conditions. Inspections shall be not less frequent than the following:

(a) For constant or intermittent use at one locality, once every 6 months,

(b) For jacks sent out of shop for special work, when sent out and when returned,

(c) For a jack subjected to abnormal load or shock, immediately before and immediately thereafter.

(7) Repair or replacement parts shall be examined for possible defects.

(8) Jacks which are out of order shall be tagged accordingly, and shall not be used until repairs are made.

PERMANENT

AMENDATORY SECTION (Amending Order 73-5, filed 5/9/73 and Order 73-4, filed 5/7/73)

**WAC 296-24-67507 Definitions.** (1) Abrasive. A solid substance used in an abrasive blasting operation.

(2) Abrasive blasting. The forcible application of an abrasive to a surface by pneumatic pressure, hydraulic pressure, or centrifugal force.

(3) Abrasive-blasting respirator. A continuous flow airline respirator constructed so that it will cover the wearer's head, neck, and shoulders ~~((to protect him))~~ and provide protection from rebounding abrasive.

(4) Air-line respirator. A device consisting of a face-piece, helmet, or hood to which clean air is supplied to the wearer through a small-diameter hose from a source not on the wearer's body.

(5) Blast cleaning barrel. A complete enclosure which rotates on an axis, or which has an internal moving tread to tumble the parts, in order to expose various surfaces of the parts to the action of an automatic blast spray.

(6) Blast cleaning room. A complete enclosure in which blasting operations are performed and where the operator works inside of the room to operate the blasting nozzle and direct the flow of the abrasive material.

(7) Blasting cabinet. An enclosure where the operator stands outside and operates the blasting nozzle through an opening or openings in the enclosure.

(8) Clean air. Air of such purity that it will not cause harm or discomfort to an individual if it is inhaled for extended periods of time.

(9) Dust collector. A device or combination of devices for separating dust from the air handled by an exhaust ventilation system.

(10) Exhaust ventilation system. A system for removing contaminated air from a space, comprising two or more of the elements; (a) enclosure or hood, (b) duct work, (c) dust collecting equipment, (d) exhauster, and (e) discharge stack.

(11) Particulate-filter respirator. An air purifying respirator, commonly referred to as a dust or a fume respirator, which removes most of the dust or fume from the air passing through the device.

(12) Respirable dust. Airborne dust in sizes capable of passing through the upper respiratory system to reach the lower lung passages.

(13) Rotary blast cleaning table. An enclosure where the pieces to be cleaned are positioned on a rotating table and are passed automatically through a series of blast sprays.

AMENDATORY SECTION (Amending Order 73-5, filed 5/9/73 and Order 73-4, filed 5/7/73)**WAC 296-24-67515 Personal protective equipment.**

(1) Abrasive-blasting respirators. Abrasive-blasting respirators shall be worn by all abrasive-blasting operators (a) when working inside of blast cleaning rooms, or (b) when using silica sand in manual blasting operations where the nozzle and blast are not physically separated from the operator in an exhaust ventilated enclosure, or (c) where concentrations of toxic dusts dispersed by the abrasive blasting may exceed the limits set in chapter 296-62 WAC.

(2) Particulate-filter respirators.

(a) Particulate-filter respirators, commonly referred to as dust-filter respirators, properly fitted, may be used for short,

intermittent, or occasional dust exposures such as clean-up, dumping of dust collectors, or unloading shipments of sand at a receiving point, when it is not feasible to control the dust by enclosure, exhaust ventilation, or other means. Respirators used shall be approved for protection against the specific type of dust encountered.

~~((a))~~ (b) Dust-filter respirators shall not be used for continuous protection where silica sand is used as the blasting abrasive, or toxic materials are blasted.

(3) Personal protective clothing. Operators shall be equipped with heavy canvas or leather gloves and aprons or equivalent protection to protect them from the impact of abrasives. Safety shoes shall be worn where there is a hazard of foot injury.

(4) Personal protective clothing, equipment and their use shall comply with the provisions of ~~((WAC 296-24-07501, 296-24-07801, 296-24-08101 through 296-24-08113, 296-24-084, and 296-24-088))~~ chapter 296-24 WAC, Part A2.

AMENDATORY SECTION (Amending Order 89-03, filed 5/15/89, effective 6/30/89)**WAC 296-24-68201 General requirements.** (1)

Flammable mixture. Mixtures of fuel gases and air or oxygen may be explosive and shall be guarded against. No device or attachment facilitating or permitting mixtures of air or oxygen with flammable gases prior to consumption, except at the burner or in a standard torch, shall be allowed unless approved for the purpose.

(2) Maximum pressure. Under no condition shall acetylene be generated, piped (except in approved cylinder manifolds) or utilized at a pressure in excess of 15 p.s.i. gage pressure or 30 p.s.i. absolute pressure. (The 30 p.s.i. absolute pressure limit is intended to prevent unsafe use of acetylene in pressurized chambers such as caissons, underground excavations or tunnel construction.) This requirement does not apply to storage of acetylene dissolved in a suitable solvent in cylinders manufactured and maintained according to U.S. Department of Transportation requirements, or to acetylene for chemical use. The use of liquid acetylene shall be prohibited.

(3) Apparatus. Only approved apparatus such as torches, regulators or pressure-reducing valves, acetylene generators, and manifolds shall be used. Use of replacement tips will not nullify the "approved apparatus" status of a torch, if such replacement tips are made to the same specifications as the original tip of the torch at the time of approval by the nationally recognized testing laboratory, or if the use of such tips in conjunction with convertor/adaptors results in the same specifications as the original tip at the time of approval by the nationally recognized testing laboratory.

(4) Personnel. ~~((Workmen))~~ Workers in charge of the oxygen or fuel-gas supply equipment, including generators, and oxygen or fuel-gas distribution piping systems shall be instructed and judged competent by their employers for this important work before being left in charge. Rules and instructions covering the operation and maintenance of oxygen or fuel-gas supply equipment including generators, and oxygen or fuel-gas distribution piping systems shall be readily available.

**AMENDATORY SECTION** (Amending Order 73-5, filed 5/9/73 and Order 73-4, filed 5/7/73)

**WAC 296-24-68501 General.** (1) Equipment selection. Welding equipment shall be chosen for safe application to the work to be done as specified in WAC 296-24-68503.

(2) Installation. Welding equipment shall be installed safely as specified by WAC 296-24-68505.

(3) Instruction. (~~Workmen~~) Workers designated to operate arc welding equipment shall have been properly instructed and qualified to operate such equipment as specified in WAC 296-24-68507.

**AMENDATORY SECTION** (Amending Order 73-5, filed 5/9/73 and Order 73-4, filed 5/7/73)

**WAC 296-24-68507 Operation and maintenance.** (1) General. (~~Workmen~~) Workers assigned to operate or maintain arc welding equipment shall be acquainted with the requirements of WAC 296-24-68501 through 296-24-68505, 296-24-69501 through 296-24-69507, 296-24-70001 through 296-24-70007 and 296-24-71501 through 296-24-71525; if doing gas-shielded arc welding, also Recommended Safe Practices for Gas-Shielded Arc Welding, A6.1-1966, American Welding Society.

(2) Machine hook up. Before starting operations all connections to the machine shall be checked to make certain they are properly made. The work lead shall be firmly attached to the work; magnetic work clamps shall be freed from adherent metal particles of spatter on contact surfaces. Coiled welding cable shall be spread out before use to avoid serious overheating and damage to insulation.

(3) Grounding. Grounding of the welding machine frame shall be checked. Special attention shall be given to safety ground connections of portable machines.

(4) Leaks. There shall be no leaks of cooling water, shielding gas or engine fuel.

(5) Switches. It shall be determined that proper switching equipment for shutting down the machine is provided.

(6) Manufacturers' instructions. Printed rules and instructions covering operation of equipment supplied by the manufacturers shall be strictly followed.

(7) Electrode holders. Electrode holders when not in use shall be so placed that they cannot make electrical contact with persons, conducting objects, fuel or compressed gas tanks.

(8) Electric shock. Cables with splices within 10 feet of the holder shall not be used. The welder should not coil or loop welding electrode cable around parts of (~~his~~) the body.

(9) Maintenance.

(a) The operator should report any equipment defect or safety hazard to (~~his~~) the supervisor and the use of the equipment shall be discontinued until its safety has been assured. Repairs shall be made only by qualified personnel.

(b) Machines which have become wet shall be thoroughly dried and tested before being used.

(c) Work and electrode lead cables should be frequently inspected for wear and damage. Cables with damaged insulation or exposed bare conductors shall be replaced. Joining lengths of work and electrode cables shall be done by the use of connecting means specifically intended for the

purpose. The connecting means shall have insulation adequate for the service conditions.

**AMENDATORY SECTION** (Amending Order 91-07, filed 11/22/91, effective 12/24/91)

**WAC 296-24-69001 General.** (1) Installation. All equipment shall be installed by a qualified electrician in conformance with chapter 296-24 WAC Part L. There shall be a safety-type disconnecting switch or a circuit breaker or circuit interrupter to open each power circuit to the machine, conveniently located at or near the machine, so that the power can be shut off when the machine or its controls are to be serviced.

(2) Thermal protection. Ignitron tubes used in resistance welding equipment shall be equipped with a thermal protection switch.

(3) Personnel. (~~Workmen~~) Workers designated to operate resistance welding equipment shall have been properly instructed and judged competent to operate such equipment.

(4) Guarding. Controls of all automatic or air and hydraulic clamps shall be arranged or guarded to prevent the operator from accidentally activating them.

**AMENDATORY SECTION** (Amending Order 73-5, filed 5/9/73 and Order 73-4, filed 5/7/73)

**WAC 296-24-69011 Maintenance.** Periodic inspection shall be made by qualified maintenance personnel, and records of the same maintained. The operator shall be instructed to report any equipment defects to (~~his~~) the supervisor and the use of the equipment shall be discontinued until safety repairs have been completed.

**AMENDATORY SECTION** (Amending Order 73-5, filed 5/9/73 and Order 73-4, filed 5/7/73)

**WAC 296-24-69503 Special precautions.** When the nature of the work to be performed falls within the scope of WAC 296-24-69501(2) certain additional precautions may be necessary:

(1) Combustible material. Wherever there are floor openings or cracks in the flooring that cannot be closed, precautions shall be taken so that no readily combustible materials on the floor below will be exposed to sparks which might drop through the floor. The same precautions shall be observed with regard to cracks or holes in walls, open doorways and open or broken windows.

(2) Fire extinguishers. Suitable fire extinguishing equipment shall be maintained in a state of readiness for instant use. Such equipment may consist of pails of water, buckets of sand, hose or portable extinguishers depending upon the nature and quantity of the combustible material exposed.

(3) Fire watch.

(a) Fire watchers shall be required whenever welding or cutting is performed in locations where other than a minor fire might develop, or any of the following conditions exist:

(i) Appreciable combustible material, in building construction or contents, closer than 35 feet to the point of operation.

(ii) Appreciable combustibles are more than 35 feet away but are easily ignited by sparks.

(iii) Wall or floor openings within a 35-foot radius expose combustible material in adjacent areas including concealed spaces in walls or floors.

(iv) Combustible materials are adjacent to the opposite side of metal partitions, walls, ceilings, or roofs and are likely to be ignited by conduction or radiation.

(b) Fire watchers shall have fire extinguishing equipment readily available and be trained in its use. They shall be familiar with facilities for sounding an alarm in the event of a fire. They shall watch for fires in all exposed areas, try to extinguish them only when obviously within the capacity of the equipment available, or otherwise sound the alarm. A fire watch shall be maintained for at least a half hour after completion of welding or cutting operations to detect and extinguish possible smoldering fires.

(4) Authorization. Before cutting or welding is permitted, the area shall be inspected by the individual responsible for authorizing cutting and welding operations. ~~((He))~~ The responsible individual shall designate precautions to be followed in granting authorization to proceed, preferably in the form of a written permit.

(5) Floors. Where combustible materials such as paper clippings, wood shavings, or textile fibers are on the floor, the floor shall be swept clean for a radius of 35 feet. Combustible floors shall be kept wet, covered with damp sand, or protected by fire-resistant shields. Where floors have been wet down, personnel operating arc welding or cutting equipment shall be protected from possible shock.

(6) Prohibited areas. Cutting or welding shall not be permitted in the following situations:

(a) In areas not authorized by management.

(b) In sprinklered buildings while such protection is impaired.

(c) In the presence of explosive atmospheres (mixtures of flammable gases, vapors, liquids, or dusts with air), or explosive atmospheres that may develop inside uncleaned or improperly prepared tanks or equipment which have previously contained such materials, or that may develop in areas with an accumulation of combustible dusts.

(d) In areas near the storage of large quantities of exposed, readily ignitable materials such as bulk sulphur, baled paper, or cotton.

(7) Relocation of combustibles. Where practicable, all combustibles shall be relocated at least 35 feet from the work site. Where relocation is impracticable, combustibles shall be protected with flameproofed covers or otherwise shielded with metal or asbestos guards or curtains. Edges of covers at the floor should be tight to prevent sparks from going under them. This precaution is also important at overlaps where several covers are used to protect a large pile.

(8) Ducts. Ducts and conveyor systems that might carry sparks to distant combustibles shall be suitably protected or shut down.

(9) Combustible walls. Where cutting or welding is done near walls, partitions, ceiling or roof of combustible construction, fire-resistant shields or guards shall be provided to prevent ignition.

(10) Noncombustible walls. If welding is to be done on a metal wall, partition, ceiling or roof, precautions shall be

taken to prevent ignition of combustibles on the other side, due to conduction or radiation, preferably by relocating combustibles. Where combustibles are not relocated, a fire watch on the opposite side from the work shall be provided.

(11) Combustible cover. Welding shall not be attempted on a metal partition, wall, ceiling or roof having a combustible covering nor on walls or partitions of combustible sandwich-type panel construction.

(12) Pipes. Cutting or welding on pipes or other metal in contact with combustible walls, partitions, ceilings or roofs shall not be undertaken if the work is close enough to cause ignition by conduction.

(13) Management. Management shall recognize its responsibility for the safe usage of cutting and welding equipment on its property and:

(a) Based on fire potentials of plant facilities, establish areas for cutting and welding, and establish procedures for cutting and welding, in other areas.

(b) Designate an individual responsible for authorizing cutting and welding operations in areas not specifically designed for such processes.

(c) Insist that cutters or welders and their supervisors are suitably trained in the safe operation of their equipment and the safe use of the process.

(d) Advise all contractors about flammable materials or hazardous conditions of which they may not be aware.

(14) Supervisor. The supervisor:

(a) Shall be responsible for the safe handling of the cutting or welding equipment and the safe use of the cutting or welding process.

(b) Shall determine the combustible materials and hazardous areas present or likely to be present in the work location.

(c) Shall protect combustibles from ignition by the following:

(i) Have the work moved to a location free from dangerous combustibles.

(ii) If the work cannot be moved, have the combustibles moved to a safe distance from the work or have the combustibles properly shielded against ignition.

(iii) See that cutting and welding are so scheduled that plant operations that might expose combustibles to ignition are not started during cutting or welding.

(d) Shall secure authorization for the cutting or welding operations from the designated management representative.

(i) Shall determine that the cutter or welder secures ~~((his))~~ their approval that conditions are safe before going ahead.

(ii) Shall determine that fire protection and extinguishing equipment are properly located at the site.

(iii) ~~((Where fire watches are required, he shall see that they))~~ Shall ensure fire watches are available at the site when required.

(15) Fire prevention precautions. Cutting or welding shall be permitted only in areas that are or have been made fire safe. Within the confines of an operating plant or building, cutting and welding should preferably be done in a specific area designed for such work, such as a maintenance shop or a detached outside location. Such areas should be of noncombustible or fire-resistive construction, essentially free of combustible and flammable contents, and suitably segregated from adjacent areas. When work cannot



be moved practically, as in most construction work, the area shall be made safe by removing combustibles or protecting combustibles from ignition sources.

**AMENDATORY SECTION** (Amending Order 73-5, filed 5/9/73 and Order 73-4, filed 5/7/73)

**WAC 296-24-70007 Work in confined spaces.** (1) General. As used herein confined space is intended to mean a relatively small or restricted space such as a tank, boiler, pressure vessel, or small compartment of a ship.

(2) Ventilation. Ventilation is a prerequisite to work in confined spaces. For ventilation requirements see WAC 296-24-71501 through 296-24-71525.

(3) Securing cylinders and machinery. When welding or cutting is being performed in any confined spaces the gas cylinders and welding machines shall be left on the outside. Before operations are started, heavy portable equipment mounted on wheels shall be securely blocked to prevent accidental movement.

(4) Lifelines. Where a welder must enter a confined space through a manhole or other small opening, means shall be provided for quickly removing ~~((him))~~ the welder in case of emergency. When safety belts and lifelines are used for this purpose they shall be so attached ~~((to))~~ in a manner so that the welder's body ~~((that his body))~~ cannot be jammed in a small exit opening. An attendant with a preplanned rescue procedure shall be stationed outside to observe the welder at all times and be capable of putting rescue operations into effect.

(5) Electrode removal. When arc welding is to be suspended for any substantial period of time, such as during lunch or overnight, all electrodes shall be removed from the holders and the holders carefully located so that accidental contact cannot occur and the machine disconnected from the power source.

(6) Gas cylinder shutoff. In order to eliminate the possibility of gas escaping through leaks or improperly closed valves, when gas welding or cutting, the torch valves shall be closed and the fuel-gas and oxygen supply to the torch positively shut off at some point outside the confined area whenever the torch is not to be used for a substantial period of time, such as during lunch hour or overnight. Where practicable the torch and hose shall also be removed from the confined space.

(7) Warning sign. After welding operations are completed, the welder shall mark the hot metal or provide some other means of warning other workers.

**AMENDATORY SECTION** (Amending Order 73-5, filed 5/9/73 and Order 73-4, filed 5/7/73)

**WAC 296-24-71503 Ventilation for general welding and cutting.** (1) General. Mechanical ventilation shall be provided when welding or cutting is done on metals not covered in WAC 296-24-71509 through 296-24-71523. (For specific material, see the ventilation requirements of WAC 296-24-71509 through 296-24-71523.)

(a) In a space of less than 10,000 cubic feet per welder.

(b) In a room having a ceiling height of less than 16 feet.

(c) In confined spaces or where the welding space contains partitions, balconies, or other structural barriers to the extent that they significantly obstruct cross ventilation.

(2) Minimum rate. Such ventilation shall be at the minimum rate of 2,000 cubic feet per minute per welder, except where local exhaust hoods and booths as per WAC 296-24-71505, or airline respirators approved by the ~~((U.S. Bureau of Mines))~~ Mine Safety and Health Administration (MSHA) and the National Institute for Occupational Safety and Health (NIOSH) for such purposes are provided. Natural ventilation is considered sufficient for welding or cutting operations where the restrictions in WAC 296-24-71503(1) are not present.

**AMENDATORY SECTION** (Amending Order 73-5, filed 5/9/73 and Order 73-4, filed 5/7/73)

**WAC 296-24-71507 Ventilation in confined spaces.**

(1) Air replacement. All welding and cutting operations carried on in confined spaces shall be adequately ventilated to prevent the accumulation of toxic materials or possible oxygen deficiency. This applies not only to the welder but also to helpers and other personnel in the immediate vicinity. All air replacing that withdrawn shall be clean and respirable.

(2) Airline respirators. In such circumstances where it is impossible to provide such ventilation, airline respirators or hose masks approved by the ~~((U.S. Bureau of Mines))~~ Mine Safety and Health Administration (MSHA) and the National Institute for Occupational Safety and Health (NIOSH) for this purpose shall be used.

(3) Self-contained units. In areas immediately hazardous to life, hose masks with blowers or self-contained breathing equipment shall be used. The breathing equipment shall be approved by the ~~((U.S. Bureau of Mines))~~ Mine Safety and Health Administration (MSHA) and the National Institute for Occupational Safety and Health (NIOSH).

(4) Outside helper. Where welding operations are carried on in confined spaces and where welders and helpers are provided with hose masks, hose masks with blowers or self-contained breathing equipment approved by the ~~((U.S. Bureau of Mines))~~ Mine Safety and Health Administration (MSHA) and the National Institute for Occupational Safety and Health (NIOSH), a worker shall be stationed on the outside of such confined spaces to insure the safety of those working within.

(5) Oxygen for ventilation. Oxygen shall not be used for ventilation.

**AMENDATORY SECTION** (Amending Order 73-5, filed 5/9/73 and Order 73-4, filed 5/7/73)

**WAC 296-24-71513 Lead.** (1) Confined spaces. In confined spaces, welding involving lead-base metals (erroneously called lead-burning) shall be done in accordance with WAC 296-24-71507 (1) through (5).

(2) Indoors. Indoors, welding involving lead-base metals shall be done in accordance with WAC 296-24-71505 (1) and (2).

(3) Local ventilation. In confined spaces or indoors, welding or cutting involving metals containing lead, other than as an impurity, or involving metals coated with lead-bearing materials, including paint shall be done using local



exhaust ventilation or airline respirators. Outdoors such operations shall be done using respiratory protective equipment approved by the ((U.S. Bureau of Mines)) Mine Safety and Health Administration (MSHA) and the National Institute for Occupational Safety and Health (NIOSH) for such purposes. In all cases, workers in the immediate vicinity of the cutting operation shall be protected as necessary by local exhaust ventilation or airline respirators.

Note: See chapter 296-62 WAC for additional requirements on lead.

AMENDATORY SECTION (Amending Order 73-5, filed 5/9/73 and Order 73-4, filed 5/7/73)

**WAC 296-24-71517 Cadmium.** (1) General. Welding or cutting indoors or in confined spaces involving cadmium-bearing or cadmium-coated base metals shall be done using local exhaust ventilation or airline respirators unless atmospheric tests under the most adverse conditions have established that the workers' exposure is within the acceptable concentrations defined by chapter 296-62 WAC. Outdoors such operations shall be done using respiratory protective equipment such as fume respirators approved by the ((U.S. Bureau of Mines)) Mine Safety and Health Administration (MSHA) and the National Institute for Occupational Safety and Health (NIOSH) for such purposes.

(2) Confined space. Welding (brazing) involving cadmium-bearing filler metals shall be done using ventilation as prescribed in WAC 296-24-71505 or 296-24-71507 if the work is to be done in a confined space.

Note: See chapter 296-62 WAC for additional requirements on cadmium.

AMENDATORY SECTION (Amending Order 73-5, filed 5/9/73 and Order 73-4, filed 5/7/73)

**WAC 296-24-71519 Mercury.** Welding or cutting indoors or in a confined space involving metals coated with mercury-bearing materials including paint, shall be done using local exhaust ventilation or airline respirators unless atmospheric tests under the most adverse conditions have established that the workers' exposure is within the acceptable concentrations defined by chapter 296-62 WAC. Outdoors such operations shall be done using respiratory protective equipment approved by the ((U.S. Bureau of Mines)) Mine Safety and Health Administration (MSHA) and the National Institute for Occupational Safety and Health (NIOSH) for such purposes.

AMENDATORY SECTION (Amending Order 89-03, filed 5/15/89, effective 6/30/89)

**WAC 296-24-73505 Aisles and passageways.** (1) Where mechanical handling equipment is used, sufficient safe clearances shall be allowed for aisles, at loading docks, through doorways and wherever turns or passage must be made. Aisles and passageways shall be kept clear and in good repairs, with no obstruction across or in aisles that could create a hazard.

(2) Permanent aisles and passageways shall be appropriately marked. "Appropriate" does not limit the marking to printed lines on the floor only. Other appropriate methods may be marked pillars, powder stripping, flags, traffic cones, or barrels, provided they are maintained in good repair and

the recognition of such markings are included in the training programs for vehicle operators and employees.

(3) All trestles in connection with industrial plants on which cars run, which are also used as walkways for ((workmen)) workers, shall be equipped with a walkway on the outer edge, so located as to give safe minimum clearance of three feet to cars. Such walkways shall be equipped with standard rails. Where a trestle crosses a driveway or passageway the trestle over such points shall be solidly boarded over.

AMENDATORY SECTION (Amending Order 73-5, filed 5/9/73 and Order 73-4, filed 5/7/73)

**WAC 296-24-73509 Floor loading protection.** (1) In every building or other structure, or part thereof, used for mercantile, business, industrial, or storage purposes, the loads approved by the building official shall be marked on plates of approved design which shall be supplied and securely affixed by the owner of the building, or ((his)) the owners duly authorized agent, in a conspicuous place in each space to which they relate. Such plates shall not be removed or defaced but, if lost, removed, or defaced, shall be replaced by the owner or ((his)) the owners agent.

(2) It shall be unlawful to place, or cause, or permit to be placed, on any floor or roof of a building or other structure a load greater than that for which such floor or roof is approved by the building official.

AMENDATORY SECTION (Amending Order 73-5, filed 5/9/73 and Order 73-4, filed 5/7/73)

**WAC 296-24-75001 Terms.** The following terms shall have the meaning ascribed in this section, when referred to in WAC 296-24-75003 through 296-24-75011, unless the context requires otherwise.

(1) Floor hole. An opening measuring less than 12 inches but more than 1 inch in its least dimension, in any floor, platform, pavement, or yard, through which materials but not persons may fall; such as a belt hole, pipe opening, or slot opening.

(2) Floor opening. An opening measuring 12 inches or more in its least dimension, in any floor, platform, pavement, or yard, through which persons may fall; such as a hatchway, stair or ladder opening, pit, or large manhole. Floor openings occupied by elevators, dumb waiters, conveyors, machinery, or containers are excluded from this ((subpart)) part.

(3) Handrail. A single bar or pipe supported on brackets from a wall or partition, as on a stairway or ramp, to furnish persons with a handhold in case of tripping.

(4) Platform. A working space for persons, elevated above the surrounding floor or ground; such as a balcony or platform for the operation of machinery and equipment.

(5) Runway. A passageway for persons, elevated above the surrounding floor or ground level, such as a footwalk along shafting or a walkway between buildings.

(6) Standard railing. A vertical barrier erected along exposed edges of a floor opening, wall opening, ramp, platform, or runway to prevent falls of person.

(7) Standard strength and construction. Any construction of railings, covers, or other guards that meets the requirements of WAC 296-24-750 through 296-24-75011.

(8) Stair railing. A vertical barrier erected along exposed sides of a stairway to prevent falls of persons.

(9) Toeboard. A vertical barrier at floor level erected along exposed edges of a floor opening, wall opening, platform, runway, or ramp to prevent falls of materials.

(10) Wall hole. An opening less than 30 inches but more than 1 inch high, of unrestricted width, in any wall or partition; such as a ventilation hole or drainage scupper.

(11) Wall opening. An opening at least 30 inches high and 18 inches wide, in any wall or partition, through which persons may fall; such as a yard-arm doorway or chute opening.

**AMENDATORY SECTION** (Amending Order 88-04, filed 5/11/88)

**WAC 296-24-78009 Care and use of ladders.** (1) Care. To insure safety and serviceability the following precautions on the care of ladders shall be observed:

(a) Ladders shall be maintained in good condition at all times, the joint between the steps and side rails shall be tight, all hardware and fittings securely attached, and the moveable parts shall operate freely without binding or undue play.

(b) Metal bearings of locks, wheels, pulleys, etc., shall be frequently lubricated.

(c) Frayed or badly worn rope shall be replaced.

(d) Safety feet and other auxiliary equipment shall be kept in good condition to insure proper performance.

(e) Ladders should be stored in such a manner as to provide ease of access or inspection, and to prevent danger of accident when withdrawing a ladder for use.

(f) Wood ladders, when not in use, should be stored at a location where they will not be exposed to the elements, but where there is good ventilation. They shall not be stored near radiators, stoves, steam pipes, or other places subjected to excessive heat or dampness.

(g) Ladders stored in a horizontal position should be supported at a sufficient number of points to avoid sagging and permanent set.

(h) Ladders carried on vehicles should be adequately supported to avoid sagging and securely fastened in position to minimize chafing and the effects of road shocks.

(i) Ladders should be kept coated with a suitable protective material. The painting of ladders is satisfactory providing the ladders are carefully inspected prior to painting by competent and experienced inspectors acting for, and responsible to, the purchaser, and providing the ladders are not for resale.

(j) Ladders shall be inspected frequently and those which have developed defects shall be withdrawn from service for repair or destruction and tagged or marked as "dangerous, do not use."

(k) Rungs should be kept free of grease and oil.

(2) Use. The following safety precautions shall be observed in connection with the use of ladders:

(a) Portable rung and cleat ladders shall, where possible, be used at such a pitch that the horizontal distance from the top support to the foot of the ladder is one-quarter of the working length of the ladder (the length along the ladder between the foot and the top support). The ladder shall be so placed as to prevent slipping, or it shall be lashed, or held

in position. Ladders shall not be used in a horizontal position as platforms, runways, or scaffolds.

(b) Ladders for which dimensions are specified should not be used by more than one (~~man~~) person at a time nor with ladder jacks and scaffold planks where use by more than one (~~man~~) person is anticipated. In such cases, specially designed ladders with larger dimensions of the parts should be procured.

(c) Portable ladders shall be so placed that the side rails have a secure footing. The top rest for portable rung and cleat ladders shall be reasonably rigid and shall have ample strength to support the applied load.

(d) Ladders shall not be placed in front of doors opening toward the ladder unless the door is blocked open, locked, or guarded.

(e) Ladders shall not be placed on boxes, barrels, or other unstable bases to obtain additional height.

(f) To support the top of the ladder at a window opening, a board should be attached across the back of the ladder, extending across the window and providing firm support against the building walls or window frames.

(g) When ascending or descending, the user should face the ladder.

(h) Ladders with broken or missing steps, rungs, or cleats, broken side rails, or other faulty equipment shall not be used; improvised repairs shall not be made.

(i) Short ladders shall not be spliced together to provide long sections.

(j) Ladders made by fastening cleats across a single rail shall not be used.

(k) Ladders shall not be used as guys, braces, or skids, or for other than their intended purposes.

(l) Tops of the ordinary types of stepladders shall not be used as steps.

(m) On two-section extension ladders the minimum overlap for the two sections in use shall be as follows:

Size of ladder (feet):	Overlap (feet)
Up to and including 36	3
Over 36 up to and including 48	4
Over 48 up to and including 60	5

(n) Portable rung ladders with reinforced rails (see WAC 296-24-78007 (3)(b)(iii) and (iv)) shall be used only with the metal reinforcement on the under side. Ladders of this type should be used with great care near electrical conductors, since the reinforcing itself is a good conductor.

(o) No ladder should be used to gain access to a roof unless the top of the ladder shall extend at least three feet above the point of support, at eave, gutter, or roof line.

(p) Adjustment of extension ladders should only be made by the user when standing at the base of the ladder, so that the user may observe when the locks are properly engaged. Adjustment of extension ladders from the top of the ladder (or any level over the locking device) is a dangerous practice and should not be attempted. Adjustment should not be made while the user is standing on the ladder.

(q) Middle and top sections of sectional or window cleaner's ladders should not be used for bottom section unless the user equips them with safety shoes.

(r) Extension ladders should always be erected so that the upper section is resting on the bottom section.

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(s) The user should equip all portable rung ladders with nonslip bases when there is a hazard of slipping. Nonslip bases are not intended as a substitute for care in safety placing, lashing, or holding a ladder that is being used upon oily metal, concrete, or slippery surfaces.

(t) The bracing on the back legs of step ladders is designed solely for increasing stability and not for climbing.

(u) When service conditions warrant, hooks may be attached at or near the top of portable ladders to give added security.

(v) Stepladders shall not be used as single ladders.

(w) Separate ladders for ascending and descending shall be provided in building construction of more than two stories in height, or where traffic is heavy.

(x) Where one broad ladder is used, a center rail shall be provided, and each side plainly marked "up" and "down."

(y) Ladder rungs shall not be used to support more than one section of plank, and not more than two ~~((men))~~ persons shall work on such section of planking at one and the same time. When two ~~((men))~~ persons are working on the same section of plank, their work should be so arranged that their weight is equally distributed between two ladders as nearly as possible.

(z) When ladders are used of a length sufficient to possess a tendency to spring when weight is applied, they shall be provided with bracing to overcome same. This applies particularly to extension ladders.

(aa) Before climbing ladders, ~~((workmen))~~ workers shall see that their shoes are free and clean of greasy or slippery substances.

(bb) When working from a stepladder over five feet high a ~~((workman))~~ worker shall not stand on a step higher than the third step from the top of the stepladder.

(cc) Ladders shall not be placed or used in elevator shafts or hoistways except where used by ~~((workmen))~~ workers engaged in work within such shafts or hoistways, and then they shall be protected from objects falling from operations at higher elevations in or adjoining the shaft.

(dd) ~~((Workmen))~~ Workers shall not ascend or descend ladders while carrying tools or materials which will interfere with the free use of both hands.

(ee) Ladders shall pass the following test:

When tested as a simple beam with a support under each end and the center rung loaded with a two hundred pound load, the ladder must support this load for ten minutes without permanent set and without showing any sign of failure. The maximum deflection shall not be greater than shown in the enclosed table.

Lengths of extended ladder in feet	Distance of supports from ends, in inches	Total deflection, in inches
12	3	2 3/4
16	3	6 3/4
20	3	11 1/2
24	3	16 1/2
28	3	21 1/2
30	3	23 1/2
34	6	26
36	6	29

40	6	37
44	9	41

(ff) When working from a ladder over twenty-five feet from the ground or floor, the ladder shall be secured at both top and bottom.

(gg) No type of work shall be performed on a ladder over twenty-five feet from the ground or floor that requires the use of both hands to perform the work, unless a safety belt is worn and the safety lanyard is secured to the ladder.

(hh) Work such as sandblasting or spray painting, that requires wearing eye protection, respirators, and handling of pressure equipment, shall be limited to not over thirty feet from the ground or floor while working on a ladder.

TABLE D-5

CLASSIFICATION OF VARIOUS SPECIES OF WOOD ACCEPTABLE FOR USE IN LADDER

The species are listed alphabetically within each group. The position of any species within a group therefore bears no relation to its strength or acceptability.

Where ladders are desired for use under conditions favorable to decay, it is recommended that the heartwood of decay-resistant species be used, or that the wood be given a treatment with a wood preservative. The species having the most durable heartwood are marked with an asterisk (\*), and these should be preferred where resistance to decay is required.

GROUP 1

The allowable fiber stress in bending for the species listed herein when used for side rails shall not exceed two thousand one hundred fifty pounds per square inch. These species may be substituted for Group 3 woods on the following basis: The dimensions may be not more than ten percent smaller for each cross-section dimension, or the thickness may remain unchanged, in which case the width may not be more than fifteen percent smaller if used edgewise (as in a rail) or twenty-five percent smaller if used flatwise (as in a tread).

White ash	Fraxinus americana, pennsylvanica, quadrangulata
Beech	Fagus grandifolia
Birch	Betula lenta, alleghaniensis, nigra (2)
Rock elm	Ulmus thomasii
Hickory	Carya ovata, laciniosa, tomentosa, glabra
Locust*	Robinia pseudoacacia, Gleditsia triacanthos
Hard maple	Acer nigrum, saccharum
Red maple	Acer rubrum (3)
Red oak	Quercus velutina, marilandica, kelloggii, falcata var. pagodaefolia, laurifolia, ellipsoidalis, rubra, nuttallii, palustris, coccinea, shumardii, falcata, laevis, phellos
White oak	Quercus arizonica, douglasii, macrocarpa, lobata, prinus, muehlenbergii, emoryi, gambelii, oblonifolia, virginiana, garryana, lyrata, stellata, michauxii, bicolor, alba
Pecan	Carya illinoensis, cordiformis, myristicaeformis (4), aquatica (4)
Persimmon	Diospyros virginiana

GROUP 2

The allowable fiber stress in bending for the species listed herein when used for side rails shall not exceed two thousand pounds per square inch. These species may be substituted for Group 3 woods on the following basis: The

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dimensions may be not more than seven and one-half percent smaller for each cross-section dimension, or the thickness may remain unchanged, in which case the width may be not more than eleven percent smaller if used edgewise (as in a rail) or twenty percent smaller if used flatwise (as in a tread).

Douglas fir (coast region)	.....	Pseudotsuga menziesii
Western larch	.....	Larix occidentalis
Southern yellow pine	.....	Pinus taeda, palustris, echinata, elliotii, rigida, virginiana

GROUP 3

The allowable fiber stress in bending for the species listed herein when used for side rails shall not exceed one thousand six hundred pounds per square inch.

Red alder	.....	Alnus rubra, rhombifolia (2)
Oregon ash	.....	Fraxinus latifolia
Pumpkin ash	.....	Fraxinus profunda
Alaska cedar*	.....	Chamaecyparis nootkatensis
Port Orford cedar*	.....	Chamaecyparis lawsoniana
Cucumber	.....	Magnolia acuminata
Cypress*	.....	Taxodium distichum
Soft elm	.....	Ulmus americana, rubra
Douglas fir (Rocky Mountain type)	.....	Pseudotsuga menziesii var. glauca
Noble fir	.....	Abies procera
Gum	.....	Liquidambar styraciflua
West coast hemlock	.....	Tsuga heterophylla
Magnolia	.....	Magnolia grandiflora
Oregon maple	.....	Acer macrophyllum
Norway pine	.....	Pinus resinosa
Poplar	.....	Liriodendron tulipifera
Redwood*	.....	Sequoia sempervirens
Eastern spruce	.....	Picea glauca, rubens
Sitka spruce	.....	Picea sitchensis
Sycamore	.....	Platanus occidentalis
Tamarack	.....	Larix laricina
Tupelo	.....	Nyssa aquatica, sylvatica

GROUP 4

The allowable fiber stress in bending for the species listed herein when used for side rails shall not exceed one thousand three hundred seventy-five pounds per square inch. These species may be substituted for Group 3 woods on the following basis: The dimensions shall be at least five percent greater for each cross-section dimension, or the thickness may remain unchanged, in which case the width shall be at least seven and one-half percent greater if used edgewise (as in a rail) or fifteen percent greater if used flatwise (as in a tread).

Aspen	.....	Populus tremuloides, grandidentata
Basswood	.....	Tilia americana, heterophylla (2)
Buckeye	.....	Aesculus octandra, glabra (2)
Butternut	.....	Juglanscinerea
Incense cedar*	.....	Libocedrus decurrens
Western red cedar*	.....	Thuja plicata
Cottonwood	.....	Populus balsamifera, deltoides, sargentii, heterophylla
White fir	.....	Abies concolor, grandis, amabilis, lasiocarpa, magnifica
Hackberry	.....	Celtis occidentalis, laevigata (2)
Eastern hemlock	.....	Tsuga canadensis
Holly	.....	Ilex opaca
Soft maple	.....	Acer saccharinum
Lodgepole pine	.....	Pinus contorta
Idaho white pine	.....	Pinus monticola
Northern white pine	.....	Pinus strobus
Ponderosa pine	.....	Pinus ponderosa, pinus jeffreyi (Jeffrey pine)

Permanent

Sugar pine	.....	Pinus lambertiana
Engelmann spruce	.....	Picea engelmannii

- Note 1: The common and scientific names of species used conform to the American Lumber Standards nomenclature and in most cases to U.S. Department of Agriculture Handbook No. 41, "Check List of Native and Naturalized Trees of the United States (including Alaska)," by Elbert L. Little. These publications can be obtained from the ((~~Superintendent of Documents~~)) U.S. Government Printing Office, North Capital and "H" Streets Northwest, Washington D.C. ((~~20225~~)) 20401.
- Note 2: This species is commonly associated with others of the same genus under American Lumber Standards nomenclature, but no strength tests have been made on it at the Forest Products Laboratory.
- Note 3: Included under soft maple in American Lumber Standards nomenclature.
- Note 4: This species is not included under this common name in American Lumber Standards nomenclature, but strength data are available and it is accordingly included in this classification.

AMENDATORY SECTION (Amending Order 73-5, filed 5/9/73 and Order 73-4, filed 5/7/73)

WAC 296-24-79505 Testing. (1) General. The following tests are intended to insure uniform testing methods for metal ladders.

(2) Straight and extension ladders.

(a) Ladder inclined strength is measured by placing the ladder unit in a flat, horizontal position, supported 6 inches from the ends of the side rails. When testing extensions, the unit is opened to the required overlap. A load of 200 pounds is applied equally to the side rails at the center of the unit by means of a beam. The ladder must withstand this test with no permanent deformation or other visible weakening of the structure. This test is based on a 200-pound ((man)) person using the ladder, set at 75 1/2° to the ground. With the ((man)) person on the center rung, the component of ((his)) the 200-pound weight at right angles to the ladder will be 50 pounds. Applying the load factor of 4, the test weight becomes 200 pounds.

(b) Test unit need only be of sufficient length for test purposes and is to consist of the base and fly sections of an extension ladder with all the hardware or fittings attached. The ladder unit is placed in a vertical position and a downward load of 775 pounds equally distributed on the ends of the side rails of the upper portion of the test unit. The unit shall withstand this test with no permanent deformation or other visible weakening of the structure.

(c) A test unit of at least three rungs is to be used from the maximum width portion of the ladder. A load of 800 pounds shall be applied to a 3 1/2-inch wide block resting on the center of the widest rung. A rung of 14 inches or less in length shall withstand this test with no permanent deformation or other visible weakening of the structure. A rung of more than 14 inches in length may have a permanent deflection of not more than one-eighth inch provided the rung cross section is not deformed and there is no other visible weakening of the structure.

(d) With at least a three-rung test unit set in a vertical position, a load of 800 pounds shall be applied to a 3 1/2-inch wide block resting on the center rung as near to the side rail as possible. On removing the load, the unit must show no indication of failure in the fasteners attaching the rungs to the side rail.

(e) The rung shall be so secured to the side rail that a torque load of 360 inch-pounds applied to the rung at a side rail shall cause no visible relative motion between the rung and the side rail.

(f) With the ladder extended to its maximum working length, and resting horizontally on level supports located 6 inches from each end of the ladder, a weight of 50 pounds shall be suspended from one of the side rails midway between supports.

The deflection of the loaded rail, and the difference in deflection between the loaded and unloaded rails shall not exceed the values in Table D-6.

(g) Deflections in Table D-6 are to be determined by measuring, at the midpoint between supports, the distance from the outside edges of both rails to the floor or other reference surface both before and after the test load of 50 pounds is applied to one rail of the ladder. The test is to be repeated loading the other rail of the ladder. The angle (a) between the loaded and unloaded rails and the horizontal is to be calculated from the trigonometric equation:

$$\text{Sine } a = \frac{\text{Difference in deflection}}{\text{Ladder width}}$$

**TABLE D-6**  
TABLE OF DEFLECTIONS

Length of ladder in feet	Maximum deflection of loaded rail in inches	Maximum difference in deflection between loaded and unloaded rails in degrees from horizontal
20	3.0	3.6
24	3.8	4.7
28	4.6	5.4
32	5.5	5.7
36	6.4	6.1
40	7.2	6.5
44	8.0	6.5
48	8.8	6.5

(3) Step, trestle, extension trestle, and platform ladders.

(a) Load test of the entire ladder is made with the ladder in an open position, and an 800-pound load applied to the center of the top. Resistance to side rail bending is tested by placing an 800-pound load on the center of the middle step. The strength of the step section is tested by applying an 800-pound load to a 3 1/2-inch-wide block resting on the center of the longest or bottom step. The pail shelf shall be so constructed as to support a distributed load of 50 pounds.

(i) In each test case, the unit must withstand the load without failure or permanent deformation.

(b) Set ladder in open position on a level floor. Place a 200-pound distributed load on the top step. The ladder is then subjected to a horizontal pulling load, applied at the top step, of 12-pound force to the side; 58-pound force to the

front; 33-pound force to the back. In each test, all side rails must remain on the floor.

**AMENDATORY SECTION** (Amending Order 91-07, filed 11/22/91, effective 12/24/91)

**WAC 296-24-79507 Care and maintenance and use of ladders.** (1) General. To get maximum serviceability, safety, and to eliminate unnecessary damage of equipment, good safe practices in the use and care of ladder equipment shall be employed by the users.

The following rules and regulations are essential to the life of the equipment and the safety of the user.

(2) Care of ladders.

(a) Ladders, shall be handled with care and not subject to unnecessary dropping, jarring, or misuse. (They are designed for a specific purpose or use; therefore, any variation from this use constitutes a mishandling of the equipment.)

(b) Ladders shall be stored on racks designed to protect the ladder when not in use. The racks shall have sufficient supporting points to prevent any possibility of excessive sagging.

(c) Ladders transported on vehicles shall be properly supported. Supporting points shall be of a softer material, such as hardwood or rubber-covered iron pipe, to minimize the chafing and effects of road shock. (Tying the ladder to each support point will greatly reduce damage due to road shock.)

(d) Ladders shall be maintained in good usable condition at all times. Hardware fittings and accessories shall be checked frequently and kept in good working condition.

(e) Ropes or cables shall be inspected frequently and replaced if defective.

(f) Complete ladder inspection shall be periodical. If a ladder is involved in any of the following, immediate inspection is necessary:

(i) If ladders tip over, inspect ladder for side rails dents or bends, or excessively dented rungs; check all rung-to-side-rail connections; check hardware connections; check rivets for shear.

(ii) If ladders are exposed to excessive heat as in the case of fire, the ladder should be inspected visually for damage and tested for deflection and strength characteristics. In doubtful cases, refer to manufacturer.

(iii) If ladders are to be subjected to certain acids or alkali solutions, a protective coating such as asphalt and varnish should be applied to the equipment.

(iv) If ladders are exposed to oil and grease, equipment should be cleaned of oil, grease, or slippery materials. This can easily be done with a solvent or steam cleaning.

(g) Ladders having defects are to be marked and taken out of service until repaired by either maintenance department or the manufacturer.

(3) Use of ladders.

(a) Portable nonself-supporting ladders shall be erected at a pitch of 75 1/2 degrees for maximum balance and strength. (A simple rule for setting up a ladder at the proper angle is to place the base a distance from the vertical wall equal to one-fourth the working length of the ladder.)

Note: Portable ladders are designed as a one-~~(man)~~ person working ladder based on a 200-pound load.

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(b) (~~(Workmen)~~) Workers shall not ascend or descend ladders while carrying tools or materials which will interfere with the free use of both hands.

(c) The ladder base section must be placed with a secure footing. Safety shoes of good substantial design should be installed on all ladders. Where ladders with no safety shoes or spikes are used on hard, slick surfaces, a foot-ladder board should be employed.

(d) The top of the ladder must be placed with the two rails supported, unless equipped with a single support attachment. Such an attachment should be substantial and large enough to support the ladder under load.

(e) When ascending or descending, the climber must face the ladder.

(f) Ladders must not be tied or fastened together to provide longer sections. They must be equipped with the hardware fittings necessary if the manufacturer endorses extended uses.

(g) Ladders should not be used as a brace, skid, guy or gin pole, gangway, or for other uses than that for which they were intended, unless specifically recommended for use by the manufacturer.

(h) See chapter 296-24 WAC Part L for work practices to be used when work is performed on or near electrical circuits.((-))

**AMENDATORY SECTION** (Amending Order 73-5, filed 5/9/73 and Order 73-4, filed 5/7/73)

**WAC 296-24-81001 Definitions.** The following terms shall have the meaning ascribed in this section when referred to in WAC 296-24-81003 through 296-24-81007 unless the context requires otherwise.

(1) Ladder. A ladder is an appliance usually consisting of two side rails joined at regular intervals by crosspieces called steps, rungs, or cleats, on which a person may step in ascending or descending.

(2) Fixed ladder. A fixed ladder is a ladder permanently attached to a structure, building, or equipment.

(3) Individual-rung ladder. An individual-rung ladder is a fixed ladder each rung of which is individually attached to a structure, building, or equipment.

(4) Rail ladder. A rail ladder is a fixed ladder consisting of side rails joined at regular intervals by rungs or cleats and fastened in full length or in sections to a building, structure, or equipment.

(5) Railings. A railing is any one or a combination of those railings constructed in accordance with WAC 296-24-75003 through 296-24-75011. A standard railing is a vertical barrier erected along exposed edges of floor openings, wall openings, ramps, platforms, and runways to prevent falls of persons.

(6) Pitch. Pitch is the included angle between the horizontal and the ladder, measured on the opposite side of the ladder from the climbing side.

(7) Fastenings. A fastening is a device to attach a ladder to a structure, building, or equipment.

(8) Rungs. Rungs are ladder crosspieces of circular or oval cross-section on which a person may step in ascending or descending.

(9) Cleats. Cleats are ladder crosspieces of rectangular cross-section placed on edge on which a person may step in ascending or descending.

(10) Steps. Steps are the flat crosspieces of a ladder on which a person may step in ascending or descending.

(11) Cage. A cage is a guard that may be referred to as a cage or basket guard which is an enclosure that is fastened to the side rails of the fixed ladder or to the structure to encircle the climbing space of the ladder for the safety of the person who must climb the ladder.

(12) Well. A well is a permanent complete enclosure around a fixed ladder, which is attached to the walls of the well. Proper clearances for a well will give the person who must climb the ladder the same protection as a cage.

(13) Ladder safety device. A ladder safety device is any device, other than a cage or well, designed to eliminate or reduce the possibility of accidental falls and which may incorporate such features as life belts, friction brakes, and sliding attachments.

(14) Grab bars. Grab bars are individual handholds placed adjacent to or as an extension above ladders for the purpose of providing access beyond the limits of the ladder.

(15) Through ladder. A through ladder is one from which a (~~(man)~~) person getting off at the top must step through the ladder in order to reach the landing.

(16) Side-step ladder. A side-step ladder is one from which a (~~(man)~~) person getting off at the top must step sideways from the ladder in order to reach the landing.

**AMENDATORY SECTION** (Amending Order 73-5, filed 5/9/73 and Order 73-4, filed 5/7/73)

**WAC 296-24-81009 Special requirements.** (1) Cages or wells.

(a) Cages or wells (except on chimney ladders) shall be built, as shown on the applicable drawings, covered in detail in Figures D-7, D-8, and D-9, or of equivalent construction.

(b) Cages or wells (except as provided in (5) of this section) conforming to the dimensions shown in Figures D-7, D-8, and D-9 shall be provided on ladders of more than 20 feet to a maximum unbroken length of 30 feet.

(c) Cages shall extend a minimum of 42 inches above the top of landing, unless other acceptable protection is provided.

(d) Cages shall extend down the ladder to a point not less than 7 feet nor more than 8 feet above the base of the ladder, with bottom flared not less than 4 inches, or portion of cage opposite ladder shall be carried to the base.

(e) Cages shall not extend less than 27 nor more than 28 inches from the centerline of the rungs of the ladder. Cage shall not be less than 27 inches in width. The inside shall be clear of projections. Vertical bars shall be located at a maximum spacing of 40 degrees around the circumference of the cage; this will give a maximum spacing of approximately 9 1/2 inches, center to center.

(f) Ladder wells shall have a clear width of at least 15 inches measured each way from the centerline of the ladder. Smooth-walled wells shall be a minimum of 27 inches from the centerline of rungs to the well wall on the climbing side of the ladder. Where other obstructions on the climbing side of the ladder exist, there shall be a minimum of 30 inches from the centerline of the rungs.

(2) Landing platforms. When ladders are used to ascend to heights exceeding 20 feet (except on chimneys), landing platforms shall be provided for each 30 feet of height or fraction thereof, except that, where no cage, well, or ladder safety device is provided, landing platforms shall be provided for each 20 feet of height or fraction thereof. Each ladder section shall be offset from adjacent sections. Where installation conditions (even for a short, unbroken length) require that adjacent sections be offset, landing platforms shall be provided at each offset.

(a) Where a ~~(man)~~ person has to step a distance greater than 12 inches from the centerline of the rung of a ladder to the nearest edge of structure or equipment, a landing platform shall be provided. The minimum step-across distance shall be 2 1/2 inches.

(b) All landing platforms shall be equipped with standard railings and toeboards, so arranged as to give safe access to the ladder. Platforms shall be not less than 24 inches in width and 30 inches in length.

(c) One rung of any section of ladder shall be located at the level of the landing laterally served by the ladder. Where access to the landing is through the ladder, the same rung spacing as used on the ladder shall be used from the landing platform to the first rung below the landing.

(3) Ladder extensions. The side rails of through or side-step ladder extensions shall extend 3 1/2 feet above parapets and landings. For through ladder extensions, the rungs shall be omitted from the extension and shall have not less than 18 nor more than 24 inches clearance between rails. For side-step or offset fixed ladder sections, at landings, the side rails and rungs shall be carried to the next regular rung beyond or above the 3 1/2 feet minimum (Fig. D-10).

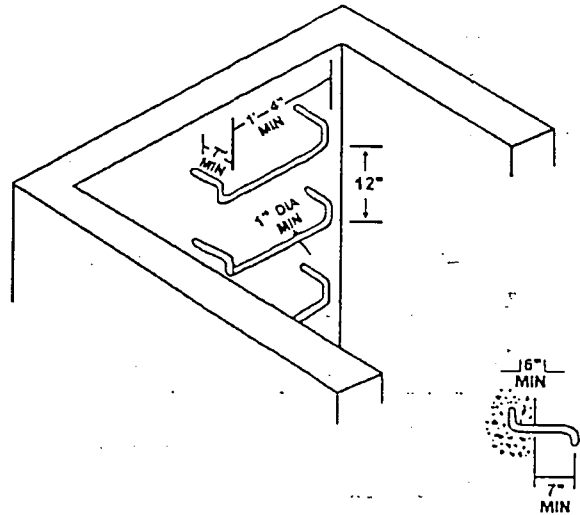
(4) Grab bars. Grab bars shall be spaced by a continuation of the rung spacing when they are located in the horizontal position. Vertical grab bars shall have the same spacing as the ladder side rails. Grab-bar diameters shall be the equivalent of the round-rung diameters.

(5) Ladder safety devices. Ladder safety devices may be used on tower, water tank, and chimney ladders over 20 feet in unbroken length in lieu of cage protection. No landing platform is required in these cases. All ladder safety devices such as those that incorporate lifebelts, friction brakes, and sliding attachments shall meet the design requirements of the ladders which they serve.

**AMENDATORY SECTION** (Amending Order 76-6, filed 3/1/76)

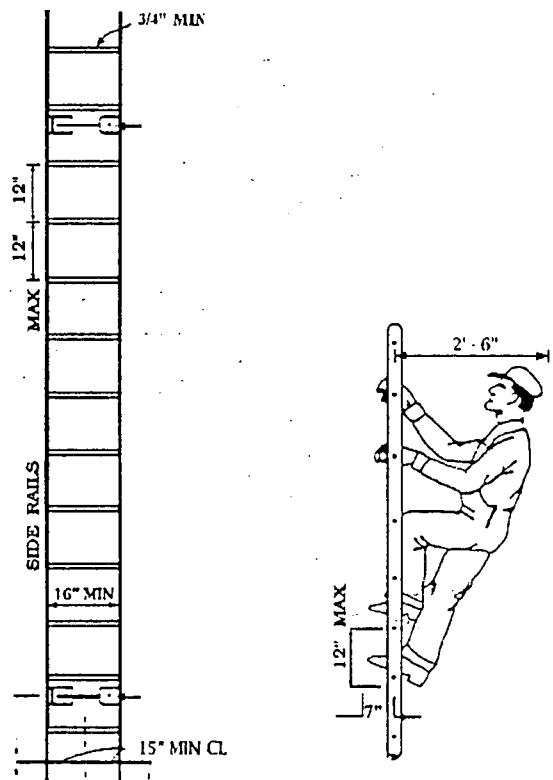
**WAC 296-24-81013 Maintenance and use.** (1) All ladders shall be maintained in a safe condition. All ladders shall be inspected regularly, with the intervals between inspections being determined by use and exposure.

Note: For illustrations, see Figs. D-1 through D-11.



**Figure D-1**

Suggested design for rungs on individual-rung ladders



**RAIL LADDER WITH BAR STEEL RAILS AND ROUND STEEL RUNGS**

**Figure D-2**

Minimum Ladder Clearances

PERMANENT



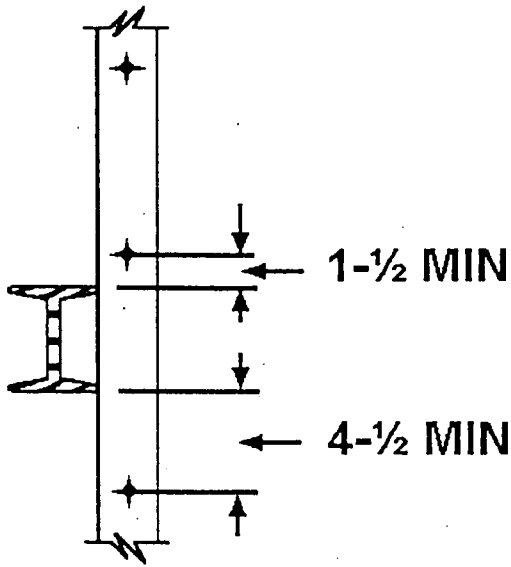


Figure D-3

Clearance for Unavoidable Obstruction at Rear of Fixed Ladder

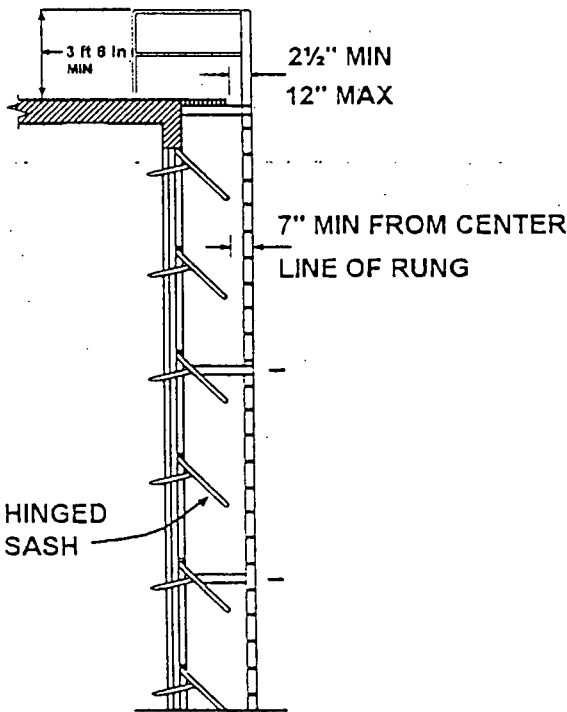


Figure D-4

Ladder Far from Wall

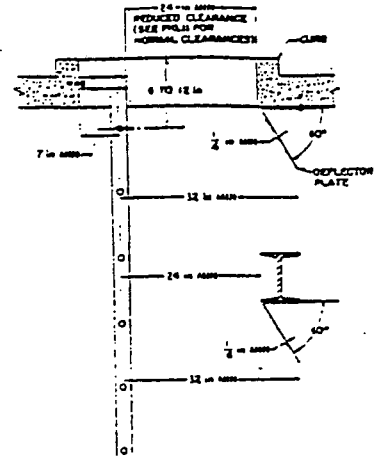


Figure D-5

Deflector Plates for Head Hazards

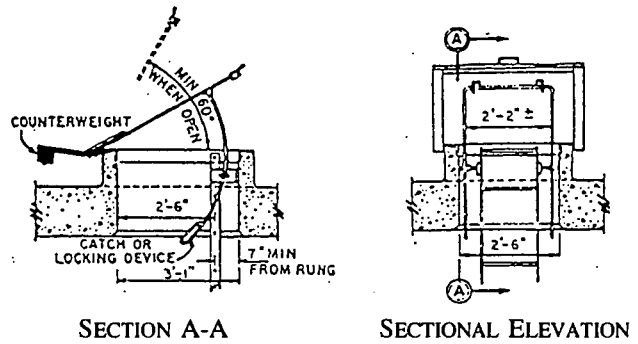


Figure D-6

Relationship of Fixed Ladder to a Safe Access Hatch

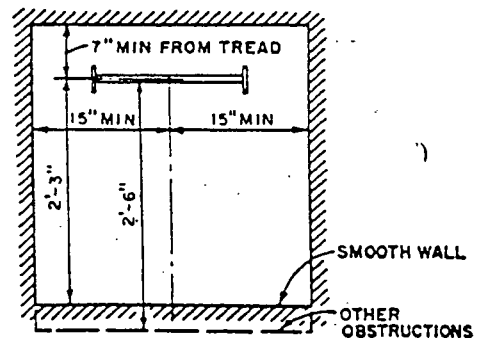


Figure D-7

Clearance Diagram for Fixed Ladder in Well

PERMANENT

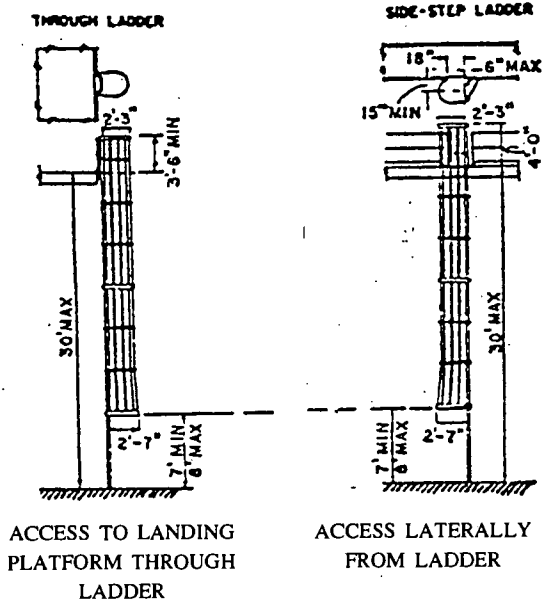


Figure D-8 (Part 1)

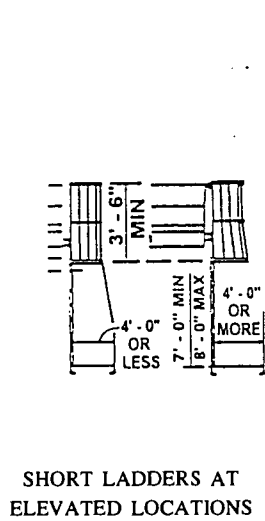


Figure D-9  
Cages—Special Applications

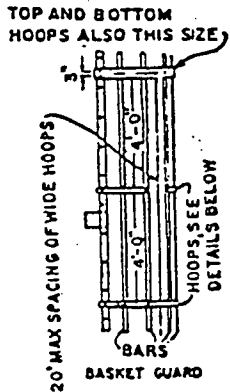


Figure D-8 (Part 2)

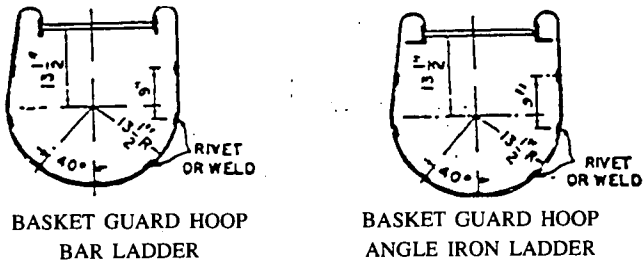


Figure D-8 (Part 3)

Cages for Ladders more than 20 Feet High

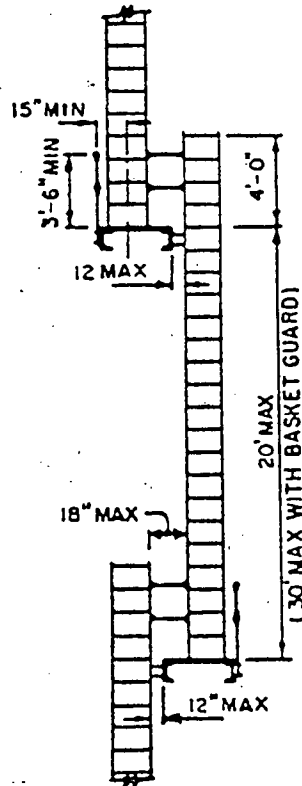


Figure D-10  
Offset Fixed Ladder Sections

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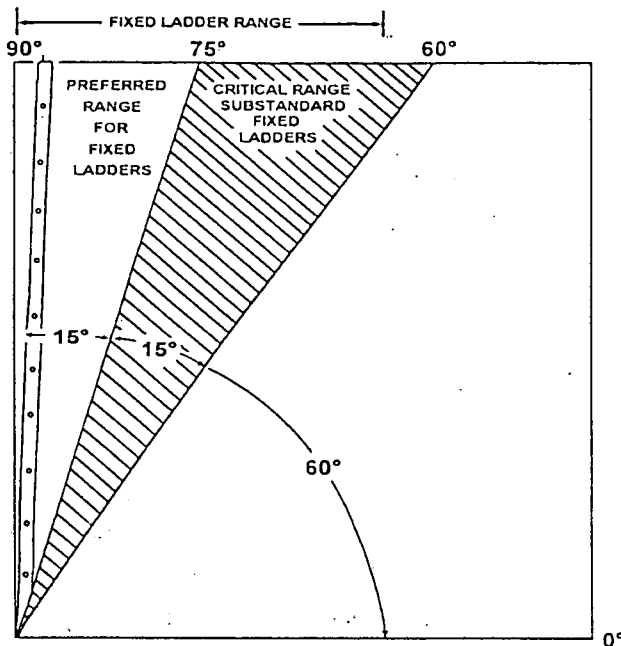


Figure D-11

Pitch of Fixed Ladders

(2) When ascending or descending, the climber must face the ladder.

(3) ((~~Workmen~~) Workers) shall not ascend or descend ladders while carrying tools or materials which will interfere with the free use of both hands.

AMENDATORY SECTION (Amending Order 73-5, filed 5/9/73 and Order 73-4, filed 5/7/73)

**WAC 296-24-82501 Definitions.** The following terms shall have the meaning ascribed in this section when referred to in WAC 296-24-82503 through 296-24-82545 unless the context requires otherwise.

(1) Bearer. A horizontal member of a scaffold upon which the platform rests and which may be supported by ledgers.

(2) Boatswain's chair. A seat supported by slings attached to a suspended rope, designed to accommodate one ((~~workman~~) worker) in a sitting position.

(3) Brace. A tie that holds one scaffold member in a fixed position with respect to another member.

(4) Bricklayer's square scaffold. A scaffold composed of framed wood squares which support a platform limited to light and medium duty.

(5) Carpenters' bracket scaffold. A scaffold consisting of wood or metal brackets supporting a platform.

(6) Coupler. A device for locking together the component parts of a tubular metal scaffold. The material used for the couplers shall be of a structural type, such as a drop-forged steel, malleable iron, or structural grade aluminum. The use of gray cast iron is prohibited.

(7) Crawling board or chicken ladder. A plank with cleats spaced and secured at equal intervals, for use by a worker on roofs, not designed to carry any material.

(8) Double pole or independent pole scaffold. A scaffold supported from the base by a double row of uprights, independent of support from the walls and constructed of uprights, ledgers, horizontal platform bearers, and diagonal bracing.

(9) Float or ship scaffold. A scaffold hung from overhead supports by means of ropes and consisting of a substantial platform having diagonal bracing underneath, resting upon and securely fastened to two parallel plank bearers at right angles to the span.

(10) Guardrail. A rail secured to uprights and erected along the exposed sides and ends of platforms.

(11) Heavy duty scaffold. A scaffold designed and constructed to carry a working load not to exceed 75 pounds per square foot.

(12) Horse scaffold. A scaffold for light or medium duty, composed of horses supporting a work platform.

(13) Interior hung scaffold. A scaffold suspended from the ceiling or roof structure.

(14) Ladder jack scaffold. A light duty scaffold supported by brackets attached to ladders.

(15) Ledger (stringer). A horizontal scaffold member which extends from post to post and which supports the putlogs or bearer forming a tie between the posts.

(16) Light duty scaffold. A scaffold designed and constructed to carry a working load not to exceed 25 pounds per square foot.

(17) Manually propelled mobile scaffold. A portable rolling scaffold supported by casters.

(18) Mason's adjustable multiple-point suspension scaffold. A scaffold having a continuous platform supported by bearers suspended by wire rope from overhead supports, so arranged and operated as to permit the raising or lowering of the platform to desired working positions.

(19) Maximum intended load. The total of all loads including the working load, the weight of the scaffold, and such other loads as may be reasonably anticipated.

(20) Medium duty scaffold. A scaffold designed and constructed to carry a working load not to exceed 50 pounds per square foot.

(21) Mid-rail. A rail approximately midway between the guardrail and platform, used when required, and secured to the uprights erected along the exposed sides and ends of platforms.

(22) Needle beam scaffold. A light duty scaffold consisting of needle beams supporting a platform.

(23) Outrigger scaffold. A scaffold supported by outriggers or thrustouts projecting beyond the wall or face of the building or structure, the inboard ends of which are secured inside of such a building or structure.

(24) Putlog. A scaffold member upon which the platform rests.

(25) Roofing bracket. A bracket used in sloped roof construction, having provisions for fastening to the roof or supported by ropes fastened over the ridge and secured to some suitable object.

(26) Runner. The lengthwise horizontal bracing or bearing members or both.

(27) Scaffold. Any temporary elevated platform and its supporting structure used for supporting ((~~workmen~~) workers) or materials or both.

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(28) Single-point adjustable suspension scaffold. A manually or power-operated unit designed for light duty use, supported by a single wire rope from an overhead support so arranged and operated as to permit the raising or lowering of the platform to desired working positions.

(29) Single pole scaffold. Platforms resting on putlogs or crossbeams, the outside ends of which are supported on ledgers secured to a single row of posts or uprights and the inner ends of which are supported on or in a wall.

(30) Stone setters' adjustable multiple-point suspension scaffold. A swinging-type scaffold having a platform supported by hangers suspended at four points so as to permit the raising or lowering of the platform to the desired working position by the use of hoisting machines.

(31) Toeboard. A barrier secured along the sides and ends of a platform, to guard against the falling of material.

(32) Tube and coupler scaffold. An assembly consisting of tubing which serves as posts, bearers, braces, ties, and runners, a base supporting the posts, and special couplers which serve to connect the uprights and to join the various members.

(33) Tubular welded frame scaffold. A sectional, panel, or frame metal scaffold substantially built up of prefabricated welded sections which consist of posts and horizontal bearer with intermediate members. Panels or frames shall be braced with diagonal or cross braces.

(34) Two-point suspension scaffold (swinging scaffold). A scaffold, the platform of which is supported by hangers (stirrups) at two points, suspended from overhead supports so as to permit the raising or lowering of the platform to the desired working position by tackle or hoisting machines.

(35) Window jack scaffold. A scaffold, the platform of which is supported by a bracket or jack which projects through a window opening.

(36) Working load. Load imposed by ~~((men))~~ people, materials, and equipment.

**AMENDATORY SECTION** (Amending Order 89-20, filed 1/11/90, effective 2/26/90)

**WAC 296-24-82503 General requirements for all scaffolds.** (1) Scaffolds shall be furnished and erected in accordance with this standard for persons engaged in work that cannot be done safely from the ground or from solid construction, except that ladders used for such work shall conform to WAC 296-24-780 through 296-24-78009 and 296-24-795 through 296-24-79507.

(2) The footing or anchorage for scaffolds shall be sound, rigid, and capable of carrying the maximum intended load without settling or displacement. Unstable objects such as barrels, boxes, loose brick, or concrete blocks shall not be used to support scaffolds or planks.

(3) Guardrails and toeboards shall be installed on all open sides and ends of platforms more than 8 feet above the ground or floor except:

(a) Scaffolding wholly within the interior of a building and covering the entire floor area of any room therein and not having any side exposed to a hoistway, elevator shaft, stairwell, or other floor openings, and

(b) Needle-beam scaffolds and floats in use by structural iron workers.

(4) Guardrails should all be 2 x 4 inches or the equivalent, installed no less than 36 inches or not more than 42 inches high, with a midrail, when required, of 1 x 4 inch nominal lumber or equivalent. Supports should be at intervals not to exceed ten feet. Toeboards shall be a minimum of 4 inches nominal lumber in height.

(5) Factory-built (laminated) scaffold planks meeting the requirements of wood scaffold planks may be substituted for wood scaffold planks.

(6) Scaffolds and their components shall be capable of supporting without failure at least four times the maximum intended load.

(7) Scaffolds and other devices mentioned or described in these standards shall be maintained in safe condition. Scaffolds shall not be altered or moved horizontally while they are in use or occupied.

(8) Any scaffold damaged or weakened from any cause shall be immediately repaired and shall not be used until repairs have been completed.

(9) Scaffolds shall not be loaded in excess of the working load for which they are intended.

(10) All load-carrying timber members of scaffold framing shall be a minimum of 1,500 f. (stress grade) construction grade lumber. All dimensions are nominal sizes as provided in the American Lumber Standards, except that where rough sizes are noted, only rough or undressed lumber of the size specified will satisfy minimum requirements. (NOTE: Where nominal sizes of lumber are used in place of rough sizes the nominal size lumber shall be such as to provide equivalent strength to that specified in Tables D-7 through D-12 and D-16.)

(11) All planking shall be Scaffold Grade as recognized by grading rules for the species of wood used. The maximum permissible spans for 2- x 9-inch or wider planks are shown in the following table:

	Material				
	Full thickness undressed lumber		Nominal thickness lumber		
Working load (p.s.f.)	25	50	75	25	50
Permissible span (ft.)	10	8	6	8	6

The maximum permissible span for 1 1/4 x 9-inch or wider plank of full thickness is 4 feet with medium loading of 50 p.s.f.

(12) Nails or bolts used in the construction of scaffolds shall be of adequate size and in sufficient numbers at each connection to develop the designed strength of the scaffold. Nails shall not be subjected to a straight pull and shall be driven full length.

(13) All planking or platforms shall be overlapped (minimum 12 inches) or secured from movement.

(14) An access ladder or equivalent safe access shall be provided.

(15) Scaffold planks shall extend over their end supports not less than 6 inches nor more than 18 inches.

(16) The poles, legs, or uprights of scaffolds shall be plumb, and securely and rigidly braced to prevent swaying and displacement.

**TABLE D-7**

MINIMUM NOMINAL SIZE AND MAXIMUM SPACING OF MEMBERS OF SINGLE POLE SCAFFOLDS LIGHT DUTY

	Maximum height of scaffold	
	20 feet	60 feet
Uniformly distributed load	Not to exceed 25 pounds per square foot.	
Poles or uprights	2 by 4 in.	4 by 4 in.
Pole spacing (longitudinal)	6 ft. 0 in.	10 ft. 0 in.
Maximum width of scaffold	5 ft. 0 in.	5 ft. 0 in.
Bearers or putlogs to 3 ft. 0 in. width	2 by 4 in.	2 by 4 in.
Bearers or putlogs to 5 ft. 0 in. width	2 by 6 in. or 3 by 4 in.	2 by 6 in. or 3 by 4 in. (rough)
Ledgers	1 by 4 in.	1 1/4 by 9 in.
Planking	1 1/4 by 9 in. (rough)	2 by 9 in.
Vertical spacing of horizontal members	7 ft. 0 in.	7 ft. 0 in.
Bracing, horizontal and diagonal	1 by 4 in.	1 by 4 in.
Tie-ins	1 by 4 in.	1 by 4 in.
Toeboards	4 in. high (minimum)	4 in. high (minimum)
Guardrail	2 by 4 in.	2 by 4 in.

All members except planking are used on edge.

**TABLE D-8**

MINIMUM NOMINAL SIZE AND MAXIMUM SPACING OF MEMBERS OF SINGLE POLE SCAFFOLDS MEDIUM DUTY

Uniformly distributed load	Not to exceed 50 pounds per square foot.	
Maximum height of scaffold	60 ft.	
Poles or uprights	4 by 4 in.	
Pole spacing (longitudinal)	8 ft. 0 in.	
Maximum width of scaffold	5 ft. 0 in.	
Bearers or putlogs	2 by 9 in. or 3 by 4 in.	

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Spacing of bearers or putlogs	8 ft. 0 in.
Ledgers	2 by 9 in.
Vertical spacing of horizontal members	9 ft. 0 in.
Bracing, horizontal	1 by 6 in. or 1 1/4 by 4 in.
Bracing, diagonal	1 by 4 in.
Tie-ins	1 by 4 in.
Planking	2 by 9 in.
Toeboards	4 in. high (minimum)
Guardrail	2 by 4 in.

All members except planking are used on edge.

**TABLE D-9**

MINIMUM NOMINAL SIZE AND MAXIMUM SPACING OF MEMBERS OF SINGLE POLE SCAFFOLDS HEAVY DUTY

Uniformly distributed load	Not to exceed 75 pounds per square foot.
Maximum height of scaffold	60 ft.
Poles or uprights	4 by 4 in.
Pole spacing (longitudinal)	6 ft. 0 in.
Maximum width of scaffold	5 ft. 0 in.
Bearers or putlogs	2 by 9 in. or 3 by 5 in. (rough)
Spacing of bearers or putlogs	6 ft. 0 in.
Ledgers	2 by 9 in.
Vertical spacing of horizontal members	6 ft. 6 in.
Bracing, horizontal and diagonal	2 by 4 in.
Tie-ins	1 by 4 in.
Planking	2 by 9 in.
Toeboards	4 in. high (minimum).
Guardrail	2 by 4 in.

All members except planking are used on edge.

**TABLE D-10**

MINIMUM NOMINAL SIZE AND MAXIMUM SPACING OF MEMBERS OF INDEPENDENT POLE SCAFFOLDS LIGHT DUTY

	Maximum height of scaffold	
	20 feet	60 feet
Uniformly distributed load	Not to exceed 25 pounds per square foot.	
Poles or uprights	2 by 4 in.	4 by 4 in.

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Pole spacing (longitudinal)	6 ft. 0 in.	10 ft. 0 in.
Pole spacing (transverse)	6 ft. 0 in.	10 ft. 0 in.
Ledgers	1 1/4 by 4 in.	1 1/4 by 9 in.
Bearers to 3 ft. 0 in. span	2 by 4 in.	2 by 4 in.
Bearers to 10 ft. 0 in. span	2 by 6 in. or 3 by 4 in.	2 by 9 (rough) or 3 by 8 in.
Planking	1 1/4 by 9 in.	2 by 9 in.
Vertical spacing of horizontal members	7 ft. 0 in.	7 ft. 0 in.
Bracing, horizontal and diagonal	1 by 4 in.	1 by 4 in.
Tie-ins	1 by 4 in.	1 by 4 in.
Toeboards	4 in. high	4 in. high (minimum).
Guardrail	2 by 4 in.	2 by 4 in.

All members except planking are used on edge.

TABLE D-11

MINIMUM NOMINAL SIZE AND MAXIMUM SPACING OF MEMBERS OF INDEPENDENT POLE SCAFFOLDS MEDIUM DUTY

Uniformly distributed load	Not to exceed 50 pounds per square foot.
Maximum height of scaffold	60 ft.
Poles or uprights	4 by 4 in.
Pole spacing (longitudinal)	8 ft. 0 in.
Pole spacing (transverse)	8 ft. 0 in.
Ledgers	2 by 9 in.
Vertical spacing of horizontal members	6 ft. 0 in.
Spacing of bearers	8 ft. 0 in.
Bearers	2 by 9 in. rough or 2 by 10 in.
Bracing, horizontal	1 by 6 in. or 1 1/4 by 4 in.
Bracing, diagonal	1 by 4 in.
Tie-ins	1 by 4 in.
Planking	2 by 9 in.
Toeboards	4 in. high (minimum).
Guardrail	2 by 4 in.

All members except planking are used on edge.

TABLE D-12

MINIMUM NOMINAL SIZE AND MAXIMUM SPACING OF MEMBERS OF INDEPENDENT POLE SCAFFOLDS HEAVY DUTY

Uniformly distributed load	Not to exceed 75 pounds per square foot.
Maximum height of scaffold	60 ft.
Poles or uprights	4 by 4 in.
Pole spacing (longitudinal)	6 ft. 0 in.
Pole spacing (transverse)	8 ft. 0 in.
Ledgers	2 by 9 in.
Vertical spacing of horizontal members	4 ft. 6 in.
Bearers	2 by 9 in. (rough).
Bracing, horizontal and diagonal	2 by 4 in.
Tie-ins	1 by 4 in.
Planking	2 by 9 in.
Toeboards	4 in. high (minimum).
Guardrail	2 by 4 in.

All members except planking are used on edge.

(17) Materials being hoisted onto a scaffold shall have a tag line.

(18) Overhead protection shall be provided for (~~workmen~~) workers working on a scaffold when they are exposed to overhead hazards.

(19) Scaffolds shall be provided with a screen between the toe board and the guardrail, extending along the entire opening, consisting of No. 18 gauge U.S. Standard Wire one-half-inch mesh or the equivalent, where persons are required to work or pass under the scaffolds.

(20) Employees shall not work on scaffolds during storms or high winds.

(21) Employees shall not work on scaffolds which are covered with ice or snow.

(22) Tools, materials, and debris shall not be allowed to accumulate in quantities to cause a hazard.

(23) Only treated or protected fiber rope shall be used for or near any work involving the use of corrosive substances or chemicals.

(24) Wire or fiber rope used for scaffold suspension shall be capable of supporting at least six times the intended load.

(25) When acid solutions are used for cleaning buildings over 50 feet in height, wire rope supported scaffolds shall be used.

(26) The use of shore scaffolds or leanto scaffolds is prohibited.

(27) Lumber sizes, when used in WAC 296-24-82505 through 296-24-82545, refer to nominal sizes except where otherwise stated.

(28) Scaffolds shall be secured to permanent structures, through use of anchor bolts, reveal bolts, or other equivalent means. Window cleaners' anchor bolts shall not be used.

(29) Special precautions shall be taken to protect scaffold members, including any wire or fiber ropes, when using a heat-producing process.

(30) When rope falls are used to support swinging scaffolding, the rope falls shall be of sufficient length to reach the ground. Lengthening rope falls by tying on additional lengths shall be prohibited.

(31) When screw shackles are used to support staging, etc., the pin must be wired or pinned so that the shackle will not become unscrewed by strain or stress.

(32) All hooks on blocks used for raising scaffolding shall be provided with a safety latch or be "moused at the throat" to prevent the hook from becoming dislodged.

(33) Lifelines size shall be 3/4 inch manila rope or equivalent with a minimum breaking strength of 5400 pounds. Safety belt lanyards shall be a minimum of 1/2 inch nylon or equivalent with a maximum length to provide for a fall of no greater than 6 feet. This rope shall have a minimum breaking strength of 5400 pounds.

**AMENDATORY SECTION** (Amending Order 88-25, filed 11/14/88)

**WAC 296-24-82513 Masons' adjustable multiple-point suspension scaffolds.** (1) The scaffold shall be capable of sustaining a working load of fifty pounds per square foot and shall not be loaded in excess of that figure.

(2) The scaffold shall be provided with hoisting machines that meet the requirements of a nationally recognized testing laboratory. Refer to federal regulation 29 CFR 1910.7 for definition of a nationally recognized testing laboratory.

(3) The platform shall be supported by wire ropes in conformity with WAC 296-24-82503(~~((22))~~) (24), suspended from overhead outrigger beams.

(4) The scaffold outrigger beams shall consist of structural metal securely fastened or anchored to the frame or floor system of the building or structure.

(5) Each outrigger beam shall be equivalent in strength to at least a standard seven-inch, 15.3-pound steel I-beam, be at least fifteen feet long, and shall not project more than six feet six inches beyond the bearing point.

(6) Where the overhang exceeds six feet six inches, outrigger beams shall be composed of stronger beams or multiple beams and be installed in accordance with approved designs and instructions.

(7) If channel iron outrigger beams are used in place of I-beams, they shall be securely fastened together with the flanges turned out.

(8) All outrigger beams shall be set and maintained with their webs in a vertical position.

(9) A stop bolt shall be placed at each end of every outrigger beam.

(10) The outrigger beam shall rest on suitable wood-bearing blocks.

(11) All parts of the scaffold such as bolts, nuts, fittings, clamps, wire rope, and outrigger beams and their fastenings, shall be maintained in sound and good working condition and shall be inspected before each installation and periodically thereafter.

(12) The free end of the suspension wire ropes shall be equipped with proper size thimbles and be secured by

splicing or other equivalent means. The running ends shall be securely attached to the hoisting drum and at least four turns of rope shall at all times remain on the drum.

(13) Where a single outrigger beam is used, the steel shackles or clevises with which the wire ropes are attached to the outrigger beams shall be placed directly over the hoisting drums.

(14) The scaffold platform shall be equivalent in strength to at least two-inch planking. (For maximum planking spans see WAC 296-24-82503(~~((22))~~) (11).)

(15) Guardrails not less than two by four inches or the equivalent and not less than thirty-six inches or more than forty-two inches high, with a mid-rail, when required, of one-inch by four-inch nominal lumber or equivalent, and toeboards, shall be installed at all open sides on all scaffolds more than eight feet above the ground or floor. Toeboards shall be a minimum of four inches nominal lumber in height. Wire mesh shall be installed in accordance with WAC 296-24-82503(~~((17))~~) (19).

(16) Overhead protection shall be provided on the scaffold, not more than nine feet above the platform, consisting of two-inch planking or material of equivalent strength laid tight, when (~~(men)~~) employees are at work on the scaffold and an overhead hazard exists.

(17) Each scaffold shall be installed or relocated in accordance with designs and instructions, of a registered professional engineer, and supervised by a competent, designated person to comply with the requirements of this section.

**AMENDATORY SECTION** (Amending Order 88-25, filed 11/14/88)

**WAC 296-24-82515 Two-point suspension scaffolds (swinging scaffolds).** (1) Two-point suspension scaffold platforms shall be not less than twenty inches nor more than thirty-six inches wide overall. The platform shall be securely fastened to the hangers by U-bolts or by other equivalent means.

(2) The hangers of two-point suspension scaffolds shall be made of wrought iron, mild steel, or other equivalent material having a cross-sectional area capable of sustaining four times the maximum intended load, and shall be designed with a support for guardrail, intermediate rail, and toeboard.

(3) When hoisting machines are used on two-point suspension scaffolds, such machines shall be of a design tested and approved by a nationally recognized testing laboratory. Refer to federal regulation 29 CFR 1910.7 for definition of nationally recognized testing laboratory.

(4) The roof irons or hooks shall be of wrought iron, mild steel, or other equivalent material of proper size and design, securely installed and anchored. Tiebacks of three-fourths-inch manila rope or the equivalent shall serve as a secondary means of anchorage, installed at right angles to the face of the building whenever possible and secured to a structurally sound portion of the building.

(5) Guardrails not less than two by four inches or the equivalent and not less than thirty-six inches or more than forty-two inches high, with a mid-rail, when required, of one-inch by four-inch nominal lumber or equivalent, and toeboards, shall be installed at all open sides on all scaffolds

more than ten feet above the ground or floor. Toeboards shall be a minimum of four inches nominal lumber in height. Wire mesh shall be installed in accordance with WAC 296-24-82503(~~((17))~~) (19).

(6) Two-point suspension scaffolds shall be suspended by wire or fiber ropes. Wire and fiber ropes shall conform to WAC 296-24-82503(~~((22))~~) (24).

(7) The blocks for fiber ropes shall be of standard six-inch size, consisting of at least one double and one single block. The sheaves of all blocks shall fit the size of rope used.

(8) All wire ropes, fiber ropes, slings, hangers, platforms, and other supporting parts shall be inspected before every installation. Periodic inspections shall be made while the scaffold is in use.

(9) On suspension scaffolds designed for a working load of five hundred pounds, no more than two (~~((men))~~) persons shall be permitted to work at one time. On suspension scaffolds with a working load of seven hundred fifty pounds, no more than three (~~((men))~~) persons shall be permitted to work at one time. Each (~~((workman))~~) worker shall be protected by a safety lifebelt attached to a lifeline. The lifeline shall be securely attached to substantial members of the structure (not scaffold), or to securely rigged lines, which will safely suspend the (~~((workman))~~) worker in case of a fall.

(10) Where acid solutions are used, fiber ropes are not permitted unless acid-proof.

(11) Two-point suspension scaffolds shall be securely lashed to the building or structure to prevent them from swaying. Window cleaners' anchors shall not be used for this purpose.

(12) The platform of every two-point suspension scaffold shall be one of the following types:

(a) The side stringer of ladder-type platforms shall be clear straight-grained spruce or materials of equivalent strength and durability. The rungs shall be of straight-grained oak, ash, or hickory, at least one and one-eighths-inch in diameter, with seven-eighths inch tenons mortised into the side stringers at least seven-eighths inch. The stringers shall be tied together with the tie rods not less than one-quarter inch in diameter, passing through the stringers and riveted up tight against washers on both ends. The flooring strips shall be spaced not more than five-eighths inch apart except at the side rails where the space may be one inch. Ladder-type platforms shall be constructed in accordance with Table D-17.

(b) Plank-type platforms shall be composed of not less than nominal two-inch by eight-inch unspliced planks, properly cleated together on the underside starting six inches from each end; intervals in between shall not exceed four feet. The plank-type platform shall not extend beyond the hangers more than eighteen inches. A bar or other effective means shall be securely fastened to the platform at each end to prevent its slipping off the hanger. The span between hangers for plank-type platforms shall not exceed ten feet.

(c) Beam platforms shall have side stringers of lumber not less than two by six inches set on edge. The span between hangers shall not exceed twelve feet when beam platforms are used. The flooring shall be supported on two-inch and six-inch crossbeams, laid flat and set into the upper edge of the stringers with a snug fit, at intervals of not more than four feet, securely nailed in place. The flooring shall

be of one-inch by six-inch material properly nailed. Floorboards shall not be spaced more than one-half inch apart. (See Table D-17.)

TABLE D-17  
SCHEDULE FOR LADDER-TYPE PLATFORMS

	Length of platform (feet)				
	12	14&16	18&20	22&24	28&30
Side stringers, minimum cross section (finished sizes):					
At ends (in.) . . . . .	1 3/4 x2 3/4	1 3/4 x2 3/4	1 3/4 x3	1 3/4 x3	1 3/4 x3 1/2
At middle (in.) . . . . .	1 3/4 x3 3/4	1 3/4 x3 3/4	1 3/4 x4	1 3/4 x4 1/4	1 3/4 x5
Reinforcing strip (minimum) . . . . .	A 1/8x7/8-in. steel reinforcing strip or its equivalent shall be attached to the side or underside, full length.				
Rungs . . . . .	Rungs shall be 1 1/8-in. minimum diameter with at least 7/8-in. diameter tenons, and the maximum spacing shall be 12 in. center to center.				
Tie rods:					
Number (minimum) . . . . .	3	4	4	5	6
Diameter (minimum) . . . . .	1/4 in.	1/4 in.	1/4 in.	1/4 in.	1/4 in.
Flooring, minimum finished size (in.) . . . . .	1/2 x2 3/4	1/2 x2 3/4	1/2 x2 3/4	1/2 x2 3/4	1/2 x2 3/4

AMENDATORY SECTION (Amending Order 88-25, filed 11/14/88)

**WAC 296-24-82519 Single-point adjustable suspension scaffolds.** (1) The scaffolding, including power units or manually operated winches, shall be of a type tested and listed by a nationally recognized testing laboratory. Refer to WAC 296-24-95601(~~((77))~~) (78) for definition of listed, and 29 CFR 1910.7 for nationally recognized testing laboratory.

(2) The power units may be either electrically or air motor driven.

(3) All power-operated gears and brakes shall be enclosed.

(4) In addition to the normal operating brake, all-power driven units must have an emergency brake which engages automatically when the normal speed of descent is exceeded.

(5) Guards, mid-rails, and toeboards shall completely enclose the cage or basket. Guardrails shall be no less than 2 by 4 inches nominal lumber or the equivalent installed no less than 36 inches nor more than 42 inches above the platform. Mid-rails shall be 1 by 6 inches nominal lumber or the equivalent, installed equidistant between the guardrail and the platform. Toeboards shall be a minimum of 4 inches nominal lumber in height.

(6) The hoisting machines, cables, and equipment shall be regularly serviced and inspected after each installation and every 30 days thereafter.

PERMANENT



(7) The units may be combined to form a two-point suspension scaffold. Such scaffold shall comply with WAC 296-24-82515.

(8) The supporting cable shall be straight for its entire length, and the operator shall not sway the basket and fix the cable to any intermediate points to change ~~((his))~~ their original path of travel.

(9) Equipment shall be maintained and used in accordance with the manufacturers' instructions.

(10) Suspension methods shall conform to applicable provisions of WAC 296-24-82515 and 296-24-82517.

**AMENDATORY SECTION** (Amending Order 80-14, filed 8/8/80)

**WAC 296-24-82521 Boatswain's chairs.** (1) The chair seat shall be not less than 12 by 24 inches, and of 1-inch thickness. The seat shall be reinforced on the underside to prevent the board from splitting.

(2) The two fiber rope seat slings shall be of 5/8-inch diameter, reeved through the four seat holes so as to cross each other on the underside of the seat.

(3) Seat slings shall be of at least 3/8-inch wire rope when a ~~((workman))~~ worker is conducting a heat producing process such as gas or arc welding.

(4) The ~~((workman))~~ worker shall be protected by a safety life belt attached to a lifeline. The lifeline shall be securely attached to substantial members of the structure (not scaffold), or to securely rigged lines, which will safely suspend the worker in case of a fall.

(5) The tackle shall consist of correct size ball bearing or bushed blocks and properly spliced 5/8-inch diameter first-grade manila rope or equivalent strength synthetic-fiber rope.

(6) The roof irons, hooks, or the object to which the tackle is anchored shall be securely installed. Tiebacks when used shall be installed at right angles to the face of the building and securely fastened to a chimney.

**AMENDATORY SECTION** (Amending Order 79-9, filed 7/31/79)

**WAC 296-24-82529 Needle beam scaffold.** (1) Wood needle beams shall be in accordance with WAC 296-24-82503 ~~((5))~~ (7) and ~~((9))~~ (11) and shall be not less than 4 by 6 inches in size, with the greater dimension placed in a vertical direction. Metal beams or the equivalent conforming to WAC 296-24-82503 ~~((4))~~ (6) and ~~((8))~~ (10) may be used.

(2) Ropes or hangers shall be provided for supports. The span between supports on the needle beam shall not exceed 10 feet for 4- by 6-inch timbers. Rope supports shall be equivalent in strength to 1-inch diameter first-grade manila rope.

(3) The ropes shall be attached to the needle beams by a scaffold hitch or a properly made eye splice. The loose end of the rope shall be tied by a bowline knot or by a round turn and one-half hitch.

(4) The platform span between the needle beams shall not exceed 8 feet when using 2-inch scaffold plank. For spans greater than 8 feet, platforms shall be designed based on design requirements for the special span. The overhang

of each end of the platform planks shall be not less than 1 foot and not more than 18 inches.

(5) When one needle beam is higher than the other or when the platform is not level the platform shall be secured against slipping.

(6) All unattached tools, bolts, and nuts used on needle beam scaffolds shall be kept in suitable containers.

(7) One end of a needle beam scaffold may be supported by a permanent structural member conforming to WAC 296-24-82503 ~~((4))~~ (6) and ~~((8))~~ (10).

(8) Each ~~((man))~~ person working on a needle beam scaffold 10 feet or more above the ground or floor, shall be protected by a safety life belt attached to a lifeline. The lifeline shall be securely attached to substantial members of the structure (not scaffold), or to securely rigged lines, which will safely suspend the ~~((workman))~~ worker in case of a fall.

**AMENDATORY SECTION** (Amending Order 73-5, filed 5/9/73 and Order 73-4, filed 5/7/73)

**WAC 296-24-82537 Window-jack scaffolds.** (1) Window-jack scaffolds shall be used only for the purpose of working at the window opening through which the jack is placed.

(2) Window jacks shall not be used to support planks placed between one window jack and another or for other elements of scaffolding.

(3) Window-jack scaffolds shall be provided with suitable guardrails unless safety belts with lifelines are attached and provided for the ~~((workman))~~ workers. Window-jack scaffolds shall be used by one ~~((man))~~ person only.

**AMENDATORY SECTION** (Amending Order 73-5, filed 5/9/73 and Order 73-4, filed 5/7/73)

**WAC 296-24-82543 Float or ship scaffolds.** (1) Float or ship scaffolds shall support not more than three ~~((men))~~ persons and a few light tools, such as those needed for riveting, bolting, and welding. They shall be constructed in accordance with WAC 296-24-82543 (2) through (6), unless substitute designs and materials provide equivalent strength, stability, and safety.

(2) The platform shall be not less than 3 feet wide and 6 feet long, made of three-quarter-inch plywood, equivalent to American Plywood Association Grade B-B, Group I, Exterior.

(3) Under the platform, there shall be two supporting bearers made from 2- x 4-inch, or 1- x 10-inch rough, selected lumber, or better. They shall be free of knots or other flaws and project 6 inches beyond the platform on both sides. The ends of the platform shall extend about 6 inches beyond the outer edges of the bearers. Each bearer shall be securely fastened to the platform.

(4) An edging of wood not less than 3/4 x 1 1/2 inches, or equivalent, shall be placed around all sides of the platform to prevent tools from rolling off.

(5) Supporting ropes shall be 1-inch diameter manila rope or equivalent, free from deterioration, chemical damage, flaws, or other imperfections. Rope connections shall be such that the platform cannot shift or slip. If two ropes are used with each float, they should be arranged so as to provide four ends which are to be securely fastened to an

overhead support. Each of the two supporting ropes shall be hitched around one end of a bearer and pass under the platforms to the other end of the bearer where it is hitched again, leaving sufficient rope at each end for the supporting ties.

(6) Each (~~(workman)~~) worker shall be protected by a safety lifeline attached to a lifeline. The lifeline shall be securely attached to substantial members of the structure (not scaffold), or to securely rigged lines, which will safely suspend the (~~(workman)~~) worker in case of a fall.

**AMENDATORY SECTION** (Amending Order 73-5, filed 5/9/73 and Order 73-4, filed 5/7/73)

**WAC 296-24-84001 Definitions.** The following terms shall have the meaning ascribed in this section when referred to in WAC 296-24-84003 through 296-24-84013 unless the context requires otherwise.

(1) Bearer. A horizontal member of a scaffold upon which the platform rests and which may be supported by ledgers.

(2) Brace. A tie that holds one scaffold member in a fixed position with respect to another member.

(3) Climbing ladder. A separate ladder with equally spaced rungs usually attached to the scaffold structure for climbing and descending.

(4) Coupler. A device for locking together the components of a tubular metal scaffold which shall be designed and used to safely support the maximum intended loads.

(5) Design working load. The maximum intended load, being the total of all loads including the weight of the (~~(men)~~) people, materials, equipment, and platform.

(6) Equivalent. Alternative design or features, which will provide an equal degree or factor of safety.

(7) Guardrail. A barrier secured to uprights and erected along the exposed sides and ends of platforms to prevent falls of persons.

(8) Handrail. A rail connected to a ladder stand running parallel to the slope and/or top step.

(9) Ladder stand. A mobile fixed size self-supporting ladder consisting of a wide flat tread ladder in the form of stairs. The assembly may include handrails.

(10) Ledger (stringer). A horizontal scaffold member which extends from post to post and which supports the bearer forming a tie between the posts.

(11) Mobile scaffold (tower). A light, medium, or heavy duty scaffold mounted on casters or wheels.

(12) Mobile. "Manually propelled."

(13) Mobile work platform. Generally a fixed work level one frame high on casters or wheels, with bracing diagonally from platform to vertical frame.

(14) Runner. The lengthwise horizontal bracing and/or bearing members.

(15) Scaffold. Any temporary elevated platform and its necessary vertical, diagonal, and horizontal members used for supporting (~~(workmen)~~) workers and materials. (Also known as a scaffold tower.)

(16) Toeboard. A barrier at platform level erected along the exposed sides and ends of a scaffold platform to prevent falls of materials.

(17) Tube and coupler scaffold. An assembly consisting of tubing which serves as posts, bearers, braces, ties, and

runners, a base supporting the posts, and uprights, and serves to join the various members, usually used in fixed locations.

(18) Tubular welded frame scaffold. A sectional, panel, or frame metal scaffold substantially built up of prefabricated welded sections, which consist of posts and bearers with intermediate connecting members and braced with diagonal or cross braces.

(19) Tubular welded sectional folding scaffold. A sectional, folding metal scaffold either of ladder frame or inside stairway design, substantially built of prefabricated welded sections, which consist of end frames, platform frame, inside inclined stairway frame and braces, or hinged connected diagonal and horizontal braces, capable of being folded into a flat package when the scaffold is not in use.

(20) Work level. The elevated platform, used for supporting (~~(workmen)~~) workers and their materials, comprising the necessary vertical, horizontal, and diagonal braces, guardrails, and ladder for access to the work platform.

**AMENDATORY SECTION** (Amending Order 73-5, filed 5/9/73 and Order 73-4, filed 5/7/73)

**WAC 296-24-84005 Mobile tubular welded frame scaffolds.** (1) General. Units shall be designed to comply with the requirements of WAC 296-24-84003.

(2) Bracing. Scaffolds shall be properly braced by cross braces and/or diagonal braces for securing vertical members together laterally. The cross braces shall be of a length that will automatically square and align vertical members so the erected scaffold is always plumb, square, and rigid.

(3) Spacing. Spacing of panels or frames shall be consistent with the loads imposed. The frames shall be placed one on top of the other with coupling or stacking pins to provide proper vertical alignment of the legs.

(4) Locking. Where uplift may occur, panels shall be locked together vertically by pins or other equivalent means.

(5) Erection. Only the manufacturer of a scaffold or (~~(his)~~) the manufacturers qualified designated agent shall be permitted to erect or supervise the erection of scaffolds exceeding 50 feet in height above the base, unless such structure is approved in writing by a registered professional engineer or erected in accordance with instructions furnished by the manufacturer.

**AMENDATORY SECTION** (Amending Order 73-5, filed 5/9/73 and Order 73-4, filed 5/7/73)

**WAC 296-24-84007 Mobile tubular welded sectional folding scaffolds.** (1) General. Units including sectional stairway and sectional ladder scaffolds shall be designed to comply with the requirements of WAC 296-24-84003.

(2) Stairway. An integral stairway and work platform shall be incorporated into the structure of each sectional folding stairway scaffold.

(3) Bracing. An integral set of pivoting and hinged folding diagonal and horizontal braces and a detachable work platform shall be incorporated into the structure of each sectional folding ladder scaffold.

(4) Sectional folding stairway scaffolds. Sectional folding stairway scaffolds shall be designed as medium duty scaffolds except for high clearance. These special base sections shall be designed as light duty scaffolds. When

upper sectional folding stairway scaffolds are used with a special high clearance base, the load capacity of the entire scaffold shall be reduced accordingly. The width of a sectional folding stairway scaffold shall not exceed 4 1/2 feet. The maximum length of a sectional folding stairway scaffold shall not exceed 6 feet.

(5) Sectional folding ladder scaffolds. Sectional folding ladder scaffolds shall be designed as light duty scaffolds including special base (open end) sections which are designed for high clearance. For certain special applications the six-foot folding ladder scaffolds, except for special high clearance base sections, shall be designed for use as medium duty scaffolds. The width of a sectional folding ladder scaffold shall not exceed 4 1/2 feet. The maximum length of a sectional folding ladder scaffold shall not exceed 6 feet 6 inches for a six-foot long unit, 8 feet 6 inches for an eight-foot unit or 10 feet 6 inches for a ten-foot long unit.

(6) End frames. The end frames of sectional ladder and stairway scaffolds shall be designed so that the horizontal bearers provide supports for multiple planking levels.

(7) Erection. Only the manufacturer of the scaffold or ~~(his)~~ the manufacturers qualified designated agent shall be permitted to erect or supervise the erection of scaffolds exceeding 50 feet in height above the base, unless such structure is approved in writing by a licensed professional engineer, or erected in accordance with instructions furnished by the manufacturer to comply with requirements in this section.

**AMENDATORY SECTION** (Amending Order 73-5, filed 5/9/73 and Order 73-4, filed 5/7/73)

**WAC 296-24-84009 Mobile tube and coupler scaffolds.** (1) Design. Units shall be designed to comply with the applicable requirements of WAC 296-24-84003.

(2) Material. The material used for the couplers shall be of a structural type, such as a drop-forged steel, malleable iron or structural grade aluminum. The use of gray cast iron is prohibited.

(3) Erection. Only the manufacturer of the scaffold or ~~(his)~~ their qualified designated agent shall be permitted to erect or supervise the erection of scaffolds exceeding 50 feet in height above the base, unless such structure is approved in writing by a licensed professional engineer, or erected in accordance with instructions furnished by the manufacturer to comply with requirements in this section.

**AMENDATORY SECTION** (Amending Order 73-5, filed 5/9/73 and Order 73-4, filed 5/7/73)

**WAC 296-24-85505 Veneer machinery.** (1) Sides of steam vats shall extend to a height of not less than 36 inches above the floor, working platform, or ground.

(2) Large steam vats divided into sections shall be provided with substantial walkways between sections. Each walkway shall be provided with a standard handrail on each exposed side. These handrails may be removable, if necessary.

(3) Covers shall be removed only from that portion of steaming vats on which ~~(men)~~ people are working and a portable railing shall be placed at this point to protect the operators.

(4) ~~(Workman)~~ Workers shall not ride or step on logs in steam vats.

**AMENDATORY SECTION** (Amending Order 90-01, filed 4/10/90, effective 5/25/90)

**WAC 296-24-87001 Definitions.** (1) Anemometer. An instrument for measuring wind velocity.

(2) Angulated roping. A system of platform suspension in which the upper wire rope sheaves or suspension points are closer to the plane of the building face than the corresponding attachment points on the platform, thus causing the platform to press against the face of the building during its vertical travel.

(3) ANSI. American National Standards Institute.

(4) Babbitted fastenings. The method of providing wire rope attachments in which the ends of the wire strands are bent back and are held in a tapered socket by means of poured molten babbitt metal.

(5) Brake-disc type. A brake in which the holding effect is obtained by frictional resistance between one or more faces of discs keyed to the rotating member to be held and fixed discs keyed to the stationary or housing member (pressure between the discs being applied axially).

(6) Brake-self-energizing band type. An essentially unidirectional brake in which the holding effect is obtained by the snubbing action of a flexible band wrapped about a cylindrical wheel or drum affixed to the rotating member to be held, the connections and linkages being so arranged that the motion of the brake wheel or drum will act to increase the tension or holding force of the band.

(7) Brake-shoe type. A brake in which the holding effect is obtained by applying the direct pressure of two or more segmental friction elements held to a stationary member against a cylindrical wheel or drum affixed to the rotating member to be held.

(8) Building face rollers. A specialized form of guide roller designed to contact a portion of the outer face or wall structure of the building, and to assist in stabilizing the operators' platform during vertical travel.

(9) Building maintenance. Operations such as window cleaning, caulking, metal polishing, reglazing, and general maintenance on building surfaces.

(10) Cable. A conductor, or group of conductors, enclosed in a weatherproof sheath, that may be used to supply electrical power and/or control current for equipment or to provide voice communication circuits.

(11) Carriage. A wheeled vehicle used for the horizontal movement and support of other equipment.

(12) Certification. A written, signed, and dated statement confirming the performance of a requirement of this section.

(13) Combination cable. A cable having both steel structural members capable of supporting the platform, and copper or other electrical conductors insulated from each other and the structural members by nonconductive barriers.

(14) Competent person. A person who, because of training and experience, is capable of identifying hazardous or dangerous conditions in powered platform installations and of training employees to identify such conditions.

(15) Continuous pressure. Operation by means of buttons or switches, any one of which may be used to

control the movement of the working platform or roof car, only as long as the button or switch is manually maintained in the actuating position.

(16) Control. A system governing starting, stopping, direction, acceleration, speed, and retardation of moving members.

(17) Controller. A device or group of devices, usually contained in a single enclosure, which serves to control in some predetermined manner the apparatus to which it is connected.

(18) Davit. A device, used singly or in pairs, for suspending a powered platform from work, storage and rigging locations on the building being serviced. Unlike outriggers, a davit reacts its operating load into a single roof socket or carriage attachment.

(19) Electrical ground. A conducting connection between an electrical circuit or equipment and the earth, or some conducting body which serves in place of the earth.

(20) Equivalent. Alternative designs, materials or methods which the employer can demonstrate will provide an equal or greater degree of safety for employees than the methods, materials or designs specified in the standard.

(21) Ground rigging. A method of suspending a working platform starting from a safe surface to a point of suspension above the safe surface.

(22) Ground rigged davit. A davit which cannot be used to raise a suspended working platform above the building face being serviced.

(23) Guide button. A building face anchor designed to engage a guide track mounted on a platform.

(24) Guide roller. A rotating, bearing-mounted, generally cylindrical member, operating separately or as part of a guide shoe assembly, attached to the platform, and providing rolling contact with building guideways, or other building contact members.

(25) Guide shoe. An assembly of rollers, slide members, or the equivalent, attached as a unit to the operators' platform, and designed to engage with the building members provided for the vertical guidance of the operators' platform.

(26) Hoisting machine. A device intended to raise and lower a suspended or supported unit.

(27) Hoist rated load. The hoist manufacturer's maximum allowable operating load.

(28) Installation. All the equipment and all affected parts of a building which are associated with the performance of building maintenance using powered platforms.

(29) Interlock. A device actuated by the operation of some other device with which it is directly associated, to govern succeeding operations of the same or allied devices.

(30) Intermittent stabilization. A method of platform stabilization in which the angulated suspension wire rope(s) are secured to regularly spaced building anchors.

(31) Lanyard. A flexible line of rope, wire rope or strap which is used to secure the body harness to a deceleration device, lifeline or anchorage.

(32) Lifeline. A component consisting of a flexible line for connection to an anchorage at one end to hang vertically (vertical lifeline), or for connection to anchorages at both ends to stretch horizontally (horizontal lifeline), and which serves as a means for connecting other components of a personal fall arrest system to the anchorage.

(33) Live load. The total static weight of workers, tools, parts, and supplies that the equipment is designed to support.

(34) Obstruction detector. A control that will stop the suspended or supported unit in the direction of travel if an obstruction is encountered, and will allow the unit to move only in a direction away from the obstruction.

(35) Operating control. A mechanism regulating or guiding the operation of equipment that ensures a specific operating mode.

(36) Operating device. A pushbutton, lever, or other manual device used to actuate a control.

(37) Outrigger. A device, used singly or in pairs, for suspending a working platform from work, storage, and rigging locations on the building being serviced. Unlike davits, an outrigger reacts its operating moment load as at least two opposing vertical components acting into two or more distinct roof points and/or attachments.

(38) Platform rated load. The combined weight of workers, tools, equipment and other material which is permitted to be carried by the working platform at the installation, as stated on the load rating plate.

(39) Poured socket. The method of providing wire rope terminations in which the ends of the rope are held in a tapered socket by means of poured spelter or resins.

(40) Powered platform. Equipment to provide access to the exterior of a building for maintenance, consisting of a suspended power-operated working platform, a roof car, or other suspension means, and the requisite operating and control devices.

(41) Primary brake. A brake designed to be applied automatically whenever power to the prime mover is interrupted or discontinued.

(42) Prime mover. The source of mechanical power for a machine.

(43) Rated load. The ~~((combined weight of employees, tools, equivalent, and other material which the working platform is designed and installed to lift))~~ manufacturer's recommended maximum load.

(44) Rated strength. The strength of wire rope, as designated by its manufacturer or vendor, based on standard testing procedures or acceptable engineering design practices.

(45) Rated working load. The combined static weight of ~~((men))~~ workers, materials, and suspended or supported equipment.

(46) Registered professional engineer. A person who has been duly and currently registered and licensed by an authority within the United States or its territories to practice the profession of engineering.

(47) Relay, direction. An electrically energized contactor responsive to an initiating control circuit, which in turn causes a moving member to travel in a particular direction.

(48) Relay, potential for vertical travel. An electrically energized contactor responsive to initiating control circuit, which in turn controls the operation of a moving member in both directions. This relay usually operates in conjunction with direction relays, as covered under the definition "relay direction."

(49) Roof car. A structure for the suspension of a working platform, providing for its horizontal movement to working positions.

(50) Roof-powered platform. A powered platform having the raising and lowering mechanism located on a roof car.

(51) Roof rigged davit. A davit used to raise the suspended working platform above the building face being serviced. This type of davit can also be used to raise a suspended working platform which has been ground-rigged.

(52) Rope. The equipment used to suspend a component of an equipment installation, i.e., wire rope.

(53) Safe surface. A horizontal surface intended to be occupied by personnel, which is so protected by a fall protection system that it can be reasonably assured that said occupants will be protected against falls.

(54) Secondary brake. A brake designed to arrest the descent of the suspended or supported equipment in the event of an overspeed condition.

(55) Self-powered platform. A powered platform having the raising and lowering mechanism located on the working platform.

(56) Speed reducer. A positive type speed reducing machine.

(57) Stability factor. The ratio of the stabilizing moment to the overturning moment.

(58) Stabilizer tie. A flexible line connecting the building anchor and the suspension wire rope supporting the platform.

(59) Supported equipment. Building maintenance equipment that is held or moved to its working position by means of attachment directly to the building or extensions of the building being maintained.

(60) Suspended equipment. Building maintenance equipment that is suspended and raised or lowered to its working position by means of ropes or combination cables attached to some anchorage above the equipment.

(61) Suspended scaffold (swinging scaffold). A scaffold supported on wire or other ropes, used for work on, or for providing access to, vertical sides of structures on a temporary basis. Such scaffold is not designed for use on a specific structure or group of structures.

(62) Tail line. The nonsupporting end of the wire rope used to suspend the platform.

(63) Tie-in guides. The portion of a building that provides continuous positive engagement between the building and a suspended or supported unit during its vertical travel on the face of the building.

(64) Traction hoist. A type of hoisting machine that does not accumulate the suspension wire rope on the hoisting drum or sheave, and is designed to raise and lower a suspended load by the application of friction forces between the suspension wire rope and the drum or sheave.

(65) Transportable outriggers. Outriggers designed to be moved from one work location to another.

(66) Traveling cable. A cable made up of electrical or communication conductors or both, and providing electrical connection between the working platform and the roof car or other fixed point.

(67) Trolley carriage. A carriage suspended from an overhead track structure.

(68) Verified. Accepted by design, evaluation, or inspection by a registered professional engineer.

(69) Weatherproof. Equipment so constructed or protected that exposure to the weather will not interfere with its proper operation.

(70) Winding drum hoist. A type of hoisting machine that accumulates the suspension wire rope on the hoisting drum.

(71) Working platform. The suspended (~~structure arranged for vertical travel which provides access to the exterior of the building or structure~~) or supported equipment intended to provide access to the face of the building and manned by persons engaged in building maintenance.

(72) Wrap. One complete turn of the suspension wire rope around the surface of a hoist drum.

(73) Yield point. The stress at which the material exhibits a permanent set of 0.2 percent.

(74) Zinc fastenings. The method of providing wire rope attachments in which the splayed or fanned wire ends are held in a tapered socket by means of poured molten zinc.

**AMENDATORY SECTION** (Amending Order 90-01, filed 4/10/90, effective 5/25/90)

**WAC 296-24-87013 Powered platform installations—Equipment.** (1) General requirements. The following requirements apply to equipment which are part of a powered platform installation, such as platforms, stabilizing components, carriages, outriggers, davits, hoisting machines, wire ropes and electrical components.

(a) Equipment installations shall be designed by or under the direction of a registered professional engineer experienced in such design;

(b) The design shall provide for a minimum live load of 250 pounds (113.6 kg) for each occupant of a suspended or supported platform;

(c) Equipment that is exposed to wind when not in service shall be designed to withstand forces generated by winds of at least 100 miles per hour (44.7 m/s) at 30 feet (9.2 m) above grade; and

(d) Equipment that is exposed to wind when in service shall be designed to withstand forces generated by winds of at least 50 miles per hour (22.4 m/s) for all elevations.

(2) Construction requirements. Bolted connections shall be self-locking or shall otherwise be secured to prevent loss of the connections by vibration.

(3) Suspension methods. Elevated building maintenance equipment shall be suspended by a carriage, outriggers, davits or an equivalent method.

(a) Carriages. Carriages used for suspension of elevated building maintenance equipment shall comply with the following:

(i) The horizontal movement of a carriage shall be controlled so as to ensure its safe movement and allow accurate positioning of the platform for vertical travel or storage;

(ii) Powered carriages shall not exceed a traversing speed of 50 feet per minute (0.3 m/s);

(iii) The initiation of a traversing movement for a manually propelled carriage on a smooth level surface shall not require a person to exert a horizontal force greater than 40 pounds (444.8 n);

(iv) Structural stops and curbs shall be provided to prevent the traversing of the carriage beyond its designed limits of travel;

(v) Traversing controls for a powered carriage shall be of a continuous pressure weatherproof type. Multiple controls when provided shall be arranged to permit operation from only one control station at a time. An emergency stop device shall be provided on each end of a powered carriage for interrupting power to the carriage drive motors;

(vi) The operating control(s) shall be so connected that in the case of suspended equipment, traversing of a carriage is not possible until the suspended portion of the equipment is located at its uppermost designed position for traversing; and is free of contact with the face of the building or building guides. In addition, all protective devices and interlocks are to be in the proper position to allow traversing of the carriage;

(vii) Stability for underfoot supported carriages shall be obtained by gravity, by an attachment to a structural support, or by a combination of gravity and a structural support. The use of flowing counterweights to achieve stability is prohibited.

(A) The stability factor against overturning shall not be less than 2 for horizontal traversing of the carriage, including the effects of impact and wind.

(B) The carriages and their anchorages shall be capable of resisting accidental over-tensioning of the wire ropes suspending the working platform, and this calculated value shall include the effect of one and one-half times the stall capacity of the hoist motor. All parts of the installation shall be capable of withstanding without damage to any part of the installation the forces resulting from the stall load of the hoist and one-half the wind load.

(C) Roof carriages which rely on having tie-down devices secured to the building to develop the required stability against overturning shall be provided with an interlock which will prevent vertical platform movement unless the tie-down is engaged;

(viii) An automatically applied braking or locking system, or equivalent, shall be provided that will prevent unintentional traversing of power-traversed or power assisted carriages;

(ix) A manual or automatic braking or locking system or equivalent, shall be provided that will prevent unintentional traversing of manually propelled carriages;

(x) A means to lock out the power supply for the carriage shall be provided;

(xi) Safe access to and egress from the carriage shall be provided from a safe surface. If the carriage traverses an elevated area, any operating area on the carriage shall be protected by a guardrail system in compliance with the provisions of subsection (5)(a)(vi) of this section. Any access gate shall be self-closing and self-latching, or provided with an interlock;

(xii) Each carriage work station position shall be identified by location markings and/or position indicators; and

(xiii) The motors shall stall if the load on the hoist motors is at any time in excess of three times that necessary for lifting the working platform with its rated load.

(b) Transportable outriggers.

(i) Transportable outriggers may be used as a method of suspension for ground rigged working platforms where the point of suspension does not exceed 300 feet (91.5 m) above a safe surface. Tie-in guide system(s) shall be provided which meet the requirements of WAC 296-24-87011(2).

(ii) Transportable outriggers shall be used only with self-powered, ground rigged working platforms.

(iii) Each transportable outrigger shall be secured with a tie-down to a verified anchorage on the building during the entire period of its use. The anchorage shall be designed to have a stability factor of not less than 4 against overturning or upsetting of the outrigger.

(iv) Access to and egress from the working platform shall be from and to a safe surface below the point of suspension.

(v) Each transportable outrigger shall be designed for lateral stability to prevent roll-over in the event an accidental lateral load is applied to the outrigger. The accidental lateral load to be considered in this design shall be not less than 70 percent of the rated load of the hoist.

(vi) Each transportable outrigger shall be designed to support an ultimate load of not less than 4 times the rated load of the hoist.

(vii) Each transportable outrigger shall be so located that the suspension wire ropes for two point suspended working platforms are hung parallel.

(viii) A transportable outrigger shall be tied-back to a verified anchorage on the building with a rope equivalent in strength to the suspension rope.

(ix) The tie-back rope shall be installed parallel to the centerline of the outrigger.

(c) Davits.

(i) Every davit installation, fixed or transportable, rotatable or nonrotatable shall be designed and installed to insure that it has a stability factor against overturning of not less than 4.

(ii) The following requirements apply to roof rigged davit systems:

(A) Access to and egress from the working platform shall be from a safe surface. Access or egress shall not require persons to climb over a building's parapet or guard railing; and

(B) The working platform shall be provided with wheels, casters or a carriage for traversing horizontally.

(iii) The following requirements apply to ground rigged davit systems:

(A) The point of suspension shall not exceed 300 feet (91.5 m) above a safe surface. Guide system(s) shall be provided which meet the requirements of WAC 296-24-87011(2);

(B) Access and egress to and from the working platform shall only be from a safe surface below the point of suspension.

(iv) A rotating davit shall not require a horizontal force in excess of 40 pounds (177.9 n) per person to initiate a rotating movement.

(v) The following requirements shall apply to transportable davits:

(A) A davit or part of a davit weighing more than 80 pounds (36 kg) shall be provided with a means for its transport, which shall keep the center of gravity of the davit

at or below 36 inches (914 mm) above the safe surface during transport;

(B) A davit shall be provided with a pivoting socket or with a base that will allow the insertion or removal of a davit at a position of not more than 35 degrees above the horizontal, with the complete davit inboard of the building face being serviced; and

(C) Means shall be provided to lock the davit to its socket or base before it is used to suspend the platform.

(4) Hoisting machines.

(a) Raising and lowering of suspended or supported equipment shall be performed only by a hoisting machine.

(b) Each hoisting machine shall be capable of arresting any overspeed descent of the load.

(c) Each hoisting machine shall be powered only by air, electric or hydraulic sources.

(d) Flammable liquids shall not be carried on the working platform.

(e) Each hoisting machine shall be capable of raising or lowering 125 percent of the rated load of the hoist.

(f) Moving parts of a hoisting machine shall be enclosed or guarded in compliance with Part C of chapter 296-24 WAC.

(g) Winding drums, traction drums and sheaves and directional sheaves used in conjunction with hoisting machines shall be compatible with, and sized for, the wire rope used.

(h) Each winding drum shall be provided with a positive means of attaching the wire rope to the drum. The attachment shall be capable of developing at least 4 times the rated load of the hoist.

(i) Each hoisting machine shall be provided with a primary brake and at least one independent secondary brake, each capable of stopping and holding not less than 125 percent of the lifting capacity of the hoist.

(i) The primary brake shall be directly connected to the drive train of the hoisting machine, and shall not be connected through belts, chains, clutches, or set screw type devices. The brake shall automatically set when power to the prime mover is interrupted.

(ii) The secondary brake shall be an automatic emergency type of brake that, if actuated during each stopping cycle, shall not engage before the hoist is stopped by the primary brake.

(iii) When a secondary brake is actuated, it shall stop and hold the platform within a vertical distance of 24 inches (609.6 mm).

(j) Any component of a hoisting machine which requires lubrication for its protection and proper functioning shall be provided with a means for that lubrication to be applied.

(5) Suspended equipment.

(a) General requirements.

(i) Each suspended unit component, except suspension ropes and guardrail systems, shall be capable of supporting, without failure, at least 4 times the maximum intended live load applied or transmitted to that component.

(ii) Each suspended unit component shall be constructed of materials that will withstand anticipated weather conditions.

(iii) Each suspended unit shall be provided with a load rating plate, conspicuously located, stating the unit weight and rated load of the suspended unit.

(iv) When the suspension points on a suspended unit are not at the unit ends, the unit shall be capable of remaining continuously stable under all conditions of use and position of the live load, and shall maintain at least a 1.5 to 1 stability factor against unit upset.

(v) Guide rollers, guide shoes or building face rollers shall be provided, and shall compensate for variations in building dimensions and for minor horizontal out-of-level variations of each suspended unit.

(vi) Each working platform of a suspended unit shall be secured to the building facade by one or more of the following methods, or by an equivalent method:

(A) Continuous engagement to building anchors as provided in WAC 296-24-87011 (2)(a);

(B) Intermittent engagement to building anchors as provided in WAC 296-24-87011 (2)(c)(i);

(C) Button guide engagement as provided in WAC 296-24-87011 (2)(c)(ii);

(D) Angulated roping and building face rollers as provided in WAC 296-24-87011 (2)(c)(iii).

(vii) Each working platform of a suspended unit shall be provided with a guardrail system on all sides which shall meet the following requirements:

(A) The system shall consist of a top guardrail, midrail, and a toeboard;

(B) The top guardrail shall not be less than 36 inches (914 mm) high and shall be able to withstand at least a 200-pound ((444 n)) (890 n) force in any downward or outward direction;

(C) The midrail shall be able to withstand at least a 75-pound (333 n) force in any downward or outward direction; and

(D) The areas between the guardrail and toeboard on the ends and outboard side, and the area between the midrail and toeboard on the inboard side, shall be closed with a material that is capable of withstanding a load of 100 pounds (45.4 KG.) applied horizontally over any area of one square foot (.09 m<sup>2</sup>). The material shall have all openings small enough to reject passage of life lines and potential falling objects which may be hazardous to persons below.

(E) Toeboards shall be capable of withstanding, without failure, a force of at least 50 pounds (222 n) applied in any downward or horizontal direction at any point along the toeboard.

(F) Toeboards shall be 4 inches (9 cm) minimum in length from their top edge to the level of the platform floor.

(G) Toeboards shall be securely fastened in place at the outermost edge of the platform and have no more than one-half inch (1.3 cm) clearance above the platform floor.

(H) Toeboards shall be solid or with an opening not over one inch (2.5 cm) in the greatest dimension.

(b) Two and four-point suspended working platforms.

(i) The working platform shall be not less than 24 inches (610 mm) wide and shall be provided with a minimum of a 12 inch (305 mm) wide passage at or past any obstruction on the platform.

(ii) The flooring shall be of a slip-resistant type and shall contain no opening that would allow the passage of life lines, cables and other potential falling objects. If a larger opening is provided, it shall be protected by placing a material under the opening which shall prevent the passage of life lines, cables and potential falling objects.



(iii) The working platform shall be provided with a means of suspension that will restrict the platform's inboard to outboard roll about its longitudinal axis to a maximum of 15 degrees from a horizontal plane when moving the live load from the inboard to the outboard side of the platform.

(iv) Any cable suspended from above the platform shall be provided with a means for storage to prevent accumulation of the cable on the floor of the platform.

(v) All operating controls for the vertical travel of the platform shall be of the continuous-pressure type, and shall be located on the platform.

(vi) Each operating station of every working platform shall be provided with a means of interrupting the power supply to all hoist motors to stop any further powered ascent or descent of the platform.

(vii) The maximum rated speed of the platform shall not exceed 50 feet per minute (0.3 ms) with single speed hoists, nor 75 feet per minute (0.4 ms) with multispeed hoists.

(viii) Provisions shall be made for securing all tools, water tanks, and other accessories to prevent their movement or accumulation on the floor of the platform.

(ix) Portable fire extinguishers conforming to the provisions of WAC 296-24-585 and 296-24-592 shall be provided and securely attached on all working platforms.

(x) Access to and egress from a working platform, except for those that land directly on a safe surface, shall be provided by stairs, ladders, platforms and runways conforming to the provisions of Part J-1 of chapter 296-24 WAC. Access gates shall be self-closing and self-latching.

(xi) Means of access to or egress from a working platform which is 48 inches (1.2 m) or more above a safe surface shall be provided with a guardrail system or ladder handrails that conform to the provisions of Part J-1 of chapter 296-24 WAC.

(xii) The platform shall be provided with a secondary wire rope suspension system if the platform contains overhead structures which restrict the emergency egress of employees. A horizontal lifeline or a direct connection anchorage shall be provided, as part of a fall arrest system which meets the requirements of Appendix C, for each employee on such a platform.

(xiii) A vertical lifeline shall be provided as part of a fall arrest system which meets the requirements of Appendix C, for each employee on a working platform suspended by 2 or more wire ropes, if the failure of one wire rope or suspension attachment will cause the platform to upset. If a secondary wire rope suspension is used, vertical lifelines are not required for the fall arrest system, provided that each employee is attached to a horizontal lifeline anchored to the platform.

(xiv) An emergency electric operating device shall be provided on roof powered platforms near the hoisting machine for use in the event of failure of the normal operating device located on the working platform, or failure of the cable connected to the platform. The emergency electric operating device shall be mounted in a secured compartment, and the compartment shall be labeled with instructions for use. A means for opening the compartment shall be mounted in a break-glass (~~receptacle~~ ~~receptacle~~) receptacle located near the emergency electric operating device or in an equipment secure and accessible location.

(c) Single point suspended working platforms.

(i) The requirements of (b)(i) through (xi) of this subsection shall also apply to a single point working platform.

(ii) Each single point suspended working platform shall be provided with a secondary wire rope suspension system, which will prevent the working platform from falling should there be a failure of the primary means of support, or if the platform contains overhead structures which restrict the egress of the employees. A horizontal life line or a direct connection anchorage shall be provided, as part of a fall arrest system which meets the requirements of Appendix C, for each employee on the platform.

(d) Ground-rigged working platforms.

(i) Ground-rigged working platforms shall comply with all the requirements of (b)(i) through (xiii) of this subsection.

(ii) After each day's use, the power supply within the building shall be disconnected from a ground-rigged working platform, and the platform shall be either disengaged from its suspension points or secured and stored at grade.

(e) Intermittently stabilized platforms.

(i) The platform shall comply with (b)(i) through (xiii) of this subsection.

(ii) Each stabilizer tie shall be equipped with a "quick connect-quick disconnect" device which cannot be accidentally disengaged, for attachment to the building anchor, and shall be resistant to adverse environmental conditions.

(iii) The platform shall be provided with a stopping device that will interrupt the hoist power supply in the event the platform contacts a stabilizer tie during its ascent.

(iv) Building face rollers shall not be placed at the anchor setting if exterior anchors are used on the building face.

(v) Stabilizer ties used on intermittently stabilized platforms shall allow for the specific attachment length needed to effect the predetermined angulation of the suspended wire rope. The specific attachment length shall be maintained at all building anchor locations.

(vi) The platform shall be in continuous contact with the face of the building during ascent and descent.

(vii) The attachment and removal of stabilizer ties shall not require the horizontal movement of the platform.

(viii) The platform-mounted equipment and its suspension wire ropes shall not be physically damaged by the loads from the stabilizer tie or its building anchor. The platform, platform-mounted equipment and wire ropes shall be able to withstand a load that is at least twice the ultimate strength of the stabilizer tie.

Note: See Figure 2 in Appendix B of this section for a description of a typical intermittent stabilization system.

(f) Button-guide stabilized platforms.

(i) The platform shall comply with (b)(i) through (xiii) of this subsection.

(ii) Each guide track on the platform shall engage a minimum of two guide buttons during any vertical travel of the platform following the initial button engagement.

(iii) Each guide track on a platform that is part of a roof rigged system shall be provided with a storage position on the platform.

(iv) Each guide track on the platform shall be sufficiently maneuverable by platform occupants to permit easy



engagement of the guide buttons, and easy movement into and out of its storage position on the platform.

(v) Two guide tracks shall be mounted on the platform and shall provide continuous contact with the building face.

(vi) The load carrying components of the button guide stabilization system which transmit the load into the platform shall be capable of supporting the weight of the platform, or provision shall be made in the guide track connectors or platform attachments to prevent the weight of the platform from being transmitted to the platform attachments.

Note: See Figure 3 in Appendix B of this section for a description of a typical button guide stabilization system.

(6) Supported equipment.

(a) Supported equipment shall maintain a vertical position in respect to the face of the building by means other than friction.

(b) Cog wheels or equivalent means shall be incorporated to provide climbing traction between the supported equipment and the building guides. Additional guide wheels or shoes shall be incorporated as may be necessary to ensure that the drive wheels are continuously held in positive engagement with the building guides.

(c) Launch guide mullions indexed to the building guides and retained in alignment with the building guides shall be used to align drive wheels entering the building guides.

(d) Manned platforms used on supported equipment shall comply with the requirements of (b)(i), (ii), and (iv) through (xi) of this subsection, covering suspended equipment.

(7) Suspension wire ropes and rope connections.

(a) Each specific installation shall use suspension wire ropes or combination cable and connections meeting the specification recommended by the manufacturer of the hoisting machine used. Connections shall be capable of developing at least 80 percent of the rated breaking strength of the wire rope.

(b) Each suspension rope shall have a "Design Factor" of at least 10. The "Design Factor" is the ratio of the rated strength of the suspension wire rope to the rated working load, and shall be calculated using the following formula:

$$F = \frac{S(N)}{W}$$

Where:

F = Design factor

S = Manufacturer's rated strength of one suspension rope

N = Number of suspension ropes under load

W = Rated working load on all ropes at any point of travel

(c) Suspension wire rope grade shall be at least improved plow steel or equivalent.

(d) Suspension wire ropes shall be sized to conform with the required design factor, but shall not be less than 5/16 inch (7.94 mm) in diameter.

(e) No more than one reverse bend in 6 wire rope lays shall be permitted.

(f) A corrosion-resistant tag shall be securely attached to one of the wire rope fastenings when a suspension wire rope is to be used at a specific location and will remain in

that location. This tag shall bear the following wire rope data:

(i) The diameter (inches and/or mm);

(ii) Construction classification;

(iii) Whether nonpreformed or preformed;

(iv) The grade of material;

(v) The manufacturer's rated strength;

(vi) The manufacturer's name;

(vii) The month and year the ropes were installed; and

(viii) The name of the person or company which installed the ropes.

(g) A new tag shall be installed at each rope renewal.

(h) The original tag shall be stamped with the date of the resocketing, or the original tag shall be retained and a supplemental tag shall be provided when ropes are resocketed. The supplemental tag shall show the date of resocketing and the name of the person or company that resocketed the rope.

(i) Winding drum type hoists shall contain at least 3 wraps of the suspension wire rope on the drum when the suspended unit has reached the lowest possible point of its vertical travel.

(j) Traction drum and sheave type hoists shall be provided with a wire rope of sufficient length to reach the lowest possible point of vertical travel of the suspended unit, and an additional length of the wire rope of at least 4 feet (1.2 m).

(k) The lengthening or repairing of suspension wire ropes is prohibited.

(l) Babbitted fastenings for suspension wire rope are prohibited.

(8) Control circuits, power circuits and their components.

(a) Electrical wiring and equipment shall comply with Part L of chapter 296-24 WAC, except as otherwise required by this section.

(b) Electrical runway conductor systems shall be of a type designed for use in exterior locations, and shall be located so that they do not come into contact with accumulated snow or water.

(c) Cables shall be protected against damage resulting from overtoning or from other causes.

(d) Devices shall be included in the control system for the equipment which will provide protection against electrical overloads, three phase reversal and phase failure. The control system shall have a separate method, independent of the direction control circuit, for breaking the power circuit in case of an emergency or malfunction.

(e) Suspended or supported equipment shall have a control system which will require the operator of the equipment to follow predetermined procedures.

(f) The following requirements shall apply to electrical protection devices:

(i) On installations where the carriage does not have a stability factor of at least 4 against overturning, electrical contract(s) shall be provided and so connected that the operating devices for the suspended or supported equipment shall be operative only when the carriage is located and mechanically retained at an established operating point.

(ii) Overload protection shall be provided in the hoisting or suspension system to protect against the equipment

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operating in the "up" direction with a load in excess of 125 percent of the rated load of the platform; and

(iii) An automatic detector shall be provided for each suspension point that will interrupt power to all hoisting motors for travel in the "down" direction, and apply the primary brakes if any suspension wire rope becomes slack. A continuous-pressure rigging-bypass switch designed for use during rigging is permitted. This switch shall only be used during rigging.

(g) Upper and lower directional switches designed to prevent the travel of suspended units beyond safe upward and downward levels shall be provided.

(h) Emergency stop switches shall be provided on remote controlled, roof-powered manned platforms adjacent to each control station on the platform.

(i) Cables which are in constant tension shall have overload devices which will prevent the tension in the cable from interfering with the load limiting device required in (f)(ii) of this subsection, or with the platform roll limiting device required in subsection (5)(b)(iii) of this section. The setting of these devices shall be coordinated with other overload settings at the time of design of the system, and shall be clearly indicated on or near the device. The device shall interrupt the equipment travel in the "down" direction.

AMENDATORY SECTION (Amending Order 90-01, filed 4/10/90, effective 5/25/90)

**WAC 296-24-87015 Maintenance.** (1) General maintenance. All parts of the equipment affecting safe operation shall be maintained in proper working order so that they may perform the functions for which they were intended. The equipment shall be taken out of service when it is not in proper working order.

(2) Cleaning.

(a) Control or power contactors and relays shall be kept clean.

(b) All other parts shall be kept clean if their proper functioning would be affected by the presence of dirt or other contaminants.

(3) Periodic resocketing of wire rope fastenings.

(a) Hoisting ropes utilizing poured socket fastenings shall be resocketed at the nondrum ends at intervals not exceeding 24 months. In resocketing the ropes, a sufficient length shall be cut from the end of the rope to remove damaged or fatigued portions.

(b) Resocketed ropes shall conform to the requirements of WAC 296-24-87013(7).

(c) Limit switches affected by the resocketed ropes shall be reset, if necessary.

(4) Periodic reshackling of suspension wire ropes. The hoisting ropes shall be reshackled at the nondrum ends at intervals not exceeding 24 months. When reshackling the ropes, a sufficient length shall be cut from the end of the rope to remove damaged or fatigued portions.

(5) Roof systems. Roof track systems, tie-downs, or similar equipment shall be maintained in proper working order so that they perform the function for which they were intended.

(6) Building face guiding members. T-rails, indented mullions, or equivalent guides located in the face of a building shall be maintained in proper working order so that

they perform the functions for which they were intended. Brackets for cable stabilizers shall similarly be maintained in proper working order.

(7) Inoperative safety devices. No person shall render a required safety device or electrical protective device inoperative, except as necessary for tests, inspections, and maintenance. Immediately upon completion of such tests, inspections, and maintenance, the device shall be restored to its normal operating condition.

~~((8) Damaged rope. Wire ropes shall be replaced whenever there are six or more broken wires in any one lay of the wire rope, or whenever the ropes are damaged or in a deteriorated condition.))~~

AMENDATORY SECTION (Amending Order 90-01, filed 4/10/90, effective 5/25/90)

**WAC 296-24-87031 Appendix A—Guidelines (advisory).** (1) Use of the appendix. Appendix A provides examples of equipment and methods to assist the employer in meeting the requirements of the indicated provision of the standard. Employers may use other equipment or procedures which conform to the requirements of the standard. This appendix neither adds to nor detracts from the mandatory requirements set forth in WAC 296-24-870 through 296-24-87037.

(2) Assurance. WAC 296-24-870(3) requires the building owner to inform the employer in writing that the powered platform installation complies with certain requirements of the standard, since the employer may not have the necessary information to make these determinations. The employer, however, remains responsible for meeting these requirements which have not been set off in WAC 296-24-870 (3)(a).

(3) Design requirements. The design requirements for each installation should be based on the limitations (stresses, deflections, etc.), established by nationally recognized standards as promulgated by the following organizations, or to equivalent standards:

AA—The Aluminum Association, ~~((818 Connecticut Avenue N.W.))~~ 900 19th Street Northwest, Suite 300, Washington, D.C. 20006

Aluminum Construction Manual  
Specifications for Aluminum Structures  
Aluminum Standards and Data

AGMA—American Gear Manufacturers Association, ~~((401 North Fort Meyer Dr., Suite 1000, Arlington, VA 22209))~~ 1500 King Street, Suite 201, Alexandria, VA 22314

AISC—American Institute of Steel Construction, ~~((400 North Michigan Avenue))~~ 1 East Wacker Drive, Suite 3100, Chicago, IL ((60611)) 60601-2001

ANSI—American National Standards Institute, Inc., ~~((1430 Broadway))~~ 11 West 42nd Street, New York, NY ((10018)) 10036

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ASCE—American Society of Civil Engineers, 345 East 47th Street, New York, NY 10017

ASME—American Society of Mechanical Engineers, 345 East 47th Street, New York, NY 10017

ASTM—American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103-1187

AWS—American Welding Society, Inc., Box 351040, 550 N.W. LeJeune Road, Miami, FL 33126

~~((JIC—Joint Industrial Council, 2139 Wisconsin Avenue N.W., Washington, D.C. 20007))~~

NEMA—National Electric Manufacturers Association, 2101 L Street N.W., Washington, D.C. 20037

(4) Tie-in guides. Indented mullions, T-rails or other equivalent guides are acceptable as tie-in guides in a building face for a continuous stabilization system. Internal guides are embedded in other building members with only the opening exposed (see Figure 1 of Appendix B). External guides, however, are installed external to the other building members and so are fully exposed. The minimum opening for tie-in guides is three-quarters of an inch (19 mm), and the minimum inside dimensions are one-inch (25 mm) deep and two inches (50 mm) wide.

Employers should be aware of the hazards associated with tie-in guides in a continuous stabilization system which was not designed properly. For example, joints in these track systems may become extended or discontinuous due to installation or building settlement. If this alignment problem is not corrected, the system could jam when a guide roller or guide shoe strikes a joint and this would cause a hazardous situation for employees. In another instance, faulty design will result in guide rollers being mounted in a line so they will jam in the track at the slightest misalignment.

(5) Building anchors (intermittent stabilization system). In the selection of the vertical distance between building anchors, certain factors should be given consideration. These factors include building height and architectural design, platform length and weight, wire rope angulation, and the wind velocities in the building area. Another factor to consider is the material of the building face, since this material may be adversely affected by the building rollers.

External or indented type building anchors are acceptable. Receptacles in the building facade used for the indented type should be kept clear of extraneous materials which will hinder their use. During the inspection of the platform installation, evidence of a failure or abuse of the anchors should be brought to the attention of the employer.

(6) Stabilizer tie length. A stabilizer tie should be long enough to provide for the planned angulation of the suspension cables. However, the length of the tie should not be excessive and become a problem by possibly becoming entangled in the building face rollers or parts of the platform machinery.

The attachment length may vary due to material elongation and this should be considered when selecting the material to be used. Consideration should also be given to the use of ties which are easily installed by employees, since this will encourage their use.

(7) Intermittent stabilization system. Intermittent stabilization systems may use different equipment, tie-in

devices and methods to restrict the horizontal movement of a powered platform with respect to the face of the building. One acceptable method employs corrosion-resistant building anchors secured in the face of the building in vertical rows every third floor or 50 feet (15.3 m), whichever is less. The anchors are spaced horizontally to allow a stabilization attachment (stabilizer tie) for each of the two platform suspension wire ropes. The stabilizer tie consists of two parts. One part is a quick connect-quick disconnect device which utilizes a corrosion-resistant yoke and retainer spring that is designed to fit over the building anchors. The second part of the stabilizer tie is a lanyard which is used to maintain a fixed distance between the suspension wire rope and the face of the building.

In this method, as the suspended powered platform descends past the elevation of each anchor, the descent is halted and each of the platform occupants secures a stabilizer tie between a suspension wire rope and a building anchor. The procedure is repeated as each elevation of a building anchor is reached during the descent of the powered platform.

As the platform ascends, the procedure is reversed; that is, the stabilizer ties are removed as each elevation of a building anchor is reached. The removal of each stabilizer tie is assured since the platform is provided with stopping devices which will interrupt power to its hoist(s) in the event either stopping device contacts a stabilizer during the ascent of the platform.

Figure 2 of Appendix B illustrates another type of acceptable intermittent stabilization system which utilizes retaining pins as the quick connect-quick disconnect device in the stabilizer tie.

(8) Wire rope inspection. The inspection of the suspension wire rope is important since the rope gradually loses strength during its useful life. The purpose of the inspection is to determine whether the wire rope has sufficient integrity to support a platform with the required design factor.

If there is any doubt concerning the condition of a wire rope or its ability to perform the required work, the rope should be replaced. The cost of wire rope replacement is quite small if compared to the cost in terms of human injuries, equipment down time and replacement.

No listing of critical inspection factors, which serve as a basis for wire rope replacement in the standard, can be a substitute for an experienced inspector of wire rope. The listing serves as a user's guide to the accepted standards by which ropes must be judged.

Rope life can be prolonged if preventive maintenance is performed regularly. Cutting off an appropriate length of rope at the end termination before the core degrades and valley brakes appear minimizes degradation at these sections.

(9) General maintenance. In meeting the general maintenance requirement in WAC 296-24-87015(1), the employer should undertake the prompt replacement of broken, worn and damaged parts, switch contacts, brushes, and short flexible conductors of electrical devices. The components of the electrical service system and traveling cables should be replaced when damaged or significantly abraded. In addition, gears, shafts, bearings, brakes and hoisting drums should be kept in proper alignment.

(10) Training. In meeting the training requirement of WAC 296-24-87017(1), employers should use both on the

job training and formal classroom training. The written work procedures used for this training should be obtained from the manufacturer, if possible, or prepared as necessary for the employee's information and use.

Employees who will operate powered platforms with intermittent stabilization systems should receive instruction in the specific ascent and descent procedures involving the assembly and disassembly of the stabilizer ties.

An acceptable training program should also include employee instruction in basic inspection procedures for the purpose of determining the need for repair and replacement of platform equipment. In addition, the program should cover the inspection, care and use of the personal fall protection equipment required in Appendix C, Part I, subsections (5) and (6).

In addition, the training program should also include emergency action plan elements. OSHA brochure #3088 (Rev.) 1985, "How to Prepare for Workplace Emergencies," details the basic steps needed to prepare to handle emergencies in the workplace.

Following the completion of a training program, the employee should be required to demonstrate competency in operating the equipment safely. Supplemental training of the employee should be provided by the employer, as necessary, if the equipment used or other working conditions should change.

An employee who is required to work with chemical products on a platform should receive training in proper cleaning procedures, and in the hazards, care and handling of these products. In addition, the employee should be supplied with the appropriate personal protective equipment, such as gloves and eye and face protection.

(11) Suspension and securing of powered platforms (equivalency). One acceptable method of demonstrating the equivalency of a method of suspending or securing a powered platform, as required in WAC 296-24-87011 (2)(c), 296-24-87013(3), and (5)(a)(vi), is to provide an engineering analysis by a registered professional engineer. The analysis should demonstrate that the proposed method will provide an equal or greater degree of safety for employees than any one of the methods specified in the standard.

**AMENDATORY SECTION** (Amending Order 76-6, filed 3/1/76)

**WAC 296-24-88501 Definitions.** (1) Aerial device. Any vehicle-mounted device, telescoping or articulating or both, which is used to position (~~((workmen))~~) workers and/or materials.

(2) Aerial ladder. An aerial device consisting of a single- or multiple-section extensible ladder.

(3) Articulating boom platform. An aerial device with two or more hinged boom sections.

(4) Extensible boom platform. An aerial device (except ladders) with a telescopic or extensible boom. Telescopic derricks with personnel platform attachments shall be considered to be extensible boom platforms when used with a personnel platform.

(5) Electric line truck. A truck used to transport (~~((men))~~) people, tools and material, and to serve as a traveling workshop for electric power line construction and maintenance work. It is sometimes equipped with a boom

and auxiliary equipment for setting poles, digging holes and elevating material and/or (~~((men))~~) people.

(6) Mobile unit. A combination of an aerial device, its vehicle, and related equipment.

(7) Platform. Any personnel-carrying device (basket or bucket) which is a component of an aerial device.

(8) Vehicle. Any carrier that is not manually propelled.

(9) Vertical tower. An aerial device designed to elevate a platform in a substantially vertical axis.

**AMENDATORY SECTION** (Amending Order 76-6, filed 3/1/76)

**WAC 296-24-88505 Specific requirements.** (1) Ladder trucks and tower trucks. Before the truck is moved for highway travel, aerial ladders shall be secured in the lower traveling position by the locking device above the truck cab, and the manually operated device at the base of the ladder, or by other equally effective means (e.g., cradles which prevent rotation of the ladder in combination with positive acting linear actuators).

(2) Extensible and articulating boom platforms.

(a) Lift controls shall be tested each day prior to use to determine that such controls are in safe working condition.

(b) Only trained persons shall operate an aerial lift.

(c) Belting off to an adjacent pole, structure, or equipment while working from an aerial lift shall not be permitted.

(d) Employees shall always stand firmly on the floor of the basket, and shall not sit or climb on the edge of the basket or use planks, ladders, or other devices for a work position.

(e) A body belt shall be worn and a lanyard attached to the boom or basket when working from an aerial lift.

(f) Boom and basket load limits specified by the manufacturer shall not be exceeded.

(g) The brakes shall be set and outriggers, when used, shall be positioned on pads or a solid surface. Wheel chocks shall be installed before using an aerial lift on an incline.

(h) An aerial lift truck may not be moved when the boom is elevated in a working position with (~~((men))~~) workers in the basket, except for equipment which is specifically designed for this type of operation in accordance with the provisions of WAC 296-24-88503 (1)(2).

(i) Articulating boom and extensible boom platforms, primarily designed as personnel carriers, shall have both platform (upper) and lower controls. Upper controls shall be in or beside the platform within easy reach of the operator. Lower controls shall provide for overriding the upper controls. Controls shall be plainly marked as to their function. Lower level controls shall not be operated unless permission has been obtained from the employee in the lift, except in case of emergency.

(j) Climbers shall not be worn while performing work from an aerial lift.

(k) Before moving an aerial lift for travel, the boom(s) shall be inspected to see that it is properly cradled and outriggers are in stowed position, except as provided in subdivision (h).

(3) Bursting safety factor. All critical hydraulic and pneumatic components shall comply with the provisions of the American National Standards Institute Standard, ANSI

A92.2-1969, Section 4.9 Bursting Safety Factor. Critical components are those in which a failure would result in a free fall or free rotation of the boom. All noncritical components shall have a bursting safety factor of at least two to one.

(4) Welding standards. All welding shall conform to the following ~~((Automotive))~~ American Welding Society (AWS) Standards, as applicable:

- (a) Standard Qualification Procedure, AWS B3.0-41.
- (b) Recommended Practices for Automotive Welding Design, AWS D8.4-61.
- (c) Standard Qualification of Welding Procedures and Welders for Piping and Tubing, AWS D10.9-69.
- (d) Specifications for Welding Highway and Railway Bridges, AWS D2.0-69. (Rev. 2-5-76.)

AMENDATORY SECTION (Amending Order 73-5, filed 5/9/73 and Order 73-4, filed 5/7/73)

**WAC 296-24-90001 Definitions.** (1) Handhold (handgrip). A handhold is a device attached to the belt which can be grasped by the passenger to provide a means of maintaining balance.

(2) Open type. One which has a handgrip surface fully exposed and capable of being encircled by the passenger's fingers.

(3) Closed type. A cup-shaped device, open at the top in the direction of travel of the step for which it is to be used, and closed at the bottom into which the passenger may place ~~((his))~~ fingers.

(4) Limit switch. A device, the purpose of which is to cut off the power to the motor and apply the brakes to stop the carrier in the event that a loaded step passes the terminal landing.

(5) Manlift. A device consisting of a power-driven endless belt moving in one direction only, and provided with steps or platforms and handholds attached to it for the transportation of personnel from floor to floor.

(6) Rated speed. Rated speed is the speed for which the device is designed and installed.

(7) Split-rail switch. An electric limit switch operated mechanically by the rollers on the manlift steps. It consists of an additional hinged or "split" rail, mounted on the regular guiderail, over which the step rollers pass. It is spring-loaded in the "split" position. If the step supports no load, the rollers will "bump" over the switch; if a loaded step should pass over the section, the split rail will be forced straight, tripping the switch and opening the electrical circuit.

(8) Step (platform). A step is a passenger carrying unit.

(9) Travel. The travel is the distance between the centers of the top and bottom pulleys.

AMENDATORY SECTION (Amending Order 91-07, filed 11/22/91, effective 12/24/91)

**WAC 296-24-90005 Mechanical requirements.** (1) Machines, general.

(a) Brakes. Brakes provided for stopping and holding a manlift shall be inherently self-engaging, by requiring power or force from an external source to cause disengagement. The brake shall be electrically released, and shall be applied to the motor shaft for direct-connected units or to the input shaft for belt-driven units. The brake shall be capable

of stopping and holding the manlift when the descending side is loaded with 250 lb on each step.

(b) Belt.

(i) The belts shall be of hard-woven canvas, rubber-coated canvas, leather, or other material meeting the strength requirements of WAC 296-24-90003(3) and having a coefficient of friction such that when used in conjunction with an adequate tension device it will meet the brake test specified in WAC 296-24-90005 (1)(a).

(ii) The width of the belt shall be not less than 12 inches for a travel not exceeding 100 feet, not less than 14 inches for a travel greater than 100 feet but not exceeding 150 feet and 16 inches for a travel exceeding 150 feet.

(iii) A belt that has become torn while in use on a manlift shall not be spliced and put back in service.

(iv) Belt fastenings. Belts shall be fastened by a lapped splice or shall be butt spliced with a strap on the side of the belt away from the pulley. For lapped splices, the overlap of the belt at the splice shall be not less than three feet where the total travel of the manlift does not exceed one hundred feet and not less than four feet, if the travel exceeds one hundred feet.

Where butt splices are used the straps shall extend not less than three feet on one side of the butt for a travel not in excess of one hundred feet, and four feet for a travel in excess of one hundred feet.

For twelve inch belts, the joint shall be fastened with not less than twenty special elevator bolts, each of a minimum diameter of one-quarter inch. These bolts shall be arranged ~~((symmetrically))~~ symmetrically in five rows so arranged as to cover the area of the joint effectively. The minimum number of bolts for a belt width of fourteen inches shall be not less than twenty-three and for belt widths of sixteen inches, the number of bolts shall be not less than twenty-seven.

(v) Pulleys. Drive pulleys and idler (boot) pulleys shall have a diameter not less than given in Table 1.

Belt Construction	Minimum Strength (lb. per inch of width)	Minimum Pulley (diameter inches)
5 ply	1500	20
6 ply	1800	20
7 ply	2100	22

Note: Table No. 1 is included solely for the purpose of determining the minimum diameter of pulley required for the listed number of plys of belt construction.

~~((vi) Pulley protection. The machine shall be so designed))~~ (vi) Pulley protection. The machine shall be so designed and constructed as to catch and hold the driving pulley in event of shaft failure.

(2) Speed. ~~((a))~~ Maximum speed. No manlift designed for a speed in excess of 80 feet per minute shall be installed.

(3) Platforms or steps.

(a) Minimum depth. Steps or platforms shall be not less than 12 inches nor more than 14 inches deep, measured from the belt to the edge of the step or platform.

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(b) Width. The width of the step or platform shall be not less than the width of the belt to which it is attached.

(c) Distance between steps. The distance between steps shall be equally spaced and not less than 16 feet measured from the upper surface of one step to the upper surface of the next step above it.

(d) Angle of step. The surface of the step shall make approximately a right angle with the "up" and "down" run of the belt, and shall travel in the approximate horizontal position with the "up" and "down" run of the belt.

(e) Surfaces. The upper or working surfaces of the step shall be of a material having inherent nonslip characteristics (coefficient of friction not less than 0.5) or shall be covered completely by a nonslip tread securely fastened to it.

(f) Strength of step supports. When subjected to a load of 400 pounds applied at the approximate center of the step, step frames, or supports and their guides shall be of adequate strength to:

(i) Prevent the disengagement of any step roller.

(ii) Prevent any appreciable misalignment.

(iii) Prevent any visible deformation of the steps or its support.

(g) Prohibition of steps without handholds. No steps shall be provided unless there is a corresponding handhold above or below it meeting the requirements of WAC 296-24-90005(4). If a step is removed for repairs or permanently, the handholds immediately above and below it shall be removed before the lift is again placed in service.

(4) Handholds.

(a) Location. Handholds attached to the belt shall be provided and installed so that they are not less than 4 feet nor more than 4 feet 8 inches above the step tread. These shall be so located as to be available on the both "up" and "down" run of the belt.

(b) Size. The grab surface of the handhold shall be not less than 4 1/2 inches in width, not less than 3 inches in depth, and shall provide 2 inches of clearance from the belt. Fastenings for handholds shall be located not less than 1 inch from the edge of the belt.

(c) Strength. The handhold shall be capable of withstanding, without damage, a load of 300 pounds applied parallel to the run of the belt.

(d) Prohibition of handhold without steps. No handhold shall be provided without a corresponding step. If a handhold is removed permanently or temporarily, the corresponding step and handhold for the opposite direction of travel shall also be removed before the lift is again placed in service.

(e) Type. All handholds shall be of the closed type.

(5) Up limit stops.

(a) Requirements. Two separate automatic stop devices shall be provided to cut off the power and apply the brake when a loaded step passes the upper terminal landing. One of these shall consist of a split-rail switch mechanically operated by the step roller and located not more than 6 inches above the top terminal landing. The second automatic stop device may consist of any of the following:

(i) Any split-rail switch placed 6 inches above and on the side opposite the first limit switch.

(ii) An electronic device.

(iii) A switch actuated by a lever, rod, or plate, the latter to be placed on the "up" side of the head pulley so as to just clear a passing step.

(b) Emergency stop switch, treadle type in pit on down side. An emergency stop treadle switch shall be placed in the area below the lowest landing on the "down" side. This switch must stop the mechanism if a person should fail to get off at the lowest landing and be ejected from the step as it approaches its position to travel around the boot pulley.

(c) Manual reset location. After the manlift has been stopped by a stop device it shall be necessary to reset the automatic stop manually. The device shall be so located that a person resetting it shall have a clear view of both the "up" and "down" runs of the manlift. It shall not be possible to reset the device from any step or platform.

(d) Cut-off point. The initial limit stop device shall function so that the manlift will be stopped before the loaded step has reached a point of 24 inches above the top terminal landing.

(e) Electrical requirements.

(i) Where such switches open the main motor circuit directly they shall be of the multipole type.

(ii) Where electronic devices are used they shall be so designed and installed that failure will result in shutting off the power to the driving motor.

(iii) Where flammable vapors or dusts may be present all electrical installations shall be according to chapter 296-24 WAC Part L.

(iv) Unless of the oil-immersed type controller contacts carrying the main motor current shall be copper to carbon or equal, except where the circuit is broken at two or more points simultaneously.

(6) Emergency stop.

(a) General. An emergency stop means shall be provided.

(b) Location. This stop means shall be within easy reach of the ascending and descending runs of the belt.

(c) Operation. This stop means shall be so connected with the control lever or operating mechanism that it will cut off the power and apply the brake when pulled in the direction of travel.

(d) Rope. If rope is used, it shall be not less than three-eighths inch in diameter. Wire rope, unless marlin-covered, shall not be used.

(7) Instruction and warning signs.

(a) Instruction signs at landings or belts. Signs of conspicuous and easily read style giving instructions for the use of the manlift shall be posted at each landing or stenciled on the belt.

(i) Such signs shall be of letters not less than 1 inch in height and of a color having high contrast with the surface on which it is stenciled or painted (white or yellow on black or black on white or gray).

(ii) The instructions shall read approximately as follows:

Face the belt.

Use the handholds.

To stop-pull rope.

(b) Top floor warning sign and light.

(i) At the top floor an illuminated sign shall be displayed bearing the following wording:

"TOP FLOOR-GET OFF"

Signs shall be in block letters not less than 2 inches in height. This sign shall be located within easy view of an ascending passenger and not more than 2 feet above the top terminal landing.

(ii) In addition to the sign required by WAC 296-24-90005(7), a red warning light of not less than 40-watt rating shall be provided immediately below the upper landing terminal and so located as to shine in the passenger's face.

(c) Bottom of manlift warning signs, light and buzzer.

(i) Sign or light. A sign or light warning ~~((the))~~ any passengers ~~((he is))~~ they are approaching the bottom landing shall be posted above bottom landing in a conspicuous place. Sign or light to be similar in size to top warning light and sign noted above.

(ii) An electric buzzer. An electric buzzer shall be installed five feet above the bottom landing on the down side to warn ~~((the))~~ any riders ~~((that he is))~~ they are approaching the bottom landing and the buzzer shall be activated automatically by the weight of a load on a step.

(d) Visitor warning. A conspicuous sign having the following legend-AUTHORIZED PERSONNEL ONLY-shall be displayed at each landing. The sign shall be of block letters not less than 2 inches in height and shall be of a color offering high contrast with the background color.

**AMENDATORY SECTION** (Amending Order 73-5, filed 5/9/73 and Order 73-4, filed 5/7/73)

**WAC 296-24-90009 Periodic inspection.** (1) Frequency. All manlifts shall be inspected by a competent designated person at intervals of not more than 30 days. Limit switches shall be checked weekly. Manlifts found to be unsafe shall not be operated until properly repaired.

(2) Items covered. This periodic inspection shall cover but is not limited to the following items:

- Steps.
- Step fastenings.
- Rails.
- Rail supports and fastenings.
- Rollers and slides.
- Belt and belt tension.
- Handholds and fastenings.
- Floor landings.
- Guardrails.
- Lubrication.
- Limit switches.
- Warning signs and lights.
- Illumination.
- Drive pulley.
- Bottom (boot) pulley and clearance.
- Pulley supports.
- Motor.
- Driving mechanism.

Brake.

Electrical switches.

Vibration and misalignment.

"Skip" on up or down run when mounting step (indicating worn gears).

(3) Inspection log. A written record shall be kept of findings at each inspection. Records of inspection shall be made available to the director of labor and industries or his/her duly authorized representative.

**AMENDATORY SECTION** (Amending Order 73-5, filed 5/9/73 and Order 73-4, filed 5/7/73)

**WAC 296-24-92003 General requirements.** (1) Application.

(a) Each employer shall determine that compressed gas cylinders under ~~((his))~~ the employers control are in a safe condition to the extent that this can be determined by visual, and other inspection required by WAC 296-24-920 through 296-24-92011.

(b) The requirements contained in these standards are not intended to apply to cylinders manufactured under specification DOT (ICC)-3HT (49 CFR Ch.1). Separate requirements covering service life and standards for visual inspection of these cylinders are contained in Compressed Gas Association Pamphlet C-8, "Standard for Requalification of ICC-3HT Cylinders."

(2) Quality of inspection. Experience in the inspection of cylinders is an important factor in determining the acceptability of a given cylinder for continued service.

Note: Users lacking this experience and having doubtful cylinders should return them to a manufacturer of the same type of cylinders for reinspection.

**AMENDATORY SECTION** (Amending Order 73-5, filed 5/9/73 and Order 73-4, filed 5/7/73)

**WAC 296-24-93503 General requirements.** (1) Application. See WAC 296-24-93003(1).

(2) Specifications and tests. All safety relief devices covered by these standards shall meet the design, construction, marking, and test specifications of the "Compressed Gas Association Safety Relief Device Standards Part 2-Cargo and Portable Tanks for Compressed Gases: S-1.2-1963."

(3) Specific requirements for safety relief devices.

(a) Each container shall be provided with one or more safety relief devices which, unless otherwise specified, shall be safety relief valves of the spring-loaded type.

(b) Safety relief valves shall be set to start-to-discharge at a pressure not in excess of 110 percent of the DOT design pressure of the container nor less than the DOT design pressure of the container except as follows:

(i) If an oversized container is used, the set pressure of the safety relief valve may be between the minimum required DOT design pressure for the lading and 110 percent of the DOT design pressure of the container used.

(ii) For sulfur dioxide containers, a minimum set pressure of 120 and 110 p.s.i.g. is permitted for the 150 and 125 p.s.i.g. DOT design pressure containers, respectively.

(iii) For carbon dioxide (refrigerated), nitrous oxide (refrigerated), and pressurized liquid argon, nitrogen and oxygen, there shall be no minimum set pressure.

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(iv) For butadiene, inhibited, and liquefied petroleum gas containers, a minimum set pressure of 90 percent of the minimum design pressure permitted for these ladings may be used.

(v) For containers constructed in accord with paragraph U-68 or U-69 of the Code 1949 Edition, the set pressure marked on the safety relief valve may be 125 percent of the original DOT design pressure of the container.

(c) Only replacement parts or assemblies provided by the manufacturer of the device shall be used unless the suitability of interchange is proved by adequate tests.

(d) Safety relief valves shall have direct communication with the vapor space of the container.

(e) Any portion of liquid piping or hose which at any time may be closed at each end must be provided with a safety relief device to prevent excessive pressure.

(f) The additional restrictions of this subdivision apply to safety relief devices on containers for carbon dioxide or nitrous oxide which are shipped in refrigerated and insulated containers. The maximum operating pressure in the container may be regulated by the use of one or more pressure controlling devices, which devices shall not be in lieu of the safety relief valve required in WAC 296-24-93503 (3)(a).

(g) All safety relief devices shall be so installed and located that the cooling effect of the contents will not prevent the effective operation of the device.

(h) In addition to the safety relief valves required by WAC 296-24-93503 (3)(a) each container for carbon dioxide may be equipped with one or more frangible disc safety relief devices of suitable design set to function at a pressure not exceeding two times the DOT design pressure of the container.

(i) Subject to conditions of 49 CFR 173.315(a)(1) (DOT regulations) for methyl chloride and sulfur dioxide optional portable tanks of 225 p.s.i.g. minimum DOT design pressure, one or more fusible plugs approved by the Bureau of Explosives, (~~63 Vesey Street, New York, NY 10007~~) 50 "F" Street Northwest, Washington, D.C. 20001, may be used in lieu of safety relief valves of the spring-loaded type. If the container is over 30 inches long a safety relief device having the total required flow capacity must be at both ends.

(j) When storage containers for liquefied petroleum gas are permitted to be shipped in accordance with 49 CFR 173.315(j) (DOT regulations), they must be equipped with safety relief devices in compliance with the requirements for safety relief devices on above-ground containers as specified in the National Fire Protection Association Pamphlet No. 58-1969 "Standard for the Storage and Handling of Liquefied Petroleum Gases."

(k) When containers are filled by pumping equipment which has a discharge capacity in excess of the capacity of the container safety relief devices, and which is capable of producing pressures in excess of DOT design pressure of the container, precautions should be taken to prevent the development of pressures in the container in excess of 120 percent of its DOT design pressure. This may be done by providing additional capacity of the safety relief valves on the container, by providing a bypass on the pump discharge, or by any other suitable method.

(l) This additional requirement applies to safety relief devices on containers for liquefied hydrogen and pressurized liquid argon, nitrogen, and oxygen. The liquid container

shall be protected by one or more safety relief valves and one or more frangible discs.

(m) Safety relief devices shall be arranged to discharge unobstructed to the open air in such a manner as to prevent any impingement of escaping gas upon the container. Safety relief devices shall be arranged to discharge upward except this is not required for carbon dioxide, nitrous oxide and pressurized liquid argon, nitrogen, and oxygen.

(n) No shutoff valves shall be installed between the safety relief devices and the container except, in cases where two or more safety relief devices are installed on the same container, a shutoff valve may be used where the arrangement of the shutoff valve or valves is such as always to insure full required capacity flow through at least one safety relief device.

(4) Maintenance requirements for safety relief devices.

(a) Care shall be exercised to avoid damage to safety relief devices. Care shall also be exercised to avoid plugging by paint or other dirt accumulation of safety relief device channels or other parts which could interfere with the functioning of the device.

(b) Only qualified personnel shall be allowed to service safety relief devices. Any servicing or repairs which require resetting of safety relief valves shall be done only by or after consultation with the valve manufacturer.

(c) Safety relief devices periodically shall be examined externally for corrosion damage, plugging of external safety relief device channels, and mechanical defects such as leakage or extrusion of fusible metal. Valves equipped with secondary resilient seals shall have the seals inspected periodically. If there is any doubt regarding the suitability of the safety relief device for service the container shall not be filled until it is equipped with a suitable safety relief device.

#### AMENDATORY SECTION (Amending Order 73-5, filed 5/9/73 and Order 73-4, filed 5/7/73)

**WAC 296-24-94001 General requirements.** (1) Application. These standards apply to compressed air receivers, and other equipment used in providing and utilizing compressed air for performing operations such as cleaning, drilling, hoisting, and chipping. On the other hand, however, this section does not deal with the special problems created by using compressed air to convey materials nor the problems created when (~~men work~~) working in compressed air as in tunnels and caissons. These standards are not intended to apply to compressed air machinery and equipment used on transportation vehicles such as steam railroad cars, electric railway cars, and automotive equipment.

(2) New and existing equipment.

(a) All new air receivers installed after the effective date of these standards shall be constructed in accordance with the 1968 Edition of the A.S.M.E. Boiler and Pressure Vessel Code, section VIII.

(b) All safety valves used shall be constructed, installed, and maintained in accordance with the A.S.M.E. Boiler and Pressure Vessel Code, section VIII edition 1968.



**AMENDATORY SECTION** (Amending Order 91-07, filed 11/22/91, effective 12/24/91)

**WAC 296-24-95601 Definitions applicable to WAC 296-24-956 through 296-24-985.** Unless the context indicates otherwise, words used in this section shall have the meaning given.

(1) **Acceptable.** An installation or equipment is acceptable to the director of labor and industries, and approved within the meaning of this section:

(a) If it is accepted, or certified, or listed, or labeled, or otherwise determined to be safe by a nationally recognized testing laboratory; or

(b) With respect to an installation or equipment of a kind which no nationally recognized testing laboratory accepts, certifies, lists, labels, or determines to be safe, if it is inspected or tested by another federal agency, or by a state, municipal, or other local authority responsible for enforcing occupational safety provisions of the National Electrical Code, and found in compliance with the provisions of the National Electrical Code as applied in this section; or

(c) With respect to custom-made equipment or related installations which are designed, fabricated for, and intended for use by a particular customer, if it is determined to be safe for its intended use by its manufacturer on the basis of test data which the employer keeps and makes available for inspection to the director and his/her authorized representatives. Refer to federal regulation 29 CFR 1910.7 for definition of nationally recognized testing laboratory.

(2) **Accepted.** An installation is "accepted" if it has been inspected and found by a nationally recognized testing laboratory to conform to specified plans or to procedures of applicable codes.

(3) **Accessible.** (As applied to wiring methods.) Capable of being removed or exposed without damaging the building structure of finish, or not permanently closed in by the structure or finish of the building. (See "concealed" and "exposed.")

(4) **Accessible.** (As applied to equipment.) Admitting close approach; not guarded by locked doors, elevation, or other effective means. (See "readily accessible.")

(5) **Ampacity.** Current-carrying capacity of electric conductors expressed in amperes.

(6) **Appliances.** Utilization equipment, generally other than industrial, normally built in standardized sizes or types, which is installed or connected as a unit to perform one or more functions such as clothes washing, air conditioning, food mixing, deep frying, etc.

(7) **Approved.** Acceptable to the authority enforcing this section. The authority enforcing this section is the director of labor and industries. The definition of "acceptable" indicates what is acceptable to the director and therefore approved within the meaning of this section.

(8) **Approved for the purpose.** Approved for a specific purpose, environment, or application described in a particular standard requirement.

Suitability of equipment or materials for a specific purpose, environment or application may be determined by a nationally recognized testing laboratory, inspection agency or other organization concerned with product evaluation as part of its listing and labeling program. (See "labeled" or "listed.")

(9) **Armored cable.** Type AC armored cable is a fabricated assembly of insulated conductors in a flexible metallic enclosure.

(10) **Askarel.** A generic term for a group of nonflammable synthetic chlorinated hydrocarbons used as electrical insulating media. Askarels of various compositional types are used. Under arcing conditions the gases produced, while consisting predominantly of noncombustible hydrogen chloride, can include varying amounts of combustible gases depending upon the askarel type.

(11) **Attachment plug (plug cap) (cap).** A device which, by insertion in a receptacle, establishes connection between the conductors of the attached flexible cord and the conductors connected permanently to the receptacle.

(12) **Automatic.** Self-acting, operating by its own mechanism when actuated by some impersonal influence, as, for example, a change in current strength, pressure, temperature, or mechanical configuration.

(13) **Bare conductor, see "conductor."**

(14) **Bonding.** The permanent joining of metallic parts to form an electrically conductive path which will assure electrical continuity and the capacity to conduct safely any current likely to be imposed.

(15) **Bonding jumper.** A reliable conductor to assure the required electrical conductivity between metal parts required to be electrically connected.

(16) **Branch circuit.** The circuit conductors between the final overcurrent device protecting the circuit and the outlet(s).

(17) **Building.** A structure which stands alone or which is cut off from adjoining structures by fire walls with all openings therein protected by approved fire doors.

(18) **Cabinet.** An enclosure designed either for surface or flush mounting, and provided with a frame, mat, or trim in which a swinging door or doors are or may be hung.

(19) **Cable tray system.** A cable tray system is a unit or assembly of units or sections, and associated fittings, made of metal or other noncombustible materials forming a rigid structural system used to support cables. Cable tray systems include ladders, troughs, channels, solid bottom trays, and other similar structures.

(20) **Cablebus.** Cablebus is an approved assembly of insulated conductors with fittings and conductor terminations in a completely enclosed, ventilated, protective metal housing.

(21) **Center pivot irrigation machine.** A center pivot irrigation machine is a multimotored irrigation machine which revolves around a central pivot and employs alignment switches or similar devices to control individual motors.

(22) **Certified.** Equipment is "certified" if it (a) has been tested and found by a nationally recognized testing laboratory to meet nationally recognized standards or to be safe for use in a specified manner, or (b) is of a kind whose production is periodically inspected by a nationally recognized testing laboratory, and (c) it bears a label, tag, or other record of certification.

(23) **Circuit breaker.**

(a) **(600 volts nominal, or less.)** A device designed to open and close a circuit by nonautomatic means and to open the circuit automatically on a predetermined overcurrent

without injury to itself when properly applied within its rating.

(b) **(Over 600 volts, nominal.)** A switching device capable of making, carrying, and breaking currents under normal circuit conditions, and also making, carrying for a specified time, and breaking currents under specified abnormal circuit conditions, such as those of short circuit.

(24) **Class I locations.** Class I locations are those in which flammable gases or vapors are or may be present in the air in quantities sufficient to produce explosive or ignitable mixtures. Class I locations include the following:

(a) **Class I, Division 1.** A Class I, Division 1 location is a location:

(i) In which hazardous concentrations of flammable gases or vapors may exist under normal operating conditions; or

(ii) In which hazardous concentrations of such gases or vapors may exist frequently because of repair or maintenance operations or because of leakage; or

(iii) In which breakdown or faulty operation of equipment or processes might release hazardous concentrations of flammable gases or vapors, and might also cause simultaneous failure of electric equipment.

**Note:** This classification usually includes locations where volatile flammable liquids or liquefied flammable gases are transferred from one container to another; interiors of spray booths and areas in the vicinity of spraying and painting operations where volatile flammable solvents are used; locations containing open tanks or vats of volatile flammable liquids; drying rooms or compartments for the evaporation of flammable solvents; locations containing fat and oil extraction equipment using volatile flammable solvents; portions of cleaning and dyeing plants where flammable liquids are used; gas generator rooms and other portions of gas manufacturing plants where flammable gas may escape; inadequately ventilated pump rooms for flammable gas or for volatile flammable liquids; the interiors of refrigerators and freezers in which volatile flammable materials are stored in open, lightly stoppered, or easily ruptured containers; and all other locations where ignitable concentrations of flammable vapors or gases are likely to occur in the course of normal operations.

(b) **Class I, Division 2.** A Class I, Division 2 location is a location:

(i) In which volatile flammable liquids or flammable gases are handled, processed, or used, but in which the hazardous liquids, vapors, or gases will normally be confined within closed containers or closed systems from which they can escape only in case of accidental rupture or breakdown of such containers or systems, or in case of abnormal operation of equipment; or

(ii) In which hazardous concentrations of gases or vapors are normally prevented by positive mechanical ventilation, and which might become hazardous through failure or abnormal operations of the ventilating equipment; or

(iii) That is adjacent to a Class I, Division 1 location, and to which hazardous concentrations of gases or vapors might occasionally be communicated unless such communication is prevented by adequate positive-pressure ventilation from a source of clean air, and effective safeguards against ventilation failure are provided.

**Note:** This classification usually includes locations where volatile flammable liquids or flammable gases or vapors are used, but which would become hazardous only in case of an accident or of some unusual operating condition. The quantity of flammable material that might escape in case of accident, the adequacy of ventilating equipment, the total area involved, and the record of the industry or business with respect to explosions or fires are all factors that merit consideration in determining the classification and extent of each location.

Piping without valves, checks, meters, and similar devices would not ordinarily introduce a hazardous condition even though used for flammable liquids or gases. Locations used for the storage of flammable liquids or a liquefied or compressed gases in sealed containers would not normally be considered hazardous unless also subject to other hazardous conditions.

Electrical conduits and their associated enclosures separated from process fluids by a single seal or barrier are classed as a Division 2 location if the outside of the conduit and enclosures is a nonhazardous location.

(25) **Class II locations.** Class II locations are those that are hazardous because of the presence of combustible dust. Class II locations include the following:

(a) **Class II, Division 1.** A Class II, Division 1 location is a location:

(i) In which combustible dust is or may be in suspension in the air under normal operating conditions, in quantities sufficient to produce explosives or ignitable mixtures; or

(ii) Where mechanical failure or abnormal operation of machinery or equipment might cause such explosive or ignitable mixtures to be produced, and might also provide a source of ignition through simultaneous failure of electric equipment, operation of protection devices, or from other causes; or

(iii) In which combustible dusts of an electrically conductive nature may be present.

**Note:** This classification may include areas of grain handling and processing plants, starch plants, sugar-pulverizing plants, malting plants, hay-grinding plants, coal pulverizing plants, areas where metal dusts and powders are produced or processed, and other similar locations which contain dust producing machinery and equipment (except where the equipment is dust-tight or vented to the outside). These areas would have combustible dust in the air, under normal operating conditions, in quantities sufficient to produce explosive or ignitable mixtures. Combustible dusts which are electrically nonconductive include dusts produced in the handling and processing of grain and grain products, pulverized sugar and cocoa, dried egg and milk powders, pulverized spices, starch and pastes, potato and woodflour, oil meal from beans and seed, dried hay, and other organic materials which may produce combustible dusts when processed or handled. Dusts containing magnesium or aluminum are particularly hazardous and the use of extreme caution is necessary to avoid ignition and explosion.

(b) **Class II, Division 2.** A Class II, Division 2 location is a location in which:

(i) Combustible dust will not normally be in suspension in the air in quantities sufficient to produce explosive or ignitable mixtures; and dust accumulations are normally insufficient to interfere with the normal operation of electrical equipment or other apparatus; or

(ii) Dust may be in suspension in the air as a result of infrequent malfunctioning of handling or processing equipment, and dust accumulations resulting therefrom may be

ignitable by abnormal operation or failure of electrical equipment or other apparatus.

**Note:** This classification includes locations where dangerous concentrations of suspended dust would not be likely but where dust accumulations might form on or in the vicinity of electric equipment. These areas may contain equipment from which appreciable quantities of dust would escape under abnormal operating conditions or be adjacent to a Class II Division 1 location, as described above, into which an explosive or ignitable concentration of dust may be put into suspension under abnormal operating conditions.

(26) **Class III locations.** Class III locations are those that are hazardous because of the presence of easily ignitable fibers or flyings but in which such fibers or flyings are not likely to be in suspension in the air in quantities sufficient to produce ignitable mixtures. Class III locations include the following:

(a) **Class III, Division 1.** A Class III, Division 1 location is a location in which easily ignitable fibers or materials producing combustible flyings are handled, manufactured, or used.

**Note:** Such locations usually include some parts of rayon, cotton, and other textile mills; combustible fiber manufacturing and processing plants; cotton gins and cottonseed mills; flax-processing plants; clothing manufacturing plants; woodworking plants, and establishments; and industries involving similar hazardous processes or conditions.

Easily ignitable fibers and flyings include rayon, cotton (including cotton linters and cotton waste), sisal or henequen, istle, jute, hemp, tow, cocoa fiber, oakum, baled waste kapok, Spanish moss, excelsior, and other materials of similar nature.

(b) **Class III, Division 2.** A Class III, Division 2 location is a location in which easily ignitable fibers are stored or handled, except in process of manufacture.

(27) **Collector ring.** A collector ring is an assembly of slip rings for transferring electrical energy from a stationary to a rotating member.

(28) **Concealed.** Rendered inaccessible by the structure or finish of the building. Wires in concealed raceways are considered concealed, even though they may become accessible by withdrawing them. (See "accessible. (As applied to wiring methods.))")

(29) **Conductor.**

(a) **Bare.** A conductor having no covering or electrical insulation whatsoever.

(b) **Covered.** A conductor encased within material of composition or thickness that is not recognized as electrical insulation.

(c) **Insulated.** A conductor encased within material of composition and thickness that is recognized as electrical insulation.

(30) **Conduit body.** A separate portion of a conduit or tubing system that provides access through a removable cover(s) to the interior of the system at a junction of two or more sections of the system or at a terminal point of the system. Boxes such as FS and FD or larger cast or sheet metal boxes are not classified as conduit bodies.

(31) **Controller.** A device or group of devices that serves to govern, in some predetermined manner, the electric power delivered to the apparatus to which it is connected.

(32) **Cooking unit, counter-mounted.** A cooking appliance designed for mounting in or on a counter and

consisting of one or more heating elements, internal wiring, and built-in or separately mountable controls. (See "oven, wall-mounted.")

(33) **Covered conductor.** See "conductor."

(34) **Cutout.** (Over 600 volts, nominal.) An assembly of a fuse support with either a fuseholder, fuse carrier, or disconnecting blade. The fuseholder or fuse carrier may include a conducting element (fuse link), or may act as the disconnecting blade by the inclusion of a nonfusible member.

(35) **Cutout box.** An enclosure designed for surface mounting and having swinging doors or covers secured directly to and telescoping with the walls of the box proper. (See "cabinet.")

(36) **Damp location.** See "location."

(37) **Dead front.** Without live parts exposed to a person on the operating side of the equipment.

(38) **Device.** A unit of an electrical system which is intended to carry but not utilize electric energy.

(39) **Dielectric heating.** Dielectric heating is the heating of a nominally insulating material due to its own dielectric losses when the material is placed in a varying electric field.

(40) **Disconnecting means.** A device, or group of devices, or other means by which the conductors of a circuit can be disconnected from their source of supply.

(41) **Disconnecting (or isolating) switch.** (Over 600 volts, nominal.) A mechanical switching device used for isolating a circuit or equipment from a source of power.

(42) **Dry location.** See "location."

(43) **Electric sign.** A fixed, stationary, or portable self-contained, electrically illuminated utilization equipment with words or symbols designed to convey information or attract attention.

(44) **Enclosed.** Surrounded by a case, housing, fence or walls which will prevent persons from accidentally contacting energized parts.

(45) **Enclosure.** The case or housing of apparatus, or the fence or walls surrounding an installation to prevent personnel from accidentally contacting energized parts, or to protect the equipment from physical damage.

(46) **Equipment.** A general term including material, fittings, devices, appliances, fixtures, apparatus, and the like, used as a part of, or in connection with, an electrical installation.

(47) **Equipment grounding conductor.** See "grounding conductor, equipment."

(48) **Explosion-proof apparatus.** Apparatus enclosed in a case that is capable of withstanding an explosion of a specified gas or vapor which may occur within it and of preventing the ignition of a specified gas or vapor surrounding the enclosure by sparks, flashes, or explosion of the gas or vapor within, and which operates at such an external temperature that it will not ignite a surrounding flammable atmosphere.

(49) **Exposed.** (As applied to live parts.) Capable of being inadvertently touched or approached nearer than a safe distance by a person. It is applied to parts not suitably guarded, isolated, or insulated. (See "accessible" and "concealed.")

(50) **Exposed.** (As applied to wiring methods.) On or attached to the surface or behind panels designed to allow access. (See "accessible. (As applied to wiring methods.)")

(51) **Exposed.** (For the purpose of WAC 296-24-95615(5), communications systems.) Where the circuit is in such a position that in case of failure of supports or insulation, contact with another circuit may result.

(52) **Externally operable.** Capable of being operated without exposing the operator to contact with live parts.

(53) **Feeder.** All circuit conductors between the service equipment, or the generator switchboard of an isolated plant, and the final branch-circuit overcurrent device.

(54) **Fitting.** An accessory such as a locknut, bushing, or other part of a wiring system that is intended primarily to perform a mechanical rather than an electrical function.

(55) **Fuse.** (Over 600 volts, nominal.) An overcurrent protective device with a circuit opening fusible part that is heated and severed by the passage of overcurrent through it. A fuse comprises all the parts that form a unit capable of performing the prescribed functions. It may or may not be the complete device necessary to connect it into an electrical circuit.

(56) **Ground.** A conducting connection, whether intentional or accidental, between an electrical circuit or equipment and the earth, or to some conducting body that serves in place of the earth.

(57) **Grounded.** Connected to earth or to some conducting body that serves in place of the earth.

(58) **Grounded, effectively.** (Over 600 volts, nominal.) Permanently connected to earth through a ground connection of sufficiently low impedance and having sufficient ampacity that ground fault current which may occur cannot build up to voltages dangerous to personnel.

(59) **Grounded conductor.** A system or circuit conductor that is intentionally grounded.

(60) **Grounding conductor.** A conductor used to connect equipment or the grounded circuit of a wiring system to a grounding electrode or electrodes.

(61) **Grounding conductor, equipment.** The conductor used to connect the noncurrent-carrying metal parts of equipment, raceways, and other enclosures to the system grounded conductor and/or the grounding electrode conductor at the service equipment or at the source of a separately derived system.

(62) **Grounding electrode conductor.** The conductor used to connect the grounding electrode to the equipment grounding conductor and/or the grounded conductor of the circuit at the service equipment or at the source of a separately derived system.

(63) **Ground-fault circuit-interrupter.** A device whose function is to interrupt the electric circuit to the load when a fault current to ground exceeds some predetermined value that is less than that required to operate the overcurrent protective device of the supply circuit.

(64) **Guarded.** Covered, shielded, fenced, enclosed, or otherwise protected by means of suitable covers, casings, barriers, rails, screens, mats, or platforms to remove the likelihood of approach to a point of danger or contact by persons or objects.

(65) **Health care facilities.** Buildings or portions of buildings and mobile homes that contain, but are not limited

to, hospitals, nursing homes, extended care facilities, clinics, and medical and dental offices, whether fixed or mobile.

(66) **Heating equipment.** For the purposes of WAC 296-24-95611(7), the term "heating equipment" includes any equipment used for heating purposes if heat is generated by induction or dielectric methods.

(67) **Hoistway.** Any shaftway, hatchway, well hole, or other vertical opening or space in which an elevator or dumbwaiter is designed to operate.

(68) **Identified.** Identified, as used in reference to a conductor or its terminal, means that such conductor or terminal can be readily recognized as grounded.

(69) **Induction heating.** Induction heating is the heating of a nominally conductive material due to its own I<sup>2</sup>R losses when the material is placed in a varying electromagnetic field.

(70) **Insulated conductor.** See "conductor."

(71) **Interrupter switch.** (Over 600 volts, nominal.) A switch capable of making, carrying, and interrupting specified currents.

(72) **Irrigation machine.** An irrigation machine is an electrically driven or controlled machine, with one or more motors, not hand portable, and used primarily to transport and distribute water for agricultural purposes.

(73) **Isolated.** Not readily accessible to persons unless special means for access are used.

(74) **Isolated power system.** A system comprising an isolating transformer or its equivalent, a line isolation monitor, and its ungrounded circuit conductors.

(75) **Labeled.** Equipment is "labeled" if there is attached to it a label, symbol, or other identifying mark of a nationally recognized testing laboratory which, (a) makes periodic inspections of the production of such equipment, and (b) whose labeling indicates compliance with nationally recognized standards or tests to determine safe use in a specified manner.

(76) **Lighting outlet.** An outlet intended for the direct connection of a lampholder, a lighting fixture, or a pendant cord terminating in a lampholder.

(77) **Line-clearance tree trimming.** The pruning, trimming, repairing, maintaining, removing, or clearing of trees or cutting of brush that is within 10 feet of electric supply lines and equipment.

(78) **Listed.** Equipment is "listed" if it is of a kind mentioned in a list which, (a) is published by a nationally recognized laboratory which makes periodic inspection of the production of such equipment, and (b) states such equipment meets nationally recognized standards or has been tested and found safe for use in a specified manner.

(79) **Location.**

(a) **Damp location.** Partially protected locations under canopies, marquees, roofed open porches, and like locations, and interior locations subject to moderate degrees of moisture, such as some basements, some barns, and some cold-storage warehouses.

(b) **Dry location.** A location not normally subject to dampness or wetness. A location classified as dry may be temporarily subject to dampness or wetness, as in the case of a building under construction.

(c) **Wet location.** Installations underground or in concrete slabs or masonry in direct contact with the earth, and locations subject to saturation with water or other

liquids, such as vehicle-washing areas, and locations exposed to weather and unprotected.

(80) **Medium voltage cable.** Type MV medium voltage cable is a single or multiconductor solid dielectric insulated cable rated 2000 volts or higher.

(81) **Metal-clad cable.** Type MC cable is a factory assembly of one or more conductors, each individually insulated and enclosed in a metallic sheath of interlocking tape, or a smooth or corrugated tube.

(82) **Mineral-insulated metal-sheathed cable.** Type MI mineral-insulated metal-sheathed cable is a factory assembly of one or more conductors insulated with a highly compressed refractory mineral insulation and enclosed in a liquidtight and gastight continuous copper sheath.

(83) **Mobile x-ray.** X-ray equipment mounted on a permanent base with wheels and/or casters for moving while completely assembled.

(84) **Nonmetallic-sheathed cable.** Nonmetallic-sheathed cable is a factory assembly of two or more insulated conductors having an outer sheath of moisture resistant, flame-retardant, nonmetallic material. Nonmetallic sheathed cable is manufactured in the following types:

(a) **Type NM.** The overall covering has a flame-retardant and moisture-resistant finish.

(b) **Type NMC.** The overall covering is flame-retardant, moisture-resistant, fungus-resistant, and corrosion-resistant.

(85) **Oil (filled) cutout.** (Over 600 volts, nominal.) A cutout in which all or part of the fuse support and its fuse link or disconnecting blade are mounted in oil with complete immersion of the contacts and the fusible portion of the conducting element (fuse link), so that arc interruption by severing of the fuse link or by opening of the contacts will occur under oil.

(86) **Open wiring on insulators.** Open wiring on insulators is an exposed wiring method using cleats, knobs, tubes, and flexible tubing for the protection and support of single insulated conductors run in or on buildings, and not concealed by the building structure.

(87) **Outlet.** A point on the wiring system at which current is taken to supply utilization equipment.

(88) **Outline lighting.** An arrangement of incandescent lamps or electric discharge tubing to outline or call attention to certain features such as the shape of a building or the decoration of a window.

(89) **Oven, wall-mounted.** An oven for cooking purposes designed for mounting in or on a wall or other surface and consisting of one or more heating elements, internal wiring, and built-in or separately mountable controls. (See "cooking unit, counter-mounted.")

(90) **Overcurrent.** Any current in excess of the rated current of equipment or the ampacity of a conductor. It may result from overload (see definition), short circuit, or ground fault. A current in excess of rating may be accommodated by certain equipment and conductors for a given set of conditions. Hence the rules for overcurrent protection are specific for particular situations.

(91) **Overload.** Operation of equipment in excess of normal, full load rating, or of a conductor in excess of rated ampacity which, when it persists for a sufficient length of time, would cause damage or dangerous overheating. A

fault, such as a short circuit or ground fault, is not an overload. (See "overcurrent.")

(92) **Panelboard.** A single panel or group of panel units designed for assembly in the form of a single panel; including buses, automatic overcurrent devices, and with or without switches for the control of light, heat, or power circuits; designed to be placed in a cabinet or cutout box placed in or against a wall or partition and accessible only from the front. (See "switchboard.")

(93) **Permanently installed decorative fountains and reflection pools.** Those that are constructed in the ground, on the ground, or in a building in such a manner that the pool cannot be readily disassembled for storage and are served by electrical circuits of any nature. These units are primarily constructed for their aesthetic value and not intended for swimming or wading.

(94) **Permanently installed swimming pools, wading and therapeutic pools.** Those that are constructed in the ground, on the ground, or in a building in such a manner that the pool cannot be readily disassembled for storage whether or not served by electrical circuits of any nature.

(95) **Portable x-ray.** X-ray equipment designed to be hand-carried.

(96) **Power and control tray cable.** Type TC power and control tray cable is a factory assembly of two or more insulated conductors, with or without associated bare or covered grounding conductors under a nonmetallic sheath, approved for installation in cable trays, in raceways, or where supported by a messenger wire.

(97) **Power fuse.** (Over 600 volts, nominal.) See "fuse."

(98) **Power-limited tray cable.** Type PLTC nonmetallic-sheathed power limited tray cable is a factory assembly of two or more insulated conductors under a nonmetallic jacket.

(99) **Power outlet.** An enclosed assembly which may include receptacles, circuit breakers, fuseholders, fused switches, buses and watt-hour meter mounting means; intended to supply and control power to mobile homes, recreational vehicles or boats, or to serve as a means for distributing power required to operate mobile or temporarily installed equipment.

(100) **Premises wiring system.** That interior and exterior wiring, including power, lighting, control, and signal circuit wiring together with all of its associated hardware, fittings, and wiring devices, both permanently and temporarily installed, which extends from the load end of the service drop, or load end of the service lateral conductors to the outlet(s). Such wiring does not include wiring internal to appliances, fixtures, motors, controllers, motor control centers, and similar equipment.

(101) **Qualified person.** One familiar with the construction and operation of the equipment and the hazards involved.

Note 1: Whether an employee is considered to be a "qualified person" will depend upon various circumstances in the workplace. It is possible and, in fact, likely for an individual to be considered "qualified" with regard to certain equipment in the workplace, but "unqualified" as to other equipment. (See WAC 296-24-970 for training requirements that specifically apply to qualified persons.)

Note 2: An employee who is undergoing on-the-job training and who, in the course of such training, has demonstrated an ability to perform duties safely at his or her level of training and who is under the direct supervision of a qualified person is considered to be a qualified person for the performance of those duties.

(102) **Raceway.** A channel designed expressly for holding wires, cables, or busbars, with additional functions as permitted in this ((subpart)) part. Raceways may be of metal or insulating material, and the term includes rigid metal conduit, rigid nonmetallic conduit, intermediate metal conduit, liquidtight flexible metal conduit, flexible metallic tubing, flexible metal conduit, electrical metallic tubing, underfloor raceways, cellular concrete floor raceways, cellular metal floor raceways, surface raceways, wireways, and busways.

(103) **Readily accessible.** Capable of being reached quickly for operation, renewal, or inspections, without requiring those to whom ready access is requisite to climb over or remove obstacles or to resort to portable ladders, chairs, etc. (See "accessible.")

(104) **Receptacle.** A receptacle is a contact device installed at the outlet for the connection of a single attachment plug. A single receptacle is a single contact device with no other contact device on the same yoke. A multiple receptacle is a single device containing two or more receptacles.

(105) **Receptacle outlet.** An outlet where one or more receptacles are installed.

(106) **Remote-control circuit.** Any electric circuit that controls any other circuit through a relay or an equivalent device.

(107) **Sealable equipment.** Equipment enclosed in a case or cabinet that is provided with a means of sealing or locking so that live parts cannot be made accessible without opening the enclosure. The equipment may or may not be operable without opening the enclosure.

(108) **Separately derived system.** A premises wiring system whose power is derived from generator, transformer, or converter winding and has no direct electrical connection, including a solidly connected grounded circuit conductor, to supply conductors originating in another system.

(109) **Service.** The conductors and equipment for delivering energy from the electricity supply system to the wiring system of the premises served.

(110) **Service cable.** Service conductors made up in the form of a cable.

(111) **Service conductors.** The supply conductors that extend from the street main or from transformers to the service equipment of the premises supplied.

(112) **Service drop.** The overhead service conductors from the last pole or other aerial support to and including the splices, if any, connecting to the service-entrance conductors at the building or other structure.

(113) **Service-entrance cable.** Service-entrance cable is a single conductor or multiconductor assembly provided with or without an overall covering, primarily used for services and of the following types:

(a) *Type SE*, having a flame-retardant, moisture-resistant covering, but not required to have inherent protection against mechanical abuse.

(b) *Type USE*, recognized for underground use, having a moisture-resistant covering, but not required to have a flame-retardant covering or inherent protection against mechanical abuse. Single-conductor cables having an insulation specifically approved for the purpose do not require an outer covering.

(114) **Service-entrance conductors, overhead system.** The service conductors between the terminals of the service equipment and a point usually outside the building, clear of building walls, where joined by tap or splice to the service drop.

(115) **Service entrance conductors, underground system.** The service conductors between the terminals of the service equipment and the point of connection to the service lateral. Where service equipment is located outside the building walls, there may be no service-entrance conductors, or they may be entirely outside the building.

(116) **Service equipment.** The necessary equipment, usually consisting of a circuit breaker or switch and fuses, and their accessories, located near the point of entrance of supply conductors to a building or other structure, or an otherwise defined area, and intended to constitute the main control and means of cutoff of the supply.

(117) **Service raceway.** The raceway that encloses the service-entrance conductors.

(118) **Shielded nonmetallic-sheathed cable.** Type SNM, shielded nonmetallic-sheathed cable is a factory assembly of two or more insulated conductors in an extruded core of moisture-resistant, flame-resistant nonmetallic material, covered with an overlapping spiral metal tape and wire shield and jacketed with an extruded moisture-resistant, flame-resistant, oil-resistant, corrosion-resistant, fungus-resistant, and sunlight-resistant nonmetallic material.

(119) **Show window.** Any window used or designed to be used for the display of goods or advertising material, whether it is fully or partly enclosed or entirely open at the rear and whether or not it has a platform raised higher than the street floor level.

(120) **Sign.** See "electric sign."

(121) **Signaling circuit.** Any electric circuit that energizes signaling equipment.

(122) **Special permission.** The written consent of the authority having jurisdiction.

(123) **Storable swimming or wading pool.** A pool with a maximum dimension of fifteen feet and a maximum wall height of three feet and is so constructed that it may be readily disassembled for storage and reassembled to its original integrity.

(124) **Switchboard.** A large single panel, frame, or assembly of panels which have switches, buses, instruments, overcurrent and other protective devices mounted on the face or back or both. Switchboards are generally accessible from the rear as well as from the front and are not intended to be installed in cabinets. (See "panelboard.")

(125) **Switches.**

(a) **General-use switch.** A switch intended for use in general distribution and branch circuits. It is rated in amperes, and it is capable of interrupting its rated current at its rated voltage.

(b) **General-use snap switch.** A form of general-use switch so constructed that it can be installed in flush device

boxes or on outlet box covers, or otherwise used in conjunction with wiring systems recognized by this ((subpart)) part.

(c) **Isolating switch.** A switch intended for isolating an electric circuit from the source of power. It has no interrupting rating, and it is intended to be operated only after the circuit has been opened by some other means.

(d) **Motor-circuit switch.** A switch, rated in horsepower, capable of interrupting the maximum operating overload current of a motor of the same horsepower rating as the switch at the rated voltage.

(126) **Switching devices.** (Over 600 volts, nominal.) Devices designed to close and/or open one or more electric circuits. Included in this category are circuit breakers, cutouts, disconnecting (or isolating) switches, disconnecting means, interrupter switches, and oil (filled) cutouts.

(127) **Transportable x-ray.** X-ray equipment installed in a vehicle or that may readily be disassembled for transport in a vehicle.

(128) **Utilization equipment.** Utilization equipment means equipment which utilizes electric energy for mechanical, chemical, heating, lighting, or similar useful purpose.

(129) **Utilization system.** A utilization system is a system which provides electric power and light for employee workplaces, and includes the premises wiring system and utilization equipment.

(130) **Ventilated.** Provided with a means to permit circulation of air sufficient to remove an excess of heat, fumes, or vapors.

(131) **Volatile flammable liquid.** A flammable liquid having a flash point below 38 degrees C (100 degrees F) or whose temperature is above its flash point.

(132) **Voltage (of a circuit).** The greatest root-mean-square (effective) difference of potential between any two conductors of the circuit concerned.

(133) **Voltage, nominal.** A nominal value assigned to a circuit or system for the purpose of conveniently designating its voltage class (as 120/240, 480Y/277, 600, etc.). The actual voltage at which a circuit operates can vary from the nominal within a range that permits satisfactory operation of equipment.

(134) **Voltage to ground.** For grounded circuits, the voltage between the given conductor and that point or conductor of the circuit that is grounded; for undergrounded circuits, the greatest voltage between the given conductor and any other conductor of the circuit.

(135) **Watertight.** So constructed that moisture will not enter the enclosure.

(136) **Weatherproof.** So constructed or protected that exposure to the weather will not interfere with successful operation. Rainproof, raintight, or watertight equipment can fulfill the requirements for weatherproof where varying weather conditions other than wetness, such as snow, ice, dust, or temperature extremes, are not a factor.

(137) **Wet location.** See "location."

(138) **Wireways.** Wireways are sheet-metal troughs with hinged or removable covers for housing and protecting electric wires and cable and in which conductors are laid in place after the wireway has been installed as a complete system.

AMENDATORY SECTION (Amending Order 87-24, filed 11/30/87)

**WAC 296-24-95605 General requirements.** (1) **Approval.** The conductors and equipment required or permitted by this section shall be acceptable only if approved.

(2) **Examination, installation, and use of equipment.**

(a) **Examination.** Electrical equipment shall be free from recognized hazards that are likely to cause death or serious physical harm to employees. Safety of equipment shall be determined using the following considerations:

(i) Suitability for installation and use in conformity with the provisions of this ((subpart)) part. Suitability of equipment for an identified purpose may be evidenced by listing or labeling for that identified purpose.

(ii) Mechanical strength and durability, including, for parts designed to enclose and protect other equipment, the adequacy of the protection thus provided.

(iii) Electrical insulation.

(iv) Heating effects under conditions of use.

(v) Arcing effects.

(vi) Classification by type, size, voltage, current capacity, specific use.

(vii) Other factors which contribute to the practical safeguarding of employees using or likely to come in contact with the equipment.

(b) **Installation and use.** Listed or labeled equipment shall be used or installed in accordance with any instructions included in the listing or labeling.

(3) **Splices.** Conductors shall be spliced or joined with splicing devices suitable for the use or by brazing, welding, or soldering with a fusible metal or alloy. Soldered splices shall first be so spliced or joined as to be mechanically and electrically secure without solder and then soldered. All splices and joints and the free ends of conductors shall be covered with an insulation equivalent to that of the conductors or with an insulating device suitable for the purpose.

(4) **Arcing parts.** Parts of electric equipment which in ordinary operation produce arcs, sparks, flames, or molten metal shall be enclosed or separated and isolated from all combustible material.

(5) **Marking.** Electrical equipment may not be used unless the manufacturer's name, trademark, or other descriptive marking by which the organization responsible for the product may be identified is placed on the equipment. Other markings shall be provided giving voltage, current, wattage, or other ratings as necessary. The marking shall be of sufficient durability to withstand the environment involved.

(6) **Identification of disconnecting means and circuits.** Each disconnecting means required by this ((subpart)) part for motors and appliances shall be legibly marked to indicate its purpose, unless located and arranged so the purpose is evident. Each service, feeder, and branch circuit, at its disconnecting means or overcurrent device, shall be legibly marked to indicate its purpose, unless located and arranged so the purpose is evident. These markings shall be of sufficient durability to withstand the environment involved.

(7) **600 volts, nominal, or less.**

(a) **Working space about electric equipment.** Sufficient access and working space shall be provided and



maintained about all electric equipment to permit ready and safe operation and maintenance of such equipment.

(i) **Working clearances.** Except as required or permitted elsewhere in this chapter, the dimension of the working space in the direction of access to live parts operating at 600 volts or less and likely to require examination, adjustment, servicing, or maintenance while alive may not be less than indicated in Table S-1. In addition to the dimensions shown in Table S-1, workspace may not be less than 30 inches wide in front of the electric equipment. Distances shall be measured from the live parts if they are exposed, or from the enclosure front or opening if the live parts are enclosed. Concrete, brick, or tile walls are considered to be grounded. Working space is not required in back of assemblies such as dead-front switchboards or motor control centers where there are no renewable or adjustable parts such as fuses or switches on the back and where all connections are accessible from locations other than the back.

TABLE S-1—Working clearances

Nominal voltage to ground	Minimum clear distance for condition <sup>2</sup> (ft)		
	(a)	(b)	(c)
0-150 .....	1 3/4	1 3/4	3
151-600 .....	1 3/4	3 1/2	4

<sup>1</sup> Minimum clear distances may be 2 feet 6 inches for installations built prior to effective date of this section.

<sup>2</sup> Conditions (a), (b), (c), are as follows: (a) Exposed live parts on one side and no live or grounded parts on the other side of the working space, or exposed live parts on both sides effectively guarded by suitable wood or other insulating material. Insulated wire or insulated busbars operating at not over 300 volts are not considered live parts. (b) Exposed live parts on one side and grounded parts on the other side (c) Exposed live parts on both sides of the workspace (not guarded as provided in condition (a)) with the operator between.

(ii) **Clear spaces.** Working space required by this ((subpart)) part may not be used for storage. When normally enclosed live parts are exposed for inspection or servicing, the working space, if in a passageway or general open space, shall be suitably guarded.

(iii) **Access and entrance to working space.** At least one entrance of sufficient area shall be provided to give access to the working space about electric equipment.

(iv) **Front working space.** Where there are live parts normally exposed on the front of switchboards or motor control centers, the working space in front of such equipment may not be less than 3 feet.

(v) **Illumination.** Illumination shall be provided for all working spaces about service equipment, switchboards, panelboards, and motor control centers installed indoors.

(vi) **Headroom.** The minimum headroom of working spaces about service equipment, switchboards, panelboards, or motor control centers shall be 6 feet 3 inches.

Note: As used in this section, a motor control center is an assembly of one or more enclosed sections having a common power bus and principally containing motor control units.

(b) **Guarding of live parts.**

(i) Except as required or permitted elsewhere in this section, live parts of electric equipment operating at 50 volts

or more shall be guarded against accidental contact by approved cabinets or other forms of approved enclosures, or by any of the following means:

(A) By location in a room, vault, or similar enclosure that is accessible only to qualified persons.

(B) By suitable permanent, substantial partitions or screens so arranged that only qualified persons will have access to the space within reach of the live parts. Any openings in such partitions or screens shall be so sized and located that persons are not likely to come into accidental contact with live parts or to bring conducting objects into contact with them.

(C) By location on a suitable balcony, gallery, or platform so elevated and arranged as to exclude unqualified persons.

(D) By elevation of 8 feet or more above the floor or other working surface.

(ii) In locations where electric equipment would be exposed to physical damage, enclosures or guards shall be so arranged and of such strength as to prevent such damage.

(iii) Entrances to rooms and other guarded locations containing exposed live parts shall be marked with conspicuous warning signs forbidding unqualified persons to enter.

(8) **Over 600 volts, nominal.**

(a) **General.** Conductors and equipment used on circuits exceeding 600 volts, nominal, shall comply with all applicable provisions of subsections (1) through (7) of this section and with the following provisions which supplement or modify those requirements. The provisions of (b), (c) and (d) of this subsection do not apply to equipment on the supply side of the service conductors.

(b) **Enclosure for electrical installations.** Electrical installations in a vault, room, closet or in an area surrounded by a wall, screen, or fence, access to which is controlled by lock and key or other approved means, are considered to be accessible to qualified persons only. A wall, screen, or fence less than 8 feet in height is not considered to prevent access unless it has other features that provide a degree of isolation equivalent to an 8 foot fence. The entrances to all buildings, rooms, or enclosures containing exposed live parts or exposed conductors operating at over 600 volts, nominal, shall be kept locked or shall be under the observation of a qualified person at all times.

(i) **Installations accessible to qualified persons only.** Electrical installations having exposed live parts shall be accessible to qualified persons only and shall comply with the applicable provisions of (c) of this subsection.

(ii) **Installations accessible to unqualified persons.** Electrical installations that are open to unqualified persons shall be made with metal-enclosed equipment or shall be enclosed in a vault or in an area, access to which is controlled by a lock. If metal-enclosed equipment is installed so that the bottom of the enclosure is less than 8 feet above the floor, the door or cover shall be kept locked. Metal-enclosed switchgear, unit substations, transformers, pull boxes, connection boxes, and other similar associated equipment shall be marked with appropriate caution signs. If equipment is exposed to physical damage from vehicular traffic, suitable guards shall be provided to prevent such damage. Ventilating or similar openings in metal-enclosed equipment shall be designed so that foreign objects inserted

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through these openings will be deflected from energized parts.

(c) **Workspace about equipment.** Sufficient space shall be provided and maintained about electric equipment to permit ready and safe operation and maintenance of such equipment. Where energized parts are exposed, the minimum clear workspace may not be less than 6 feet 6 inches high (measured vertically from the floor or platform), or less than 3 feet wide (measured parallel to the equipment). The depth shall be as required in Table S-2. The workspace shall be adequate to permit at least a 90-degree opening of doors or hinged panels.

(i) **Working space.** The minimum clear working space in front of electric equipment such as switchboards, control panels, switches, circuit breakers, motor controllers, relays, and similar equipment may not be less than specified in Table S-2 unless otherwise specified in this ((subpart)) part. Distances shall be measured from the live parts if they are exposed, or from the enclosure front or opening if the live parts are enclosed. However, working space is not required in back of equipment such as deadfront switchboards or control assemblies where there are no renewable or adjustable parts (such as fuses or switches) on the back and where all connections are accessible from locations other than the back. Where rear access is required to work on deenergized parts on the back of enclosed equipment, a minimum working space of 30 inches horizontally shall be provided.

TABLE S-2—Minimum Depth of Clear Working Space in Front of Electric Equipment

Nominal voltage to ground	Conditions <sup>2</sup> (ft)		
	(a)	(b)	(c)
601 to 2,500	3	4	5
2,501 to 9,000	4	5	6
9,001 to 25,000	5	6	9
25,001 to 75kV <sup>1</sup>	6	8	10
Above 75kV <sup>1</sup>	8	10	12

<sup>1</sup> Minimum depth of clear working space in front of electric equipment with a nominal voltage to ground above 25,000 volts may be the same as for 25,000 volts under conditions (a), (b) and (c) for installations built prior to April 16, 1981. (2) Conditions (a), (b) and (c) are as follows: (a) Exposed live parts on one side and no live or grounded parts on the other side of the working space, or exposed live parts on both sides effectively guarded by suitable wood or other insulating materials. Insulated wire or insulated busbars operating at not over 300 volts are not considered live parts. (b) Exposed live parts on one side and grounded parts on the other side. Concrete, brick, or tile walls will be considered as grounded surfaces. (c) Exposed live parts on both sides of the workspace not guarded as provided in condition (a) with the operator between.

(ii) **Illumination.** Adequate illumination shall be provided for all working spaces about electric equipment. The lighting outlets shall be so arranged that persons changing lamps or making repairs on the lighting system will not be endangered by live parts or other equipment. The points of control shall be so located that persons are not likely to come in contact with any live part or moving part of the equipment while turning on the lights.

(iii) **Elevation of unguarded live parts.** Unguarded live parts above working space shall be maintained at elevations not less than specified in Table S-3.

TABLE S-3—Elevation of Unguarded Energized Parts Above Working Space

Nominal voltage between phases	Minimum elevation
601 to 7,500	*8 feet 6 inches.
7,501 to 35,000	9 feet.
Over 35kV	9 feet + 0.37 inches per kV above 35kV.

Note: Minimum elevation may be 8 feet 0 inches for installations built prior to April 16, 1981, if the nominal voltage between phases is in the range of 601-6600 volts.

(d) **Entrance and access to workspace.** (See WAC 296-24-95603 (2)(c).)

(i) At least one entrance not less than 24 inches wide and 6 feet 6 inches high shall be provided to give access to the working space about electric equipment. On switchboard and control panels exceeding 48 inches in width, there shall be one entrance at each end of such board where practicable. Where bare energized parts at any voltage or insulated energized parts above 600 volts are located adjacent to such entrance, they shall be suitably guarded.

(ii) Permanent ladders or stairways shall be provided to give safe access to the working space around electric equipment installed on platforms, balconies, mezzanine floors, or in attic or roof rooms or spaces.

**AMENDATORY SECTION** (Amending Order 87-24, filed 11/30/87)

**WAC 296-24-95609 Wiring methods, components, and equipment for general use.** (1) **Wiring methods.** The provisions of this section do not apply to the conductors that are an integral part of factory-assembled equipment.

(a) **General requirements.**

(i) **Electrical continuity of metal raceways and enclosures.** Metal raceways, cable armor, and other metal enclosures for conductors shall be metallicity joined together into a continuous electric conductor and shall be so connected to all boxes, fittings, and cabinets as to provide effective electrical continuity.

(ii) **Wiring in ducts.** No wiring systems of any type shall be installed in ducts used to transport dust, loose stock or flammable vapors. No wiring system of any type may be installed in any duct used for vapor removal or for ventilation of commercial-type cooking equipment, or in any shaft containing only such ducts.

(b) **Temporary wiring.** Temporary electrical power and lighting wiring methods may be of a class less than would be required for a permanent installation. Except as specifically modified in this ((paragraph)) section, all other requirements of this ((subpart)) part for permanent wiring shall apply to temporary wiring installations.

(i) **Uses permitted, 600 volts, nominal or less.** Temporary electrical power and lighting installations 600 volts, nominal, or less may be used only:

(A) During and for remodeling, maintenance, repair, or demolition of buildings, structures, or equipment, and similar activities;

(B) For experimental or development work; and

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(C) For a period not to exceed 90 days for Christmas decorative lighting, carnivals, and similar purposes.

(ii) **Uses permitted, over 600 volts, nominal.** Temporary wiring over 600 volts, nominal, may be used only during periods of tests, experiments, or emergencies.

(iii) **General requirements for temporary wiring.**

(A) Feeders shall originate in an approved distribution center. The conductors shall be run as multiconductor cord or cable assemblies, or, where not subject to physical damage, they may be run as open conductors on insulators not more than 10 feet apart.

(B) Branch circuits shall originate in an approved power outlet or panelboard. Conductors shall be multiconductor cord or cable assemblies or open conductors. If run as open conductors they shall be fastened at ceiling height every 10 feet. No branch-circuit conductor may be laid on the floor. Each branch circuit that supplies receptacles or fixed equipment shall contain a separate equipment grounding conductor if run as open conductors.

(C) Receptacles shall be of the grounding type. Unless installed in a complete metallic raceway, each branch circuit shall contain a separate equipment grounding conductor and all receptacles shall be electrically connected to the grounding conductor.

(D) No bare conductors nor earth returns may be used for the wiring of any temporary circuit.

(E) Suitable disconnecting switches or plug connectors shall be installed to permit the disconnection of all ungrounded conductors of each temporary circuit.

(F) Lamps for general illumination shall be protected from accidental contact or breakage. Protection shall be provided by elevation of at least 7 feet from normal working surface or by a suitable fixture or lampholder with a guard.

(G) Flexible cords and cables shall be protected from accidental damage. Sharp corners and projections shall be avoided. Where passing through doorways or other pinch points, flexible cords and cables shall be provided with protection to avoid damage.

(c) **Cable trays.**

(i) **Uses permitted.**

(A) Only the following may be installed in cable tray systems:

- (I) Mineral-insulated metal-sheathed cable (Type MI);
- (II) Armored cable (Type AC);
- (III) Metal-clad cable (Type MC);
- (IV) Power-limited tray cable (Type PLTC);
- (V) Nonmetallic-sheathed cable (Type NM or NMC);
- (VI) Shielded nonmetallic-sheathed cable (Type SNM);
- (VII) Multiconductor service-entrance cable (Type SE or USE);

(VIII) Multiconductor underground feeder and branch-circuit cable (Type UF);

(IX) Power and control tray cable (Type TC);

(X) Other factory-assembled, multiconductor control, signal, or power cables which are specifically approved for installation in cable trays; or

(XI) Any approved conduit or raceway with its contained conductors.

(B) In industrial establishments only, where conditions of maintenance and supervision assure that only qualified persons will service the installed cable tray system, the

following cables may also be installed in ladder, ventilated trough, or 4 inch ventilated channel-type cable trays:

(I) Single conductor cables which are 250 MCM or larger and are Types RHH, RHW, MV, USE, or THW, and other 250 MCM or larger single conductor cables if specifically approved for installation in cable trays. Where exposed to direct rays of the sun, cables shall be sunlight-resistant.

(II) Type MV cables, where exposed to direct rays of the sun, shall be sunlight-resistant.

(C) Cable trays in hazardous (classified) locations shall contain only the cable types permitted in such locations.

(ii) **Uses not permitted.** Cable tray systems may not be used in hoistways or where subjected to severe physical damage.

(d) **Open wiring on insulators.**

(i) **Uses permitted.** Open wiring on insulators is only permitted on systems of 600 volts, nominal, or less for industrial or agricultural establishments and for services.

(ii) **Conductor supports.** Conductors shall be rigidly supported on noncombustible, nonabsorbent insulating materials and may not contact any other objects.

(iii) **Flexible nonmetallic tubing.** In dry locations where not exposed to severe physical damage, conductors may be separately enclosed in flexible nonmetallic tubing. The tubing shall be in continuous lengths not exceeding 15 feet and secured to the surface by straps at intervals not exceeding 4 feet 6 inches.

(iv) **Through walls, floors, wood cross members, etc.** Open conductors shall be separated from contact with walls, floors, and wood cross members, or partitions through which they pass by tubes or bushings of noncombustible, nonabsorbent insulating material. If the bushing is shorter than the hole, a waterproof sleeve of nonconductive material shall be inserted in the hole and an insulating bushing slipped into the sleeve at each end in such a manner as to keep the conductors absolutely out of contact with the sleeve. Each conductor shall be carried through a separate tube or sleeve.

(v) **Protection from physical damage.** Conductors within 7 feet from the floor are considered exposed to physical damage. Where open conductors cross ceiling joints and wall studs and are exposed to physical damage, they shall be protected.

(2) **Cabinets, boxes, and fittings.**

(a) **Conductors entering boxes, cabinets, or fittings.** Conductors entering boxes, cabinets, or fittings shall be protected from abrasion, and openings through which conductors enter shall be effectively closed. Unused openings in cabinets, boxes, and fittings shall also be effectively closed.

(b) **Covers and canopies.** All pull boxes, junction boxes, and fittings shall be provided with covers approved for the purpose. If metal covers are used they shall be grounded. In completed installations each outlet box shall have a cover, faceplate, or fixture canopy. Covers of outlet boxes having holes through which flexible cord pendants pass shall be provided with bushings designed for the purpose or shall have smooth, well-rounded surfaces on which the cords may bear.

(c) **Pull and junction boxes for systems over 600 volts, nominal.** In addition to other requirements in this section for pull and junction boxes, the following shall apply to these boxes for systems over 600 volts, nominal:

(i) Boxes shall provide a complete enclosure for the contained conductors or cables.

(ii) Boxes shall be closed by suitable covers securely fastened in place. Underground box covers that weight over 100 pounds meet this requirement. Covers for boxes shall be permanently marked "HIGH VOLTAGE." The marking shall be on the outside of the box cover and shall be readily visible and legible.

**(3) Switches.**

(a) **Knife switches.** Single-throw knife switches shall be so connected that the blades are dead when the switch is in the open position. Single-throw knife switches shall be so placed that gravity will not tend to close them. Single-throw knife switches approved for use in the inverted position shall be provided with a locking device that will ensure that the blades remain in the open position when so set. Double-throw knife switches may be mounted so that the throw will be either vertical or horizontal. However, if the throw is vertical a locking device shall be provided to ensure that the blades remain in the open position when so set.

(b) **Faceplates for flush-mounted snap switches.** Flush snap switches that are mounted in ungrounded metal boxes and located within reach of conducting floors or other conducting surfaces shall be provided with faceplates of nonconducting, noncombustible material.

(4) **Switchboards and panelboards.** Switchboards that have any exposed live parts shall be located in permanently dry locations and accessible only to qualified persons. Panelboards shall be mounted in cabinets, cutout boxes, or enclosures approved for the purpose and shall be dead front. However, panelboards other than the dead front externally-operable type are permitted where accessible only to qualified persons. Exposed blades of knife switches shall be dead when open.

**(5) Enclosures for damp or wet locations.**

(a) Cabinets, cutout boxes, fittings, boxes, and panelboard enclosures in damp or wet locations shall be installed so as to prevent moisture or water from entering and accumulating within the enclosures. In wet locations the enclosures shall be weatherproof.

(b) Switches, circuit breakers, and switchboards installed in wet locations shall be enclosed in weatherproof enclosures.

(6) **Conductors for general wiring.** All conductors used for general wiring shall be insulated unless otherwise permitted in this section. The conductor insulation shall be of a type that is approved for the voltage, operating temperature, and location of use. Insulated conductors shall be distinguishable by appropriate color or other suitable means as being grounded conductors, ungrounded conductors, or equipment grounding conductors.

**(7) Flexible cords and cables.**

**(a) Use of flexible cords and cables.**

(i) Flexible cords and cables shall be approved and suitable for conditions of use and location. Flexible cords and cables shall be used only for:

- (A) Pendants;
- (B) Wiring of fixtures;
- (C) Connection of portable lamps or appliances;
- (D) Elevator cables;
- (E) Wiring of cranes and hoists;

(F) Connection of stationary equipment to facilitate their frequent interchange;

(G) Prevention of the transmission of noise or vibration;

(H) Appliances where the fastening means and mechanical connections are designed to permit removal for maintenance and repair; or

(I) Data processing cables approved as a part of the data processing system.

(ii) If used as permitted in subitem (a)(i)(C), (a)(i)(F) or (a)(i)(H) of this subsection, the flexible cord shall be equipped with an attachment plug and shall be energized from an approved receptacle outlet.

(iii) Unless specifically permitted in item (a)(i) of this subsection, flexible cords and cables may not be used:

(A) As a substitute for the fixed wiring of a structure;

(B) Where run through holes in walls, ceilings, or floors;

(C) Where run through doorways, windows, or similar openings;

(D) Where attached to building surfaces; or

(E) Where concealed behind building walls, ceilings, or floors.

(iv) Flexible cords used in show windows and showcases shall be Type S, SO, SJ, SJO, ST, STO, SJT, SJTO, or AFS except for the wiring of chain-supported lighting fixtures and supply cords for portable lamps and other merchandise being displayed or exhibited.

**(b) Identification, splices, and terminations.**

(i) A conductor of a flexible cord or cable that is used as a grounded conductor or an equipment grounding conductor shall be distinguishable from other conductors. Types SJ, SJO, SJT, SJTO, S, SO, ST, and STO shall be durably marked on the surface with the type designation, size, and number of conductors.

(ii) Flexible cords shall be used only in continuous lengths without splice or tap. Hard service flexible cords No. 12 or larger may be repaired if spliced so that the splice retains the insulation, outer sheath properties, and usage characteristics of the cord being spliced.

(iii) Flexible cords shall be connected to devices and fittings so that strain relief is provided which will prevent pull from being directly transmitted to joints or terminal screws.

(8) **Portable cables over 600 volts, nominal.** Multiconductor portable cable for use in supplying power to portable or mobile equipment at over 600 volts, nominal, shall consist of No. 8 or larger conductors employing flexible stranding. Cables operated at over 2,000 volts shall be shielded for the purpose of confining the voltage stresses to the insulation. Grounding conductors shall be provided. Connectors for these cables shall be of a locking type with provisions to prevent their opening or closing while energized. Strain relief shall be provided at connections and terminations. Portable cables may not be operated with splices unless the splices are of the permanent molded, vulcanized, or other approved type. Termination enclosures shall be suitably marked with a high voltage hazard warning, and terminations shall be accessible only to authorized and qualified personnel.

**(9) Fixture wires.**

(a) **General.** Fixture wires shall be approved for the voltage, temperature, and location of use. A fixture wire which is used as a grounded conductor shall be identified.

(b) **Uses permitted.** Fixture wires may be used:

(i) For installation in lighting fixtures and in similar equipment where enclosed or protected and not subject to bending or twisting in use; or

(ii) For connecting lighting fixtures to the branch-circuit conductors supplying the fixtures.

(c) **Uses not permitted.** Fixture wires may not be used as branch-circuit conductors except as permitted for Class 1 power limited circuits.

(10) **Equipment for general use.**

(a) **Lighting fixtures, lampholders, lamps, and receptacles.**

(i) Fixtures, lampholders, lamps, rosettes, and receptacles may have no live parts normally exposed to employee contact. However, rosettes and cleat-type lampholders and receptacles located at least 8 feet above the floor may have exposed parts.

(ii) Handlamps of the portable type supplied through flexible cords shall be equipped with a handle of molded composition or other material approved for the purpose, and a substantial guard shall be attached to the lampholder or the handle.

(iii) Lampholders of the screw-shell type shall be installed for use as lampholders only. Lampholders installed in wet or damp locations shall be of the weatherproof type.

(iv) Fixtures installed in wet or damp locations shall be approved for the purpose and shall be so constructed or installed that water cannot enter or accumulate in wireways, lampholders, or other electrical parts.

(b) **Receptacles, cord connectors, and attachment plugs (caps).**

(i) Receptacles, cord connectors, and attachment plugs shall be constructed so that no receptacle or cord connector will accept an attachment plug with a different voltage or current rating than that for which the device is intended. However, a 20-ampere T-slot receptacle or cord connector may accept a 15-ampere attachment plug of the same voltage rating.

(ii) A receptacle installed in a wet or damp location shall be suitable for the location.

(c) **Appliances.**

(i) Appliances, other than those in which the current-carrying parts at high temperatures are necessarily exposed, may have no live parts normally exposed to employee contact.

(ii) A means shall be provided to disconnect each appliance.

(iii) Each appliance shall be marked with its rating in volts and amperes or volts and watts.

(d) **Motors.** This ((paragraph)) subdivision applies to motors, motor circuits, and controllers.

(i) **In sight from.** If specified that one piece of equipment shall be "in sight from" another piece of equipment, one shall be visible and not more than 50 feet from the other.

(ii) **Disconnecting means.**

(A) A disconnecting means shall be located in sight from the controller location. However, a single disconnecting means may be located adjacent to a group of coordinated

controllers mounted adjacent to each other or a multimotor continuous process machine. The controller disconnecting means for motor branch circuits over 600 volts, nominal, may be out of sight of the controller, if the controller is marked with a warning label giving the location and identification of the disconnecting means which is to be locked in the open position.

(B) The disconnecting means shall disconnect the motor and the controller from all ungrounded supply conductors and shall be so designed that no pole can be operated independently.

(C) If a motor and the driven machinery are not in sight from the controller location, the installation shall comply with one of the following conditions:

(I) The controller disconnecting means shall be capable of being locked in the open position.

(II) A manually operable switch that will disconnect the motor from its source of supply shall be placed in sight from the motor location.

(D) The disconnecting means shall plainly indicate whether it is in the open (off) or closed (on) position.

(E) The disconnecting means shall be readily accessible. If more than one disconnect is provided for the same equipment, only one need be readily accessible.

(F) An individual disconnecting means shall be provided for each motor, but a single disconnecting means may be used for a group of motors under any one of the following conditions:

(I) If a number of motors drive special parts of a single machine or piece of apparatus, such as a metal or wood-working machine, crane, or hoist;

(II) If a group of motors is under the protection of one set of branch-circuit protective devices; or

(III) If a group of motors is in a single room in sight from the location of the disconnecting means.

(iii) **Motor overload, short-circuit, and ground-fault protection.** Motors, motor-control apparatus, and motor branch-circuit conductors shall be protected against overheating due to motor overloads or failure to start, and against short-circuits or ground faults. These provisions shall not require overload protection that will stop a motor where a shutdown is likely to introduce additional or increased hazards, as in the case of fire pumps, or where continued operation of a motor is necessary for a safe shutdown of equipment or process and motor overload sensing devices are connected to a supervised alarm.

(iv) **Protection of live parts—all voltages.**

(A) Stationary motors having commutators, collectors, and brush rigging located inside of motor end brackets and not conductively connected to supply circuits operating at more than 150 volts to ground need not have such parts guarded. Exposed live parts of motors and controllers operating at 50 volts or more between terminals shall be guarded against accidental contact by any of the following:

(I) By installation in a room or enclosure that is accessible only to qualified persons;

(II) By installation on a suitable balcony, gallery, or platform, so elevated and arranged as to exclude unqualified persons; or

(III) By elevation 8 feet or more above the floor.

(B) Where live parts of motors or controllers operating at over 150 volts to ground are guarded against accidental

contact only by location, and where adjustment or other attendance may be necessary during the operation of the apparatus, suitable insulating mats or platforms shall be provided so that the attendant cannot readily touch live parts unless standing on the mats or platforms.

(e) **Transformers.**

(i) The following ~~((paragraphs))~~ items cover the installation of all transformers except the following:

- (A) Current transformers;
- (B) Dry-type transformers installed as a component part of other apparatus;
- (C) Transformers which are an integral part of an x-ray, high frequency, or electrostatic-coating apparatus;
- (D) Transformers used with Class 2 and Class 3 circuits, sign and outline lighting, electric discharge lighting, and power-limited fire-protective signalling circuits; and
- (E) Liquid-filled or dry-type transformers used for research, development, or testing, where effective safeguard arrangements are provided.

(ii) The operating voltage of exposed live parts of transformer installations shall be indicated by warning signs or visible markings on the equipment or structure.

(iii) Dry-type, high fire point liquid-insulated, and askarel-insulated transformers installed indoors and rated over 35kV shall be in a vault.

(iv) If they present a fire hazard to employees, oil-insulated transformers installed indoors shall be in a vault.

(v) Combustible material, combustible buildings and parts of buildings, fire escapes, and door and window openings shall be safeguarded from fires which may originate in oil-insulated transformers attached to or adjacent to a building or combustible material.

(vi) Transformer vaults shall be constructed so as to contain fire and combustible liquids within the vault and to prevent unauthorized access. Locks and latches shall be so arranged that a vault door can be readily opened from the inside.

(vii) Any pipe or duct system foreign to the vault installation may not enter or pass through a transformer vault.

(viii) Materials may not be stored in transformer vaults.

(f) **Capacitors.**

(i) All capacitors, except surge capacitors or capacitors included as a component part of other apparatus, shall be provided with an automatic means of draining the stored charge after the capacitor is disconnected from its source of supply.

(ii) Capacitors rated over 600 volts, nominal, shall comply with the following additional requirements:

(A) Isolating or disconnecting switches (with no interrupting rating) shall be interlocked with the load interrupting device or shall be provided with prominently displayed caution signs to prevent switching load current.

(B) For series capacitors (see WAC 296-24-95603 (2)(c)), the proper switching shall be assured by use of at least one of the following:

- (I) Mechanically sequenced isolating and bypass switches;
- (II) Interlocks; or
- (III) Switching procedure prominently displayed at the switching location.

(g) **Storage batteries.** Provisions shall be made for sufficient diffusion and ventilation of gases from storage batteries to prevent the accumulation of explosive mixtures.

AMENDATORY SECTION (Amending Order 87-24, filed 11/30/87)

**WAC 296-24-95613 Hazardous (classified) locations.**

(1) **Scope.** This section covers the requirements for electric equipment and wiring in locations which are classified depending on the properties of the flammable vapors, liquids or gases, or combustible dusts or fibers which may be present therein and the likelihood that a flammable combustible concentration or quantity is present. Hazardous (classified) locations may be found in occupancies such as, but not limited to, the following: Aircraft hangars, gasoline dispensing and service stations, bulk storage plants for gasoline or other volatile flammable liquids, paint-finishing process plants, health care facilities, agricultural or other facilities where excessive combustible dusts may be present, marinas, boat yards, and petroleum and chemical processing plants. Each room, section or area shall be considered individually in determining its classification. These hazardous (classified) locations are assigned six designations as follows:

Class I,	Division 1
Class I,	Division 2
Class II,	Division 1
Class II,	Division 2
Class III,	Division 1
Class III,	Division 2

For definitions of these locations see WAC 296-24-95601(1). All applicable requirements in this ~~((subpart))~~ part shall apply to hazardous (classified) locations, unless modified by provisions of this section.

(2) **Electrical installations.** Equipment, wiring methods, and installations of equipment in hazardous (classified) locations shall be intrinsically safe, or approved for the hazardous (classified) location, or safe for the hazardous (classified) location. Requirements for each of these options are as follows:

(a) **Intrinsically safe.** Equipment and associated wiring approved as intrinsically safe shall be permitted in any hazardous (classified) location for which it is approved.

(b) **Approved for the hazardous (classified) location.**

(i) Equipment shall be approved not only for the class of location but also for the ignitable or combustible properties of the specific gas, vapor, dust, or fiber that will be present.

Note: NFPA 70, the National Electrical Code, lists or defines hazardous gases, vapors, and dusts by "groups" characterized by their ignitable or combustible properties.

(ii) Equipment shall be marked to show the class, group, and operating temperature or temperature range, based on operation in a 40 degrees C ambient, for which it is approved. The temperature marking may not exceed the ignition temperature of the specific gas or vapor to be encountered. However, the following provisions modify this marking requirement for specific equipment:

(A) Equipment of the nonheat-producing type, such as junction boxes, conduit, and fittings, and equipment of the heat-producing type having a maximum temperature not

more than 100 degrees C (212 degrees F) need not have a marked operating temperature or temperature range.

(B) Fixed lighting fixtures marked for use in Class I, Division 2 locations only, need not be marked to indicate the group.

(C) Fixed general-purpose equipment in Class I locations, other than lighting fixtures, which is acceptable for use in Class I, Division 2 locations need not be marked with the class, group, division, or operating temperature.

(D) Fixed dust-tight equipment, other than lighting fixtures, which is acceptable for use in Class II, Division 2 and Class III locations need not be marked with the class, group, division, or operating temperature.

(c) **Safe for the hazardous (classified) location.** Equipment which is safe for the location shall be of a type and design which the employer demonstrates will provide protection from the hazards arising from the combustibility and flammability of vapors, liquids, gases, dusts, or fibers.

Note: The National Electrical Code, NFPA 70, contains guidelines for determining the type and design of equipment and installations which will meet this requirement. The guidelines of this document address electric wiring, equipment, and systems installed in hazardous (classified) locations and contain specific provisions for the following: Wiring methods, wiring connections; conductor insulation, flexible cords, sealing and drainage, transformers, capacitors, switches, circuit breakers, fuses, motor controllers, receptacles, attachment plugs, meters, relays, instruments, resistors, generators, motors, lighting fixtures, storage battery charging equipment, electric cranes, electric hoists and similar equipment, utilization equipment, signaling systems, alarm systems, remote control systems, local loud speaker and communication systems, ventilation piping, live parts, lighting surge protection, and grounding. Compliance with these guidelines will constitute one means, but not the only means, of compliance with this subsection.

(3) **Conduits.** All conduits shall be threaded and shall be made wrench-tight. Where it is impractical to make a threaded joint tight, a bonding jumper shall be utilized.

(4) **Equipment in Division 2 locations.** Equipment that has been approved for a Division 1 location may be installed in a Division 2 location of the same class and group. General-purpose equipment or equipment in general-purpose enclosures may be installed in Division 2 locations if the equipment does not constitute a source of ignition under normal operating conditions.

(5) **Motors and generators.** Motors and generators shall conform to the following: Class I, Division 1. In Class I, Division 1 locations, motors, generators and other rotating electric machinery shall be: (a) Approved for Class I, Division 1 locations (explosion-proof); or (b) of the totally enclosed type supplied with positive-pressure ventilation from a source of clean air with discharge to a safe area, so arranged to prevent energizing of the machine until ventilation has been established and the enclosure has been purged with at least 10 volumes of air, and also arranged to automatically deenergize the equipment when the air supply fails; or (c) of the totally enclosed inert-gas-filled type supplied with a suitable reliable source of inert gas for pressuring the enclosure, with devices provided to ensure a positive pressure in the enclosure and arranged to automatically deenergize the equipment when the gas supply fails; or (d) of a type designed to be submerged in a liquid which is flammable only when vaporized and mixed with air, or in a gas or vapor at a pressure greater than atmospheric and

which is flammable only when mixed with air; and the machine is so arranged to prevent energizing it until it has been purged with the liquid or gas to exclude air, and also arranged to automatically deenergize the equipment when the supply of liquid, or gas or vapor fails or the pressure is reduced to atmospheric. Totally enclosed motors of types (b) and (c) shall have no external surface with an operating temperature in degrees Celsius in excess of eighty percent of the ignition temperature of the gas or vapor involved, as determined by ASTM test procedure (Designation: D-2155-69). Appropriate devices shall be provided to detect any increase in temperature of the motor beyond design limits and automatically deenergize the equipment or provide an adequate alarm. Auxiliary equipment shall be of a type approved for the location in which it is installed.

AMENDATORY SECTION (Amending Order 91-07, filed 11/22/91, effective 12/24/91)

**WAC 296-24-960 Working on or near exposed energized parts.** (1) Application. This section applies to work performed on exposed live parts (involving either direct contact or contact by means of tools or materials) or near enough to them for employees to be exposed to any hazard they present.

(2) Work on energized equipment. Only qualified persons shall work on electric circuit parts or equipment that have not been deenergized under the procedures of WAC 296-24-975(2). Such persons shall be capable of working safely on energized circuits and shall be familiar with the proper use of special precautionary techniques, personal protective equipment, insulating and shielding materials, and insulated tools.

(3) General requirements - high voltage lines.

(a) Minimum clearance.

(i) No work shall be performed, no material shall be piled, stored or otherwise handled, no scaffolding, commercial signs, or structures shall be erected or dismantled, nor any tools, machinery or equipment operated within the specified minimum distances from any energized high voltage electrical conductor capable of energizing the material or equipment; except where the electrical distribution and transmission lines have been deenergized and visibly grounded at point of work, or where insulating barriers not a part of or an attachment to the equipment have been erected, to prevent physical contact with the lines, equipment shall be operated proximate to, under, over, by, or near powerlines only in accordance with the following:

(ii) For lines rated 50 kv. or below, minimum clearance between the lines and any part of the equipment or load shall be 10 feet.

(iii) For lines rated over 50 kv. minimum, clearance between the lines and any part of the equipment or load shall be 10 feet plus 0.4 inch for each 1 kv. over 50 kv., or twice the length of the line insulator but never less than 10 feet.

(b) Overhead electric lines. Where overhead electric conductors are encountered in proximity to a work area, the employer shall be responsible for:

(i) Ascertaining the voltage and minimum clearance distance required, and

(ii) Maintaining the minimum clearance distance, and

(iii) Ensuring that the requirements of subsection ((4)) (3) of this section are complied with.

(c) Not covered: Employees working under chapters 296-32 and 296-45 WAC.

(4) Low voltage lines. When work is being carried out in proximity to energized electrical service conductors operating at 750 volts or less, such work shall be performed in a manner to prevent contact by any worker with the energized conductors.

(5) Overhead lines. If work is to be performed near overhead lines, the lines shall be deenergized and grounded, or other protective measures shall be provided before work is started. If the lines are to be deenergized, arrangements shall be made with the person or organization that operates or controls the electric circuits involved to deenergize and ground them. If protective measures, such as guarding, isolating, or insulating, these precautions shall prevent employees from contacting such lines directly with any part of their body or indirectly through conductive materials, tools, or equipment.

(6) Unqualified persons. When an unqualified person is working in an elevated position, or on the ground, near overhead lines, the location shall be such that the person and the longest conductive object he or she may contact cannot come closer to any unguarded, energized overhead line than the following distances:

(a) For voltages to ground 50kV or below—10 ft.;

(b) For voltages to ground over 50kV—10 ft. plus 0.4 inch for every 1 kV over 50 kV.

(7) Qualified persons. When a qualified person is working in the vicinity of overhead lines, whether in an elevated position or on the ground, the person shall not approach or take any conductive object without an approved insulating handle closer to exposed energized parts than shown in subsections (3) and (4) of this section unless:

(a) The person is insulated from the energized part (gloves, with sleeves if necessary, rated for the voltage involved are considered to be insulation of the person from the energized part on which work is performed); or

(b) The energized part is insulated both from all other conductive objects at a different potential and from the person; or

(c) The person is insulated from all conductive objects at a potential different from that of the energized part.

(8) Vehicular and mechanical equipment.

(a) Any vehicle or mechanical equipment capable of having parts of its structure elevated near energized overhead lines shall be operated so that a clearance of 10 ft. is maintained. If the voltage is higher than 50kV, the clearance shall be increased 0.4 inch for every 1kV over that voltage. However, under any of the following conditions, the clearance may be reduced:

(i) If the vehicle is in transit with its structure lowered, the clearance may be reduced to 4 ft. If the voltage is higher than 50kV, the clearance shall be increased 0.4 inch for every 1kV over that voltage.

(ii) If insulating barriers are installed to prevent contact with the lines, and if the barriers are rated for the voltage of the line being guarded and are not a part of or an attachment to the vehicle or its raised structure, the clearance may be reduced to a distance within the designed working dimensions of the insulating barrier.

(b) If the equipment is an aerial lift insulated for the voltage involved, and if the work is performed by a qualified person, the clearance (between the uninsulated portion of the aerial lift and the power line) may be reduced to the distance given in subsections (3) and (4) of this section.

(c) Employees standing on the ground shall not contact the vehicle or mechanical equipment or any of its attachments, unless:

(i) The employee is using protective equipment rated for the voltage; or

(ii) The equipment is located so that no uninsulated part of its structure (that portion of the structure that provides a conductive path to employees on the ground) can come closer to the line than permitted in this section.

(d) If any vehicle or mechanical equipment capable of having parts of its structure elevated near energized overhead lines is intentionally grounded, employees working on the ground near the point of grounding shall not stand at the grounding location whenever there is a possibility of overhead line contact. Additional precautions, such as the use of barricades or insulation, shall be taken to protect employees from hazardous ground potentials, depending on earth resistivity and fault currents, which can develop within the first few feet or more outward from the grounding point.

(9) Illumination.

(a) Employees shall not enter spaces containing exposed energized parts, unless illumination is provided that enables the employees to perform the work safely.

(b) Where lack of illumination or an obstruction precludes observation of the work to be performed, employees shall not perform tasks near exposed energized parts. Employees shall not reach blindly into areas which may contain energized parts.

(10) Confined or enclosed work spaces. When an employee works in a confined or enclosed space (such as a manhole or vault) that contains exposed energized parts, the employer shall provide, and the employee shall use, protective shields, protective barriers, or insulating materials as necessary to avoid inadvertent contact with these parts. Doors, hinged panels, and the like shall be secured to prevent their swinging into an employee and causing the employee to contact exposed energized parts.

(11) Conductive materials and equipment. Conductive materials and equipment that are in contact with any part of an employee's body shall be handled in a manner that will prevent them from contacting exposed energized conductors or circuit parts. If an employee must handle long dimensional conductive objects (such as ducts and pipes) in areas with exposed live parts, the employer shall institute work practices (such as the use of insulation, guarding, and material handling techniques) which will minimize the hazard.

(12) Portable ladders. Portable ladders shall have nonconductive siderails if they are used where the employee or the ladder could contact exposed energized parts.

(13) Conductive apparel. Conductive articles of jewelry and clothing (such as watch bands, bracelets, rings, key chains, necklaces, metalized aprons, cloth with conductive thread, or metal headgear) shall not be worn if they might contact exposed energized parts.

(14) Housekeeping duties.



(a) Where live parts present an electrical contact hazard, employees shall not perform housekeeping duties at such close distances to the parts that there is a possibility of contact, unless adequate safeguards (such as insulating equipment or barriers) are provided.

(b) Electrically conductive cleaning materials (including conductive solids such as steel wool, metalized cloth, and silicon carbide, as well as conductive liquid solutions) shall not be used in proximity to energized parts unless procedures are followed which will prevent electrical contact.

(15) Interlocks. Only a qualified person following the requirements of this section may defeat an electrical safety interlock, and then only temporarily while he or she is working on the equipment. The interlock system shall be returned to its operable condition when this work is completed.

**AMENDATORY SECTION** (Amending Order 91-07, filed 11/22/91, effective 12/24/91)

**WAC 296-24-975 Selection and use of work practices.** (1) General. Safety-related work practices shall be employed to prevent electric shock or other injuries resulting from either direct or indirect electrical contacts, when work is performed near or on equipment or circuits which are or may be energized. The specific safety-related work practices shall be consistent with the nature and extent of the associated electrical hazards.

(a) Deenergized parts. Live parts to which an employee may be exposed shall be deenergized before the employee works on or near them, unless the employer can demonstrate that deenergizing introduces additional or increased hazards or is infeasible due to equipment design or operational limitations. Live parts that operate at less than 50 volts to ground need not be deenergized if there will be no increased exposure to electrical burns or to explosion due to electric arcs.

Note 1: Examples of increased or additional hazards include interruption of life support equipment, deactivation of emergency alarm systems, shutdown of hazardous location ventilation equipment, or removal of illumination for an area.

Note 2: Examples of work that may be performed on or near energized circuit parts because of infeasibility due to equipment design or operational limitations include testing of electric circuits that can only be performed with the circuit energized and work on circuits that form an integral part of a continuous industrial process in a chemical plant that would otherwise need to be completely shut down in order to permit work on one circuit or piece of equipment.

Note 3: Work on or near deenergized parts is covered by subsection (2) of this section.

(b) Energized parts. If the exposed live parts are not deenergized (i.e., for reasons of increased or additional hazards or infeasibility), other safety-related work practices shall be used to protect employees who may be exposed to the electrical hazards involved. Such work practices shall protect employees against contact with energized circuit parts directly with any part of their body or indirectly through some other conductive object. The work practices that are used shall be suitable for the conditions under which the work is to be performed and for the voltage level of the exposed electric conductors or circuit parts. Specific work practice requirements are detailed in WAC 296-24-960.

(2) Working on or near exposed deenergized parts.

(a) Application. This subsection applies to work on exposed deenergized parts or near enough to them to expose the employee to any electrical hazard they present. Conductors and parts of electric equipment that have been deenergized but have not been locked out or tagged according to this subsection shall be treated as energized parts, and WAC 296-24-960 applies to work on or near them.

(b) Lockout and tagging. While any employee is exposed to contact with parts of fixed electric equipment or circuits which have been deenergized, the circuits energizing the parts shall be locked out or tagged or both according to the requirements of this section. The requirements shall be followed in the order in which they are presented (i.e., (b)(i) of this subsection first, then (b)(ii) of this subsection.

Note 1: As used in this section, fixed equipment refers to equipment fastened in place or connected by permanent wiring methods.

Note 2: Lockout and tagging procedures that comply with chapter 296-24 WAC Part A-4 will also be deemed to comply with (b) of this subsection provided that:

1. The procedures address the electrical safety hazards covered by this ~~((subpart))~~ part; and
2. The procedures also incorporate the requirements of (b)(iii)(D) and (b)(iv)(B) of this subsection.

(i) Procedures. The employer shall maintain a written copy of the procedures outlined in (b) of this subsection and shall make it available for inspection by employees and by the director and his or her authorized representatives.

Note: The written procedures may be in the form of a copy of subsection (2) of this section.

(ii) Deenergizing equipment.

(A) Safe procedures for deenergizing circuits and equipment shall be determined before circuits or equipment are deenergized.

(B) The circuits and equipment to be worked on shall be disconnected from all electric energy sources. Control circuit devices, such as push buttons, selector switches, and interlocks, shall not be used as the sole means for deenergizing circuits or equipment. Interlocks for electric equipment shall not be used as a substitute for lockout and tagging procedures.

(C) Stored electric energy which might endanger personnel shall be released. Capacitors shall be discharged and high capacitance elements shall be short-circuited and grounded, if the stored electric energy might endanger personnel.

Note: If the capacitors or associated equipment are handled in meeting this requirement, they shall be treated as energized.

(D) Stored nonelectrical energy in devices that could reenergize electric circuit parts shall be blocked or relieved to the extent that the circuit parts could not be accidentally energized by the device.

(iii) Application of locks and tags.

(A) A lock and a tag shall be placed on each disconnecting means used to deenergize circuits and equipment on which work is to be performed, except as provided in subitems (C) and (E) of this item. The lock shall be attached to prevent persons from operating the disconnecting means unless they resort to undue force or the use of tools.



(B) Each tag shall contain a statement prohibiting unauthorized operation of the disconnecting means and removal of the tag.

(C) If a lock cannot be applied, or if the employer can demonstrate that tagging procedures will provide a level of safety equivalent to that obtained by the use of a lock, a tag may be used without a lock.

(D) A tag used without a lock, as permitted by subitem (C) of this item, shall be supplemented by at least one additional safety measure that provides a level of safety equivalent to that obtained by the use of a lock. Examples of additional safety measures include the removal of an isolating circuit element, blocking of a controlling switch, or opening of an extra disconnecting device.

(E) A lock may be placed without a tag only under the following conditions:

(I) Only one circuit or piece of equipment is deenergized; and

(II) The lockout period does not extend beyond the work shift; and

(III) Employees exposed to the hazards associated with reenergizing the circuit or equipment are familiar with this procedure.

(iv) Verification of deenergized condition. The requirements of this ~~((paragraph))~~ subsection shall be met before any circuits or equipment can be considered and worked as deenergized.

(A) A qualified person shall operate the equipment operating controls or otherwise verify that the equipment cannot be restarted.

(B) A qualified person shall use test equipment to test the circuit elements and electrical parts of equipment to which employees will be exposed and shall verify that the circuit elements and equipment parts are deenergized. The test shall also determine if any energized condition exists as a result of inadvertently induced voltage or unrelated voltage backfeed even though specific parts of the circuit have been deenergized and presumed to be safe. If the circuit to be tested is over 600 volts, nominal, the test equipment shall be checked for proper operation immediately before and immediately after this test.

(v) Reenergizing equipment. These requirements shall be met, in the order given, before circuits or equipment are reenergized, even temporarily.

(A) A qualified person shall conduct tests and visual inspections, as necessary, to verify that all tools, electrical jumpers, shorts, grounds, and other such devices have been removed, so that the circuits and equipment can be safely energized.

(B) Employees exposed to the hazards associated with reenergizing the circuit or equipment shall be warned to stay clear of circuits and equipment.

(C) Each lock and tag shall be removed by the employee who applied it or under his or her direct supervision. However, if this employee is absent from the workplace, then the lock or tag may be removed by a qualified person designated to perform this task provided that:

(I) The employer ensures that the employee who applied the lock or tag is not available at the workplace; and

(II) The employer ensures that the employee is aware that the lock or tag has been removed before he or she resumes work at that workplace.

(D) There shall be a visual determination that all employees are clear of the circuits and equipment.

AMENDATORY SECTION (Amending Order 79-9, filed 7/31/79)

**WAC 296-27-050 Supplementary record.** In addition to the log and summary of occupational injuries and illnesses provided for under WAC 296-27-030, each employer shall have available for inspection at each establishment or other location as specified in WAC 296-27-020 within six working days after receiving information that a recordable case has occurred, a supplementary record for each occupational injury or illness for that establishment. The record shall be completed in the detail prescribed in the instructions accompanying Form OSHA No. 101. The department of labor and industries accident report Form ~~((LI-210-130))~~ F 242-130-000 may be used as an alternative to the Form OSHA 101. Other reports are acceptable alternative records if they contain the information required by Form OSHA No. 101. If no acceptable alternative record is maintained for other purposes, Form OSHA No. 101 shall be used for the necessary information or shall be otherwise maintained in a convenient form.

AMENDATORY SECTION (Amending Order 78-10, filed 6/28/78)

**WAC 296-27-060 Annual summary.** (1) Each employer shall post an annual summary of occupational injuries and illnesses for each establishment. This summary shall consist of a copy of the year's totals from the Form OSHA No. 200 and the following information from that form: Calendar year covered, company name, establishment name, establishment address, certification signature, title, and date. A Form OSHA No. 200 shall be used in presenting the summary. If no injuries or illnesses occurred in the year, zeros must be entered on the totals line, and the form must be posted.

(2) The summary shall be completed by February 1 ~~((beginning with the calendar year 1979))~~ each calendar year.

(3) Each employer, or the officer or employee of the employer who supervises the preparation of the log and summary of occupational injuries and illnesses, shall certify that the annual summary of occupational injuries and illnesses is true and complete. The certification shall be accomplished by affixing the signature of the employer, or the officer or employer who supervises the preparation of the annual summary of occupational injuries and illnesses, at the bottom of the last page of the log and summary, or by appending a separate statement to the log and summary certifying that the summary is true and complete.

(4)(a) Each employer shall post a copy of the establishment's summary in each establishment. The summary covering the previous calendar year shall be posted no later than February 1, and shall remain in place until March 1. For employees who do not primarily report or work at a single establishment, or who do not report to any fixed establishment on a regular basis, employers shall satisfy this posting requirement by presenting or mailing a copy of the summary portion of the log and summary during the month of February of the following year to each such

employee who receives pay during that month. For multi-establishment employers where operations have closed down in some establishments during the calendar year, it will not be necessary to post summaries for those establishments.

(b) A failure to post a copy of the establishment's summary, or otherwise satisfy the posting requirements as specified in this section, may result in the issuance of citations and assessments of penalties pursuant to RCW 49.17.120 and 49.17.180.

AMENDATORY SECTION (Amending Order 79-9, filed 7/31/79)

**WAC 296-27-070 Retention of records.** Records provided for in WAC 296-27-030, 296-27-050, and 296-27-060 including Form OSHA No. 200 (~~and its predecessor Forms WISHA No. 100 and WISHA No. 102~~) shall be retained in each establishment for five years following the end of the year to which they relate.

AMENDATORY SECTION (Amending Order 83-34, filed 11/30/83)

**WAC 296-27-078 Private employers classified in standard industrial classification codes (SIC) 52 through 89, (except 52 through 54, 70, 75, 76, 79 and 80).** A private employer whose establishment is classified in SIC's 52 through 89, (excluding 52 through 54, 70, 75, 76, 79 and 80) need not comply, for such establishment, with the recordkeeping requirements of this chapter except the following:

(1) Obligation to report under WAC 296-27-090 concerning fatalities or multiple hospitalization accidents.

(2) Obligation to maintain a log of occupational injuries and illnesses under WAC 296-27-140, upon being notified in writing by the Bureau of Labor Statistics that the employer has been selected to participate in a statistical survey of occupational injuries and illnesses.

(3) The requirements of this section shall become effective January 1, 1984.

AMENDATORY SECTION (Amending Order 79-9, filed 7/31/79)

**WAC 296-27-080 Access to records.** (1) Each employer shall provide upon request records provided for in WAC 296-27-030, 296-27-050, and 296-27-060, for inspection and copying by designated or authorized representatives of the department of labor and industries, compliance safety and health officers of the Occupational Safety and Health Administration, U.S. Department of Labor during any occupational safety and health inspection provided for under 29 CFR 1903 and section 8 of the Federal Occupational Safety and Health Act, by any representatives of the Bureau of Labor Statistics, U.S. Department of Labor, or by any representative of the Secretary of Health (~~Education and Welfare~~) and Human Services during any investigation under section 20(b) of the Federal Occupational Safety and Health Act.

(2)(a) The log and summary of all recordable occupational injuries and illnesses (OSHA No. 200) (the log) provided for in WAC 296-27-030 shall, upon request, be made available by the employer to any employee, former

employee, and to their representatives for examination and copying in a reasonable manner and at reasonable times. The employee, former employee, and their representatives shall have access to the log for any establishment in which the employee is or has been employed.

(b) Nothing in this section shall be deemed to preclude employees and employee representatives from collectively bargaining to obtain access to information relating to occupational injuries and illnesses in addition to the information made available under this section.

(c) Access to the log provided under this section shall pertain to all logs retained under the requirements of WAC 296-27-070.

AMENDATORY SECTION (Amending Order 74-22, filed 5/6/74)

**WAC 296-27-110 Change of ownership.** Where an establishment has changed ownership, the employer shall be responsible for maintaining records and filing reports only for that period of the year during which he/she owned such establishment. However, in the case of any change of ownership, the employer shall preserve those records, if any, of the prior ownership which are required to be kept under this chapter. These records shall be retained at each establishment to which they relate, for the period, or the remainder thereof, required under WAC 296-27-070.

AMENDATORY SECTION (Amending Order 78-10, filed 6/28/78)

**WAC 296-27-120 Petitions for recordkeeping exceptions.** (1)(a) In order to achieve a uniform, national system for the recordkeeping and reporting of occupational injuries and illnesses, the state of Washington and the United States Department of Labor have agreed that as applied to employers as defined by subsection 3(5) of the Occupational Safety and Health Act of 1970 (Public Law 91-596, 81 STAT 1950) the state shall not grant any variances or exceptions to the record keeping and reporting regulations of this chapter, with the exception of approval of forms to serve as the substitutes for OSHA 101 and OSHA 200 (see WAC 296-27-030 and 296-27-050), without prior approval of the bureau of labor statistics.

(b) Any public employer who wishes to maintain records in a manner different from that prescribed by this chapter may submit a petition containing the information specified in subsection (5) of this section to the director, Department of Labor and Industries, (~~General Administration Building~~) P.O. Box 44000, Olympia, Washington 98504(~~(+)-4000~~).

(2) All petitions for authorization to maintain records in a manner different than that required by this chapter shall be submitted to the director or directly to the bureau of labor statistics. The director, upon receipt of a petition submitted pursuant to the provisions of subsection (3) of this section, shall immediately forward copies of same to appropriate officials of the bureau of labor statistics. Should said federal officials inform the director of their belief in the desirability or necessity of additional notice or conferences pursuant to provisions of subsection (7) of this section, the director shall provide or cause to be provided such additional notice and/or afford an opportunity for interested parties for informal

conferences or hearings concerning the petition. For the purposes of this section, the occupational safety and health administration and the bureau of labor statistics shall be considered interested parties.

The bureau of labor statistics shall be afforded the opportunity to review the petition and any comments submitted in regard thereto. The director shall not grant the petition prior to a finding by the said federal agency that the alternative procedure proposed will not hamper or interfere with the purposes of the Occupational Safety and Health Act of 1970.

(3) Submission of petition. Any employer, who for good cause wishes to maintain records in a manner different from that required by this chapter, may submit a petition containing the information specified in subsection (5) of this section to the director.

(4) Opportunity for comment. Affected employees, or their representatives shall have an opportunity to submit written data, views, or arguments concerning the petition to the director within ten working days following the receipt of notice under subdivision (5)(e) of this section.

(5) Contents of petition. A petition filed under subsection (3) of this section shall include:

- (a) The name and address of the applicant;
- (b) The address of the place or places (establishment or establishments) of the employment involved;
- (c) Specifications of the reasons for seeking relief;
- (d) A description of the different recordkeeping procedures which are proposed by the applicant;
- (e) A statement that:
  - (i) The applicant has informed his/her affected employees of the petition by giving a copy thereof to them or to their authorized representative, posting a statement giving a summary of the petition and specifying where a copy of the petition may be obtained, at the place or places where notices to employees are normally posted, and by other appropriate means. A statement posted pursuant to these provisions shall be posted in each establishment identified in WAC ((296-27-120-(4)(b))) 296-27-020(8).

(ii) The applicant has in the same manner informed affected employees and their representatives of their rights under subsection (3) of this section.

(6) Additional notice - conferences.

(a) In addition to the actual notice provided for in subdivision (5)(e) of this section, the director may provide, or cause to be provided, such additional notice of the petition as he/she may deem appropriate.

(b) The director may also afford an opportunity to interested parties for informational conferences or hearings concerning the petition.

(7) After review of the petition, and any comments submitted in regard thereto, and upon completion of any necessary appropriate investigation concerning the petition, if the director finds that the alternative procedure proposed will not hamper or interfere with the purposes of the act, and will provide equivalent information, he/she may grant the petition subject to such conditions as he/she may determine appropriate, subject to the provisions of WAC ((296-200-120)) 296-27-120(2), and subject to revocation for cause.

(8) Publication. When any relief is granted to an applicant under this chapter, notice of such relief, and the reasons therefor, may be published in the federal register.

(9) Revocation. Whenever any relief under this section is sought to be revoked for any failure to comply with the conditions thereof, an opportunity for informal hearing or conference shall be afforded to the employers and effected employees, or their representatives, and other interested parties. Except in cases of willfulness or where public safety or health requires otherwise, before the commencement of any such informal proceeding, the employer shall:

- (a) Be notified in writing of the facts of conduct which may warrant the action and,
- (b) Be given an opportunity to demonstrate or achieve compliance.

(10) Compliance after submission of petitions. The submission of a petition or any delay by the director in acting upon a petition shall not relieve any employer from any obligation to comply with the provisions of this chapter.

(11) The director shall honor exceptions to the provisions of 29 CFR 1904 - RECORDING AND REPORTING OCCUPATIONAL INJURIES AND ILLNESSES, granted by the bureau of labor statistics to companies having establishments in states other than Washington, when such exceptions apply to the establishments within this state.

(12) There shall be consultation between the appropriate representatives of the department, the occupational safety and health administration, and the bureau of labor statistics in order to enjoy the effective implementation of this chapter.

AMENDATORY SECTION (Amending Order 78-10, filed 6/28/78)

**WAC 296-27-140 Duties of employers—Statistical program.** Upon receipt of an occupational injuries and illnesses survey form, ((Form OSHA No. 200-S)) supplied by the department of labor and industries in conjunction with the Bureau of Labor Statistics, the employer shall promptly complete the form in accordance with the instructions contained therein and return it in accordance with the aforesaid instructions.

AMENDATORY SECTION (Amending Order 88-11, filed 7/6/88)

**WAC 296-27-15501 Division of ((~~industrial safety and health~~)) consultation and compliance, public records.** Requests for inspection or copies of records and documents in the custody of the ((~~division of industrial safety and health~~)) department should be made to the ((~~division's~~)) department's designated records officer. The ((~~division's~~)) department's records are maintained at ((~~805 Plum Street Southeast~~)) 7273 Linderson Way, SW, Tumwater, WA P.O. Box ((207)) 44632, Olympia, WA 98504-4632. General information can be obtained at service locations and field offices throughout the state.

AMENDATORY SECTION (Amending Order 86-02, filed 1/17/86)

**WAC 296-27-15503 Confidential reports within the department's files.** Whenever a ((~~divisional~~)) departmental file contains any report or information from an independent source that has requested that the information contained in the department's file be protected as confidential, such information will not be released without court order. When

such information is withheld the records officer shall clearly identify which information has been withheld and the information's source.

**AMENDATORY SECTION** (Amending Order 86-02, filed 1/17/86)

**WAC 296-27-15505 Accident investigation reports.** Results of accident investigations and related reports are confidential and will not be freely released by the department, see RCW 49.17.260.

Accident investigation reports will be made available without the need of a court order only to the following:

- (1) Employees of governmental agencies in the performance of their official duties;
- (2) The injured worker, his/her legal representative, or his/her labor organization representative;
- (3) The legal representative or labor organization representative of a deceased worker, including any beneficiary of a deceased worker actually receiving benefits under the terms of Title 51 RCW, the Industrial Insurance Act. The records officer may provide accident investigation reports to the closest surviving member of the deceased worker's immediate family;
- (4) The employer of any injured or deceased (~~workman~~) worker;
- (5) Any other employer or person whose actions or business operations are the subject of the report or investigation; or
- (6) Any attorney representing a party in any pending legal action in which an investigative report constitutes material and relevant evidence.

**AMENDATORY SECTION** (Amending Order 86-48, filed 1/12/87)

**WAC 296-27-16020 Inspection selection, scheduling criteria, and limit on number of inspections.** (1) Inspection selection criteria.

(a) WISHA's priority system for inspection scheduling is intended to distribute available resources as efficiently as possible to ensure that the maximum protection is effectively provided to the working men and women of this state.

(b) The assistant director of the (~~industrial safety and health~~) consultation and compliance division shall ensure that inspections are scheduled within the framework of this chapter and are consistent with the objectives of chapter 49.17 RCW, the Washington Industrial Safety and Health Act of 1973, as currently amended, or as amended in the future.

(c) The assistant director shall not permit more than two scheduled comprehensive inspections at the same fixed site location of an individual employer within any period of twelve consecutive months.

(2) Employer contacts. Employer requests for information or voluntary compliance services will not initiate compliance inspection.

(a) Such employer requests shall not protect the establishment from compliance inspections conducted pursuant to the guidelines established by this chapter.

(b) If an employer or their representative indicates that an imminent danger exists or that a fatality or catastrophe has occurred, the assistant director shall ensure that action is

taken in accordance with the inspection priority procedures established by this chapter.

**AMENDATORY SECTION** (Amending Order 76-38, filed 12/30/76)

**WAC 296-32-210 Definitions.** (1) The terms used in these standards shall be interpreted in the most commonly accepted sense consistent with the communications industry. The words "shall" and "must," are used to indicate the provisions which are mandatory.

(2) "Aerial lifts." Aerial lifts include the following types of vehicle-mounted aerial devices used to elevate personnel to jobsites above ground:

- (a) Extensible boom platforms,
- (b) Aerial ladders,
- (c) Articulating boom platforms,
- (d) Vertical towers,

(e) A combination of any of the above defined in ANSI A92.2-1969. These devices are made of metal, wood, fiberglass, reinforced plastic (FRP), or other material; are powered or manually operated and are deemed to be aerial lifts whether or not they are capable of rotating about a substantially vertical axis.

(3) "Aerial splicing platform." This consists of a platform, approximately 3 feet x 4 feet, used to perform aerial cable work. It is furnished with fiber or synthetic ropes for supporting the platform from aerial strand, detachable guy ropes for anchoring it, and a device for raising and lowering it with a handline.

(4) "Aerial tent." A small tent usually constructed of vinyl coated canvas which is usually supported by light metal or plastic tubing. It is designed to protect employees in inclement weather while working on ladders, aerial splicing platforms, or aerial devices.

(5) "Alive or live (energized)." Electrically connected to a source of potential difference, or electrically charged so as to have a potential significantly different from that of the earth in the vicinity. The term "live" is sometimes used in the place of the term "current-carrying," where the intent is clear, to avoid repetition of the longer term.

(6) "Barricade." A physical obstruction such as tapes, cones, or "A" frame type wood and/or metal structure intended to warn and limit access to a work area.

(7) "Barrier." A physical obstruction which is intended to prevent contact with energized lines or equipment, or to prevent unauthorized access to work area.

(8) "Bond." An electrical connection from one conductive element to another for the purpose of minimizing potential differences or providing suitable conductivity for fault current or for mitigation of leakage current and electrolytic action.

(9) "Cable." A conductor with insulation, or a stranded conductor with or without insulation and other coverings (single-conductor cable), or a combination of conductors insulated from one another (multiple-conductor cable).

(10) "Cable sheath." A protective covering applied to cables.

Note: A cable sheath may consist of multiple layers of which one or more is conductive.

(11) "Circuit." A conductor or system of conductors through which an electric current is intended to flow.

(12) "Clearance."

(a) The certification by the proper authority that a specified line or piece of equipment is de-energized; that the proper precautionary measures have been taken and that the line or equipment is being turned over to the workers.

(b) Separation or protection by the use of protective devices to prevent accidental contact by persons or objects on approach to a point of danger.

(13) "Climbing space." The vertical space reserved along the side of poles or structures to permit ready access for ~~((linemen))~~ lineworkers to equipment and conductors located on poles or structures.

(14) "Communication lines." The conductors and their supporting or containing structures for telephone, telegraph, railroad signal, data, clock, fire, police-alarm, community television antenna and other systems which are used for public or private signal or communication service, and which operate at potentials not exceeding 400 volts to ground or 750 volts between any two points of the circuit, and the transmitted power of which does not exceed 150 watts. When communications lines operate at less than 150 volts to ground, no limit is placed on the capacity of the system. Specifically designed communications cables may include communication circuits not complying with the preceding limitations, where such circuits are also used incidentally to supply power to communication equipment.

(15) "Communication plant." The conductors and their associated equipment required to provide public or private signals or communicative service.

(16) "Competent or qualified person." A person who is familiar with the construction of, or operation of, such lines and/or equipment that concerns ~~((his))~~ their position and who is fully aware of the hazards connected therewith OR one who has passed a journeyman's examination for the particular branch of the trades with which ~~((he))~~ they may be connected. In case of dispute, competency shall be established by a committee appointed by the director or assistant director of the ((division of industrial safety and health)) department of labor and industries consisting of representatives of all interested parties.

(17) "Conductor." A material, usually in the form of a wire, cable, or bus bar, suitable for carrying an electric current.

(18) "Effectively grounded." Intentionally connected to earth through a ground connection or connections of sufficiently low impedance and having sufficient current-carrying capacity to prevent the build-up of voltages which may result in undue hazard to connected equipment or to persons.

(19) "Emergency." When an unusual condition exists that endangers life and/or property.

(20) "Energized." Electrically connected to a source of potential difference or electrically charged so as to have a potential different from that of the earth or different from that of adjacent conductors or equipment. For the purpose of these rules, potential differences less than 100 volts shall not apply. This definition does not include communication lines of less than 300 volts.

(21) "Equipment." A general term which includes materials, fittings, devices, appliances, fixtures, apparatus, and similar items used as part of, or in connection with, a supply or communications installation.

(22) "~~((Foreman))~~ Crewleader or ~~((man))~~ person-in-charge." That person directly in charge of workers doing the work regardless of title.

(23) "Ground (reference)." That conductive body usually earth, to which an electric potential is referenced.

(24) "Ground (as a noun)." A conductive connection, whether intentional or accidental, by which an electric circuit or equipment is connected to reference ground.

(25) "Ground (as a verb)." The connecting or establishment of a connection, whether by intention or accident, of an electric circuit or equipment to reference ground.

(26) "Grounding." The act of placing shorts and grounds on conductors and equipment for the purpose of protecting workers from dangerous voltages while working on such lines or equipment.

(27) "Ground tent." A small tent usually constructed of vinyl coated canvas supported by a metal or plastic frame. Its purpose is to protect employees from inclement weather while working at buried cable pedestal sites or similar locations.

(28) "Grounded conductor." A system or circuit conductor which is intentionally grounded.

(29) "Grounded systems." A system of conductors in which at least one conductor or point (usually the middle wire, or the neutral point of transformer or generator windings) is intentionally grounded, either solidly or through a current-limiting device (not a current-interrupting device).

(30) "Grounding electrode conductor (grounding conductor)." A conductor used to connect equipment or the grounded circuit of a wiring system to a grounding electrode.

(31) "Guard or guarded." Covered, shielded, fenced, enclosed, or otherwise protected by means of suitable covers, casings, barriers, rails, screens, mats, platforms, or warning signs or devices to remove the possibility of dangerous contact on approach by other persons or objects to a point of danger.

(32) "Insulated." Separated from other conducting surfaces by a dielectric substance (including air space) offering a high resistance to the passage of current.

Note: When any object is said to be insulated, it is understood to be insulated in suitable manner for the conditions to which it is subjected. Otherwise, it is, within the purpose of these standards, uninsulated. Insulating coverings of conductors is one means of making the conductor insulated.

(33) "Insulation (as applied to cable)." That which is relied upon to insulate the conductor from other conductors or conducting parts or from ground.

(34) "Joint use." The sharing of a common facility, such as a manhole, trench or pole, by two or more different kinds of utilities, (e.g., power and telecommunications).

(35) "Ladder platform." A device designed to facilitate working aloft from an extension ladder. A typical device consists of a platform (approximately 9" x 18") hinged to a welded pipe frame. The rear edge of the platform and the bottom crossmember of the frame are equipped with latches to lock the platform to ladder rungs.

(36) "Ladder seat." A removable seat used to facilitate work at an elevated position on rolling ladders in telecommunication centers.

(37) "Manhole." A subsurface enclosure which personnel may enter and which is used for the purpose of install-

ing, operating, and maintaining submersible equipment and/or cable.

(38) "Manhole platform." A platform consisting of separate planks which are laid across steel platform supports. The ends of the supports are engaged in the manhole cable racks.

(39) "Manlift equipment." Such types of portable truck-mounted equipment as mechanical, electric or hydraulic ladders and boom-mounted buckets or cages.

(40) "Microwave transmission." The act of communicating or signaling utilizing a frequency between 1 GHz<sub>z</sub> (gigahertz) and 300 GHz<sub>z</sub> inclusively.

(41) "Nominal voltage." The nominal voltage of a system or circuit is the value assigned to a system or circuit of a given voltage class for the purpose of convenient designation. The actual voltage may vary above or below this value.

(42) "Pole balcony or seat." A balcony or seat used as a support for workers at pole-mounted equipment or terminal boxes. A typical device consists of a bolted assembly of steel details and a wooden platform. Steel braces run from the pole to the underside of the balcony. A guard rail (approximately 30" high) may be provided.

(43) "Pole platform." A platform intended for use by a worker in splicing and maintenance operations in an elevated position adjacent to a pole. It consists of a platform equipped at one end with a hinged chain binder for securing the platform to a pole. A brace from the pole to the underside of the platform is also provided.

(44) "Protection from hazardous voltage." The isolation from or de-energizing of equipment to prevent accidental contact by persons or objects on approach to point of danger.

(45) "Protective devices." Those devices such as rubber gloves, rubber blankets, line hose, rubber hoods or other insulating devices, which are specially designed for the protection of workers.

(46) "Public highway." Every way, land, road, street, boulevard, and every way or place in the state open as matter of right to public vehicular travel, both inside and outside the limit of cities and towns.

(47) "Qualified employee." Any worker who by reason of ~~(his)~~ their training and experience has demonstrated ~~(his)~~ an ability to safely perform ~~(his)~~ their duties.

(48) "Qualified line-clearance tree trimmer." A tree worker who through related training and on-the-job experience is familiar with the special techniques and hazards involved in line clearance.

(49) "Qualified line-clearance tree-trimmer trainee." Any worker regularly assigned to a line-clearance tree-trimming crew and undergoing on-the-job training who, in the course of such training, has demonstrated ~~(his)~~ their ability to perform ~~(his)~~ duties safely at ~~(his)~~ their level of training.

(50) "Sheath." As applied to sharp tools that effectively covers the tool.

(51) "System operator/owner." The person or organization that operates or controls the electrical conductors involved.

(52) "Telecommunications center." An installation of communication equipment under the exclusive control of an organization providing telecommunications service, that is

located outdoors or in a vault, chamber, or a building space used primarily for such installations.

Note: Telecommunication centers are facilities established, equipped and arranged in accordance with engineered plans for the purpose of providing telecommunications service. They may be located on premises owned or leased by the organization providing telecommunication service, or on the premises owned or leased by others. This definition includes switch rooms (whether electromechanical, electronic, or computer controlled), terminal rooms, power rooms, repeater rooms, transmitter and receiver rooms, switchboard operating rooms, cable vaults, and miscellaneous communications equipment rooms. Simulation rooms of telecommunication centers for training or developmental purposes are also included.

(53) "Telecommunications derricks." Rotating or nonrotating derrick structures permanently mounted on vehicles for the purpose of lifting, lowering, or positioning hardware and materials used in telecommunications work.

(54) "Telecommunication line truck." A truck used to transport ~~(men)~~ workers, tools, and material, and to serve as a traveling workshop for telecommunication installation and maintenance work. It is sometimes equipped with a boom and auxiliary equipment for setting poles, digging holes, and elevating material or workers.

(55) "Telecommunication service." The furnishing of a capability to signal or communicate at a distance by means such as telephone, telegraph, police and fire-alarm, community antenna television, or similar system, using wire, conventional cable, coaxial cable, wave guides, microwave transmission, or other similar means.

(56) "Unvented vault." An enclosed vault in which the only openings are access openings.

(57) "Vault." An enclosure above or below ground which personnel may enter, and which is used for the purpose of installing, operating, and/or maintaining equipment and/or cable which need not be of submersible design.

(58) "Vented vault." An enclosure as described in subsection (57) of this section, with provision for air changes using exhaust flue stack(s) and low level air intake(s), operating on differentials of pressure and temperature providing for air flow.

(59) "Voltage communications." Voltage used for electronic communications equipment to which workers or protective equipment may be subjected.

(a) *High* means over 600 volts to ground—RMS AC or DC or over 1,000 volts RMS across bare parts.

(b) *Medium high* means 151 to 600 volts to ground—RMS AC or DC or 301 to 1,000 volts RMS AC across any bare parts.

(60) "Voltage electric supply." The maximum effective line voltage to which the workers or protective equipment may be subjected.

(a) *Low* includes voltages from 100 to 750 volts.

(b) *High* means those voltages in excess of 750 volts.

(61) "Voltage of an effectively grounded circuit." The voltage between any conductor and ground unless otherwise indicated.

(62) "Voltage of a circuit not effectively grounded." The voltage between any two conductors. If one circuit is directly connected to and supplied from another circuit of higher voltage (as in the case of an autotransformer), both are considered as of the higher voltage, unless the circuit of lower voltage is effectively grounded, in which case its

voltage is not determined by the circuit of higher voltage. Direct connection implies electric connection as distinguished from connection merely through electromagnetic or electrostatic induction.

**AMENDATORY SECTION** (Amending Order 76-38, filed 12/30/76)

**WAC 296-32-220 General.** (1) Buildings containing telecommunications centers.

(a) Illumination. Lighting in telecommunication centers shall be provided in an amount such that continuing work operations, routine observations, and the passage of employees can be carried out in a safe and healthful manner.

(b) Specific tasks in centers, such as splicing cable and the maintenance and repair of equipment frame lineups, the employer shall install permanent lighting or portable supplemental lighting to attain a higher level of illumination.

(c) Refer to WAC 296-62-09003 (general occupational health standards) which shall apply as minimum standards of illumination for industrial interiors.

(d) Illumination of field work. Whenever natural light is insufficient to illuminate the worksite, artificial illumination shall be provided to enable the employee to perform the work safely.

(2) Working surfaces.

(a) Working surfaces shall be in conformance with the latest edition of the general safety and health standard WAC 296-24-735 through 296-24-76523.

(b) Guard rails and toe boards may be omitted on distribution frame mezzanine platforms to permit access to equipment. This exemption applies only on the side or sides of the platform facing the frames and only on those portions of the platform adjacent to equipped frames.

(3) Working spaces.

(a) Space shall be provided for access to all medium high and high voltage equipment.

(b) Every structure, new or old, designed for human occupancy shall be provided with exits to permit the prompt escape of occupants in case of fire or other emergency. The means of egress shall be a continuous and unobstructed way of exit travel from any point in a building or structure to a public way and consist of three separate and distinct parts; the way of exit access, the exit and the way of exit discharge. A means of egress comprises the vertical and horizontal ways of travel and shall include intervening room spaces, doorways, hallways, corridors, passageways, balconies, ramps, stairs, enclosures, lobbies, escalators, horizontal exits, courts and yards.

(c) "Maintenance aisles," or "wiring aisles," between equipment frame lineups are working spaces and are not a means of egress for purposes of WAC 296-24-550((+)).

(4) Special doors.

(a) When blastproof or power actuated doors are installed in specially designed hardsite security buildings and spaces, they shall be designed and installed so that they can be used as a means of egress in emergencies.

(b) When high voltage apparatus is isolated in a supplementary enclosure, interlocks shall be provided on all access doors. Warning signs shall be provided, which are visible both when the guard or cover is in place or removed.

(5) Equipment, machinery and machine guarding.

(a) When power plant machinery in telecommunications centers is operated with commutators and couplings uncovered, the adjacent housing shall be clearly marked to alert personnel to the rotating machinery.

(b) All power switches on power panels shall be in an open position when they are not controlling an operating circuit. Before opening any power circuit, the load shall be reduced. "Men working" signs, or similar wording shall be placed on switches associated with motors or generators under repair.

(c) When working on the brushes of a machine in operation, employees shall use care not to break a circuit. When it is necessary to remove a brush from the holder, the machine shall be shut down.

(d) Only fuse pullers specifically designed for that purpose shall be used when replacing cartridge type fuses.

(6) Battery handling.

(a) Eye protection devices which provide side as well as frontal eye protection for employees shall be provided when measuring storage battery specific gravity or handling electrolyte, and the employer shall ensure that such devices are used by the employees.

(b) The employer shall also ensure that acid resistant gloves and aprons shall be worn for protection against spattering.

(c) Facilities for quick drenching or flushing of the eyes and body shall be provided unless the storage batteries are of the enclosed type and equipped with explosion proof vents, in which case sealed water rinse or neutralizing packs may be substituted for the quick drenching or flushing facilities.

(d) Employees assigned to work with storage batteries shall be instructed in emergency procedures such as dealing with accidental acid spills.

(e) Electrolyte (acid or base, and distilled water) for battery cells shall be mixed in a well ventilated room. Acid or base shall be poured gradually, while stirring, into the water. Water shall never be poured into concentrated (greater than 75 percent) acid solutions. Electrolyte shall never be placed in metal containers nor stirred with metal objects.

(f) When taking specific gravity readings, the open end of the hydrometer shall be covered with an acid resistant material while moving it from cell to cell to avoid splashing or throwing the electrolyte.

(g) Ventilation, shall be provided to ensure diffusion of the gasses from the battery to prevent the accumulation of an explosive type mixture.

(h) Racks and trays shall be substantial and treated to be resistant to the electrolyte.

(i) Floors shall be of acid resistant construction or be protected from acid accumulation.

(7) Hazardous materials.

(a) Highway mobile vehicles and trailers stored in garages in accordance with WAC 296-24-47513 (4)(b) may be equipped to carry more than one LP-gas container, but the total capacity of LP-gas containers per work vehicle stored in garages shall not exceed 100 pounds of LP-gas.

(b) All container valves shall be closed when not in use.

(8) Compressed gas.



(a) When using or transporting nitrogen cylinders, special compartments, racks, or blocking shall be provided to prevent cylinder movement.

(b) Regulators shall be removed or guarded before a cylinder is transported.

(9) Support structures.

(a) No employee, or any material or equipment, shall be supported or permitted to be supported on any portion of a pole structure, platform, ladder, walkway or other elevated structure or aerial device unless the employer ensures that the support structure is first inspected by a competent person and it is determined to be strong, in good working condition and properly secured in place.

(b) ~~(Workmen)~~ Workers shall not throw anything from pole to ground, from pole to pole or from ground to pole.

(10) Power exposures.

(a) The employer shall ensure that no employee approaches or takes any conductive object closer to any electrically energized overhead power lines and parts than prescribed in Table 1 unless:

(i) The employee is insulated or guarded from the energized parts (insulating gloves rated for the voltage involved shall be considered adequate insulation), or

(ii) The energized parts are insulated or guarded from the employee and any other conductive object at a different potential, or

(iii) The power conductors and equipment are deenergized and grounded.

(b) While handling communication wires, metal sheaths, or communication equipment, contact shall be avoided with street lamp brackets, trolley span wires, power guys, transformer cases and any other power equipment that may be energized. The safest possible working position shall be assumed before starting work.

(c) Communication employees shall never work in the pole space on jointly used poles between normal primary and secondary attachments.

(d) Where a hazard of a power contact exists, due to use of long handled tools, proper rubber equipment shall be used.

TABLE 1

APPROACH DISTANCES TO EXPOSED ENERGIZED OVERHEAD POWER LINES AND PARTS

Voltage Range (phase to phase, RMS)	Approach Distance (inches)
300 V and less	(1)
Over 300 V, not over 750 V	12
Over 750 V not over 2 kV	18
Over 2 kV, not over 15 kV	24
Over 15 kV, not over 37 kV	36
Over 37 kV, not over 87.5 kV	42
Over 87.5 kV, not over 121 kV	48
Over 121 kV, not over 140 kV	54

(1) Avoid contact.

AMENDATORY SECTION (Amending Order 89-03, filed 5/15/89, effective 6/30/89)

**WAC 296-32-230 Training.** (1) Employers shall provide training in the various precautions and safe practices described in this section and shall insure that employees do

not engage in the activities to which this chapter applies until such employees have received proper training in the various precautions and safe practices required by this section. However, where the employer can demonstrate that an employee is already trained in the precautions and safe practices required by this section prior to ~~((his))~~ their employment, training need not be provided to that employee in accordance with this section.

(2) Where training is required, it shall consist of on-the-job training or classroom-type training or a combination of both.

(3) The training program shall include a list of the subject courses and the types of personnel required to receive such instruction. A written description of the training program and a record of employees who have received such training shall be maintained for the duration of the employee's employment and shall be made available upon request to the ~~((assistant))~~ director of ~~((industrial safety and health))~~ the department of labor and industries, or his/her authorized representative.

(4) Such training shall, where appropriate, include the following subjects:

(a) Recognition and avoidance of dangers relating to encounters with harmful substances, and animal, insect, or plant life.

(b) Procedures to be followed in emergency situations, and

(c) First aid training, including instruction in artificial respiration.

(5) It shall be the responsibility of the employer to hold monthly safety meetings at practical points throughout the operation and insist upon employees attending said meetings. Minutes shall be kept of each safety meeting and retained for a period of one year.

(6) It shall be the responsibility of management to develop and maintain a hazard communication program as required by ~~((WAC 296-62-054 through 296-62-05427))~~ chapter 296-62 WAC, Part C which will provide information to all employees relative to hazardous chemicals or substances to which they are exposed, or may become exposed, in the course of their employment.

AMENDATORY SECTION (Amending Order 76-38, filed 12/30/76)

**WAC 296-32-270 Personal climbing equipment.** (1) General. Safety belts and straps shall be provided and the employer shall ensure their use when work is performed at positions more than 4 feet above ground, on poles, and on towers, except as provided in WAC 296-32-340 (7)(8) of this chapter. No safety belts, safety straps or lanyards acquired after January 1, 1976, may be used unless they meet the tests set forth in chapter 296-45 WAC. The employer shall ensure that all safety belts and straps are inspected by a competent person prior to each day's use to determine that they are in safe working condition.

(2) Telecommunication Lineman's body belts, safety straps and lanyards~~((-))~~, ~~((@))~~ general requirements. ~~((@))~~ Hardware for lineman's body belts, safety straps and lanyards shall be drop forged or pressed steel and shall have a corrosion resistant finish tested to meet the requirements of

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the American Society for Testing and Materials B117-64 (50-hour test).

Exception: Lineman's body belts shall be at least four inches in width.

(3) Pole climbers.

(a) Pole climbers may not be used if the gaffs are less than 1-1/4 inches in length as measured on the underside of the gaff.

((+)) (b) The gaffs of pole climbers shall be covered with safety caps when not being used for their intended use.

((+)) (c) The employer shall ensure that pole climbers are inspected by a competent person for the following conditions: Fractured or cracked gaffs or leg irons, loose or dull gaffs, broken straps or buckles. If any of these conditions exist, the defect shall be corrected before the climbers are used.

((+)) (d) Pole climbers shall be inspected as required in this subsection before each day's use and a gaff cut-out test performed at least weekly when in use.

((+)) (e) Pole climbers shall not be worn when:

(i) Working in trees (specifically designed tree climbers shall be used for tree climbing),

(ii) Working on ladders,

(iii) Working in an aerial lift,

(iv) Driving a vehicle,

(v) Walking on rocky, hard, frozen, brushy or hilly terrain.

**AMENDATORY SECTION** (Amending Order 76-38, filed 12/30/76)

**WAC 296-32-280 Ladders.** (1) The employer shall ensure that no employee nor any material or equipment shall be supported or permitted to be supported on any portion of a ladder unless it is first determined, by inspections and checks conducted by a competent person that such ladder is free of defects, in good condition and secured in place.

(2) The spacing between steps or rungs permanently installed on poles and towers shall be no more than 18 inches (36 inches on any one side). This requirement also applies to fixed ladders on towers, when towers are so equipped. Spacing between steps shall be uniform above the initial unstepped section, except where working, standing, or access steps are required. Fixed ladder rungs and step rungs for poles and towers shall have a minimum diameter of 5/8 inch. Fixed ladder rungs shall have a minimum clear width of 12 inches. Steps for poles and towers shall have a minimum clear width of 4-1/2 inches. The spacing between detachable steps may not exceed 30 inches on any one side, and these steps shall be secured when in use.

(3) After October 31, 1975, portable wood ladders intended for general use shall not be painted but may be coated with a translucent nonconductive coating. Portable wood ladders shall not be longitudinally reinforced with metal.

(4) Portable wood ladders that are not being carried on vehicles and are not in active use shall be stored where they will not be exposed to the elements and where there is good ventilation.

(5) Rolling ladders.

(a) Rolling ladders used in telecommunication centers shall have a width between the side rails, inside to inside, of at least 12 inches.

((+)) (b) Except in working spaces that are not a means of egress, the ladders shall have a minimum inside width, between the side rails, of at least eight inches.

(6) Climbing ladders or stairways on scaffolds used for access and egress shall be affixed or built into the scaffold by proper design and engineering, and shall be so located that their use will not disturb the stability of the scaffold. The rungs of the climbing device shall be equally spaced, but may not be less than 12 inches nominal nor more than 16 inches nominal apart. Horizontal end rungs used for platform support may also be utilized as a climbing device if such rungs meet the spacing requirement of this subsection, and if clearance between the rung and the edge of the platform is sufficient to afford a secure handhold. If a portable ladder is affixed to the scaffold, it shall be securely attached and shall have rungs meeting the spacing requirements of this subsection. Clearance shall be provided in the back of the ladder of not less than 6 inches from center of rung to the nearest scaffold structural member.

(7) When a ladder is supported by an aerial strand, and ladder hooks or other supports are not being used, the ladder shall be extended at least 2 feet above the strand and shall be secured to it (e.g. lashed or held by a safety strap around the strand and ladder side rail). When a ladder is supported by a pole, it shall be securely lashed to the pole unless the ladder is specifically designed to prevent movement when used in this application.

(8) Portable wood straight ladders, when in use, shall be equipped with safety shoes.

(9) Ladders shall be inspected by a competent person prior to each use. Ladders which have developed defects shall be withdrawn from service for repair or destruction and tagged or marked as "dangerous do not use."

**AMENDATORY SECTION** (Amending Order 76-38, filed 12/30/76)

**WAC 296-32-290 Vehicle-mounted material handling devices and other mechanical equipment.** (1) General.

(a) The employer shall ensure that visual inspections are made of the equipment by a competent person each day the equipment is to be used to ascertain that it is in good condition.

(b) The employer shall ensure that tests shall be made at the beginning of each shift by a competent person to insure the vehicle brakes and operating systems are in proper working condition.

(2) Scrapers, loaders, dozers, graders and tractors.

((+)) All mobile, self-propelled scrapers, mobile front end loaders, mobile dozers, agricultural and industrial tractors, crawler tractors, crawler-type loaders, and motor graders, with or without attachments, that are used in telecommunications work shall have rollover protective structures that meet the requirements of WAC 296-155-950 through 296-155-965.

(3) Aerial manlift equipment.

(a) These devices shall not be operated with any conductive part of the equipment closer to exposed energized

power lines than the clearances set forth in Table 1 of this chapter.

(b) Only qualified drivers shall be permitted to operate aerial manlift equipment and shall possess a current motor vehicle operator's license.

(c) When performing work from aerial manlift equipment, the ((workman)) worker shall wear a safety belt attached to the boom.

(d) When any aerial manlift equipment is parked at the jobsite, the brakes shall be set. Wheel chocks shall be used to prevent uncontrolled movement. If equipped with outriggers, the outriggers shall be implanted on firm footing.

(e) Manufacturer's recommended maximum load limit shall be posted near each set of controls, kept in legible condition and the maximum load limit shall not be exceeded.

(f) Flashing warning lights shall be installed and maintained on all aerial manlift equipment used on public thoroughfares.

(4)(a) The operation of all motor vehicles and trailers shall be in conformance with the motor vehicle laws, the general safety and health standards of the state of Washington and all local traffic ordinances.

(b) When it is necessary for the worker to work in the bucket at an elevated position with the vehicle in motion, there shall be direct communication between the worker and the vehicle operator.

(5) Derrick trucks and similar equipment.

(a) This equipment shall not be operated with any conductive part of the equipment closer to exposed energized power lines than the clearances set forth in Table 1 of this chapter.

(b) When derricks are used to handle poles near energized power conductors, these operations shall comply with the requirements contained in WAC 296-32-220(10) and 296-32-330(11) of this chapter.

(c) Moving parts of equipment and machinery carried on or mounted on telecommunications line trucks shall be guarded. This may be done with barricades as specified in WAC 296-32-240(2) of this chapter.

(d) Derricks and the operation of derricks shall comply with the following requirements:

(i) Manufacturer's specifications, load ratings and instructions for derrick operation shall be strictly observed.

(ii) Rated load capacities and instructions related to derrick operation shall be conspicuously posted on a permanent weather-resistant plate or decal in a location on the derrick that is plainly visible to the derrick operator.

(iii) Prior to derrick operation the parking brake must be set and the stabilizers extended if the vehicle is so equipped. When the vehicle is situated on a grade, at least two wheels must be chocked on the downgrade side.

(iv) Only persons trained in the operation of the derrick shall be permitted to operate the derrick.

(v) Hand signals to derrick operators shall be those prescribed by ANSI B30.6-1969, "Safety Code for Derricks."

(vi) The employer shall ensure that the derrick and its associated equipment are inspected by a competent person at intervals set by the manufacturer but in no case less than once per year. Records shall be maintained including the dates of inspections, and necessary repairs made.

(vii) Modifications or additions to the derrick and its associated equipment that alter its capacity or affect its safe

operation shall be made only with written certification from the manufacturer, or other equivalent entity, such as a nationally recognized testing laboratory, that the modification results in the equipment being safe for its intended use. Such changes shall require the changing and posting of revised capacity and instruction decals or plates. These new ratings or limitations shall be as provided by the manufacturer or other equivalent entity.

(viii) Wire rope used with derricks shall be of improved plow steel or equivalent. Wire rope safety factors shall be in accordance with American National Standards Institute B30.6-1969.

(ix) Wire rope shall be taken out of service, or the defective portion removed, when any of the following conditions exist:

(A) The rope strength has been significantly reduced due to corrosion, pitting, or excessive heat, or

(B) The thickness of the outer wires of the rope has been reduced to two-thirds or less of the original thickness, or

(C) There are more than six broken wires in any one rope lay, or

(D) There is excessive permanent distortion caused by kinking, crushing, or severe twisting of the rope.

AMENDATORY SECTION (Amending Order 76-38, filed 12/30/76)

**WAC 296-32-300 Materials handling and storage.**

(1) Poles.

(a) When working with poles in piles or stacks, work shall be performed from the ends of the poles and precautions shall be taken for the safety of employees at the other end of the pole.

(b) During pole hauling operations, all loads shall be secured to prevent displacement. Lights, reflectors and/or flags shall be displayed on the end and sides of the load.

(c) The requirements for installation, removal, or other handling of poles in pole lines are prescribed in WAC 296-32-330 which pertains to overhead lines.

(d) In the case of hoisting machinery equipped with a positive stop load-holding device, it shall be permissible for the operator to leave ((his)) their position at the controls (while a load is suspended) for the sole purpose of assisting in positioning the load prior to landing it.

(e) Prior to unloading steel, poles, crossarms, and similar material, the load shall be thoroughly examined to ascertain that the load has not shifted, that binders or stakes have not broken, and that the load is not otherwise hazardous to employees.

(2) Cable reels. Cable reels and poles in storage shall be checked or otherwise restrained to prevent uncontrollable movement.

(3) All tools and materials shall be stored in a safe and orderly manner.

(4) Workers shall not carry loose materials, tools, or equipment on or in vehicles in a manner that would constitute a hazard.

(5) All buildings, storage yards, equipment and other property shall be kept in a clean and orderly manner.

AMENDATORY SECTION (Amending Order 76-38, filed 12/30/76)

**WAC 296-32-320 Grounding for employee protection—Pole lines.** (1) Power conductors. Electric power conductors and equipment shall be considered as energized until the employee can determine that they are bonded to one of the grounds as listed in subsection (4) of this section.

(2) Nonworking open wire. Nonworking open wire communications lines shall be bonded to one of the grounds listed in subsection (4) of this section.

(3) Vertical power conduit, power ground wires and street light fixtures.

(a) Metal power conduit on joint use poles, exposed vertical power ground wires, and street light fixtures which are below communications attachments or less than 20 inches above these attachments, shall be considered energized and shall be tested for voltage unless the employee can visually determine that they are bonded to the communications suspension strand or cable sheath.

(b) If no hazardous voltage is shown by the voltage test, a temporary bond shall be placed between such street light fixture, exposed vertical power grounding conductor, or metallic power conduit and the communications cable strand. Temporary bonds used for this purpose shall have sufficient conductivity to carry at least 500 amperes for a period of one second without fusing.

(4) Protective grounding. Acceptable grounds for protective grounding are as follows:

(a) A vertical ground wire which has been tested, found safe, and is connected to a power system multigrounded neutral or the grounded neutral of a power secondary system where there are at least three services connected;

(b) Communications cable sheath or shield and its supporting strand where the sheath or shield is:

(i) Bonded to an underground or buried cable which is connected to a central office ground, or

(ii) Bonded to an underground metallic piping system, or

(iii) Bonded to a power system multigrounded neutral or grounded neutral of a power secondary system which has at least three services connected;

(c) Guys which are bonded to the grounds specified in subdivisions (a) and (b) of this subsection and which have continuity uninterrupted by an insulator; and

(d) If all of the preceding grounds are not available, arrays of driven ground rods where the resultant resistance to ground will be low enough to eliminate danger to personnel or permit prompt operation of protective devices.

(5) Attaching and removing temporary bonds. When attaching grounds (bonds), the first attachment shall be made to the protective ground. When removing bonds, the connection to the line or equipment shall be removed first. Insulating gloves shall be worn during these operations.

(6) Temporary grounding of suspension strand.

(a) The suspension strand shall be grounded to the existing grounds listed in subsection (4) of this section when being placed on jointly used poles.

(b) Where power crossings are encountered on nonjoint lines, the strand shall be bonded to an existing ground listed in subsection (4) of this section as close as possible to the crossing. This bonding is not required where crossings are

made on a common crossing pole unless there is an upward change in grade at the pole.

(c) Where traveling roller-type bonds are used, they shall be restrained so as to avoid stressing the electrical connections.

(d) Bonds between the suspension strand and the existing ground shall be at least No. 6AWG copper.

(e) Temporary bonds shall be left in place until the strand has been tensioned, dead-ended, and permanently grounded.

(f) The requirements of subdivision (a) through (e) of this subsection do not apply to the installation of insulated strand.

(7) Antenna work-radio transmitting stations 3-30 MHZ.

(a) Prior to grounding a radio transmitting station antenna, the employer shall insure that the rigger in charge:

(i) Prepares a danger tag signed with ~~((his))~~ their signature,

(ii) Requests the transmitting technician to shutdown the transmitter and to ground the antenna with its grounding switch,

(iii) Is notified by the transmitting technician that the transmitter has been shutdown, and

(iv) Tags the antenna ground switch personally in the presence of the transmitting technician after the antenna has been grounded by the transmitting technician.

(b) Power shall not be applied to the antenna, nor shall the grounding switch be opened under any circumstances while the tag is affixed.

(c)(i) Where no grounding switches are provided, grounding sticks shall be used, one on each side of line, and tags shall be placed on the grounding sticks, antenna switch, or plate power switch in a conspicuous place.

(ii) To further reduce excessive radio frequency pickup, ground sticks or short circuits shall be placed directly on the transmission lines near the transmitter in addition to the regular grounding switches.

(iii) In other cases, the antenna lines may be disconnected from ground and the transmitter to reduce pickup at the point in the field.

(d) All radio frequency line wires shall be tested for pickup with an insulated probe before they are handled either with bare hands or with metal tools.

(e) The employer shall insure that the transmitting technician warn the riggers about adjacent lines which are, or may become energized.

(f) The employer shall insure that when antenna work has been completed, the rigger in charge of the job returns to the transmitter, notifies the transmitting technician in charge that work has been completed, and personally removes the tag from the antenna ground switch.

AMENDATORY SECTION (Amending Order 76-38, filed 12/30/76)

**WAC 296-32-360 Tree trimming—Electrical hazards.** (1) General.

(a) Employees engaged in pruning, trimming, removing, or clearing trees from lines shall be required to consider all overhead and underground electrical power conductors to be energized with potentially fatal voltages, never to be touched (contacted) either directly or indirectly.

(b) Employees engaged in line-clearing operations shall be instructed that:

(i) A direct contact is made when any part of the body touches or contacts an energized conductor, or other energized electrical fixture or apparatus.

(ii) An indirect contact is made when any part of the body touches any object in contact with an energized electrical conductor, or other energized fixture or apparatus.

(iii) An indirect contact can be made through conductive tools, tree branches, truck equipment, or other objects, or as a result of communications wires, cables, fences, or guy wires being accidentally energized.

(iv) Electric shock will occur when an employee, by either direct or indirect contact with an energized conductor, energized tree limb, tool, equipment, or other object, provides a path for the flow of electricity to a grounded object or to the ground itself. Simultaneous contact with two energized conductors will also cause electric shock which may result in serious or fatal injury.

(c) Before any work is performed in proximity to energized conductors, the system operator/owner of the energized conductors shall be contacted to ascertain if ~~(he)~~ they know~~(s)~~ of any hazards associated with the conductors which may not be readily apparent. This rule does not apply when operations are performed by the system operator/owner.

(2) Working in proximity to electrical hazards.

(a) Employers shall ensure that a close inspection is made by the employee and by the ~~(foreman)~~ crewleader or supervisor in charge before climbing, entering, or working around any tree, to determine whether an electrical power conductor passes through the tree, or passes within reaching distance of an employee working in the tree. If any of these conditions exist either directly or indirectly, an electrical hazard shall be considered to exist unless the system operator/owner has caused the hazard to be removed by deenergizing the lines, or installing protective equipment.

(b) Only employees or trainees, familiar with the special techniques and hazards involved in line clearance, shall be permitted to perform the work if it is found that an electrical hazard exists.

(c) During all tree working operations aloft where an electrical hazard of more than 750 volts exists, there shall be a second employee or trainee qualified in line clearance tree trimming within normal voice communication.

(d) Where tree work is performed by employees qualified in line-clearance tree trimming and trainees qualified in line-clearance tree trimming, the clearances from energized conductors given in Table 2 shall apply.

TABLE 2

Minimum Working Distances From Energized Conductors For Line-Clearance Tree Trimmers and Line-Clearance Tree-Trimner Trainees

Voltage Range (Phase to Phase) (kilovolts)	Minimum Working Distance
2.1 to 15.0	2 ft. 0 in.
15.1 to 35.0	2 ft. 4 in.
35.1 to 46.0	2 ft. 6 in.
46.1 to 72.5	3 ft. 0 in.
72.6 to 121.0	3 ft. 4 in.
138.0 to 145.0	3 ft. 6 in.
161.0 to 169.0	3 ft. 8 in.

230.0 to 242.0	5 ft. 0 in.
345.0 to 362.0	7 ft. 0 in.
500.0 to 552.0	11 ft. 0 in.
700.0 to 765.0	15 ft. 0 in.

(e) Branches hanging on an energized conductor may only be removed using insulated equipment by a qualified electrical worker.

(f) Rubber footwear, including lineman's overshoes, shall not be considered as providing any measure of safety from electrical hazards.

(g) Ladders, platforms, and aerial devices, including insulated aerial devices, shall not be brought in contact with an electrical conductor. Reliance shall not be placed on their dielectric capabilities.

(h) When an aerial lift device contacts an electrical conductor, the truck supporting the aerial lift device shall be considered as energized.

(3) Storm work and emergency conditions.

(a) Since storm work and emergency conditions create special hazards, only authorized representatives of the electric utility system operator/owner and not telecommunication workers may perform tree work in these situations where energized electrical power conductors are involved.

(b) When an emergency condition develops due to tree operations, work shall be suspended and the system operator/owner shall be notified immediately.

AMENDATORY SECTION (Amending Order 92-06, filed 10/30/92, effective 12/8/92)

**WAC 296-37-510 Scope and application.** (1) The requirements included in this vertical chapter shall apply throughout the state wherever diving takes place within the jurisdiction of the department of labor and industries. These requirements shall also be applicable to those diving related and supportive work activities not at the diving site but which have a direct effect on the safety of the diving operations. Examples may include but are not limited to: The supply of breathing air or gas; the supply of materials, equipment or supplies required by this chapter; the maintenance of diving equipment.

(2) This standard applies to diving and related support operations conducted in connection with all types of work and employments, including general industry, construction, ship repairing, shipbuilding, shipbreaking and longshoring. However, this standard does not apply to any diving operation:

(a) Performed solely for instructional purposes, using open-circuit, compressed-air SCUBA and conducted within the no-decompression limits;

(b) Performed solely for search, rescue, or related public safety purposes by or under the control of a governmental agency; or

(c) Governed by 45 CFR Part 46 (Protection of Human Subjects, United States Department of Health~~(-Education, and Welfare))~~ and Human Services) or equivalent rules or regulations established by another federal agency, which regulate research, development, or related purposes involving human subjects.

(d) Defined as scientific diving and which is under the direction and control of a diving program containing at least the following elements:

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(i) Diving safety manual which includes at a minimum: Procedures covering all diving operations specific to the program; procedures for emergency care, including recompression and evacuation; and criteria for diver training and certification.

(ii) Diving control (safety) board, with the majority of its members being active divers, which shall at a minimum have the authority to: Approve and monitor diving projects; review and revise the diving safety manual; assure compliance with the manual; certify the depths to which a diver has been trained; take disciplinary action for unsafe practices; and, assure adherence to the buddy system (a diver is accompanied by and is in continuous contact with another diver in the water) for SCUBA diving.

(3) This chapter shall augment the requirements of the general safety and health standard, chapter 296-24 WAC and the general occupational health standard, chapter 296-62 WAC. In instances where this chapter is in direct conflict with the requirements of any general horizontal standard, the requirements of this chapter shall apply.

(4) Hoisting gear used in diving operations shall be inspected and certified as required by chapter 296-56 WAC, safety standards for longshore, stevedore and related waterfront operations.

(5) Application in emergencies. An employer may deviate from the requirements of this standard to the extent necessary to prevent or minimize a situation which is likely to cause death, serious physical harm, or major environmental damage, provided that the employer:

(a) Notifies the assistant director of the department of labor and industries in Olympia or the regional administrator for the region within 48 hours of the onset of the emergency situation indicating the nature of the emergency and extent of the deviation from the prescribed regulations; and

(b) Upon request from the authority notified, submits such information in writing.

(6) Employer obligation. The employer shall be responsible for compliance with:

(a) All provisions of this standard of general applicability; and

(b) All requirements pertaining to specific diving modes to the extent diving operations in such modes are conducted.

**AMENDATORY SECTION** (Amending Order 78-18, filed 10/2/78)

**WAC 296-37-512 Variance and procedure.** Realizing that conditions may exist in operations under which certain state standards will not have practical application, the director of the department of labor and industries or his/her authorized representative may, pursuant to this section, RCW 49.17.080 and/or 49.17.090 and appropriate administrative rules of this state and the department of labor and industries and upon receipt of application and after adequate investigation by the department, permit a variation from these requirements when other means of providing an equivalent measure of protection are afforded. Such variation granted shall be limited to the particular case or cases covered in the application for variance and may be revoked for cause. The permit for variance shall be conspicuously posted on the premises and shall remain posted during the time it is in effect. All requests for variances from safety and health

standards included in this or any other chapter of Title 296 WAC, shall be made in writing to the director of the department of labor and industries at Olympia, Washington, or his/her duly authorized representative, or the assistant director, (~~division of industrial safety and health~~) Department of Labor and Industries, P.O. Box 44600, Olympia, Washington 98504-4600. Variance application forms may be obtained from the department upon request.

**AMENDATORY SECTION** (Amending Order 92-06, filed 10/30/92, effective 12/8/92)

**WAC 296-37-575 Recordkeeping requirements.** (1) Recording and reporting.

(a) The employer shall comply with the requirements of chapters 296-27 and 296-350 WAC.

(b) The employer shall record the occurrence of any diving-related injury or illness which requires any dive team member to be hospitalized for 24 hours or more, specifying the circumstances of the incident and the extent of any injuries or illnesses.

(2) Availability of records.

(a) Upon the request of the director of the department of labor and industries or his duly authorized designees, the employer shall make available for inspection and copying any record or document required by this standard.

(b) Records and documents required by this standard shall be provided upon request to employees, designated representatives, and the assistant director in accordance with WAC 296-62-05201 through 296-62-05209 and 296-62-05213 through 296-62-05217. Safe practices manuals (WAC 296-37-530), depth-time profiles (WAC 296-37-540), recording of dives (WAC 296-37-545), decompression procedure assessment evaluations (WAC 296-37-545), and records of hospitalizations (WAC 296-37-575) shall be provided in the same manner as employee exposure records or analyses using exposure or medical records. Equipment inspections and testing records which pertain to employees (WAC 296-37-570) shall also be provided upon request to employees and their designated representatives.

(c) Records and documents required by this standard shall be retained by the employer for the following period:

(i) Dive team member medical records (physician's reports) (WAC 296-37-525) - five years;

(ii) Safe practices manual (WAC 296-37-530) - current document only;

(iii) Depth-time profile (WAC 296-37-540) - until completion of the recording of dive, or until completion of decompression procedure assessment where there has been an incident of decompression sickness;

(iv) Recording dive (WAC 296-37-545) one year, except five years where there has been an incident of decompression sickness;

(v) Decompression procedure assessment evaluations (WAC 296-37-545) - five years;

(vi) Equipment inspections and testing records (WAC 296-37-570) - current entry or tag, or until equipment is withdrawn from service;

(vii) Records of hospitalizations (WAC 296-37-575) - five years.

(d) After the expiration of the retention period of any record required to be kept for five years, the employer shall

forward such records to the National Institute for Occupational Safety and Health, Department of Health and Human Services. The employer shall also comply with any additional requirements set forth in WAC 296-62-05215.

(e) In the event the employer ceases to do business:

(i) The successor employer shall receive and retain all dive and employee medical records required by this standard; or

(ii) If there is no successor employer, dive and employee medical records shall be forwarded to the National Institute for Occupational Safety and Health, Department of Health(~~(Education, and Welfare)~~) and Human Services.

**AMENDATORY SECTION** (Amending Order 83-34, filed 11/30/83)

**WAC 296-62-020 Definitions applicable to all sections of this chapter.** Unless the context indicates otherwise, words used in this chapter shall have the meaning given in this section.

(1) "Adequate" or "effective" means compliance with terms and intent of these standards.

(2) "Appendix" means references or recommendations to be used as guides in applying the provisions of this chapter.

(3) "Approved" means approved by the director of the department of labor and industries or his authorized representative: *Provided, however,* That should a provision of this chapter state that approval by an agency or organization other than the department of labor and industries is required, such as Underwriters' Laboratories or the (~~Bureau of Mines~~) Mine Safety and Health Administration and the National Institute for Occupational Safety and Health, the provision of WAC 296-24-006 shall apply.

(4) "Authorized person" means a person approved or assigned by the employer to perform a specific type of duty or duties or to be at a specific location or locations at the job site.

(5) "Coal tar pitch volatiles" as used in WAC 296-62-07515, Table I, include the fused polycyclic hydrocarbons which volatilize from the distillation residues of coal, petroleum, (excluding asphalt), wood, and other organic matter. Asphalt (CAS 8052-42-4, and CAS 64742-93-4) is not covered under the "coal tar pitch volatiles" standard.

(6) "Competent person" means one who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective action to eliminate them.

(7) "Department" means the department of labor and industries.

(8) "Director" means the director of the department of labor and industries, or his designated representative.

(9) "Employer" means any person, firm, corporation, partnership, business trust, legal representative, or other business entity which engages in any business, industry, profession, or activity in this state and employs one or more employees or who contracts with one or more persons, the essence of which is the personal labor of such person or persons and includes the state, counties, cities, and all municipal corporations, public corporations, political subdivisions of the state[,] and charitable organizations: *Provided,*

That any persons, partnership, or business entity not having employees, and who is covered by the industrial insurance act shall be considered both an employer and an employee.

(10) "Hazard" means that condition, potential or inherent, which can cause injury, death, or occupational disease.

(11) "Occupational disease" means such disease or infection as arises naturally and proximately out of employment.

(12) "Qualified" means one who, by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training, and experience, has successfully demonstrated (~~his~~) ability to solve or resolve problems relating to the subject matter, the work, or the project.

(13) "Shall" or "must" means mandatory.

(14) "Should" or "may" means recommended.

(15) "Suitable" means that which fits, or has the qualities or qualifications to meet a given purpose, occasion, condition, function, or circumstance.

(16) (~~Workmen~~) Worker, "personnel," (~~man,~~) "person," "employee," and other terms of like meaning, unless the context of the provision containing such term indicates otherwise, mean an employee of an employer who is employed in the business of (~~his~~) their employer whether by way of manual labor or otherwise and every person in this state who is engaged in the employment of or who is working under an independent contract the essence of which is (~~his~~) their personal labor for an employer whether by manual labor or otherwise.

(17) "Work place" means any plant, yard, premises, room, or other place where an employee or employees are employed for the performance of labor or service over which the employer has the right of access or control[,] and includes, but is not limited to, all work places covered by industrial insurance under Title 51 RCW, as now or hereafter amended.

(18) Abbreviations used in this chapter:

(a) "ANSI" means American National Standards Institute.

(b) "ASHRE" means American Society of Heating and Refrigeration Engineers.

(c) "BTU" means British thermal unit.

(d) "BTUH" means British thermal unit per hour.

(e) "CFM" means cubic feet per minute.

(f) "CFR" means Code of Federal Register.

(g) "CGA" means Compressed Gas Association.

(h) "ID" means inside diameter.

(i) "MCA" means Manufacturing Chemist Association or Chemical Manufacturer Association (CMA).

(j) "NEMA" means National Electrical Manufacturing Association.

(k) "NFPA" means National Fire Protection Association.

(l) "OD" means outside diameter.

(m) "WAC" means Washington Administrative Code.

(n) "WISHA" means Washington Industrial Safety and Health Act (Chapter 80, Laws of 1973).

**Reviser's note:** The brackets and enclosed material in the text of the above section occurred in the copy filed by the agency and appear in the Register pursuant to the requirements of RCW 34.08.040.

AMENDATORY SECTION (Amending Order 93-04, filed 9/22/93, effective 11/1/93)

**WAC 296-62-07105 Definitions.** (1) Abrasive-blasting respirator. See "respirator." A respirator designed to protect the wearer against inhalation of abrasive material and against impact and abrasion from rebounding abrasive material.

(2) Accepted. Reviewed and listed as satisfactory for a specified use by the director or his or her designee.

(3) Aerodynamic diameter. The diameter of a unit density sphere having the same settling velocity as the particle in question of whatever shape and density.

(4) Aerosol. A system consisting of particles, solid or liquid, suspended in air.

(5) Air-line respirator. See "respirator."

(6) Air-purifying respirator. See "respirator."

(7) Air-regulating valve. An adjustable valve used to regulate, but which cannot completely shut off the airflow to the facepiece, helmet, hood, or suit of an air-line respirator.

(8) Air-supply device. A hand- or motor-operated blower for the hose mask, or a compressor or other source of respirable air for the air-line respirator.

(9) Approved. Tested and listed as satisfactory by the Bureau of Mines (BM) of the U.S. Department of Interior, or jointly by the Mining Enforcement and Safety Administration (MESA) of the U.S. Department of Interior and the National Institute for Occupational Safety and Health (NIOSH) of the U.S. Department of Health and Human Services, or jointly by the Mine Safety and Health Administration (MSHA) of the U.S. Department of Labor and NIOSH under the provisions of Title 30, Code of Federal Regulations, Part 11.

(10) Bioassay. A determination of the concentration of a substance in a human body by an analysis of urine, feces, blood, bone, or tissue.

(11) Breathing tube. A tube through which air or oxygen flows to the facepiece, mouthpiece, helmet, hood, or suit.

(12) Canister (air-purifying). A container with a filter, sorbent, or catalyst, or any combination thereof, which removes specific contaminants from the air drawn through it.

(13) Canister (oxygen-generating). A container filled with a chemical which generates oxygen by chemical reaction.

(14) Carcinogen. A substance known to produce cancer in some individuals following a latent period (for example: Asbestos, Chromates, radioactive particulates).

(15) Cartridge (air-purifying). A small canister.

(16) Catalyst. In respirator use, a substance which converts a toxic gas (or vapor) into a less-toxic gas (or vapor).

(17) Ceiling concentration. The concentration of an airborne substance that shall not be exceeded.

(18) Chemical-cartridge respirator. See respirator.

(19) Confined space. Chapter 296-62 WAC Part M.

(20) Contaminant. A harmful, irritating, or nuisance material that is foreign to the normal atmosphere.

(21) Corrective lens. A lens ground to the wearer's individual corrective prescription to permit normal visual acuity.

(22) Demand. A type of self-contained breathing apparatus or type of air-line respirator which functions due

to the negative pressure created by inhalation (i.e., air flow into the facepiece on "demand").

(23) Detachable coupling. A device which permits the respirator wearer, without using hand tools, to detach the air-supply line from that part of the respirator worn on the person.

(24) Dust. See WAC 296-62-07001(1).

(25) Emergency respirator use. Wearing a respirator when a hazardous atmosphere suddenly occurs that requires immediate use of a respirator either for escape from the hazardous atmosphere or for entry into the hazardous atmosphere.

(26) Exhalation valve. A device that allows exhaled air to leave a respirator and prevents outside air from entering through the valve.

(27) Eyepiece. A gas-tight, transparent window(s) in a full facepiece, helmet, hood, or suit, through which the wearer may see.

(28) Facepiece. That portion of a respirator that covers the wearer's nose and mouth in quarter-mask (above the chin) or half-mask (under the chin) facepiece or that covers the nose, mouth, and eyes in a full facepiece. It is designed to make a gas-tight or particle-tight fit with the face and includes the headbands, exhalation valve(s), and connections for an air-purifying device or respirable gas source, or both.

(29) Face shield. A device worn in front of the eyes and a portion of, or all of, the face, whose predominant function is protection of the eyes and the face.

(30) Fibrosis-producing dust. Dust which, when inhaled, deposited, and retained in the lungs, may produce findings of fibrotic growth that may cause pulmonary disease.

(31) Filter. A media component used in respirators to remove solid or liquid particles from the inspired air.

(32) Filter respirator. See respirator.

(33) Fog. A mist of sufficient concentration to perceptibly obscure vision.

(34) Full facepiece. See facepiece.

(35) Fume. See WAC 296-62-07001(2).

(36) Gas. An aeriform fluid which is in the gaseous state at ordinary temperature and pressure.

(37) Gas mask. See respirator.

(38) Goggle. A device, with contour-shaped eyecups with glass or plastic lenses, worn over eyes and held in place by a headband or other suitable means for the protection of the eyes and eye sockets.

(39) Half-mask facepiece. See facepiece.

(40) Hazardous atmosphere. Any atmosphere, either immediately or not immediately dangerous to life or health, which is oxygen deficient or which contains a toxic or disease-producing contaminant.

(41) Head harness. That part of a facepiece assembly which secures the facepiece to the wearer.

(42) Helmet. That portion of a respirator which shields the eyes, face, neck, and other parts of the head.

(43) High-efficiency filter. A filter which removes from air 99.97% or more of monodisperse dioctyl phthalate (DOP) particles having a mean particle diameter of 0.3 micrometer.

(44) Hood. That portion of a respirator which completely covers the head, neck, and portions of the shoulders.

(45) Hose mask. See respirator.



(46) Immediately dangerous to life or health (IDLH). Any atmosphere that poses an immediate hazard to life or produces immediate irreversible debilitating effects on health.

(47) Inhalation valve. A device that allows respirable air to enter a respirator and prevents exhaled air from leaving the respirator through the valve.

(48) Irrespirable. Unfit for breathing.

(49) Maximum use limit of filter, cartridge, or canister. The maximum concentration of a contaminant for which an air-purifying filter, cartridge, or canister is approved for use.

(50) Mist. See WAC 296-62-07001(4).

(51) Mouthpiece. That portion of a respirator which is held in the wearer's mouth and is connected to an air-purifying device or respirable gas source, or both. It is designed to make a gas-tight or particle-tight fit with the mouth.

(52) MPCa. Maximum permissible airborne concentration. These concentrations are set by the National Committee on Radiation Protection. They are recommended maximum average concentrations of radionuclides to which a worker may be exposed, assuming that he/she works 8 hours a day, 5 days a week, and 50 weeks a year.

(53) Negative pressure respirator. A respirator in which the air pressure inside the respiratory-inlet covering is positive during exhalation in relation to the air pressure of the outside atmosphere and negative during inhalation in relation to the air pressure of the outside atmosphere.

(54) Nonroutine respirator use. Wearing a respirator when carrying out a special task that occurs infrequently.

(55) Nose clamp. A device used with a respirator equipped with a mouthpiece that closes the nostrils of the wearer (sometimes called a nose clip).

(56) Not immediately dangerous to life or health. Any hazardous atmosphere which may produce physical discomfort immediately, chronic poisoning after repeated exposure, or acute adverse physiological symptoms after prolonged exposure.

(57) Odor threshold limit. The lowest concentration of a contaminant in air that can be detected by the olfactory sense.

(58) Oxygen deficiency - immediately dangerous to life or health. An atmosphere which causes an oxygen partial pressure of ~~((400))~~ 95 millimeters of mercury column or less or has less than 12.5% by volume in the freshly inspired air in the upper portion of the lungs which is saturated with water vapor.

(59) Oxygen deficiency - not immediately dangerous to life or health. An atmosphere having an oxygen concentration below the minimum legal requirement of 19.5% by volume or has a partial pressure of oxygen of 148 millimeters of mercury for respirable air at sea-level conditions, but above that which is immediately dangerous to life or health.

(60) Particulate matter. A suspension of fine solid or liquid particles in air, such as: Dust, fog, fume, mist, smoke, or spray. Particulate matter suspended in air is commonly known as an aerosol.

(61) Permissible exposure limit (PEL). The legally established time-weighted average (TWA) concentration or ceiling concentration of a contaminant that shall not be exceeded.

(62) Pneumoconiosis-producing dust. Dust which, when inhaled, deposited, and retained in the lungs, may produce signs, symptoms, and findings of pulmonary disease.

(63) Positive-pressure respirator. A respirator in which the air pressure inside the respiratory-inlet covering is positive in relation to the air pressure of the outside atmosphere during exhalation and inhalation.

(64) Powered air-purifying respirator. See respirator.

(65) Pressure demand. Similar to a demand type respirator but so designed to maintain positive pressure in the facepiece at all times.

(66) Protection factor. The ratio of the ambient concentration of an airborne substance to the concentration of the substance inside the respirator at the breathing zone of the wearer. The protection factor is a measure of the degree of protection provided by a respirator to the wearer. As used herein, a protection factor is synonymous with the fit factor assigned to a respirator facepiece by the use of qualitative and quantitative fitting tests.

(67) Rescue respirator use. Wearing a respirator for entry into a hazardous atmosphere to rescue a person(s) in the hazardous atmosphere.

(68) Resistance. Opposition to the flow of air, as through a canister, cartridge, particulate filter, orifice, valve, or hose.

(69) Respirable. Suitable for breathing.

(70) Respirator. A device designed to protect the wearer from the inhalation of harmful atmospheres.

(71) Respiratory-inlet covering. That portion of a respirator which connects the wearer's respiratory tract to an air-purifying device or respirable gas source, or both. It may be a facepiece, helmet, hood, suit, or mouthpiece/nose clamp.

(72) Routine respirator use. Wearing a respirator as a normal procedure when carrying out a regular and frequently repeated task.

(73) Sanitization. The removal of dirt and the inhibiting of the action of agents that cause infection or disease.

(74) Self-contained breathing apparatus. See respirator.

(75) Service life. The period of time that a respirator provides adequate protection to the wearer - for example, the period of time that an air-purifying device is effective for removing a harmful substance from inspired air.

(76) Smoke. A system which includes the products of combustion, pyrolysis, or chemical reaction of substances in the form of visible and invisible solid and liquid particles and gaseous products in air. Smoke is usually of sufficient concentration to perceptibly obscure vision.

(77) Sorbent. A material which is contained in cartridge or canister and which removes toxic gases and vapors from the inhaled air.

(78) Spray. A liquid, mechanically produced particle with sizes generally in the visible or macroscopic range.

(79) Supplied-air respirator. See respirator.

(80) Supplied-air suit. A suit that is impermeable to most particulate and gaseous contaminants and that is provided with an adequate supply of respirable air.

(81) Time-weighted average (TWA). The average concentration of a contaminant in air during a specific time period.

(82) Valve (air or oxygen). A device which controls the pressure, direction, or rate of flow of air or oxygen.

(83) Vapor. The gaseous state of a substance that is solid or liquid at ordinary temperature and pressure.

(84) Welding helmet. A device designed to provide protection for the eyes and face against intense radiant energy and molten metal splatter encountered in the welding and cutting of metals.

(85) Window indicator. A device on a cartridge or canister that visually denotes the service life of the cartridge or canister.

**AMENDATORY SECTION** (Amending Order 85-09, filed 4/19/85)

**WAC 296-62-07302 List of carcinogens.** (1) The following substances are deemed to be carcinogens for the purposes of WAC 296-62-073 through 296-62-07316.

(2) Any reference to carcinogens in WAC 296-62-07304 through 296-62-07316 shall mean only those carcinogens listed in WAC 296-62-07302.

(a) 4-Nitrobiphenyl - Chemical Abstracts Registry Number ((92933)) 92-93-3.

(b) Alpha-Naphthylamine - Chemical Abstracts Registry Number ((434327)) 134-32-7.

(c) 4,4' Methylene bis (2 - chloroaniline) - Chemical Abstracts Service Registry Number ((40144)) 101-14-4.

(d) Methyl chloromethyl ether - Chemical Abstracts Service Registry Number ((407302)) 107-30-2.

(e) 3,3'-Dichlorobenzidine (and its salts) - Chemical Abstracts Service Registry Number ((94941)) 91-94-1.

(f) Bis-Chloromethyl ether - Chemical Abstracts Service Registry Number ((542884)) 542-88-1.

(g) Beta-Naphthylamine - Chemical Abstracts Service Registry Number ((91598)) 91-59-8.

(h) Benzidine - Chemical Abstracts Service Registry Number ((92875)) 92-87-5.

(i) 4-Aminodiphenyl - Chemical Abstracts Service Registry Number ((92674)) 92-67-1.

(j) Ethyleneimine - Chemical Abstracts Service Registry Number ((451564)) 151-56-4.

(k) Beta-Propiolactone - Chemical Abstracts Service Registry Number ((57578)) 57-57-8.

(l) 2-Acetylaminofluorene - Chemical Abstracts Service Registry Number ((53963)) 53-96-3.

(m) 4-Dimethylaminoazobenzene - Chemical Abstracts Service Registry Number ((60117)) 60-11-7.

(n) N-Nitrosodimethylamine - Chemical Abstracts Service Registry Number ((62759)) 62-75-9.

**AMENDATORY SECTION** (Amending Order 90-18, filed 1/10/91, effective 2/12/91)

**WAC 296-62-07329 Vinyl chloride.** (1) Scope and application.

(a) This section includes requirements for the control of employee exposure to vinyl chloride (chloroethene), Chemical Abstracts Service Registry No. 75014.

(b) This section applies to the manufacture, reaction, packaging, repackaging, storage, handling or use of vinyl chloride or polyvinyl chloride, but does not apply to the handling or use of fabricated products made of polyvinyl chloride.

(c) This section applies to the transportation of vinyl chloride or polyvinyl chloride except to the extent that the

department of transportation may regulate the hazards covered by this section.

(2) Definitions.

(a) "Action level" means a concentration of vinyl chloride of 0.5 ppm averaged over an 8-hour work day.

(b) "Authorized person" means any person specifically authorized by the employer whose duties require him/her to enter a regulated area or any person entering such an area as a designated representative of employees for the purpose of exercising an opportunity to observe monitoring and measuring procedures.

(c) "Director" means (~~chief, industrial hygiene section~~) the director of department of labor and industries or his/her designated representative.

(d) "Emergency" means any occurrence such as, but not limited to, equipment failure, or operation of a relief device which is likely to, or does, result in massive release of vinyl chloride.

(e) "Fabricated product" means a product made wholly or partly from polyvinyl chloride, and which does not require further processing at temperatures, and for times, sufficient to cause mass melting of the polyvinyl chloride resulting in the release of vinyl chloride.

(f) "Hazardous operation" means any operation, procedure, or activity where a release of either vinyl chloride liquid or gas might be expected as a consequence of the operation or because of an accident in the operation, which would result in an employee exposure in excess of the permissible exposure limit.

(g) "Polyvinyl chloride" means polyvinyl chloride homopolymer or copolymer before such is converted to a fabricated product.

(h) "Vinyl chloride" means vinyl chloride monomer.

(3) Permissible exposure limit.

(a) No employee may be exposed to vinyl chloride at concentrations greater than 1 ppm averaged over any 8-hour period, and

(b) No employee may be exposed to vinyl chloride at concentrations greater than 5 ppm averaged over any period not exceeding 15 minutes.

(c) No employee may be exposed to vinyl chloride by direct contact with liquid vinyl chloride.

(4) Monitoring.

(a) A program of initial monitoring and measurement shall be undertaken in each establishment to determine if there is any employee exposed, without regard to the use of respirators, in excess of the action level.

(b) Where a determination conducted under (~~paragraph (4))~~ subdivision (a) of this (section) subsection shows any employee exposures without regard to the use of respirators, in excess of the action level, a program for determining exposures for each such employee shall be established. Such a program:

(i) Shall be repeated at least monthly where any employee is exposed, without regard to the use of respirators, in excess of the permissible exposure limit.

(ii) Shall be repeated not less than quarterly where any employee is exposed, without regard to the use of respirators, in excess of the action level.

(iii) May be discontinued for any employee only when at least two consecutive monitoring determinations, made not

less than 5 working days apart, show exposures for that employee at or below the action level.

(c) Whenever there has been a production, process or control change which may result in an increase in the release of vinyl chloride, or the employer has any other reason to suspect that any employee may be exposed in excess of the action level, a determination of employee exposure under ~~((subsection (4)))~~ subdivision (a) of this ~~((section))~~ subsection shall be performed.

(d) The method of monitoring and measurement shall have an accuracy (with a confidence level of 95 percent) of not less than plus or minus 50 percent from 0.25 through 0.5 ppm, plus or minus 35 percent from over 0.5 ppm through 1.0 ppm, plus or minus 25 percent over 1.0 ppm, (methods meeting these accuracy requirements are available from the director).

(e) Employees or their designated representatives shall be afforded reasonable opportunity to observe the monitoring and measuring required by this ~~((subdivision))~~ subsection.

(5) Regulated area.

(a) A regulated area shall be established where:

(i) Vinyl chloride or polyvinyl chloride is manufactured, reacted, repackaged, stored, handled or used; and

(ii) Vinyl chloride concentrations are in excess of the permissible exposure limit.

(b) Access to regulated areas shall be limited to authorized persons.

(6) Methods of compliance. Employee exposures to vinyl chloride shall be controlled to at or below the permissible exposure limit provided in subsection (3) of this section by engineering, work practice, and personal protective controls as follows:

(a) Feasible engineering and work practice controls shall immediately be used to reduce exposures to at or below the permissible exposure limit.

(b) Wherever feasible engineering and work practice controls which can be instituted immediately are not sufficient to reduce exposures to at or below the permissible exposure limit, they shall nonetheless be used to reduce exposures to the lowest practicable level, and shall be supplemented by respiratory protection in accordance with subsection ~~((6))~~ (7) of this section. A program shall be established and implemented to reduce exposures to at or below the permissible exposure limit, or to the greatest extent feasible, solely by means of engineering and work practice controls, as soon as feasible.

(c) Written plans for such a program shall be developed and furnished upon request for examination and copying to the director. Such plans shall be updated at least every six months.

(7) Respiratory protection. Where respiratory protection is required under this section:

(a) The employer shall provide a respirator which meets the requirements of this subdivision and shall assure that the employee uses such respirator.

(b) Respirators shall be selected from among those jointly approved by the ~~((Mining Enforcement and))~~ Mine Safety and Health Administration, ~~((Department of the Interior;))~~ and the National Institute for Occupational Safety and Health under the provisions of 30 CFR Part 11.

Note: The Department of Interior published an article in Federal Register in April 1976 which extended time requirement for

respirators used for protection against vinyl chloride to have a cartridge or canister with an end-of-service-life indicator. The indicator is an additional safety feature but does not adversely affect the effectiveness of currently approved respirator cartridges or canisters. Until approved end-of-service-life indicators are available, the respirators, cartridges, or canisters presently approved are considered to meet requirements for vinyl chloride when used per manufacturer's instructions.

(c) A respiratory protection program meeting the requirements of chapter 296-62 WAC shall be established and maintained.

(d) Selection of respirators for vinyl chloride shall be as follows:

Atmospheric concentration of Vinyl Chloride	Required Apparatus
(i) Unknown, or above 3,600 ppm	Open-circuit, self-contained breathing apparatus, pressure demand type, with full facepiece.
(ii) Not over 3,600 ppm	Combination Type C supplied air respirator, pressure demand type, with full or half facepiece, and auxiliary self-contained air supply.
(iii) Not over 250 ppm	Type C, supplied air respirator, continuous flow type, with full or half facepiece, helmet or hood.
(iv) Not over 100 ppm	Supplied air respirator demand type, with full facepiece.
(v) Not over 25 ppm	(A) A powered air-purifying respirator with hood, helmet, full or half facepiece, and a canister which provides a service life of at least 4 hours for concentrations of vinyl chloride up to 25 ppm, or (B) Gas mask, front or back-mounted canister which provides a service life of at least 4 hours for concentrations of vinyl chloride up to 25 ppm.
(vi) Not over 10 ppm	Any chemical cartridge respirator with a vinyl chloride cartridge which provides a service life of at least 1 hour for concentrations of vinyl chloride up to 10 ppm.

(e)(i) Entry into unknown concentrations or concentrations greater than 36,000 ppm (lower explosive limit) may be made only for purposes of life rescue; and

(ii) Entry into concentrations of less than 36,000 ppm, but greater than 3,600 ppm may be made only for purposes of life rescue, fire fighting, or securing equipment so as to prevent a greater hazard from release of vinyl chloride.

(f) Where air-purifying respirators are used:

PERMANENT

PERMANENT

(i) Air-purifying canisters or cartridges shall be replaced prior to the expiration of their service life or the end of the shift in which they are first used, whichever occurs first, and

(ii) A continuous monitoring and alarm system shall be provided where concentrations of vinyl chloride could reasonably exceed the allowable concentrations for the devices in use. Such system shall be used to alert employees when vinyl chloride concentrations exceed the allowable concentrations for the devices in use.

(g) Apparatus prescribed for higher concentrations may be used for any lower concentration.

(8) Hazardous operations.

(a) Employees engaged in hazardous operations, including entry of vessels to clean polyvinyl chloride residue from vessel walls, shall be provided and required to wear and use;

(i) Respiratory protection in accordance with subsections (3) and ~~((6))~~ (7) of this section; and

(ii) Protective garments to prevent skin contact with liquid vinyl chloride or with polyvinyl chloride residue from vessel walls. The protective garments shall be selected for the operation and its possible exposure conditions.

(b) Protective garments shall be provided clean and dry for each use.

~~((+))~~ (c) Emergency situations. A written operational plan for emergency situations shall be developed for each facility storing, handling, or otherwise using vinyl chloride as a liquid or compressed gas. Appropriate portions of the plan shall be implemented in the event of an emergency. The plan shall specifically provide that:

~~((A))~~ (i) Employees engaged in hazardous operations or correcting situations of existing hazardous releases shall be equipped as required in ~~((subsection (8)))~~ subdivisions (a) and (b) of this ~~((section))~~ subsection;

~~((B))~~ (ii) Other employees not so equipped shall evacuate the area and not return until conditions are controlled by the methods required in subsection (6) of this section and the emergency is abated.

(9) Training. Each employee engaged in vinyl chloride or polyvinyl chloride operations shall be provided training in a program relating to the hazards of vinyl chloride and precautions for its safe use.

(a) The program shall include:

(i) The nature of the health hazard from chronic exposure to vinyl chloride including specifically the carcinogenic hazard;

(ii) The specific nature of operations which could result in exposure to vinyl chloride in excess of the permissible limit and necessary protective steps;

(iii) The purpose for, proper use, and limitations of respiratory protective devices;

(iv) The fire hazard and acute toxicity of vinyl chloride, and the necessary protective steps;

(v) The purpose for and a description of the monitoring program;

(vi) The purpose for and a description of, the medical surveillance program;

(vii) Emergency procedures:

(A) Specific information to aid the employee in recognition of conditions which may result in the release of vinyl chloride; and

(B) A review of this standard at the employee's first training and indoctrination program, and annually thereafter.

(b) All materials relating to the program shall be provided upon request to the director.

(10) Medical surveillance. A program of medical surveillance shall be instituted for each employee exposed, without regard to the use of respirators, to vinyl chloride in excess of the action level. The program shall provide each such employee with an opportunity for examinations and tests in accordance with this subsection. All medical examinations and procedures shall be performed by or under the supervision of a licensed physician and shall be provided without cost to the employee.

(a) At the time of initial assignment, or upon institution of medical surveillance;

(i) A general physical examination shall be performed with specific attention to detecting enlargement of liver, spleen or kidneys, or dysfunction in these organs, and for abnormalities in skin, connective tissues and the pulmonary system (see Appendix A).

(ii) A medical history shall be taken, including the following topics:

(A) Alcohol intake,

(B) Past history of hepatitis,

(C) Work history and past exposure to potential hepatotoxic agents, including drugs and chemicals,

(D) Past history of blood transfusions, and

(E) Past history of hospitalizations.

(iii) A serum specimen shall be obtained and determinations made of:

(A) Total bilirubin,

(B) Alkaline phosphatase,

(C) Serum glutamic oxalacetic transaminase (SGOT),

(D) Serum glutamic pyruvic transaminase (SGPT), and

(E) Gamma glutamyl transpeptidase.

(b) Examinations provided in accordance with this subdivision shall be performed at least:

(i) Every 6 months for each employee who has been employed in vinyl chloride or polyvinyl chloride manufacturing for 10 years or longer; and

(ii) Annually for all other employees.

(c) Each employee exposed to an emergency shall be afforded appropriate medical surveillance.

(d) A statement of each employee's suitability for continued exposure to vinyl chloride including use of protective equipment and respirators, shall be obtained from the examining physician promptly after any examination. A copy of the physician's statement shall be provided each employee.

(e) If any employee's health would be materially impaired by continued exposure, such employee shall be withdrawn from possible contact with vinyl chloride.

(f) Laboratory analyses for all biological specimens included in medical examinations shall be performed in laboratories licensed under 42 CFR Part 74.

(g) If the examining physician determines that alternative medical examinations to those required by ~~((subsection (10)))~~ subdivision (a) of this ~~((section))~~ subsection will provide at least equal assurance of detecting medical conditions pertinent to the exposure to vinyl chloride, the employer may accept such alternative examinations as meeting the requirements of ~~((subsection (10)))~~ subdivision

(a) of this ((~~section~~)) subsection, if the employer obtains a statement from the examining physician setting forth the alternative examinations and the rationale for substitution. This statement shall be available upon request for examination and copying to authorized representatives of the director.

(11) Signs and labels.

(a) Entrances to regulated areas shall be posted with legible signs bearing the legend:

CANCER-SUSPECT AGENT AREA AUTHORIZED PERSONNEL  
ONLY

(b) Areas containing hazardous operations or where an emergency currently exists shall be posted with legible signs bearing the legend:

CANCER-SUSPECT AGENT IN THIS AREA PROTECTIVE  
EQUIPMENT REQUIRED AUTHORIZED PERSONNEL ONLY

(c) Containers of polyvinyl chloride resin waste from reactors or other waste contaminated with vinyl chloride shall be legibly labeled:

CONTAMINATED WITH VINYL CHLORIDE CANCER-SUSPECT  
AGENT

(d) Containers of polyvinyl chloride shall be legibly labeled:

POLYVINYL CHLORIDE (OR TRADE NAME) CONTAINS VINYL  
CHLORIDE VINYL CHLORIDE IS A CANCER-SUSPECT AGENT

(e) Containers of vinyl chloride shall be legibly labeled either:

VINYL CHLORIDE EXTREMELY FLAMMABLE GAS UNDER  
PRESSURE CANCER-SUSPECT AGENT

(or)

(f) In accordance with 49 CFR Part 173, Subpart H, with the additional legends:

CANCER-SUSPECT AGENT

applied near the label or placard.

(g) No statement shall appear on or near any required sign, label or instruction which contradicts or detracts from the effect of any required warning, information or instruction.

(12) Records.

(a) All records maintained in accordance with this section shall include the name and social security number of each employee where relevant.

(b) Records of required monitoring and measuring and medical records shall be provided upon request to employees, designated representatives, and the ((~~assistant~~)) director in accordance with WAC 296-62-05201 through 296-62-05209; and 296-62-05213 through 296-62-05217. These records shall be provided upon request to the director. Authorized personnel rosters shall also be provided upon request to the ((~~assistant~~)) director.

(i) Monitoring and measuring records shall:

(A) State the date of such monitoring and measuring and the concentrations determined and identify the instruments and methods used;

(B) Include any additional information necessary to determine individual employee exposures where such

exposures are determined by means other than individual monitoring of employees; and

(C) Be maintained for not less than 30 years.

(ii) Medical records shall be maintained for the duration of the employment of each employee plus 20 years, or 30 years, whichever is longer.

(c) In the event that the employer ceases to do business and there is no successor to receive and retain his/~~her~~ records for the prescribed period, these records shall be transmitted by registered mail to the director, and each employee individually notified in writing of this transfer. The employer shall also comply with any additional requirements set forth in WAC 296-62-05215.

(d) Employees or their designated representatives shall be provided access to examine and copy records of required monitoring and measuring.

(e) Former employees shall be provided access to examine and copy required monitoring and measuring records reflecting their own exposures.

(f) Upon written request of any employee, a copy of the medical record of that employee shall be furnished to any physician designated by the employee.

(13) Reports.

(a) Not later than 1 month after the establishment of a regulated area, the following information shall be reported to the director. Any changes to such information shall be reported within 15 days.

(i) The address and location of each establishment which has one or more regulated areas; and

(ii) The number of employees in each regulated area during normal operations, including maintenance.

(b) Emergencies and the facts obtainable at that time, shall be reported within 24 hours to the director. Upon request of the director, the employer shall submit additional information in writing relevant to the nature and extent of employee exposures and measures taken to prevent future emergencies of similar nature.

(c) Within 10 working days following any monitoring and measuring which discloses that any employee has been exposed, without regard to the use of respirators, in excess of the permissible exposure limit, each such employee shall be notified in writing of the results of the exposure measurement and the steps being taken to reduce the exposure to within the permissible exposure limit.

((~~†~~)) (14) Effective January 1, 1975, the provisions set forth in WAC 296-62-07329 shall apply.

APPENDIX A SUPPLEMENTARY MEDICAL INFORMATION

When required tests under ((~~paragraph~~)) subsection (10)(a) of this section show abnormalities, the tests should be repeated as soon as practicable, preferably within 3 to 4 weeks. If tests remain abnormal, consideration should be given to withdrawal of the employee from contact with vinyl chloride, while a more comprehensive examination is made.

Additional tests which may be useful:

(A) For kidney dysfunction: Urine examination for albumin, red blood cells, and exfoliative abnormal cells.

(B) Pulmonary system: Forced vital capacity, forced expiratory volume at 1 second, and chest roentgenogram (posterior-anterior, 14 x 17 inches).

(C) Additional serum tests: Lactic acid dehydrogenase, lactic acid dehydrogenase isoenzyme, protein determination, and protein electrophoresis.

(D) For a more comprehensive examination on repeated abnormal serum tests: Hepatitis B antigen, and liver scanning.

**AMENDATORY SECTION** (Amending Order 88-04, filed 5/11/88)

**WAC 296-62-07337 Appendix A—Substance safety data sheet for acrylonitrile.** (1) Substance identification.

(a) Substance: Acrylonitrile (CH<sub>2</sub>CHCN).

(b) Synonyms: Propenenitrile; vinyl cyanide; cyanoethylene; AN; VCN; acylon; carbacryl; fumigriant; ventox.

(c) Acrylonitrile can be found as a liquid or vapor, and can also be found in polymer resins, rubbers, plastics, polyols, and other polymers having acrylonitrile as a raw or intermediate material.

(d) AN is used in the manufacture of acrylic and modiacrylic fibers, acrylic plastics and resins, speciality polymers, nitrile rubbers, and other organic chemicals. It has also been used as a fumigant.

(e) Appearance and odor: Colorless to pale yellow liquid with a pungent odor which can only be detected at concentrations above the permissible exposure level, in a range of 13-19 parts AN per million parts of air (13-19 ppm).

(f) Permissible exposure: Exposure may not exceed either:

(i) Two parts AN per million parts of air (2 ppm) averaged over the eight-hour workday; or

(ii) Ten parts AN per million parts of air (10 ppm) averaged over any fifteen-minute period in the workday.

(iii) In addition, skin and eye contact with liquid AN is prohibited.

(2) Health hazard data.

(a) Acrylonitrile can affect your body if you inhale the vapor (breathing), if it comes in contact with your eyes or skin, or if you swallow it. It may enter your body through your skin.

(b) Effects of overexposure:

(i) Short-term exposure: Acrylonitrile can cause eye irritation, nausea, vomiting, headache, sneezing, weakness, and light-headedness. At high concentrations, the effects of exposure may go on to loss of consciousness and death. When acrylonitrile is held in contact with the skin after being absorbed into shoe leather or clothing, it may produce blisters following several hours of no apparent effect. Unless the shoes or clothing are removed immediately and the area washed, blistering will occur. Usually there is no pain or inflammation associated with blister formation.

(ii) Long-term exposure: Acrylonitrile has been shown to cause cancer in laboratory animals and has been associated with higher incidences of cancer in humans. Repeated or prolonged exposure of the skin to acrylonitrile may produce irritation and dermatitis.

(iii) Reporting signs and symptoms: You should inform your employer if you develop any signs or symptoms and suspect they are caused by exposure to acrylonitrile.

(3) Emergency first aid procedures.

(a) Eye exposure: If acrylonitrile gets into your eyes, wash your eyes immediately with large amounts of water, lifting the lower and upper lids occasionally. Get medical attention immediately. Contact lenses should not be worn when working with this chemical.

(b) Skin exposure: If acrylonitrile gets on your skin, immediately wash the contaminated skin with water. If acrylonitrile soaks through your clothing, especially your shoes, remove the clothing immediately and wash the skin with water. If symptoms occur after washing, get medical attention immediately. Thoroughly wash the clothing before reusing. Contaminated leather shoes or other leather articles should be discarded.

(c) Inhalation: If you or any other person breathes in large amounts of acrylonitrile, move the exposed person to fresh air at once. If breathing has stopped, perform artificial respiration. Keep the affected person warm and at rest. Get medical attention as soon as possible.

(d) Swallowing: When acrylonitrile has been swallowed, give the person large quantities of water immediately. After the water has been swallowed, try to get the person to vomit by having him touch the back of his throat with his finger. Do not make an unconscious person vomit. Get medical attention immediately.

(e) Rescue: Move the affected person from the hazardous exposure. If the exposed person has been overcome, notify someone else and put into effect the established emergency procedures. Do not become a casualty yourself. Understand your emergency rescue procedures and know the location of the emergency equipment before the need arises.

(f) Special first aid procedures: First aid kits containing an adequate supply (at least two dozen) of amyl nitrite pearls, each containing 0.3 ml, should be maintained at each site where acrylonitrile is used. When a person is suspected of receiving an overexposure to acrylonitrile, immediately remove that person from the contaminated area using established rescue procedures. Contaminated clothing must be removed and the acrylonitrile washed from the skin immediately. Artificial respiration should be started at once if breathing has stopped. If the person is unconscious, amyl nitrite may be used as an antidote by a properly trained individual in accordance with established emergency procedures. Medical aid should be obtained immediately.

(4) Respirators and protective clothing.

(a) Respirators:

(i) You may be required to wear a respirator for nonroutine activities, in emergencies, while your employer is in the process of reducing acrylonitrile exposures through engineering controls, and in areas where engineering controls are not feasible. If respirators are worn, they must have a Mine Safety and Health Administration (MSHA or MESA) or National Institute for Occupational Safety and Health (NIOSH) label of approval for use with organic vapors. (Older respirators may have a Bureau of Mines approval label.) For effective protection, respirators must fit your face and head snugly. Respirators should not be loosened or removed in work situations where their use is required.

(ii) Acrylonitrile does not have a detectable odor except at levels above the permissible exposure limits. Do not depend on odor to warn you when a respirator cartridge or canister is exhausted. Cartridges or canisters must be changed daily or before the end-of-service-life, whichever

comes first. Reuse of these may allow ((acrylonitrile)) acrylonitrile to gradually filter through the cartridge and cause exposures which you cannot detect by odor. If you can smell ((acrylonitrile)) acrylonitrile while wearing a respirator, proceed immediately to fresh air. If you experience difficulty breathing while wearing a respirator, tell your employer.

(b) Supplied-air suits: In some work situations, the wearing of supplied-air suits may be necessary. Your employer must instruct you in their proper use and operation.

(c) Protective clothing:

(i) You must wear impervious clothing, gloves, face shield, or other appropriate protective clothing to prevent skin contact with liquid ((acrylonitrile)) acrylonitrile. Where protective clothing is required, your employer is required to provide clean garments to you as necessary to assume that the clothing protects you adequately.

(ii) Replace or repair impervious clothing that has developed leaks.

(iii) Acrylonitrile should never be allowed to remain on the skin. Clothing and shoes which are not impervious to acrylonitrile should not be allowed to become contaminated with acrylonitrile, and if they do the clothing and shoes should be promptly removed and decontaminated. The clothing should be laundered or discarded after the AN is removed. Once acrylonitrile penetrates shoes or other leather articles, they should not be worn again.

(d) Eye protection: You must wear splashproof safety goggles in areas where liquid acrylonitrile may contact your eyes. In addition, contact lenses should not be worn in areas where eye contact with acrylonitrile can occur.

(5) Precautions for safe use, handling, and storage.

(a) Acrylonitrile is a flammable liquid, and its vapors can easily form explosive mixtures in air.

(b) Acrylonitrile must be stored in tightly closed containers in a cool, well-ventilated area, away from heat, sparks, flames, strong oxidizers (especially bromine), strong bases, copper, copper alloys, ammonia, and amines.

(c) Sources of ignition such as smoking and open flames are prohibited wherever acrylonitrile is handled, used, or stored in a manner that could create a potential fire or explosion hazard.

(d) You should use nonsparking tools when opening or closing metal containers of acrylonitrile, and containers must be bonded and grounded when pouring or transferring liquid acrylonitrile.

(e) You must immediately remove any nonimpervious clothing that becomes wetted with acrylonitrile, and this clothing must not be reworn until the acrylonitrile is removed from the clothing.

(f) Impervious clothing wet with liquid acrylonitrile can be easily ignited. This clothing must be washed down with water before you remove it.

(g) If your skin becomes wet with liquid acrylonitrile, you must promptly and thoroughly wash or shower with soap or mild detergent to remove any acrylonitrile from your skin.

(h) You must not keep food, beverages, or smoking materials, nor are you permitted to eat or smoke in regulated areas where acrylonitrile concentrations are above the permissible exposure limits.

(i) If you contact liquid acrylonitrile, you must wash your hands thoroughly with soap or mild detergent and water before eating, smoking, or using toilet facilities.

(j) Fire extinguishers and quick drenching facilities must be readily available, and you should know where they are and how to operate them.

(k) Ask your supervisor where acrylonitrile is used in your work area and for any additional plant safety and health rules.

(6) Access to information.

(a) Each year, your employer is required to inform you of the information contained in this Substance Safety Data Sheet for acrylonitrile. In addition, your employer must instruct you in the proper work practices for using acrylonitrile, emergency procedures, and the correct use of protective equipment.

(b) Your employer is required to determine whether you are being exposed to acrylonitrile. You or your representative has the right to observe employee measurements and to record the results obtained. Your employer is required to inform you of your exposure. If your employer determines that you are being overexposed, he or she is required to inform you of the actions which are being taken to reduce your exposure to within permissible exposure limits.

(c) Your employer is required to keep records of your exposures and medical examinations. These records must be kept by the employer for at least forty years or for the period of your employment plus twenty years, whichever is longer.

(d) Your employer is required to release your exposure and medical records to you or your representative upon your request.

AMENDATORY SECTION (Amending Order 88-04, filed 5/11/88)

**WAC 296-62-07343 Appendix A—Substance safety data sheet for DBCP.** (1) Substance identification.

(a) Synonyms and trade names: DBCP; Dibromochloropropane; Fumazone (Dow Chemical Company TM); Nemaforme; Nemagon (Shell Chemical Co. TM); Nemaset; BBC 12; and OS 1879.

(b) Permissible exposure:

(i) Airborne. 1 part DBCP vapor per billion parts of air (1 ppb); time-weighted average (TWA) for an eight-hour workday.

(ii) Dermal. Eye contact and skin contact with DBCP are prohibited.

(c) Appearance and odor: Technical grade DBCP is a dense yellow or amber liquid with a pungent odor. It may also appear in granular form, or blended in varying concentrations with other liquids.

(d) Uses: DBCP is used to control nematodes, very small worm-like plant parasites, on crops including cotton, soybeans, fruits, nuts, vegetables and ornamentals.

(2) Health hazard data.

(a) Routes of entry: Employees may be exposed:

(i) Through inhalation (breathing);

(ii) Through ingestion (swallowing);

(iii) Skin contact; and

(iv) Eye contact.

(b) Effects of exposure:



(i) Acute exposure. DBCP may cause drowsiness, irritation of the eyes, nose, throat and skin, nausea and vomiting. In addition, overexposure may cause damage to the lungs, liver or kidneys.

(ii) Chronic exposure. Prolonged or repeated exposure to DBCP has been shown to cause sterility in humans. It also has been shown to produce cancer and sterility in laboratory animals and has been determined to constitute an increased risk of cancer in ~~((man))~~ people.

(iii) Reporting signs and symptoms. If you develop any of the above signs or symptoms that you think are caused by exposure to DBCP, you should inform your employer.

(3) Emergency first-aid procedures.

(a) Eye exposure. If DBCP liquid or dust containing DBCP gets into your eyes, wash your eyes immediately with large amounts of water, lifting the lower and upper lids occasionally. Get medical attention immediately. Contact lenses should not be worn when working with DBCP.

(b) Skin exposure. If DBCP liquids or dusts containing DBCP get on your skin, immediately wash using soap or mild detergent and water. If DBCP liquids or dusts containing DBCP penetrate through your clothing, remove the clothing immediately and wash. If irritation is present after washing get medical attention.

(c) Breathing. If you or any person breathe in large amounts of DBCP, move the exposed person to fresh air at once. If breathing has stopped, perform artificial respiration. Do not use mouth-to-mouth. Keep the affected person warm and at rest. Get medical attention as soon as possible.

(d) Swallowing. When DBCP has been swallowed and the person is conscious, give the person large amounts of water immediately. After the water has been swallowed, try to get the person to vomit by having him touch the back of his throat with his finger. Do not make an unconscious person vomit. Get medical attention immediately.

(e) Rescue. Notify someone. Put into effect the established emergency rescue procedures. Know the locations of the emergency rescue equipment before the need arises.

(4) Respirators and protective clothing.

(a) Respirators. You may be required to wear a respirator in emergencies and while your employer is in the process of reducing DBCP exposures through engineering controls. If respirators are worn, they must have a National Institute for Occupational Safety and Health (NIOSH) approval label (older respirators may have a Bureau of Mines Approval label). For effective protection, a respirator must fit your face and head snugly. The respirator should not be loosened or removed in work situations where its use is required. DBCP does not have a detectable odor except at 1,000 times or more above the permissible exposure limit. If you can smell DBCP while wearing a respirator, the respirator is not working correctly; go immediately to fresh air. If you experience difficulty breathing while wearing a respirator, tell your employer.

(b) Protective clothing. When working with DBCP you must wear for your protection impermeable work clothing provided by your employer. (Standard rubber and neoprene protective clothing do not offer adequate protection). DBCP must never be allowed to remain on the skin. Clothing and shoes must not be allowed to become contaminated with DBCP, and if they do, they must be promptly removed and

not worn again until completely free of DBCP. Turn in impermeable clothing that has developed leaks for repair or replacement.

(c) Eye protection. You must wear splashproof safety goggles where there is any possibility of DBCP liquid or dust contacting your eyes.

(5) Precautions for safe use, handling, and storage.

(a) DBCP must be stored in tightly closed containers in a cool, well-ventilated area.

(b) If your work clothing may have become contaminated with DBCP, or liquids or dusts containing DBCP, you must change into uncontaminated clothing before leaving the work premises.

(c) You must promptly remove any protective clothing that becomes contaminated with DBCP. This clothing must not be reworn until the DBCP is removed from the clothing.

(d) If your skin becomes contaminated with DBCP, you must immediately and thoroughly wash or shower with soap or mild detergent and water to remove any DBCP from your skin.

(e) You must not keep food, beverages, cosmetics, or smoking materials, nor eat or smoke, in regulated areas.

(f) If you work in a regulated area, you must wash your hands thoroughly with soap or mild detergent and water, before eating, smoking or using toilet facilities.

(g) If you work in a regulated area, you must remove any protective equipment or clothing before leaving the regulated area.

(h) Ask your supervisor where DBCP is used in your work area and for any additional safety and health rules.

(6) Access to information.

(a) Each year, your employer is required to inform you of the information contained in this substance safety data sheet for DBCP. In addition, your employer must instruct you in the safe use of DBCP, emergency procedures, and the correct use of protective equipment.

(b) Your employer is required to determine whether you are being exposed to DBCP. You or your representative have the right to observe employee exposure measurements and to record the result obtained. Your employer is required to inform you of your exposure. If your employer determines that you are being overexposed, ~~((he is))~~ they are required to inform you of the actions which are being taken to reduce your exposure.

(c) Your employer is required to keep records of your exposure and medical examinations. Your employer is required to keep exposure and medical data for at least forty years or the duration of your employment plus twenty years, whichever is longer.

(d) Your employer is required to release exposure and medical records to you, your physician, or other individual designated by you upon your written request.

AMENDATORY SECTION (Amending Order 81-21, filed 8/27/81)

**WAC 296-62-07347 Inorganic arsenic.** (1) Scope and application. This section applies to all occupational exposures to inorganic arsenic except that this section does not apply to employee exposures in agriculture or resulting from pesticide application, the treatment of wood with preservatives or the utilization of arsenically preserved wood.

## (2) Definitions.

(a) "Action level" - a concentration of inorganic arsenic of 5 micrograms per cubic meter of air ( $5 \mu\text{g}/\text{m}^3$ ) averaged over any eight-hour period.

(b) "Authorized person" - any person specifically authorized by the employer whose duties require the person to enter a regulated area, or any person entering such an area as a designated representative of employees for the purpose of exercising the right to observe monitoring and measuring procedures under subsection (5) of this section.

(c) "Director" - the director of the department of labor and industries, or his/her designated representative.

(d) "Inorganic arsenic" - copper aceto-arsenite and all inorganic compounds containing arsenic except arsine, measured as arsenic (As).

(3) Permissible exposure limit. The employer shall assure that no employee is exposed to inorganic arsenic at concentrations greater than 10 micrograms per cubic meter of air ( $10 \mu\text{g}/\text{m}^3$ ), averaged over any eight-hour period.

## (4) Notification of use.

(a) By October 1, 1978, or within sixty days after the introduction of inorganic arsenic into the workplace, every employer who is required to establish a regulated area in his/her workplaces shall report in writing to the department of labor and industries for each such workplace:

(i) The address of each such workplace;

(ii) The approximate number of employees who will be working in regulated areas; and

(iii) A brief summary of the operations creating the exposure and the actions which the employer intends to take to reduce exposures.

(b) Whenever there has been a significant change in the information required by subsection (4)(a) of this section, the employer shall report the changes in writing within sixty days to the department of labor and industries.

## (5) Exposure monitoring.

## (a) General.

(i) Determinations of airborne exposure levels shall be made from air samples that are representative of each employee's exposure to inorganic arsenic over an eight-hour period.

(ii) For the purposes of this section, employee exposure is that exposure which would occur if the employee were not using a respirator.

(iii) The employer shall collect full shift (for at least seven continuous hours) personal samples including at least one sample for each shift for each job classification in each work area.

(b) Initial monitoring. Each employer who has a workplace or work operation covered by this standard shall monitor each such workplace and work operation to accurately determine the airborne concentration of inorganic arsenic to which employees may be exposed.

## (c) Frequency.

(i) If the initial monitoring reveals employee exposure to be below the action level the measurements need not be repeated except as otherwise provided in subsection (5)(d) of this section.

(ii) If the initial monitoring, required by this section, or subsequent monitoring reveals employee exposure to be above the permissible exposure limit, the employer shall repeat monitoring at least quarterly.

(iii) If the initial monitoring, required by this section, or subsequent monitoring reveals employee exposure to be above the action level and below the permissible exposure limit the employee shall repeat monitoring at least every six months.

(iv) The employer shall continue monitoring at the required frequency until at least two consecutive measurements, taken at least seven days apart, are below the action level at which time the employer may discontinue monitoring for that employee until such time as any of the events in subsection (5)(d) of this section occur.

(d) Additional monitoring. Whenever there has been a production, process, control or personal change which may result in new or additional exposure to inorganic arsenic, or whenever the employer has any other reason to suspect a change which may result in new or additional exposures to inorganic arsenic, additional monitoring which complies with subsection (5) of this section shall be conducted.

## (e) Employee notification.

(i) Within five working days after the receipt of monitoring results, the employer shall notify each employee in writing of the results which represent that employee's exposures.

(ii) Whenever the results indicate that the representative employee exposure exceeds the permissible exposure limit, the employer shall include in the written notice a statement that the permissible exposure limit was exceeded and a description of the corrective action taken to reduce exposure to or below the permissible exposure limit.

## (f) Accuracy of measurement.

(i) The employer shall use a method of monitoring and measurement which has an accuracy (with a confidence level of 95 percent) of not less than plus or minus 25 percent for concentrations of inorganic arsenic greater than or equal to  $10 \mu\text{g}/\text{m}^3$ .

(ii) The employer shall use a method of monitoring and measurement which has an accuracy (with confidence level of 95 percent) of not less than plus or minus 35 percent for concentrations of inorganic arsenic greater than  $5 \mu\text{g}/\text{m}^3$  but less than  $10 \mu\text{g}/\text{m}^3$ .

## (6) Regulated area.

(a) Establishment. The employer shall establish regulated areas where worker exposures to inorganic arsenic, without regard to the use of respirators, are in excess of the permissible limit.

(b) Demarcation. Regulated areas shall be demarcated and segregated from the rest of the workplace in any manner that minimizes the number of persons who will be exposed to inorganic arsenic.

(c) Access. Access to regulated areas shall be limited to authorized persons or to persons otherwise authorized by the Act or regulations issued pursuant thereto to enter such areas.

(d) Provision of respirators. All persons entering a regulated area shall be supplied with a respirator, selected in accordance with subsection (8)(b) of this section.

(e) Prohibited activities. The employer shall assure that in regulated areas, food or beverages are not consumed, smoking products, chewing tobacco and gum are not used and cosmetics are not applied, except that these activities may be conducted in the lunchrooms, change rooms and

showers required under subsection (12) of this section. Drinking water may be consumed in the regulated area.

(7) Methods of compliance.

(a) Controls.

(i) The employer shall institute at the earliest possible time but not later than December 31, 1979, engineering and work practice controls to reduce exposures to or below the permissible exposure limit, except to the extent that the employer can establish that such controls are not feasible.

(ii) Where engineering and work practice controls are not sufficient to reduce exposures to or below the permissible exposure limit, they shall nonetheless be used to reduce exposures to the lowest levels achievable by these controls and shall be supplemented by the use of respirators in accordance with subsection (8) of this section and other necessary personal protective equipment. Employee rotation is not required as a control strategy before respiratory protection is instituted.

(b) Compliance program.

(i) The employer shall establish and implement a written program to reduce exposures to or below the permissible exposure limit by means of engineering and work practice controls.

(ii) Written plans for these compliance programs shall include at least the following:

(A) A description of each operation in which inorganic arsenic is emitted; e.g., machinery used, material processed, controls in place, crew size, operating procedures and maintenance practices;

(B) Engineering plans and studies used to determine methods selected for controlling exposure to inorganic arsenic;

(C) A report of the technology considered in meeting the permissible exposure limit;

(D) Monitoring data;

(E) A detailed schedule for implementation of the engineering controls and work practices that cannot be implemented immediately and for the adaption and implementation of any additional engineering and work practices necessary to meet the permissible exposure limit;

(F) Whenever the employer will not achieve the permissible exposure limit with engineering controls and work practices by December 31, 1979, the employer shall include in the compliance plan an analysis of the effectiveness of the various controls, shall install engineering controls and institute work practices on the quickest schedule feasible, and shall include in the compliance plan and implement a program to minimize the discomfort and maximize the effectiveness of respirator use; and

(G) Other relevant information.

(iii) Written plans for such a program shall be submitted upon request to the director, and shall be available at the worksite for examination and copying by the director, any affected employee or authorized employee representatives.

(iv) The plans required by this subsection shall be revised and updated at least every six months to reflect the current status of the program.

(8) Respiratory protection.

(a) General. The employer shall assure that respirators are used where required under this section to reduce employee exposures to below the permissible exposure limit and in

emergencies. Respirators shall be used in the following circumstances:

(i) During the time period necessary to install or implement feasible engineering or work practice controls;

(ii) In work operations such as maintenance and repair activities in which the employer establishes that engineering and work practice controls are not feasible;

(iii) In work situations in which engineering controls and supplemental work practice controls are not yet sufficient to reduce exposures to or below the permissible exposure limit; or

(iv) In emergencies.

(b) Respirator selection.

(i) Where respirators are required under this section the employer shall select, provide at no cost to the employee and assure the use of the appropriate respirator or combination of respirators from Table I for inorganic arsenic compounds without significant vapor pressure, or Table II for inorganic arsenic compounds which have significant vapor pressure.

(ii) Where employee exposures exceed the permissible exposure limit for inorganic arsenic and also exceed the relevant limit for particular gasses such as sulfur dioxide, any air purifying respirator supplied to the employee as permitted by this standard must have a combination high efficiency filter with an appropriate gas sorbent. (See footnote in Table I)

TABLE I

RESPIRATORY PROTECTION FOR INORGANIC ARSENIC PARTICULATE EXCEPT FOR THOSE WITH SIGNIFICANT VAPOR PRESSURE

Concentration of Inorganic Arsenic (as As) or Condition of Use	Required Respirator
(i) Unknown or greater or lesser than 20,000 $\mu\text{g}/\text{m}^3$ (20 $\text{mg}/\text{m}^3$ ) firefighting.	(A) Any full facepiece self-contained or breathing apparatus operated in positive pressure mode.
(ii) Not greater than 20,000 $\mu\text{g}/\text{m}^3$ (20 $\text{mg}/\text{m}^3$ )	(A) Supplied air respirator with full facepiece, hood, or helmet or suit and operated in positive pressure mode.
(iii) Not greater than 10,000 $\mu\text{g}/\text{m}^3$ (10 $\text{mg}/\text{m}^3$ )	(A) Powered air-purifying respirators in all inlet face coverings with high-efficiency filters. <sup>1</sup> (B) Half-mask supplied air respirators operated in positive pressure mode.

PERMANENT

- (iv) Not greater than 500 µg/m<sup>3</sup>
  - (A) Full facepiece air-purifying respirator equipped with high-efficiency filter.<sup>1</sup>
  - (B) Any full facepiece supplied air respirator.
  - (C) Any full facepiece self-contained breathing apparatus.
- (v) Not greater than 100 µg/m<sup>3</sup>
  - (A) Half-mask air-purifying respirator equipped with high-efficiency filter.<sup>1</sup>
  - (B) Any half-mask supplied air respirator.

- (v) Not greater than 100 µg/m<sup>3</sup>
  - (A) Half-mask<sup>2</sup> air-purifying respirator equipped with high-efficiency filter<sup>1</sup> and acid gas cartridge.
  - (B) Any half-mask supplied air respirator.

<sup>1</sup> High efficiency filter-99.97 pct efficiency against 0.3 micrometer monodisperse diethyl-hexyl phthalate (DOP) particles.

<sup>2</sup> Half-mask respirators shall not be used for protection against arsenic trichloride, as it is rapidly absorbed through the skin.

(iii) The employer shall select respirators from among those approved for protection against dust, fume, and mist by the National Institute for Occupational Safety and Health (NIOSH) under the provisions of 30 CFR Part 11.

(c) Respirator usage.

(i) The employer shall assure that the respirator issued to the employee exhibits minimum facepiece leakage and that the respirator is fitted properly.

(ii) The employer shall perform qualitative fit tests at the time of initial fitting and at least semi-annually thereafter for each employee wearing respirators, where quantitative fit tests are not required.

(iii) Employers with more than twenty employees wearing respirators shall perform a quantitative face fit test at the time of initial fitting and at least semi-annually thereafter for each employee wearing negative pressure respirators. The test shall be used to select facepieces that provide the required protection as prescribed in Table I or II.

(iv) If an employee has demonstrated difficulty in breathing during the fitting test or during use, he or she shall be examined by a physician trained in pulmonary medicine to determine whether the employee can wear a respirator while performing the required duty.

(d) Respirator program.

(i) The employer shall institute a respiratory protection program in accordance with WAC 296-62-071.

(ii) The employer shall permit each employee who uses a filter respirator to change the filter elements whenever an increase in breathing resistance is detected and shall maintain an adequate supply of filter elements for this purpose.

(iii) Employees who wear respirators shall be permitted to leave work areas to wash their face and respirator facepiece to prevent skin irritation associated with respirator use.

(e) Commencement of respirator use.

(i) The employer's obligation to provide respirators commences on August 1, 1978, for employees exposed over 500 µg/m<sup>3</sup> of inorganic arsenic, as soon as possible but not later than October 1, 1978, for employees exposed to over 50 µg/m<sup>3</sup> of inorganic arsenic, and as soon as possible but not later than December 1, 1978, for employees exposed between 10 and 50 µg/m<sup>3</sup> of inorganic arsenic.

(ii) Employees with exposures below 50 µg/m<sup>3</sup> of inorganic arsenic may choose not to wear respirators until December 31, 1979.

(iii) After December 1, 1978, any employee required to wear air purifying respirators may choose, and if so chosen the employer must provide, if it will give proper protection, a powered air purifying respirator and in addition if neces-

<sup>1</sup> High-efficiency filter-99.97 pct efficiency against 0.3 micrometer monodisperse diethyl-hexyl phthalate (DOP) particles.

TABLE II

RESPIRATORY PROTECTION FOR INORGANIC ARSENICALS (SUCH AS ARSENIC TRICHLORIDE<sup>2</sup> AND ARSENIC PHOSPHIDE) WITH SIGNIFICANT VAPOR PRESSURE

Concentration of Inorganic Arsenic (as As) or Condition of Use	Required Respirator
(i) Unknown or greater or lesser than 20,000 µg/m <sup>3</sup> (20 mg/m <sup>3</sup> ) or firefighting.	(A) Any full facepiece contained breathing apparatus operated in positive pressure mode.
(ii) Not greater than 20,000 µg/m <sup>3</sup> (20 mg/m <sup>3</sup> )	(A) Supplied air respirator with full facepiece hood, or helmet or suit and operated in positive pressure mode.
(iii) Not greater than 10,000 µg/m <sup>3</sup> (10 mg/m <sup>3</sup> )	(A) Half-mask <sup>2</sup> supplied air respirator operated in positive pressure mode.
(iv) Not greater than 500 µg/m <sup>3</sup>	(A) Front or back mounted gas mask equipped with high-efficiency filter <sup>1</sup> and acid gas canister. (B) Any full facepiece supplied air respirator. (C) Any full facepiece self-contained breathing apparatus.

PERMANENT

sary a combination dust and acid gas respirator for times where exposures to gases are over the relevant exposure limits.

(9) **Reserved.**

(10) **Protective work clothing and equipment.**

(a) **Provision and use.** Where the possibility of skin or eye irritation from inorganic arsenic exists, and for all workers working in regulated areas, the employer shall provide at no cost to the employee and assure that employees use appropriate and clean protective work clothing and equipment such as, but not limited to:

- (i) Coveralls or similar full-body work clothing;
- (ii) Gloves, and shoes or coverlets;
- (iii) Face shields or vented goggles when necessary to prevent eye irritation, which comply with the requirements of WAC 296-24-07801(1) - (6).

(iv) Impervious clothing for employees subject to exposure to arsenic trichloride.

(b) **Cleaning and replacement.**

(i) The employer shall provide the protective clothing required in subsection (10)(a) of this section in a freshly laundered and dry condition at least weekly, and daily if the employee works in areas where exposures are over  $100 \mu\text{g}/\text{m}^3$  of inorganic arsenic or in areas where more frequent washing is needed to prevent skin irritation.

(ii) The employer shall clean, launder, or dispose of protective clothing required by subsection (10)(a) of this section.

(iii) The employer shall repair or replace the protective clothing and equipment as needed to maintain their effectiveness.

(iv) The employer shall assure that all protective clothing is removed at the completion of a work shift only in change rooms prescribed in subsection (13)(a) of this section.

(v) The employer shall assure that contaminated protective clothing which is to be cleaned, laundered, or disposed of, is placed in a closed container in the change-room which prevents dispersion of inorganic arsenic outside the container.

(vi) The employer shall inform in writing any person who cleans or launders clothing required by this section, of the potentially harmful affects including the carcinogenic effects of exposure to inorganic arsenic.

(vii) The employer shall assure that the containers of contaminated protective clothing and equipment in the workplace or which are to be removed from the workplace are labeled as follows:

**Caution:** Clothing contaminated with inorganic arsenic; do not remove dust by blowing or shaking. Dispose of inorganic arsenic contaminated wash water in accordance with applicable local, state, or federal regulations.

(viii) The employer shall prohibit the removal of inorganic arsenic from protective clothing or equipment by blowing or shaking.

(11) **Housekeeping.**

(a) **Surfaces.** All surfaces shall be maintained as free as practicable of accumulations of inorganic arsenic.

(b) **Cleaning floors.** Floors and other accessible surfaces contaminated with inorganic arsenic may not be cleaned by the use of compressed air, and shoveling and

brushing may be used only where vacuuming or other relevant methods have been tried and found not to be effective.

(c) **Vacuums.** Where vacuuming methods are selected, the vacuums shall be used and emptied in a manner to minimize the reentry of inorganic arsenic into the workplace.

(d) **Housekeeping plan.** A written housekeeping and maintenance plan shall be kept which shall list appropriate frequencies for carrying out housekeeping operations, and for cleaning and maintaining dust collection equipment. The plan shall be available for inspection by the director.

(e) **Maintenance of equipment.** Periodic cleaning of dust collection and ventilation equipment and checks of their effectiveness shall be carried out to maintain the effectiveness of the system and a notation kept of the last check of effectiveness and cleaning or maintenance.

(12) **Reserved.**

(13) **Hygiene facilities and practices.**

(a) **Change rooms.** The employer shall provide for employees working in regulated areas or subject to the possibility of skin or eye irritation from inorganic arsenic, clean change rooms equipped with storage facilities for street clothes and separate storage facilities for protective clothing and equipment in accordance with WAC 296-24-12011.

(b) **Showers.**

(i) The employer shall assure that employees working in regulated areas or subject to the possibility of skin or eye irritation from inorganic arsenic shower at the end of the work shift.

(ii) The employer shall provide shower facilities in accordance with WAC 296-24-12009(3).

(c) **Lunchrooms.**

(i) The employer shall provide for employees working in regulated areas, lunchroom facilities which have a temperature controlled, positive pressure, filtered air supply, and which are readily accessible to employees working in regulated areas.

(ii) The employer shall assure that employees working in the regulated area or subject to the possibility of skin or eye irritation from exposure to inorganic arsenic wash their hands and face prior to eating.

(d) **Lavatories.** The employer shall provide lavatory facilities which comply with WAC 296-24-12009 (1) and (2).

(e) **Vacuums clothes.** The employer shall provide facilities for employees working in areas where exposure, without regard to the use of respirators, exceeds  $100 \mu\text{g}/\text{m}^3$  to vacuum their protective clothing and clean or change shoes worn in such areas before entering change rooms, lunchrooms or shower rooms required by subsection (10) of this section and shall assure that such employees use such facilities.

(f) **Avoidance of skin irritation.** The employer shall assure that no employee is exposed to skin or eye contact with arsenic trichloride, or to skin or eye contact with liquid or particulate inorganic arsenic which is likely to cause skin or eye irritation.

(14) **Medical surveillance.**

(a) **General.**

(i) **Employees covered.** The employer shall institute a medical surveillance program for the following employees:

(A) All employees who are or will be exposed above the action level, without regard to the use of respirators, at least thirty days per year; and

(B) All employees who have been exposed above the action level, without regard to respirator use, for thirty days or more per year for a total of ten years or more of combined employment with the employer or predecessor employers prior to or after the effective date of this standard. The determination of exposures prior to the effective date of this standard shall be based upon prior exposure records, comparison with the first measurements taken after the effective date of this standard, or comparison with records of exposures in areas with similar processes, extent of engineering controls utilized and materials used by that employer.

(ii) Examination by physician. The employer shall assure that all medical examinations and procedures are performed by or under the supervision of a licensed physician, and shall be provided without cost to the employee, without loss of pay and at a reasonable time and place.

(b) Initial examinations. By December 1, 1978, for employees initially covered by the medical provisions of this section, or thereafter at the time of initial assignment to an area where the employee is likely to be exposed over the action level at least thirty days per year, the employer shall provide each affected employee an opportunity for a medical examination, including at least the following elements:

(i) A work history and a medical history which shall include a smoking history and the presence and degree of respiratory symptoms such as breathlessness, cough, sputum production and wheezing.

(ii) A medical examination which shall include at least the following:

(A) A 14" by 17" posterior-anterior chest x-ray and International Labor Office UICC/Cincinnati (ILO U/C) rating;

(B) A nasal and skin examination;

(C) A sputum cytology examination; and

(D) Other examinations which the physician believes appropriate because of the employees exposure to inorganic arsenic or because of required respirator use.

(c) Periodic examinations.

(i) The employer shall provide the examinations specified in subsections (14)(b)(i) and (14)(b)(ii)(A), (B) and (D) of this section at least annually for covered employees who are under forty-five years of age with fewer than ten years of exposure over the action level without regard to respirator use.

(ii) The employer shall provide the examinations specified in subsections (14)(b)(i) and (ii) of this section at least semi-annually for other covered employees.

(iii) Whenever a covered employee has not taken the examinations specified in subsection (14)(b)(i) and (ii) of this section within six months preceding the termination of employment, the employer shall provide such examinations to the employee upon termination of employment.

(d) Additional examinations. If the employee for any reason develops signs or symptoms commonly associated with exposure to inorganic arsenic the employer shall provide an appropriate examination and emergency medical treatment.

(e) Information provided to the physician. The employer shall provide the following information to the examining physician:

(i) A copy of this standard and its appendices;

(ii) A description of the affected employee's duties as they relate to the employee's exposure;

(iii) The employee's representative exposure level or anticipated exposure level;

(iv) A description of any personal protective equipment used or to be used; and

(v) Information from previous medical examinations of the affected employee which is not readily available to the examining physician.

(f) Physician's written opinion.

(i) The employer shall obtain a written opinion from the examining physician which shall include:

(A) The results of the medical examination and tests performed;

(B) The physician's opinion as to whether the employee has any detected medical conditions which would place the employee at increased risk of material impairment of the employee's health from exposure to inorganic arsenic;

(C) Any recommended limitations upon the employee's exposure to inorganic arsenic or upon the use of protective clothing or equipment such as respirators; and

(D) A statement that the employee has been informed by the physician of the results of the medical examination and any medical conditions which require further (~~explanation~~) examination or treatment.

(ii) The employer shall instruct the physician not to reveal in the written opinion specific findings or diagnoses unrelated to occupational exposure.

(iii) The employer shall provide a copy of the written opinion to the affected employee.

(15) Employee information and training.

(a) Training program.

(i) The employer shall institute a training program for all employees who are subject to exposure to inorganic arsenic above the action level without regard to respirator use, or for whom there is the possibility of skin or eye irritation from inorganic arsenic. The employer shall assure that those employees participate in the training program.

(ii) The training program shall be provided by October 1, 1978 for employees covered by this provision, at the time of initial assignment for those subsequently covered by this provision, and shall be repeated at least quarterly for employees who have optional use of respirators and at least annually for other covered employees thereafter, and the employer shall assure that each employee is informed of the following:

(A) The information contained in Appendix A;

(B) The quantity, location, manner of use, storage, sources of exposure, and the specific nature of operations which could result in exposure to inorganic arsenic as well as any necessary protective steps;

(C) The purpose, proper use, and limitation of respirators;

(D) The purpose and a description of medical surveillance program as required by subsection (14) of this section;

(E) The engineering controls and work practices associated with the employee's job assignment; and

(F) A review of this standard.

(b) Access to training materials.

(i) The employer shall make readily available to all affected employees a copy of this standard and its appendices.

(ii) The employer shall provide, upon request, all materials relating to the employee information and training program to the director.

(16) Signs and labels.

(a) General.

(i) The employer may use labels or signs required by other statutes, regulations, or ordinances in addition to, or in combination with, signs and labels required by this subsection.

(ii) The employer shall assure that no statement appears on or near any sign or label required by this subsection which contradicts or detracts from the meaning of the required sign or label.

(b) Signs.

(i) The employer shall post signs demarcating regulated areas bearing the legend:

DANGER  
INORGANIC ARSENIC  
CANCER HAZARD  
AUTHORIZED PERSONNEL ONLY  
NO SMOKING OR EATING  
RESPIRATOR REQUIRED

(ii) The employer shall assure that signs required by this subsection are illuminated and cleaned as necessary so that the legend is readily visible.

(c) Labels. The employer shall apply precautionary labels to all shipping and storage containers of inorganic arsenic, and to all products containing inorganic arsenic except when the inorganic arsenic in the product is bound in such a manner so as to make unlikely the possibility of airborne exposure to inorganic arsenic. (Possible examples of products not requiring labels are semiconductors, light emitting diodes and glass.) The label shall bear the following legend:

DANGER  
CONTAINS INORGANIC ARSENIC  
CANCER HAZARD  
HARMFUL IF INHALED OR  
SWALLOWED  
USE ONLY WITH ADEQUATE  
VENTILATION  
OR RESPIRATORY PROTECTION

(17) Recordkeeping.

(a) Exposure monitoring.

(i) The employer shall establish and maintain an accurate record of all monitoring required by subsection (5) of this section.

(ii) This record shall include:

(A) The date(s), number, duration location, and results of each of the samples taken, including a description of the sampling procedure used to determine representative employee exposure where applicable;

(B) A description of the sampling and analytical methods used and evidence of their accuracy;

(C) The type of respiratory protective devices worn, if any;

(D) Name, Social Security number, and job classification of the employees monitored and of all other employees whose exposure the measurement is intended to represent; and

(E) The environmental variables that could affect the measurement of the employee's exposure.

(iii) The employer shall maintain these monitoring records for at least forty years or for the duration of employment plus twenty years, whichever is longer.

(b) Medical surveillance.

(i) The employer shall establish and maintain an accurate record for each employee subject to medical surveillance as required by subsection (14) of this section.

(ii) This record shall include:

(A) The name, Social Security number, and description of duties of the employee;

(B) A copy of the physician's written opinions;

(C) Results of any exposure monitoring done for that employee and the representative exposure levels supplied to the physician; and

(D) Any employee medical complaints related to exposure to inorganic arsenic.

(iii) The employer shall in addition keep, or assure that the examining physician keeps, the following medical records:

(A) A copy of the medical examination results including medical and work history required under subsection (14) of this section;

(B) A description of the laboratory procedures and a copy of any standards or guidelines used to interpret the test results or references to that information;

(C) The initial x-ray;

(D) The x-rays for the most recent five years;

(E) Any x-rays with a demonstrated abnormality and all subsequent x-rays;

(F) The initial cytologic examination slide and written description;

(G) The cytologic examination slide and written description for the most recent five years; and

(H) Any cytologic examination slides with demonstrated atypia, if such atypia persists for three years, and all subsequent slides and written descriptions.

(iv) The employer shall maintain or assure that the physician maintains those medical records for at least forty years, or for the duration of employment, plus twenty years, whichever is longer.

(c) Availability.

(i) The employer shall make available upon request all records required to be maintained by subsection (17) of this section to the director for examination and copying.

(ii) Records required by this subsection shall be provided upon request to employees, designated representatives, and the assistant director in accordance with WAC 296-62-05201 through 296-62-05209 and 296-62-05213 through 296-62-05217.

(iii) The employer shall make available upon request an employee's medical records and exposure records representative of that employee's exposure required to be maintained



by subsection (17) of this section to the affected employee or former employee or to a physician designated by the affected employee or former employee.

(d) Transfer of records.

(i) Whenever the employer ceases to do business, the successor employer shall receive and retain all records required to be maintained by this section.

(ii) Whenever the employer ceases to do business and there is no successor employer to receive and retain the records required to be maintained by this section for the prescribed period, these records shall be transmitted to the director.

(iii) At the expiration of the retention period for the records required to be maintained by this section, the employer shall notify the director at least three months prior to the disposal of such records and shall transmit those records to the director if he requests them within that period.

(iv) The employer shall also comply with any additional requirements involving transfer of records set forth in WAC 296-62-05215.

(18) Observation of monitoring.

(a) Employee observation. The employer shall provide affected employees or their designated representatives an opportunity to observe any monitoring of employee exposure to inorganic arsenic conducted pursuant to subsection (5) of this section.

(b) Observation procedures.

(i) Whenever observation of the monitoring of employee exposure to inorganic arsenic requires entry into an area where the use of respirators, protective clothing, or equipment is required, the employer shall provide the observer with and assure the use of such respirators, clothing, and such equipment, and shall require the observer to comply with all other applicable safety and health procedures.

(ii) Without interfering with the monitoring, observers shall be entitled to;

(A) Receive an explanation of the measurement procedures;

(B) Observe all steps related to the monitoring of inorganic arsenic performed at the place of exposure; and

(C) Record the results obtained or receive copies of the results when returned by the laboratory.

(19) Effective date. This standard shall become effective thirty days after filing with the code reviser.

(20) Appendices. The information contained in the appendices to this section is not intended by itself, to create any additional obligations not otherwise imposed by this standard nor detract from any existing obligation.

(21) Startup dates.

(a) General. The startup dates of requirements of this standard shall be the effective date of this standard unless another startup date is provided for, either in other subsections of this section or in this subsection.

(b) Monitoring. Initial monitoring shall be commenced by August 1, 1978, and shall be completed by September 15, 1978.

(c) Regulated areas. Regulated areas required to be established as a result of initial monitoring shall be set up as soon as possible after the results of that monitoring is known and no later than October 1, 1978.

(d) Compliance program. The written program required by subsection (7)(b) as a result of initial monitoring shall be

made available for inspection and copying as soon as possible and no later than December 1, 1978.

(e) Hygiene and lunchroom facilities. Construction plans for change-rooms, showers, lavatories, and lunchroom facilities shall be completed no later than December 1, 1978, and these facilities shall be constructed and in use no later than July 1, 1979. However, if as part of the compliance plan it is predicted by an independent engineering firm that engineering controls and work practices will reduce exposures below the permissible exposure limit by December 31, 1979, for affected employees, then such facilities need not be completed until one year after the engineering controls are completed or December 31, 1980, whichever is earlier, if such controls have not in fact succeeded in reducing exposure to below the permissible exposure limit.

(f) Summary of startup dates set forth elsewhere in this standard.

#### STARTUP DATES

August 1, 1978 - Respirator use over 500  $\mu\text{g}/\text{m}^3$ .

#### AS SOON AS POSSIBLE BUT NO LATER THAN

September 15, 1978 - Completion of initial monitoring.

October 1, 1978 - Complete establishment of regulated areas.

Respirator use for employees exposed above 50  $\mu\text{g}/\text{m}^3$ .

Completion of initial training. Notification of use.

December 1, 1978 - Respirator use over 10  $\mu\text{g}/\text{m}^3$ . Comple-

tion of initial medical. Completion of compliance plan.

Optional use of powered air-purifying respirators.

July 1, 1979 - Completion of lunch rooms and hygiene facilities.

December 31, 1979 - Completion of engineering controls.

All other requirements of the standard have as their startup date August 1, 1978.

AMENDATORY SECTION (Amending Order 93-06, filed 10/20/93, effective 12/1/93)

**WAC 296-62-07441 Appendix A, substance safety data sheet—Cadmium.** (1) Substance identification.

(a) Substance: Cadmium.

(b) 8-Hour, time-weighted-average, permissible exposure limit (TWA PEL):

(c) TWA PEL: Five micrograms of cadmium per cubic meter of air 5  $\mu\text{g}/\text{m}^3$ , time-weighted average (TWA) for an 8-hour workday.

(d) Appearance: Cadmium metal—soft, blue-white, malleable, lustrous metal or grayish-white powder. Some cadmium compounds may also appear as a brown, yellow, or red powdery substance.

(2) Health hazard data.

(a) Routes of exposure. Cadmium can cause local skin or eye irritation. Cadmium can affect your health if you inhale it or if you swallow it.

(b) Effects of overexposure.

(i) Short-term (acute) exposure: Cadmium is much more dangerous by inhalation than by ingestion. High exposures to cadmium that may be immediately dangerous to life or health occur in jobs where workers handle large quantities of cadmium dust or fume; heat cadmium-containing compounds or cadmium-coated surfaces; weld with

cadmium solders or cut cadmium-containing materials such as bolts.

(ii) Severe exposure may occur before symptoms appear. Early symptoms may include mild irritation of the upper respiratory tract, a sensation of constriction of the throat, a metallic taste and/or a cough. A period of one to ten hours may precede the onset of rapidly progressing shortness of breath, chest pain, and flu-like symptoms with weakness, fever, headache, chills, sweating, and muscular pain. Acute pulmonary edema usually develops within twenty-four hours and reaches a maximum by three days. If death from asphyxia does not occur, symptoms may resolve within a week.

(iii) Long-term (chronic) exposure. Repeated or long-term exposure to cadmium, even at relatively low concentrations, may result in kidney damage and an increased risk of cancer of the lung and of the prostate.

(c) Emergency first aid procedures.

(i) Eye exposure: Direct contact may cause redness or pain. Wash eyes immediately with large amounts of water, lifting the upper and lower eyelids. Get medical attention immediately.

(ii) Skin exposure: Direct contact may result in irritation. Remove contaminated clothing and shoes immediately. Wash affected area with soap or mild detergent and large amounts of water. Get medical attention immediately.

(iii) Ingestion: Ingestion may result in vomiting, abdominal pain, nausea, diarrhea, headache, and sore throat. Treatment for symptoms must be administered by medical personnel. Under no circumstances should the employer allow any person whom he/she retains, employs, supervises, or controls to engage in therapeutic chelation. Such treatment is likely to translocate cadmium from pulmonary or other tissue to renal tissue. Get medical attention immediately.

(iv) Inhalation: If large amounts of cadmium are inhaled, the exposed person must be moved to fresh air at once. If breathing has stopped, perform cardiopulmonary resuscitation. Administer oxygen if available. Keep the affected person warm and at rest. Get medical attention immediately.

(v) Rescue: Move the affected person from the hazardous exposure. If the exposed person has been overcome, attempt rescue only after notifying at least one other person of the emergency and putting into effect established emergency procedures. Do not become a casualty yourself. Understand your emergency rescue procedures and know the location of the emergency equipment before the need arises.

(3) Employee information.

(a) Protective clothing and equipment.

(i) Respirators: You may be required to wear a respirator for nonroutine activities; in emergencies; while your employer is in the process of reducing cadmium exposures through engineering controls; and where engineering controls are not feasible. If respirators are worn in the future, they must have a joint Mine Safety and Health Administration (MSHA) and National Institute for Occupational Safety and Health (NIOSH) label of approval. Cadmium does not have a detectable odor except at levels well above the permissible exposure limits. If you can smell cadmium while wearing a respirator, proceed immediately to fresh air. If you

experience difficulty breathing while wearing a respirator, tell your employer.

(ii) Protective clothing: You may be required to wear impermeable clothing, gloves, foot gear, a face shield, or other appropriate protective clothing to prevent skin contact with cadmium. Where protective clothing is required, your employer must provide clean garments to you as necessary to assure that the clothing protects you adequately. The employer must replace or repair protective clothing that has become torn or otherwise damaged.

(iii) Eye protection: You may be required to wear splash-proof or dust resistant goggles to prevent eye contact with cadmium.

(b) Employer requirements.

(i) Medical: If you are exposed to cadmium at or above the action level, your employer is required to provide a medical examination, laboratory tests and a medical history according to the medical surveillance provisions under WAC 296-62-07423. (See summary chart and tables in this section, appendix A.) These tests shall be provided without cost to you. In addition, if you are accidentally exposed to cadmium under conditions known or suspected to constitute toxic exposure to cadmium, your employer is required to make special tests available to you.

(ii) Access to records: All medical records are kept strictly confidential. You or your representative are entitled to see the records of measurements of your exposure to cadmium. Your medical examination records can be furnished to your personal physician or designated representative upon request by you to your employer.

(iii) Observation of monitoring: Your employer is required to perform measurements that are representative of your exposure to cadmium and you or your designated representative are entitled to observe the monitoring procedure. You are entitled to observe the steps taken in the measurement procedure, and to record the results obtained. When the monitoring procedure is taking place in an area where respirators or personal protective clothing and equipment are required to be worn, you or your representative must also be provided with, and must wear the protective clothing and equipment.

(c) Employee requirements. You will not be able to smoke, eat, drink, chew gum or tobacco, or apply cosmetics while working with cadmium in regulated areas. You will also not be able to carry or store tobacco products, gum, food, drinks, or cosmetics in regulated areas because these products easily become contaminated with cadmium from the workplace and can therefore create another source of unnecessary cadmium exposure. Some workers will have to change out of work clothes and shower at the end of the day, as part of their workday, in order to wash cadmium from skin and hair. Handwashing and cadmium-free eating facilities shall be provided by the employer and proper hygiene should always be performed before eating. It is also recommended that you do not smoke or use tobacco products, because among other things, they naturally contain cadmium. For further information, read the labeling on such products.

(4) Physician information.

(a) Introduction. The medical surveillance provisions of WAC 296-62-07423 generally are aimed at accomplishing three main interrelated purposes: First, identifying employ-

ees at higher risk of adverse health effects from excess, chronic exposure to cadmium; second, preventing cadmium-induced disease; and third, detecting and minimizing existing cadmium-induced disease. The core of medical surveillance in this standard is the early and periodic monitoring of the employee's biological indicators of:

- (i) Recent exposure to cadmium;
- (ii) Cadmium body burden; and

(iii) Potential and actual kidney damage associated with exposure to cadmium. The main adverse health effects associated with cadmium overexposure are lung cancer and kidney dysfunction. It is not yet known how to adequately biologically monitor human beings to specifically prevent cadmium-induced lung cancer. By contrast, the kidney can be monitored to provide prevention and early detection of cadmium-induced kidney damage. Since, for noncarcinogenic effects, the kidney is considered the primary target organ of chronic exposure to cadmium, the medical surveillance provisions of this standard effectively focus on cadmium-induced kidney disease. Within that focus, the aim, where possible, is to prevent the onset of such disease and, where necessary, to minimize such disease as may already exist. The by-products of successful prevention of kidney disease are anticipated to be the reduction and prevention of other cadmium-induced diseases.

(b) Health effects. The major health effects associated with cadmium overexposure are described below.

(i) Kidney: The most prevalent nonmalignant disease observed among workers chronically exposed to cadmium is kidney dysfunction. Initially, such dysfunction is manifested as proteinuria. The proteinuria associated with cadmium exposure is most commonly characterized by excretion of low-molecular weight proteins (15,000 to 40,000 MW) accompanied by loss of electrolytes, uric acid, calcium, amino acids, and phosphate. The compounds commonly excreted include: beta-2-microglobulin ( $\beta_2$ -M), retinol binding protein (RBP), immunoglobulin light chains, and lysozyme. Excretion of low molecular weight proteins are characteristic of damage to the proximal tubules of the kidney (Iwao et al., 1980). It has also been observed that exposure to cadmium may lead to urinary excretion of high-molecular weight proteins such as albumin, immunoglobulin G, and glycoproteins (Ex. 29). Excretion of high-molecular weight proteins is typically indicative of damage to the glomeruli of the kidney. Bernard et al., (1979) suggest that damage to the glomeruli and damage to the proximal tubules of the kidney may both be linked to cadmium exposure but they may occur independently of each other. Several studies indicate that the onset of low-molecular weight proteinuria is a sign of irreversible kidney damage (Friberg et al., 1974; Roels et al., 1982; Piscator 1984; Elinder et al., 1985; Smith et al., 1986). Above specific levels of  $\beta_2$ -M associated with cadmium exposure it is unlikely that  $\beta_2$ -M levels return to normal even when cadmium exposure is eliminated by removal of the individual from the cadmium work environment (Friberg, Ex. 29, 1990). Some studies indicate that such proteinuria may be progressive; levels of  $\beta_2$ -M observed in the urine increase with time even after cadmium exposure has ceased. See, for example, Elinder et al., 1985. Such observations, however, are not universal, and it has been suggested that studies in which proteinuria has not been observed to progress may not have tracked

patients for a sufficiently long time interval (Jarup, Ex. 8-661). When cadmium exposure continues after the onset of proteinuria, chronic nephrotoxicity may occur (Friberg, Ex. 29). Uremia results from the inability of the glomerulus to adequately filter blood. This leads to severe disturbance of electrolyte concentrations and may lead to various clinical complications including kidney stones (L-140-50). After prolonged exposure to cadmium, glomerular proteinuria, glucosuria, aminoaciduria, phosphaturia, and hypercalciuria may develop (Exs. 8-86, 4-28, 14-18). Phosphate, calcium, glucose, and amino acids are essential to life, and under normal conditions, their excretion should be regulated by the kidney. Once low molecular weight proteinuria has developed, these elements dissipate from the human body. Loss of glomerular function may also occur, manifested by decreased glomerular filtration rate and increased serum creatinine. Severe cadmium-induced renal damage may eventually develop into chronic renal failure and uremia (Ex. 55). Studies in which animals are chronically exposed to cadmium confirm the renal effects observed in humans (Friberg et al., 1986). Animal studies also confirm problems with calcium metabolism and related skeletal effects which have been observed among humans exposed to cadmium in addition to the renal effects. Other effects commonly reported in chronic animal studies include anemia, changes in liver morphology, immunosuppression and hypertension. Some of these effects may be associated with co-factors. Hypertension, for example, appears to be associated with diet as well as cadmium exposure. Animals injected with cadmium have also shown testicular necrosis (Ex. 8-86B).

(ii) Biological markers. It is universally recognized that the best measures of cadmium exposures and its effects are measurements of cadmium in biological fluids, especially urine and blood. Of the two, CdU is conventionally used to determine body burden of cadmium in workers without kidney disease. CdB is conventionally used to monitor for recent exposure to cadmium. In addition, levels of CdU and CdB historically have been used to predict the percent of the population likely to develop kidney disease (Thun et al., Ex. L-140-50; WHO, Ex. 8-674; ACGIH, Exs. 8-667, 140-50).

The third biological parameter upon which WISHA relies for medical surveillance is beta-2-microglobulin in urine ( $\beta_2$ -M), a low molecular weight protein. Excess  $\beta_2$ -M has been widely accepted by physicians and scientists as a reliable indicator of functional damage to the proximal tubule of the kidney (Exs. 8-447, 144-3-C, 4-47, L-140-45, 19-43-A). Excess  $\beta_2$ -M is found when the proximal tubules can no longer reabsorb this protein in a normal manner. This failure of the proximal tubules is an early stage of a kind of kidney disease that commonly occurs among workers with excessive cadmium exposure. Used in conjunction with biological test results indicating abnormal levels of CdU and CdB, the finding of excess  $\beta_2$ -M can establish for an examining physician that any existing kidney disease is probably cadmium-related (Trs. 6/6/90, pp. 82-86, 122, 134). The upper limits of normal levels for cadmium in urine and cadmium in blood are 3  $\mu$ g Cd/gram creatinine in urine and 5  $\mu$ gCd/liter whole blood, respectively. These levels were derived from broad-based population studies. Three issues confront the physicians in the use of  $\beta_2$ -M as a marker of kidney dysfunction and material impairment. First, there are a few other causes of elevated levels of  $\beta_2$ -M not related to

cadmium exposures, some of which may be rather common diseases and some of which are serious diseases (e.g., myeloma or transient flu, Exs. 29 and 8-086). These can be medically evaluated as alternative causes (Friberg, Ex. 29). Also, there are other factors that can cause  $\beta_2$ -M to degrade so that low levels would result in workers with tubular dysfunction. For example, regarding the degradation of  $\beta_2$ -M, workers with acidic urine (pH<6) might have  $\beta_2$ -M levels that are within the "normal" range when in fact kidney dysfunction has occurred (Ex. L-140-1) and the low molecular weight proteins are degraded in acid urine. Thus, it is very important that the pH of urine be measured, that urine samples be buffered as necessary (See WAC 296-62-07451, appendix F.), and that urine samples be handled correctly, i.e., measure the pH of freshly voided urine samples, then if necessary, buffer to Ph>6 (or above for shipping purposes), measure Ph again and then, perhaps, freeze the sample for storage and shipping. (See also WAC 296-62-07451, appendix F.) Second, there is debate over the pathological significance of proteinuria, however, most world experts believe that  $\beta_2$ -M levels greater than 300  $\mu$ g/g Cr are abnormal (Elinder, Ex. 55, Friberg, Ex. 29). Such levels signify kidney dysfunction that constitutes material impairment of health. Finally, detection of  $\beta_2$ -M at low levels has often been considered difficult, however, many laboratories have the capability of detecting excess  $\beta_2$ -M using simple kits, such as the Phadebas Delphia test, that are accurate to levels of 100  $\mu$ g  $\beta_2$ -M/g Cr U (Ex. L-140-1). Specific recommendations for ways to measure  $\beta_2$ -M and proper handling of urine samples to prevent degradation of  $\beta_2$ -M have been addressed by WISHA in WAC 296-62-07451, appendix F, in the section on laboratory standardization. All biological samples must be analyzed in a laboratory that is proficient in the analysis of that particular analyte, under WAC 296-62-07423 (1)(d). (See WAC 296-62-07451, appendix F.) Specifically, under WAC 296-62-07423 (1)(d), the employer is to assure that the collecting and handling of biological samples of cadmium in urine (CdU), cadmium in blood (CdB), and beta-2 microglobulin in urine ( $\beta_2$ -M) taken from employees is collected in a manner that assures reliability. The employer must also assure that analysis of biological samples of cadmium in urine (CdU), cadmium in blood (CdB), and beta-2 microglobulin in urine ( $\beta_2$ -M) taken from employees is performed in laboratories with demonstrated proficiency for that particular analyte. (See WAC 296-62-07451, appendix F.)

(iii) Lung and prostate cancer. The primary sites for cadmium-associated cancer appear to be the lung and the prostate (L-140-50). Evidence for an association between cancer and cadmium exposure derives from both epidemiological studies and animal experiments. Mortality from prostate cancer associated with cadmium is slightly elevated in several industrial cohorts, but the number of cases is small and there is not clear dose-response relationship. More substantive evidence exists for lung cancer. The major epidemiological study of lung cancer was conducted by Thun et al., (Ex. 4-68). Adequate data on cadmium exposures were available to allow evaluation of dose-response relationships between cadmium exposure and lung cancer. A statistically significant excess of lung cancer attributed to cadmium exposure was observed in this study even when confounding variables such as co-exposure to arsenic and

smoking habits were taken into consideration (Ex. L-140-50).

The primary evidence for quantifying a link between lung cancer and cadmium exposure from animal studies derives from two rat bioassay studies; one by Takenaka et al., (1983), which is a study of cadmium chloride and a second study by Oldiges and Glaser (1990) of four cadmium compounds. Based on the above cited studies, the U.S. Environmental Protection Agency (EPA) classified cadmium as "B1", a probable human carcinogen, in 1985 (Ex. 4-4). The International Agency for Research on Cancer (IARC) in 1987 also recommended that cadmium be listed as "2A", a probable human carcinogen (Ex. 4-15). The American Conference of Governmental Industrial Hygienists (ACGIH) has recently recommended that cadmium be labeled as a carcinogen. Since 1984, NIOSH has concluded that cadmium is possibly a human carcinogen and has recommended that exposures be controlled to the lowest level feasible.

(iv) Noncarcinogenic effects. Acute pneumonitis occurs 10 to 24 hours after initial acute inhalation of high levels of cadmium fumes with symptoms such as fever and chest pain (Exs. 30, 8-86B). In extreme exposure cases pulmonary edema may develop and cause death several days after exposure. Little actual exposure measurement data is available on the level of airborne cadmium exposure that causes such immediate adverse lung effects, nonetheless, it is reasonable to believe a cadmium concentration of approximately 1 mg/m<sup>3</sup> over an eight hour period is "immediately dangerous" (55 FR 4052, ANSI; Ex. 8-86B). In addition to acute lung effects and chronic renal effects, long term exposure to cadmium may cause other severe effects on the respiratory system. Reduced pulmonary function and chronic lung disease indicative of emphysema have been observed in workers who have had prolonged exposure to cadmium dust or fumes (Exs. 4-29, 4-22, 4-42, 4-50, 4-63). In a study of workers conducted by Kazantzis et al., a statistically significant excess of worker deaths due to chronic bronchitis was found, which in his opinion was directly related to high cadmium exposures of 1 mg/m<sup>3</sup> or more (Tr. 6/8/90, pp. 156-157). Cadmium need not be respirable to constitute a hazard. Inspirable cadmium particles that are too large to be respirable but small enough to enter the tracheobronchial region of the lung can lead to bronchoconstriction, chronic pulmonary disease, and cancer of that portion of the lung. All of these diseases have been associated with occupational exposure to cadmium (Ex. 8-86B). Particles that are constrained by their size to the extra-thoracic regions of the respiratory system such as the nose and maxillary sinuses can be swallowed through mucociliary clearance and be absorbed into the body (ACGIH, Ex. 8-692). The impaction of these particles in the upper airways can lead to anosmia, or loss of sense of smell, which is an early indication of overexposure among workers exposed to heavy metals. This condition is commonly reported among cadmium-exposed workers (Ex. 8-86-B).

(c) Medical surveillance. In general, the main provisions of the medical surveillance section of the standard, under WAC 296-62-07423 (1) through (16), are as follows:

- (i) Workers exposed above the action level are covered;
- (ii) Workers with intermittent exposures are not covered;
- (iii) Past workers who are covered receive biological monitoring for at least one year;

(iv) Initial examinations include a medical questionnaire and biological monitoring of cadmium in blood (CdB), cadmium in urine (CdU), and Beta-2-microglobulin in urine ( $\beta_2$ -M);

(v) Biological monitoring of these three analytes is performed at least annually; full medical examinations are performed biennially;

(vi) Until five years from the effective date of the standard, medical removal is required when CdU is greater than 15  $\mu$ g/gram creatinine (g Cr), or CdB is greater than 15  $\mu$ g/liter whole blood (lwb), or  $\beta_2$ -M is greater than 1500  $\mu$ g/g Cr, and CdB is greater than 5  $\mu$ g/lwb or CdU is greater than 3  $\mu$ g/g Cr;

(vii) Beginning five years after the standard is in effect, medical removal triggers will be reduced;

(viii) Medical removal protection benefits are to be provided for up to eighteen months;

(ix) Limited initial medical examinations are required for respirator usage;

(x) Major provisions are fully described under WAC 296-62-07423; they are outlined here as follows:

(A) Eligibility.

(B) Biological monitoring.

(C) Actions triggered by levels of CdU, CdB, and  $\beta_2$ -M (See Summary Charts and Tables in WAC 296-62-07441(5).)

(D) Periodic medical surveillance.

(E) Actions triggered by periodic medical surveillance (See appendix A Summary Chart and Tables in WAC 296-62-07441(5).)

(F) Respirator usage.

(G) Emergency medical examinations.

(H) Termination examination.

(I) Information to physician.

(J) Physician's medical opinion.

(K) Medical removal protection.

(L) Medical removal protection benefits.

(M) Multiple physician review.

(N) Alternate physician review.

(O) Information employer gives to employee.

(P) Recordkeeping.

(Q) Reporting on OSHA form 200.

(xi) The above mentioned summary of the medical surveillance provisions, the summary chart, and tables for the actions triggered at different levels of CdU, CdB and  $\beta_2$ -M (in subsection (5) of this section, Attachment 1) are included only for the purpose of facilitating understanding of the provisions of WAC 296-62-07423(3) of the final cadmium standard. The summary of the provisions, the summary chart, and the tables do not add to or reduce the requirements in WAC 296-62-07423(3).

(d) Recommendations to physicians.

(i) It is strongly recommended that patients with tubular proteinuria are counseled on: The hazards of smoking; avoidance of nephrotoxins and certain prescriptions and over-the-counter medications that may exacerbate kidney symptoms; how to control diabetes and/or blood pressure; proper hydration, diet, and exercise (Ex. 19-2). A list of prominent or common nephrotoxins is attached. (See subsection (6) of this section, Attachment 2.)

(ii) DO NOT CHELATE; KNOW WHICH DRUGS ARE NEPHROTOXINS OR ARE ASSOCIATED WITH NEPHRITIS.

(iii) The gravity of cadmium-induced renal damage is compounded by the fact there is no medical treatment to prevent or reduce the accumulation of cadmium in the kidney (Ex. 8-619). Dr. Friberg, a leading world expert on cadmium toxicity, indicated in 1992, that there is no form of chelating agent that could be used without substantial risk. He stated that tubular proteinuria has to be treated in the same way as other kidney disorders (Ex. 29).

(iv) After the results of a workers' biological monitoring or medical examination are received the employer is required to provide an information sheet to the patient, briefly explaining the significance of the results. (See subsection (7) of this section.)

(v) For additional information the physician is referred to the following additional resources:

(A) The physician can always obtain a copy of the OSHA final rule preamble, with its full discussion of the health effects, from OSHA's Computerized Information System (OCIS).

(B) The OSHA Docket Officer maintains a record of the OSHA rulemaking. The Cadmium Docket (H-057A), is located at 200 Constitution Ave. NW., Room N-2625, Washington, DC 20210; telephone: (202) 219-7894.

(C) The following articles and exhibits in particular from that docket (H- 057A):

Exhibit number	Author and paper title
8-447	Lauwerys et. al., Guide for physicians, "Health Maintenance of Workers Exposed to Cadmium," published by the Cadmium Council.
4-67	Takenaka, S., H. Oldiges, H. Konig, D. Hochrainer, G. Oberdorster. "Carcinogenicity of Cadmium Chloride Aerosols in Wistar Rats". JNCI 70:367-373, 1983. (32)
4-68	Thun, M.J., T.M. Schnoor, A.B. Smith, W.E. Halperin, R.A. Lemen. "Mortality Among a Cohort of U.S. Cadmium Production Workers—An Update." JNCI 74(2):325-33, 1985. (8)
4-25	Elinder, C.G., Kjellstrom, T., Hogstedt, C., et al., "Cancer Mortality of Cadmium Workers." Brit. J. Ind. Med. 42:651-655, 1985. (14)
4-26	Ellis, K.J. et al., "Critical Concentrations of Cadmium in Human Renal Cortex: Dose Effect Studies to Cadmium Smelter Workers." J. Toxicol. Environ. Health 7:691-703, 1981. (76)
4-27	Ellis, K.J., S.H. Cohn and T.J. Smith. "Cadmium Inhalation Exposure Estimates: Their Significance with Respect to Kidney and Liver Cadmium Burden." J. Toxicol. Environ. Health 15:173-187, 1985.

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- 4-28 Falck, F.Y., Jr., Fine, L.J., Smith, R.G., McClatchey, K.D., Annesley, T., England, B., and Schork, A.M. "Occupational Cadmium Exposure and Renal Status." *Am. J. Ind. Med.* 4:541, 1983. (64)
- 8-86A Friberg, L., C.G. Elinder, et al., "Cadmium and Health a Toxicological and Epidemiological Appraisal, Volume I, Exposure, Dose, and Metabolism." CRC Press, Inc., Boca Raton, FL, 1986. (Available from the OSHA Technical Data Center)
- 8-86B Friberg, L., C.G. Elinder, et al., "Cadmium and Health: A Toxicological and Epidemiological Appraisal, Volume II, Effects and Response." CRC Press, Inc., Boca Raton, FL, 1986. (Available from the OSHA Technical Data Center)
- L-140-45 Elinder, C.G., "Cancer Mortality of Cadmium Workers", *Brit. J. Ind. Med.*, 42, 651-655, 1985.
- L-140-50 Thun, M., Elinder, C.G., Friberg, L., "Scientific Basis for an Occupational Standard for Cadmium, *Am. J. Ind. Med.*, 20; 629-642, 1991.

B, providing no result exceeds the levels listed for category B.

(vi) An employee is assigned category C if any monitoring result for any of the three biological markers are above the levels listed for category C.

(c) The user of Tables A and B should know that these tables are provided only to facilitate understanding of the relevant provisions of WAC 296-62-07423. Tables A and B are not meant to add to or subtract from the requirements of those provisions.

**Table A**  
**Categorization of Biological Monitoring Results**  
**Applicable Through 1998 Only**

Biological marker	Monitoring result categories		
	A	B	C
Cadmium in urine (CdU) (µg/g creatinine)	≤3	>3 and ≤15	>15
B <sub>2</sub> -microglobulin (B <sub>2</sub> -M) (µg/g creatinine)	≤300	>300 and ≤1500	>1500*
Cadmium in blood (CdB) (µg/liter whole blood)	≤5	>5 and ≤15	>15

\* If an employee's B<sub>2</sub>-M levels are above 1,500 µg/g creatinine, in order for mandatory medical removal to be required (See WAC 296-62-07441, Appendix A Table B.), either the employee's CdU level must also be >3 µg/g creatinine or CdB level must also be >5 µg/liter whole blood.

**Applicable Beginning January 1, 1999**

Biological marker	Monitoring result categories		
	A	B	C
Cadmium in urine (CdU) (µg/g creatinine)	≤3	>3 and ≤7	>7
B <sub>2</sub> -microglobulin (B <sub>2</sub> -M) (µg/g creatinine)	≤300	>300 and ≤750	>750*
Cadmium in blood (CdB) (µg/liter whole blood)	≤5	>5 and ≤10	>10

\* If an employee's B<sub>2</sub>-M levels are above 750 µg/g creatinine, in order for mandatory medical removal to be required (See WAC 296-62-07441, Appendix A Table B.), either the employee's CdU level must also be >3 µg/g creatinine or CdB level must also be >5 µg/liter whole blood.

(5) Information sheet. The information sheet (subsection (8) of this section, Attachment 3) or an equally explanatory one should be provided to you after any biological monitoring results are reviewed by the physician, or where applicable, after any medical examination.

(6) Attachment 1—Appendix A, summary chart and Tables A and B of actions triggered by biological monitoring.

(a) Summary chart: WAC 296-62-07423(3) Medical surveillance—Categorizing biological monitoring results.

(i) Biological monitoring results categories are set forth in Table A for the periods ending December 31, 1998, and for the period beginning January 1, 1999.

(ii) The results of the biological monitoring for the initial medical exam and the subsequent exams shall determine an employee's biological monitoring result category.

(b) Actions triggered by biological monitoring.

(i) The actions triggered by biological monitoring for an employee are set forth in Table B.

(ii) The biological monitoring results for each employee under WAC 296-62-07423(3) shall determine the actions required for that employee. That is, for any employee in biological monitoring category C, the employer will perform all of the actions for which there is an X in column C of Table B.

(iii) An employee is assigned the alphabetical category ("A" being the lowest) depending upon the test results of the three biological markers.

(iv) An employee is assigned category A if monitoring results for all three biological markers fall at or below the levels indicated in the table listed for category A.

(v) An employee is assigned category B if any monitoring result for any of the three biological markers fall within the range of levels indicated in the table listed for category

**Table B—Actions determined by biological monitoring.**

This table presents the actions required based on the monitoring result in Table A. Each item is a separate requirement in citing noncompliance. For example, a medical examination within ninety days for an employee in category B is separate from the requirement to administer a periodic medical examination for category B employees on an annual basis.

**Table B**  
**Monitoring result category**

	A <sup>1</sup>	B <sup>1</sup>	C <sup>1</sup>
Required actions			
(1) Biological monitoring:			
(a) Annual.	X		
(b) Semiannual		X	
(c) Quarterly			X

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- (2) Medical examination:
  - (a) Biennial X
  - (b) Annual. X X
  - (c) Semiannual. X X
  - (d) Within 90 days X X
- (3) Assess within two weeks:
  - (a) Excess cadmium exposure X X
  - (b) Work practices X X
  - (c) Personal hygiene X X
  - (d) Respirator usage X X
  - (e) Smoking history X X
  - (f) Hygiene facilities X X
  - (g) Engineering controls X X
  - (h) Correct within 30 days X X
  - (i) Periodically assess exposures X X
- (4) Discretionary medical removal X X
- (5) Mandatory medical removal X<sup>2</sup>

ees. The use of such medications should be under physician discretion.  
 (8) Attachment 3—Biological monitoring and medical examination results.

Employee \_\_\_\_\_  
 Testing \_\_\_\_\_  
 Date \_\_\_\_\_

Cadmium in Urine \_\_\_ µg/g Cr—Normal Levels:  
 ≤3 µg/g Cr.  
 Cadmium in Blood \_\_\_ µg/lwb—Normal Levels:  
 ≤5 µg/lwb.  
 Beta-2-microglobulin in Urine \_\_\_ µg/g Cr—Normal Levels: ≤300 µg/g Cr.  
 Physical Examination Results: N/A \_\_\_ Satisfactory \_\_\_  
 Unsatisfactory \_\_\_ (see physician again).  
 Physician's Review of Pulmonary Function Test:  
 N/A \_\_\_ Normal \_\_\_  
 Abnormal \_\_\_.  
 Next biological monitoring or medical examination scheduled for \_\_\_\_\_

(a) The biological monitoring program has been designed for three main purposes:

- (i) To identify employees at risk of adverse health effects from excess, chronic exposure to cadmium;
- (ii) To prevent cadmium-induced disease(s); and
- (iii) To detect and minimize existing cadmium-induced disease(s).

(b) The levels of cadmium in the urine and blood provide an estimate of the total amount of cadmium in the body. The amount of a specific protein in the urine (beta-2-microglobulin) indicates changes in kidney function. All three tests must be evaluated together. A single mildly elevated result may not be important if testing at a later time indicates that the results are normal and the workplace has been evaluated to decrease possible sources of cadmium exposure. The levels of cadmium or beta-2-microglobulin may change over a period of days to months and the time needed for those changes to occur is different for each worker.

(c) If the results for biological monitoring are above specific "high levels" (cadmium urine greater than 10 micrograms per gram of creatinine µg/g Cr), cadmium blood greater than 10 micrograms per liter of whole blood (µg/lwb), or beta-2-microglobulin greater than 1000 micrograms per gram of creatinine (µg/g Cr)), the worker has a much greater chance of developing other kidney diseases.

(d) One way to measure for kidney function is by measuring beta-2-microglobulin in the urine. Beta-2-microglobulin is a protein which is normally found in the blood as it is being filtered in the kidney, and the kidney reabsorbs or returns almost all of the beta-2-microglobulin to the blood. A very small amount (less than 300 µg/g Cr in the urine) of beta-2-microglobulin is not reabsorbed into the blood, but is released in the urine. If cadmium damages the kidney, the amount of beta-2-microglobulin in the urine increases because the kidney cells are unable to reabsorb the beta-2-microglobulin normally. An increase in the amount of beta-2-microglobulin in the urine is a very early sign of kidney dysfunction. A small increase in beta-2-microglobu-

<sup>1</sup> For all employees covered by medical surveillance exclusively because of exposures prior to the effective date of this standard, if they are in Category A, the employer shall follow the requirements of WAC 296-62-07423 (3)(a)(ii) and (4)(e)(i). If they are in Category B or C, the employer shall follow the requirements of WAC 296-62-07423 (4)(e)(ii) and (iii).

<sup>2</sup> See footnote in Table A.

(7) Attachment 2, list of medications.

(a) A list of the more common medications that a physician, and the employee, may wish to review is likely to include some of the following:

- (i) Anticonvulsants: Paramethadione, phenytoin, trimethadone;
- (ii) Antihypertensive drugs: Captopril, methyl dopa;
- (iii) Antimicrobials: Aminoglycosides, amphotericin B, cephalosporins, ethambutol;
- (iv) Antineoplastic agents: Cisplatin, methotrexate, mitomycin-C, nitrosoureas, radiation;
- (v) Sulfonamide diuretics: Acetazolamide, chlorthalidone, furosemide, thiazides;
- (vi) Halogenated alkanes, hydrocarbons, and solvents that may occur in some settings: Carbon tetrachloride, ethylene glycol, toluene; iodinated radiographic contrast media; nonsteroidal anti-inflammatory drugs; and
- (vii) Other miscellaneous compounds: Acetaminophen, allopurinol, amphetamines, azathioprine, cimetidine, cyclosporine, lithium, methoxyflurane, methysergide, D-penicillamine, phenacetin, phenendione.

(b) A list of drugs associated with acute interstitial nephritis includes:

- (i) Antimicrobial drugs: Cephalosporins, chloramphenicol, colistin, erythromycin, ethambutol, isoniazid, para-aminosalicylic acid, penicillins, polymyxin B, rifampin, sulfonamides, tetracyclines, and vancomycin;
- (ii) Other miscellaneous drugs: Allopurinol, antipyrine, azathioprine, captopril, cimetidine, clofibrate, methyl dopa, phenindione, phenylpropanolamine, phenytoin, probenecid, sulfipyrazone, sulfonamide diuretics, triamterene; and
- (iii) Metals: Bismuth, gold. This list has been derived from commonly available medical textbooks (e.g., Ex. 14-18). The list has been included merely to facilitate the physician's, employer's, and employee's understanding. The list does not represent an official OSHA opinion or policy regarding the use of these medications for particular employ-

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lin in the urine will serve as an early warning sign that the worker may be absorbing cadmium from the air, cigarettes contaminated in the workplace, or eating in areas that are cadmium contaminated.

(e) Even if cadmium causes permanent changes in the kidney's ability to reabsorb beta-2-microglobulin, and the beta-2-microglobulin is above the "high levels," the loss of kidney function may not lead to any serious health problems. Also, renal function naturally declines as people age. The risk for changes in kidney function for workers who have biological monitoring results between the "normal values" and the "high levels" is not well known. Some people are more cadmium-tolerant, while others are more cadmium-susceptible.

(f) For anyone with even a slight increase of beta-2-microglobulin, cadmium in the urine, or cadmium in the blood, it is very important to protect the kidney from further damage. Kidney damage can come from other sources than excess cadmium-exposure so it is also recommended that if a worker's levels are "high" he/she should receive counseling about drinking more water; avoiding cadmium-tainted tobacco and certain medications (nephrotoxins, acetaminophen); controlling diet, vitamin intake, blood pressure and diabetes; etc.

**AMENDATORY SECTION** (Amending Order 88-23, filed 10/6/88, effective 11/7/88)

**WAC 296-62-07533 Appendix E qualitative and quantitative fit testing procedures.** Fit test protocols.

(1) The employer shall include the following provisions in the fit test procedures. These provisions apply to both qualitative fit testing (QLFT) and quantitative fit testing (QNFT).

(a) The test subject shall be allowed to pick the most comfortable respirator from a selection including respirators of various sizes from different manufacturers. The selection shall include at least three sizes of elastomeric facepieces of the type of respirator that is to be tested, i.e., three sizes of half mask; or three sizes of full facepiece; and units from at least two manufacturers.

(b) Prior to the selection process, the test subject shall be shown how to put on a respirator, how it should be positioned on the face, how to set strap tension and how to determine a comfortable fit. A mirror shall be available to assist the subject in evaluating the fit and positioning the respirator. This instruction may not constitute the subject's formal training on respirator use, as it is only a review.

(c) The test subject shall be informed that he/she is being asked to select the respirator which provides the most comfortable fit. Each respirator represents a different size and shape, and if fitted and used properly, will provide adequate protection.

(d) The test subject shall be instructed to hold each facepiece up to the face and eliminate those which obviously do not give a comfortable fit.

(e) The more comfortable facepieces are noted; the most comfortable mask is donned and worn at least five minutes to assess comfort. Assistance in assessing comfort can be given by discussing the points in (f) of this subsection. If the test subject is not familiar with using a particular respirator, the test subject shall be directed to don the mask

several times and to adjust the straps each time to become adept at setting proper tension on the straps.

(f) Assessment of comfort shall include reviewing the following points with the test subject and allowing the test subject adequate time to determine the comfort of the respirator:

- (i) Position of the mask on the nose;
- (ii) Room for eye protection;
- (iii) Room to talk; and
- (iv) Position of mask on face and cheeks.

(g) The following criteria shall be used to help determine the adequacy of the respirator fit:

- (i) Chin properly placed;
- (ii) Adequate strap tension, not overly tightened;
- (iii) Fit across nose bridge;
- (iv) Respirator of proper size to span distance from nose to chin;
- (v) Tendency of respirator to slip; and
- (vi) Self-observation in mirror to evaluate fit and respirator position.

(h) The test subject shall conduct the negative and positive pressure fit checks as described below or ANSI Z88.2-1980. Before conducting the negative or positive pressure test, the subject shall be told to seat the mask on the face by moving the head from side-to-side and up and down slowly while taking in a few slow deep breaths. Another facepiece shall be selected and retested if the test subject fails the fit check tests.

(i) Positive pressure test. Close off the exhalation valve and exhale gently onto the facepiece. The face fit is considered satisfactory if a slight positive pressure can be built up inside the facepiece without any evidence of outward leakage of air at the seal. For most respirators this method of leak testing requires the wearer to first remove the exhalation valve cover before closing off the exhalation valve and then carefully replacing it after the test.

(ii) Negative pressure test. Close off the inlet opening of the canister or cartridge(s) by covering with the palm of the hand(s) or by replacing the filter seal(s), inhale gently so that the facepiece collapses slightly, and hold the breath for ten seconds. If the facepiece remains in its slightly collapsed condition and no inward leakage of air is detected, the tightness of the respirator is considered satisfactory.

(i) The test shall not be conducted if there is any hair growth between the skin and the facepiece sealing surface, such as stubble beard growth, beard, or long sideburns which cross the respirator sealing surface. Any type of apparel which interferes with a satisfactory fit shall be altered or removed.

(j) If a test subject exhibits difficulty in breathing during the tests, she or he shall be referred to a physician trained in respiratory disease or pulmonary medicine to determine whether the test subject can wear a respirator while performing her or his duties.

(k) The test subject shall be given the opportunity to wear the successfully fitted respirator for a period of two weeks. If at any time during this period the respirator becomes uncomfortable, the test subject shall be given the opportunity to select a different facepiece and to be retested.

(l) The employer shall certify that a successful fit test has been administered to the employee. The certification shall include the following information:

- (i) Name of employee;
- (ii) Type, brand, and size of respirator; and
- (iii) Date of test.

Where QNFT is used, the fit factor, strip chart, or other recording of the results of the test, shall be retained with the certification. The certification shall be maintained until the next fit test is administered.

(m) Exercise regimen. Prior to the commencement of the fit test, the test subject shall be given a description of the fit test and the test subject's responsibilities during the test procedure. The description of the process shall include a description of the test exercises that the subject will be performing. The respirator to be tested shall be worn for at least five minutes before the start of the fit test.

(n) Test exercises. The test subject shall perform exercises, in the test environment, in the manner described below:

(i) Normal breathing. In a normal standing position, without talking, the subject shall breathe normally.

(ii) Deep breathing. In a normal standing position, the subject shall breathe slowly and deeply, taking caution so as to not hyperventilate.

(iii) Turning head side to side. Standing in place, the subject shall slowly turn his/her head from side to side between the extreme positions on each side. The head shall be held at each extreme momentarily so the subject can inhale at each side.

(iv) Moving head up and down. Standing in place, the subject shall slowly move his/her head up and down. The subject shall be instructed to inhale in the up position (i.e., when looking toward the ceiling).

(v) Talking. The subject shall talk out loud slowly and loud enough so as to be heard clearly by the test conductor. The subject can read from a prepared text such as the Rainbow Passage, count backward from one hundred, or recite a memorized poem or song.

(vi) Grimace. The test subject shall grimace by smiling or frowning.

(vii) Bending over. The test subject shall bend at the waist as if he/she were to touch his/her toes. Jogging in place shall be substituted for this exercise in those test environments such as shroud type QNFT units which prohibit bending at the waist.

(viii) Normal breathing. Same as exercise in (n)(i) of this subsection.

Each test exercise shall be performed for one minute except for the grimace exercise which shall be performed for fifteen seconds.

The test subject shall be questioned by the test conductor regarding the comfort of the respirator upon completion of the protocol. If it has become uncomfortable, another model of respirator shall be tried.

## (2) Qualitative fit test (QLFT) protocols.

### (a) General.

(i) The employer shall assign specific individuals who shall assume full responsibility for implementing the respirator qualitative fit test program.

(ii) The employer shall ensure that persons administering QLFT are able to prepare test solutions, calibrate equipment and perform tests properly, recognize invalid tests, and assure that test equipment is in proper working order.

(iii) The employer shall assure that QLFT equipment is kept clean and well maintained so as to operate at the parameters for which it was designed.

### (b) Isoamyl acetate protocol.

#### (i) Odor threshold screening.

The odor threshold screening test, performed without wearing a respirator, is intended to determine if the individual tested can detect the odor of isoamyl acetate.

(A) Three one-liter glass jars with metal lids are required.

(B) Odor free water (e.g., distilled or spring water) at approximately twenty-five degrees C shall be used for the solutions.

(C) The isoamyl acetate (IAA) (also known as isopentyl acetate) stock solution is prepared by adding 1 cc of pure IAA to 800 cc of odor free water in a one liter jar and shaking for thirty seconds. A new solution shall be prepared at least weekly.

(D) The screening test shall be conducted in a room separate from the room used for actual fit testing. The two rooms shall be well ventilated but shall not be connected to the same recirculating ventilation system.

(E) The odor test solution is prepared in a second jar by placing 0.4 cc of the stock solution into 500 cc of odor free water using a clean dropper or pipette. The solution shall be shaken for thirty seconds and allowed to stand for two to three minutes so that the IAA concentration above the liquid may reach equilibrium. This solution shall be used for only one day.

(F) A test blank shall be prepared in a third jar by adding 500 cc of odor free water.

(G) The odor test and test blank jars shall be labeled 1 and 2 for jar identification. Labels shall be placed on the lids so they can be periodically peeled, dried off, and switched to maintain the integrity of the test.

(H) The following instruction shall be typed on a card and placed on the table in front of the two test jars (i.e., 1 and 2): "The purpose of this test is to determine if you can smell banana oil at a low concentration. The two bottles in front of you contain water. One of these bottles also contains a small amount of banana oil. Be sure the covers are on tight, then shake each bottle for two seconds. Unscrew the lid of each bottle, one at a time, and sniff at the mouth of the bottle. Indicate to the test conductor which bottle contains banana oil."

(I) The mixtures used in the IAA odor detection test shall be prepared in an area separate from where the test is performed, in order to prevent olfactory fatigue in the subject.

(J) If the test subject is unable to correctly identify the jar containing the odor test solution, the IAA qualitative fit test shall not be performed.

(K) If the test subject correctly identifies the jar containing the odor test solution, the test subject may proceed to respirator selection and fit testing.

#### (ii) Isoamyl acetate fit test.

(A) The fit test chamber shall be similar to a clear fifty-five gallon drum liner suspended inverted over a two-foot diameter frame so that the top of the chamber is about six inches above the test subject's head. The inside top center of the chamber shall have a small hook attached.

(B) Each respirator used for the fitting and fit testing shall be equipped with organic vapor cartridges or offer protection against organic vapors. The cartridges or masks shall be changed at least weekly.

(C) After selecting, donning, and properly adjusting a respirator, the test subject shall wear it to the fit testing room. This room shall be separate from the room used for odor threshold screening and respirator selection, and shall be well ventilated, as by an exhaust fan or lab hood, to prevent general room contamination.

(D) A copy of the test exercises and any prepared text from which the subject is to read shall be taped to the inside of the test chamber.

(E) Upon entering the test chamber, the test subject shall be given a six-inch by five-inch piece of paper towel, or other porous, absorbent, single-ply material, folded in half and wetted with 0.75 cc of pure IAA. The test subject shall hand the wet towel on the hook at the top of the chamber.

(F) Allow two minutes for the IAA test concentration to stabilize before starting the fit test exercises. This would be an appropriate time to talk with the test subject; to explain the fit test, the importance of his/her cooperation, and the purpose for the head exercises; or to demonstrate some of the exercises.

(G) If at any time during the test, the subject detects the banana like odor of IAA, the test has failed. The subject shall quickly exit from the test chamber and leave the test area to avoid olfactory fatigue.

(H) If the test has failed, the subject shall return to the selection room and remove the respirator, repeat the odor sensitivity test, select and put on another respirator, return to the test chamber and again begin the procedure described in (b)(ii)(A) through (G) of this subsection. The process continues until a respirator that fits well has been found. Should the odor sensitivity test be failed, the subject shall wait about five minutes before retesting. Odor sensitivity will usually have returned by this time.

(I) When a respirator is found that passes the test, its efficiency shall be demonstrated for the subject by having the subject break the face seal and take a breath before exiting the chamber.

(J) When the test subject leaves the chamber, the subject shall remove the saturated towel and return it to the person conducting the test. To keep the test area from becoming contaminated, the used towels shall be kept in a self sealing bag so there is no significant IAA concentration build-up in the test chamber during subsequent tests.

(c) Saccharin solution aerosol protocol. The saccharin solution aerosol QLFT protocol is the only currently available, validated test protocol for use with particulate disposable dust respirators not equipped with high-efficiency filters. The entire screening and testing procedure shall be explained to the test subject prior to the conduct of the screening test.

(i) Taste threshold screening. The saccharin taste threshold screening, performed without wearing a respirator, is intended to determine whether the individual being tested can detect the taste of saccharin.

(A) Threshold screening as well as fit testing subjects shall wear an enclosure about the head and shoulders that is approximately twelve inches in diameter by fourteen inches tall with at least the front portion clear and that allows free movements of the head when a respirator is worn. An

enclosure substantially similar to the 3M hood assembly, parts NZ FT 14 and NZ FT 15 combined, is adequate.

(B) The test enclosure shall have a three-quarter inch hole in front of the test subject's nose and mouth area to accommodate the nebulizer nozzle.

(C) The test subject shall don the test enclosure. Throughout the threshold screening test, the test subject shall breathe through his/her wide open mouth with tongue extended.

(D) Using a DeVilbiss Model 40 Inhalation Medication Nebulizer the test conductor shall spray the threshold check solution into the enclosure. This nebulizer shall be clearly marked to distinguish it from the fit test solution nebulizer.

(E) The threshold check solution consists of 0.83 grams of sodium saccharin USP in 1 cc of warm water. It can be prepared by putting 1 cc of the fit test solution (see ~~((b))~~(c)(ii)(E) of this subsection) in 100 cc of distilled water.

(F) To produce the aerosol, the nebulizer bulb is firmly squeezed so that it collapses completely, then released and allowed to fully expand.

(G) Ten squeezes are repeated rapidly and then the test subject is asked whether the saccharin can be tasted.

(H) If the first response is negative, ten more squeezes are repeated rapidly and the test subject is again asked whether the saccharin is tasted.

(I) If the second response is negative, ten more squeezes are repeated rapidly and the test subject is again asked whether the saccharin is tasted.

(J) The test conductor will take note of the number of squeezes required to solicit a taste response.

(K) If the saccharin is not tasted after thirty squeezes (subitem (J)), the test subject may not perform the saccharin fit test.

(L) If a taste response is elicited, the test subject shall be asked to take note of the taste for reference in the fit test.

(M) Correct use of the nebulizer means that approximately 1 cc of liquid is used at a time in the nebulizer body.

(N) The nebulizer shall be thoroughly rinsed in water, shaken dry, and refilled at least each morning and afternoon or at least every four hours.

(ii) Saccharin solution aerosol fit test procedure.

(A) The test subject may not eat, drink (except plain water), or chew gum for fifteen minutes before the test.

(B) The fit test uses the same enclosure described in (c)(i) of this subsection.

(C) The test subject shall don the enclosure while wearing the respirator selected in (c)(i) of this subsection. The respirator shall be properly adjusted and equipped with a particulate filter(s).

(D) A second DeVilbiss Model 40 Inhalation Medication Nebulizer is used to spray the fit test solution into the enclosure. This nebulizer shall be clearly marked to distinguish it from the screening test solution nebulizer.

(E) The fit test solution is prepared by adding eighty-three grams of sodium saccharin to 100 cc of warm water.

(F) As before, the test subject shall breathe through the open mouth with tongue extended.

(G) The nebulizer is inserted into the hole in the front of the enclosure and the fit test solution is sprayed into the enclosure using the same number of squeezes required to elicit a taste response in the screening test.

(H) After generating the aerosol the test subject shall be instructed to perform the exercises in subsection (1)(h) of this section.

(I) Every thirty seconds the aerosol concentration shall be replenished using one-half the number of squeezes as initially.

(J) The test subject shall indicate to the test conductor if at any time during the fit test the taste of saccharin is detected.

(K) If the taste of saccharin is detected, the fit is deemed unsatisfactory and a different respirator shall be tried.

(d) Irritant fume protocol.

(i) The respirator to be tested shall be equipped with high-efficiency particulate air (HEPA) filters.

(ii) The test subject shall be allowed to smell a weak concentration of the irritant smoke before the respirator is donned to become familiar with its characteristic odor.

(iii) Break both ends of a ventilation smoke tube containing stannic oxychloride, such as the MSA part No. 5645, or equivalent. Attach one end of the smoke tube to a low flow air pump set to deliver two hundred milliliters per minute.

(iv) Advise the test subject that the smoke can be irritating to the eyes and instruct the subject to keep his/her eyes closed while the test is performed.

(v) The test conductor shall direct the stream of irritant smoke from the smoke tube towards the face seal area of the test subject. He/she shall begin at least twelve inches from the facepiece and gradually move to within one inch, moving around the whole perimeter of the mask.

(vi) The exercises identified in subsection (1)(n) of this section shall be performed by the test subject while the respirator seal is being challenged by the smoke.

(vii) Each test subject passing the smoke test without evidence of a response shall be given a sensitivity check of the smoke from the same tube once the respirator has been removed to determine whether he/she reacts to the smoke. Failure to evoke a response shall void the fit test.

(viii) The fit test shall be performed in a location with exhaust ventilation sufficient to prevent general contamination of the testing area by the test agent.

(3) Quantitative fit test (QNFT) protocol.

(a) General.

(i) The employer shall assign specific individuals who shall assume full responsibility for implementing the respirator quantitative fit test program.

(ii) The employer shall ensure that persons administering QNFT are able to calibrate equipment and perform tests properly, recognize invalid tests, calculate fit factors properly and assure that test equipment is in proper working order.

(iii) The employer shall assure that QNFT equipment is kept clean and well maintained so as to operate at the parameters for which it was designed.

(b) Definitions.

(i) "Quantitative fit test." The test is performed in a test chamber. The normal air-purifying element of the respirator is replaced by a high-efficiency particulate air (HEPA) filter in the case of particulate QNFT aerosols or a sorbent offering contaminant penetration protection equivalent to high-efficiency filters where the QNFT test agent is a gas or vapor.

(ii) "Challenge agent" means the aerosol, gas, or vapor introduced into a test chamber so that its concentration inside and outside the respirator may be measured.

(iii) "Test subject" means the person wearing the respirator for quantitative fit testing.

(iv) "Normal standing position" means standing erect and straight with arms down along the sides and looking straight ahead.

(v) "Maximum peak penetration method" means the method of determining test agent penetration in the respirator as determined by strip chart recordings of the test. The highest peak penetration for a given exercise is taken to be representative of average penetration into the respirator for that exercise.

(vi) "Average peak penetration method" means the method of determining test agent penetration into the respirator utilizing a strip chart recorder, integrator, or computer. The agent penetration is determined by an average of the peak heights on the graph or by computer integration, for each exercise except the grimace exercise. Integrators or computers which calculate the actual test agent penetration into the respirator for each exercise will also be considered to meet the requirements of the average peak penetration method.

(vii) "Fit factor" means the ratio of challenge agent concentration outside with respect to the inside of a respirator inlet covering (facepiece or enclosure).

(c) Apparatus.

(i) Instrumentation. Aerosol generation, dilution, and measurement systems using corn oil or sodium chloride as test aerosols shall be used for quantitative fit testing.

(ii) Test chamber. The test chamber shall be large enough to permit all test subjects to perform freely all required exercises without disturbing the challenge agent concentration or the measurement apparatus. The test chamber shall be equipped and constructed so that the challenge agent is effectively isolated from the ambient air, yet uniform in concentration throughout the chamber.

(iii) When testing air-purifying respirators, the normal filter or cartridge element shall be replaced with a high-efficiency particulate filter supplied by the same manufacturer.

(iv) The sampling instrument shall be selected so that a strip chart record may be made of the test showing the rise and fall of the challenge agent concentration with each inspiration and expiration at fit factors of at least two thousand. Integrators or computers which integrate the amount of test agent penetration leakage into the respirator for each exercise may be used provided a record of the readings is made.

(v) The combination of substitute air-purifying elements, challenge agent and challenge agent concentration in the test chamber shall be such that the test subject is not exposed in excess of an established exposure limit for the challenge agent at any time during the testing process.

(vi) The sampling port on the test specimen respirator shall be placed and constructed so that no leakage occurs around the port (e.g., where the respirator is probed), a free air flow is allowed into the sampling line at all times and so that there is no interference with the fit or performance of the respirator.

(vii) The test chamber and test set up shall permit the person administering the test to observe the test subject inside the chamber during the test.

(viii) The equipment generating the challenge atmosphere shall maintain the concentration of challenge agent inside the test chamber constant to within a ten percent variation for the duration of the test.

(ix) The time lag (interval between an event and the recording of the event on the strip chart or computer or integrator) shall be kept to a minimum. There shall be a clear association between the occurrence of an event inside the test chamber and its being recorded.

(x) The sampling line tubing for the test chamber atmosphere and for the respirator sampling port shall be of equal diameter and of the same material. The length of the two lines shall be equal.

(xi) The exhaust flow from the test chamber shall pass through a high-efficiency filter before release.

(xii) When sodium chloride aerosol is used, the relative humidity inside the test chamber shall not exceed fifty percent.

(xiii) The limitations of instrument detection shall be taken into account when determining the fit factor.

(xiv) Test respirators shall be maintained in proper working order and inspected for deficiencies such as cracks, missing valves and gaskets, etc.

(d) Procedural requirements.

(i) When performing the initial positive or negative pressure test the sampling line shall be crimped closed in order to avoid air pressure leakage during either of these tests.

(ii) An abbreviated screening isoamyl acetate test or irritant fume test may be utilized in order to quickly identify poor fitting respirators which passed the positive and/or negative pressure test and thus reduce the amount of QNFT time. When performing a screening isoamyl acetate test, combination high-efficiency organic vapor cartridges/canisters shall be used.

(iii) A reasonably stable challenge agent concentration shall be measured in the test chamber prior to testing. For canopy or shower curtain type of test units the determination of the challenge agent stability may be established after the test subject has entered the test environment.

(iv) Immediately after the subject enters the test chamber, the challenge agent concentration inside the respirator shall be measured to ensure that the peak penetration does not exceed five percent for a half mask or one percent for a full facepiece respirator.

(v) A stable challenge concentration shall be obtained prior to the actual start of testing.

(vi) Respirator restraining straps shall not be overtightened for testing. The straps shall be adjusted by the wearer without assistance from other persons to give a reasonable comfortable fit typical of normal use.

(vii) The test shall be terminated whenever any single peak penetration exceeds five percent for half masks and one percent for full facepiece respirators. The test subject shall be refitted and retested. If two of the three required tests are terminated, the fit shall be deemed inadequate.

(viii) In order to successfully complete a QNFT, three successful fit tests are required. The results of each of the three independent fit tests must exceed the minimum fit

factor needed for the class of respirator (e.g., half mask respirator, full facepiece respirator).

(ix) Calculation of fit factors.

(A) The fit factor shall be determined for the quantitative fit test by taking the ratio of the average chamber concentration to the concentration inside the respirator.

(B) The average test chamber concentration is the arithmetic average of the test chamber concentration at the beginning and at the end of the test.

(C) The concentration of the challenge agent inside the respirator shall be determined by one of the following methods:

(I) Average peak concentration;

(II) Maximum peak concentration; or

(III) Integration by calculation of the area under the individual peak for each exercise. This includes computerized integration.

(x) Interpretation of test results. The fit factor established by the quantitative fit testing shall be the lowest of the three fit factor values calculated from the three required fit tests.

(xi) The test subject shall not be permitted to wear a half mask, or full facepiece respirator unless a minimum fit factor equivalent to at least ten times the hazardous exposure level is obtained.

(xii) Filters used for quantitative fit testing shall be replaced at least weekly, or whenever increased breathing resistance is encountered, or when the test agent has altered the integrity of the filter media. Organic vapor cartridges/canisters shall be replaced daily (when used) or sooner if there is any indication of breakthrough by a test agent.

AMENDATORY SECTION (Amending Order 92-13, filed 11/10/92, effective 12/18/92)

**WAC 296-62-07540 Formaldehyde.** (1) Scope and application. This standard applies to all occupational exposures to formaldehyde, i.e., from formaldehyde gas, its solutions, and materials that release formaldehyde.

(2) Definitions. For purposes of this standard, the following definitions shall apply:

(a) "Action level" means a concentration of 0.5 part formaldehyde per million parts of air (0.5 ppm) calculated as an 8-hour time-weighted average (TWA) concentration.

(b) "Approved" means approved by the director of the department of labor and industries or his/her authorized representative: *Provided, however,* That should a provision of this chapter state that approval by an agency or organization other than the department of labor and industries is required, such as Underwriters' Laboratories or the (~~Bureau of Mines~~) Mine Safety and Health Administration and the National Institute for Occupational Safety and Health, the provision of WAC 296-24-006 shall apply.

(c) "Authorized person" means any person required by work duties to be present in regulated work areas, or authorized to do so by the employer, by this section of the standard, or by the WISHA Act.

(d) "Director" means the director of the department of labor and industries, or his/her designated representative.

(e) "Emergency" is any occurrence, such as but not limited to equipment failure, rupture of containers, or failure

of control equipment that results in an uncontrolled release of a significant amount of formaldehyde.

(f) "Employee exposure" means the exposure to airborne formaldehyde which would occur without corrections for protection provided by any respirator that is in use.

(g) "Formaldehyde" means the chemical substance, HCHO, Chemical Abstracts Service Registry No. 50-00-0.

(3) Permissible exposure limit (PEL).

(a) TWA: The employer shall assure that no employee is exposed to an airborne concentration of formaldehyde which exceeds (~~(one)~~) 0.75 part formaldehyde per million parts of air (~~(1 ppm)~~) as an 8-hour TWA.

(b) Short term exposure limit (STEL): The employer shall assure that no employee is exposed to an airborne concentration of formaldehyde which exceeds two parts formaldehyde per million parts of air (2 ppm) as a fifteen-minute STEL.

(4) Exposure monitoring.

(a) General.

(i) Each employer who has a workplace covered by this standard shall monitor employees to determine their exposure to formaldehyde.

(ii) Exception. Where the employer documents, using objective data, that the presence of formaldehyde or formaldehyde-releasing products in the workplace cannot result in airborne concentrations of formaldehyde that would cause any employee to be exposed at or above the action level or the STEL under foreseeable conditions of use, the employer will not be required to measure employee exposure to formaldehyde.

(iii) When an employee's exposure is determined from representative sampling, the measurements used shall be representative of the employee's full shift or short-term exposure to formaldehyde, as appropriate.

(iv) Representative samples for each job classification in each work area shall be taken for each shift unless the employer can document with objective data that exposure levels for a given job classification are equivalent for different workshifts.

(b) Initial monitoring. The employer shall identify all employees who may be exposed at or above the action level or at or above the STEL and accurately determine the exposure of each employee so identified.

(i) Unless the employer chooses to measure the exposure of each employee potentially exposed to formaldehyde, the employer shall develop a representative sampling strategy and measure sufficient exposures within each job classification for each workshift to correctly characterize and not underestimate the exposure of any employee within each exposure group.

(ii) The initial monitoring process shall be repeated each time there is a change in production, equipment, process, personnel, or control measures which may result in new or additional exposure to formaldehyde.

(iii) If the employer receives reports or signs or symptoms of respiratory or dermal conditions associated with formaldehyde exposure, the employer shall promptly monitor the affected employee's exposure.

(c) Periodic monitoring.

(i) The employer shall periodically measure and accurately determine exposure to formaldehyde for employees

shown by the initial monitoring to be exposed at or above the action level or at or above the STEL.

(ii) If the last monitoring results reveal employee exposure at or above the action level, the employer shall repeat monitoring of the employees at least every six months.

(iii) If the last monitoring results reveal employee exposure at or above the STEL, the employer shall repeat monitoring of the employees at least once a year under worst conditions.

(d) Termination of monitoring. The employer may discontinue periodic monitoring for employees if results from two consecutive sampling periods taken at least seven days apart show that employee exposure is below the action level and the STEL. The results must be statistically representative and consistent with the employer's knowledge of the job and work operation.

(e) Accuracy of monitoring. Monitoring shall be accurate, at the ninety-five percent confidence level, to within plus or minus twenty-five percent for airborne concentrations of formaldehyde at the TWA and the STEL and to within plus or minus thirty-five percent for airborne concentrations of formaldehyde at the action level.

(f) Employee notification of monitoring results. Within fifteen days of receiving the results of exposure monitoring conducted under this standard, the employer shall notify the affected employees of these results. Notification shall be in writing, either by distributing copies of the results to the employees or by posting the results. If the employee exposure is over either PEL, the employer shall develop and implement a written plan to reduce employee exposure to or below both PELs, and give written notice to employees. The written notice shall contain a description of the corrective action being taken by the employer to decrease exposure.

(g) Observation of monitoring.

(i) The employer shall provide affected employees or their designated representatives an opportunity to observe any monitoring of employee exposure to formaldehyde required by this standard.

(ii) When observation of the monitoring of employee exposure to formaldehyde requires entry into an area where the use of protective clothing or equipment is required, the employer shall provide the clothing and equipment to the observer, require the observer to use such clothing and equipment, and assure that the observer complies with all other applicable safety and health procedures.

(5) Regulated areas.

(a) The employer shall establish regulated areas where the concentration of airborne formaldehyde exceeds either the TWA or the STEL and post all entrances and accessways with signs bearing the following information:

DANGER  
FORMALDEHYDE  
IRRITANT AND POTENTIAL CANCER HAZARD  
AUTHORIZED PERSONNEL ONLY

(b) The employer shall limit access to regulated areas to authorized persons who have been trained to recognize the hazards of formaldehyde.

(c) An employer at a multi-employer worksite who establishes a regulated area shall communicate the access

restrictions and locations of these areas to other employers with work operations at that worksite.

(6) Methods of compliance.

(a) Engineering controls and work practices. The employer shall institute engineering and work practice controls to reduce and maintain employee exposures to formaldehyde at or below the TWA and the STEL.

(b) Exception. Whenever the employer has established that feasible engineering and work practice controls cannot reduce employee exposure to or below either of the PELs, the employer shall apply these controls to reduce employee exposures to the extent feasible and shall supplement them with respirators which satisfy this standard.

(7) Respiratory protection.

(a) General. Where respiratory protection is required, the employer shall provide the respirators at no cost to the employee and shall assure that they are properly used. The respirators shall comply with the requirements of this standard and shall reduce the concentration of formaldehyde inhaled by the employee to at or below both the TWA and the STEL. Respirators shall be used in the following circumstances:

(i) During the interval necessary to install or implement feasible engineering and work practice controls;

(ii) In work operations, such as maintenance and repair activities or vessel cleaning, for which the employer establishes that engineering and work practice controls are not feasible;

(iii) In work situations where feasible engineering and work practice controls are not yet sufficient to reduce exposure to or below the PELs; and

(iv) In emergencies.

(b) Respirator selection.

(i) The appropriate respirators as specified in Table 1 shall be selected from those approved by the Mine Safety and Health Administration (MSHA) and by the National Institute for Occupational Safety and Health (NIOSH) under the provisions of 30 CFR Part 11.

(ii) The employer shall make available a powered air-purifying respirator adequate to protect against formaldehyde exposure to any employee who experiences difficulty wearing a negative-pressure respirator to reduce exposure to formaldehyde.

(c) Respirator usage.

(i) Whenever respirator use is required by this standard, the employer shall institute a respiratory protection program in accordance with WAC 296-62-07109, 296-62-07111, 296-62-07115, and 296-62-07117.

(ii) The employer shall perform either quantitative or qualitative face fit tests in accordance with the procedures outlined in Appendix E at the time of initial fitting and at least annually thereafter for all employees required by this standard to wear negative-pressure respirators.

(A) Respirators selected shall be from those exhibiting the best facepiece fit.

(B) No respirator shall be chosen that would potentially permit the employee to inhale formaldehyde at concentrations in excess of either the TWA or the STEL.

TABLE 1  
MINIMUM REQUIREMENTS FOR RESPIRATORY PROTECTION  
AGAINST FORMALDEHYDE

Condition of use or formaldehyde concentration (ppm)	Minimum respirator required <sup>1</sup>
Up to 7.5 ppm (10 x PEL) . . . . .	Full facepiece with cartridges or canisters specifically approved for protection against formaldehyde <sup>2</sup> .
Up to 75 ppm (100 x PEL) . . . . .	Full-face mask with chin style or chest or back mounted type industrial size canister specifically approved for protection against formaldehyde.  Type C supplied-air respirator pressure demand or continuous flow type, with full facepiece, hood, or helmet.
Above 75 ppm or unknown (emergencies) (100 x PEL) . . . . .	Self-contained breathing apparatus (SCBA) with positive-pressure full facepiece.  Combination supplied-air, full facepiece positive-pressure respirator with auxiliary self-contained air supply.
Fire fighting . . . . .	SCBA with positive-pressure in full facepiece.
Escape . . . . .	SCBA in demand or pressure demand mode.  Full-face mask with chin style or front or back mounted type industrial size canister specifically approved for protection against formaldehyde.

<sup>1</sup> Respirators specified for use at higher concentrations may be used at lower concentrations.

<sup>2</sup> A half-mask respirator with cartridges specifically approved for protection against formaldehyde can be substituted for the full facepiece respirator providing that effective gas-proof goggles are provided and used in combination with the half-mask respirator.

(iii) Where air-purifying chemical cartridge respirators are used, the cartridges shall be replaced after three hours of use or at the end of the workshift, whichever is sooner unless the cartridge contains a NIOSH-approved end-of-service indicator to show when breakthrough occurs.

(iv) Unless the canister contains a NIOSH-approved end-of-service life indicator to show when breakthrough occurs, canisters used in atmospheres up to 7.5 ppm (10 x PEL) shall be replaced every four hours and industrial sized canisters used in atmospheres up to 75 ppm (100 x PEL) shall be replaced every two hours or at the end of the workshift, whichever is sooner.

(v) Employers shall permit employees to leave the work area to wash their faces and respirator facepieces as needed to prevent skin irritation from respirator use.

(8) Protective equipment and clothing. Employers shall comply with the provisions of WAC 296-24-07501 and ((296-24-078)) 296-24-07801. When protective equipment or clothing is provided under these provisions, the employer

PERMANENT



shall provide these protective devices at no cost to the employee and assure that the employee wears them.

(a) Selection. The employer shall select protective clothing and equipment based upon the form of formaldehyde to be encountered, the conditions of use, and the hazard to be prevented.

(i) All contact of the eyes and skin with liquids containing one percent or more formaldehyde shall be prevented by the use of chemical protective clothing made of material impervious to formaldehyde and the use of other personal protective equipment, such as goggles and face shields, as appropriate to the operation.

(ii) Contact with irritating or sensitizing materials shall be prevented to the extent necessary to eliminate the hazard.

(iii) Where a face shield is worn, chemical safety goggles are also required if there is a danger of formaldehyde reaching the area of the eye.

(iv) Full body protection shall be worn for entry into areas where concentrations exceed 100 ppm and for emergency reentry into areas of unknown concentration.

(b) Maintenance of protective equipment and clothing.

(i) The employer shall assure that protective equipment and clothing that has become contaminated with formaldehyde is cleaned or laundered before its reuse.

(ii) When ventilating formaldehyde-contaminated clothing and equipment, the employer shall establish a storage area so that employee exposure is minimized. Containers for contaminated clothing and equipment and storage areas shall have labels and signs containing the following information:

**DANGER**

**FORMALDEHYDE-CONTAMINATED (CLOTHING) EQUIPMENT  
AVOID INHALATION AND SKIN CONTACT**

(iii) The employer shall assure that only persons trained to recognize the hazards of formaldehyde remove the contaminated material from the storage area for purposes of cleaning, laundering, or disposal.

(iv) The employer shall assure that no employee takes home equipment or clothing that is contaminated with formaldehyde.

(v) The employer shall repair or replace all required protective clothing and equipment for each affected employee as necessary to assure its effectiveness.

(vi) The employer shall inform any person who launders, cleans, or repairs such clothing or equipment of formaldehyde's potentially harmful effects and of procedures to safely handle the clothing and equipment.

(9) Hygiene protection.

(a) The employer shall provide change rooms, as described in WAC 296-24-120 for employees who are required to change from work clothing into protective clothing to prevent skin contact with formaldehyde.

(b) If employees' skin may become splashed with solutions containing one percent or greater formaldehyde, for example because of equipment failure or improper work practices, the employer shall provide conveniently located quick drench showers and assure that affected employees use these facilities immediately.

(c) If there is any possibility that an employee's eyes may be splashed with solutions containing 0.1 percent or greater formaldehyde, the employer shall provide acceptable

eyewash facilities within the immediate work area for emergency use.

(10) Housekeeping. For operations involving formaldehyde liquids or gas, the employer shall conduct a program to detect leaks and spills, including regular visual inspections.

(a) Preventative maintenance of equipment, including surveys for leaks, shall be undertaken at regular intervals.

(b) In work areas where spillage may occur, the employer shall make provisions to contain the spill, to decontaminate the work area, and to dispose of the waste.

(c) The employer shall assure that all leaks are repaired and spills are cleaned promptly by employees wearing suitable protective equipment and trained in proper methods for cleanup and decontamination.

(d) Formaldehyde-contaminated waste and debris resulting from leaks or spills shall be placed for disposal in sealed containers bearing a label warning of formaldehyde's presence and of the hazards associated with formaldehyde.

(11) Emergencies. For each workplace where there is the possibility of an emergency involving formaldehyde, the employer shall assure appropriate procedures are adopted to minimize injury and loss of life. Appropriate procedures shall be implemented in the event of an emergency.

(12) Medical surveillance.

(a) Employees covered.

(i) The employer shall institute medical surveillance programs for all employees exposed to formaldehyde at concentrations at or exceeding the action level or exceeding the STEL.

(ii) The employer shall make medical surveillance available for employees who develop signs and symptoms of overexposure to formaldehyde and for all employees exposed to formaldehyde in emergencies. When determining whether an employee may be experiencing signs and symptoms of possible overexposure to formaldehyde, the employer may rely on the evidence that signs and symptoms associated with formaldehyde exposure will occur only in exceptional circumstances when airborne exposure is less than 0.1 ppm and when formaldehyde is present in materials in concentrations less than 0.1 percent.

(b) Examination by a physician. All medical procedures, including administration of medical disease questionnaires, shall be performed by or under the supervision of a licensed physician and shall be provided without cost to the employee, without loss of pay, and at a reasonable time and place.

(c) Medical disease questionnaire. The employer shall make the following medical surveillance available to employees prior to assignment to a job where formaldehyde exposure is at or above the action level or above the STEL and annually thereafter. The employer shall also make the following medical surveillance available promptly upon determining that an employee is experiencing signs and symptoms indicative of possible overexposure to formaldehyde.

(i) Administration of a medical disease questionnaire, such as in Appendix D, which is designed to elicit information on work history, smoking history, any evidence of eye, nose, or throat irritation; chronic airway problems or hyperreactive airway disease; allergic skin conditions or dermatitis; and upper or lower respiratory problems.

(ii) A determination by the physician, based on evaluation of the medical disease questionnaire, of whether a medical examination is necessary for employees not required to wear respirators to reduce exposure to formaldehyde.

(d) Medical examinations. Medical examinations shall be given to any employee who the physician feels, based on information in the medical disease questionnaire, may be at increased risk from exposure to formaldehyde and at the time of initial assignment and at least annually thereafter to all employees required to wear a respirator to reduce exposure to formaldehyde. The medical examination shall include:

(i) A physical examination with emphasis on evidence of irritation or sensitization of the skin and respiratory system, shortness of breath, or irritation of the eyes.

(ii) Laboratory examinations for respirator wearers consisting of baseline and annual pulmonary function tests. As a minimum, these tests shall consist of forced vital capacity (FVC), forced expiratory volume in one second (FEV1), and forced expiratory flow (FEF).

(iii) Any other test which the examining physician deems necessary to complete the written opinion.

(iv) Counseling of employees having medical conditions that would be directly or indirectly aggravated by exposure to formaldehyde on the increased risk of impairment of their health.

(e) Examinations for employees exposed in an emergency. The employer shall make medical examinations available as soon as possible to all employees who have been exposed to formaldehyde in an emergency.

(i) The examination shall include a medical and work history with emphasis on any evidence of upper or lower respiratory problems, allergic conditions, skin reaction or hypersensitivity, and any evidence of eye, nose, or throat irritation.

(ii) Other examinations shall consist of those elements considered appropriate by the examining physician.

(f) Information provided to the physician. The employer shall provide the following information to the examining physician:

(i) A copy of this standard and Appendices A, C, D, and E;

(ii) A description of the affected employee's job duties as they relate to the employee's exposure to formaldehyde;

(iii) The representative exposure level for the employee's job assignment;

(iv) Information concerning any personal protective equipment and respiratory protection used or to be used by the employee; and

(v) Information from previous medical examinations of the affected employee within the control of the employer.

(vi) In the event of a nonroutine examination because of an emergency, the employer shall provide to the physician as soon as possible: A description of how the emergency occurred and the exposure the victim may have received.

(g) Physician's written opinion.

(i) For each examination required under this standard, the employer shall obtain a written opinion from the examining physician. This written opinion shall contain the results of the medical examination except that it shall not reveal specific findings or diagnoses unrelated to occupational

exposure to formaldehyde. The written opinion shall include:

(A) The physician's opinion as to whether the employee has any medical condition that would place the employee at an increased risk of material impairment of health from exposure to formaldehyde;

(B) Any recommended limitations on the employee's exposure or changes in the use of personal protective equipment, including respirators;

(C) A statement that the employee has been informed by the physician of any medical conditions which would be aggravated by exposure to formaldehyde, whether these conditions may have resulted from past formaldehyde exposure or from exposure in an emergency, and whether there is a need for further examination or treatment.

(ii) The employer shall provide for retention of the results of the medical examination and tests conducted by the physician.

(iii) The employer shall provide a copy of the physician's written opinion to the affected employee within fifteen days of its receipt.

(h) Medical removal.

(i) The provisions of this subdivision apply when an employee reports significant irritation of the mucosa of the eyes or of the upper airways, respiratory sensitization, dermal irritation, or dermal sensitization attributed to workplace formaldehyde exposure. Medical removal provisions do not apply in case of dermal irritation or dermal sensitization when the product suspected of causing the dermal condition contains less than 0.05% formaldehyde.

(ii) An employee's report of signs or symptoms of possible overexposure to formaldehyde shall be evaluated by a physician selected by the employer pursuant to (c) of this subsection. If the physician determines that a medical examination is not necessary under (c)(ii) of this subsection, there shall be a two-week evaluation and remediation period to permit the employer to ascertain whether the signs or symptoms subside untreated or with the use of creams, gloves, first aid treatment, or personal protective equipment. Industrial hygiene measures that limit the employee's exposure to formaldehyde may also be implemented during this period. The employee shall be referred immediately to a physician prior to expiration of the two-week period if the signs or symptoms worsen. Earnings, seniority, and benefits may not be altered during the two-week period by virtue of the report.

(iii) If the signs or symptoms have not subsided or been remedied by the end of the two-week period, or earlier if signs or symptoms warrant, the employee shall be examined by a physician selected by the employer. The physician shall presume, absent contrary evidence, that observed dermal irritation or dermal sensitization are not attributable to formaldehyde when products to which the affected employee is exposed contain less than 0.1% formaldehyde.

(iv) Medical examinations shall be conducted in compliance with the requirements of (e)(i) and (ii) of this subsection. Additional guidelines for conducting medical exams are contained in WAC 296-62-07546, Appendix C.

(v) If the physician finds that significant irritation of the mucosa of the eyes or the upper airways, respiratory sensitization, dermal irritation, or dermal sensitization result from workplace formaldehyde exposure and recommends restrictions or removal. The employer shall promptly comply with

the restrictions or recommendations of removal. In the event of a recommendation of removal, the employer shall remove the affected employee from the current formaldehyde exposure and if possible, transfer the employee to work having no or significantly less exposure to formaldehyde.

(vi) When an employee is removed pursuant to item (v) of this subdivision, the employer shall transfer the employee to comparable work for which the employee is qualified or can be trained in a short period (up to six months), where the formaldehyde exposures are as low as possible, but not higher than the action level. The employer shall maintain the employee's current earnings, seniority, and other benefits. If there is no such work available, the employer shall maintain the employee's current earnings, seniority, and other benefits until such work becomes available, until the employee is determined to be unable to return to workplace formaldehyde exposure, until the employee is determined to be able to return to the original job status, or for six months, whichever comes first.

(vii) The employer shall arrange for a follow-up medical examination to take place within six months after the employee is removed pursuant to this subsection. This examination shall determine if the employee can return to the original job status, or if the removal is to be permanent. The physician shall make a decision within six months of the date the employee was removed as to whether the employee can be returned to the original job status, or if the removal is to be permanent.

(viii) An employer's obligation to provide earnings, seniority, and other benefits to a removed employee may be reduced to the extent that the employee receives compensation for earnings lost during the period of removal either from a publicly or employer-funded compensation program or from employment with another employer made possible by virtue of the employee's removal.

(ix) In making determinations of the formaldehyde content of materials under this subsection the employer may rely on objective data.

(i) Multiple physician review.

(i) After the employer selects the initial physician who conducts any medical examination or consultation to determine whether medical removal or restriction is appropriate, the employee may designate a second physician to review any findings, determinations, or recommendations of the initial physician and to conduct such examinations, consultations, and laboratory tests as the second physician deems necessary and appropriate to evaluate the effects of formaldehyde exposure and to facilitate this review.

(ii) The employer shall promptly notify an employee of the right to seek a second medical opinion after each occasion that an initial physician conducts a medical examination or consultation for the purpose of medical removal or restriction.

(iii) The employer may condition its participation in, and payment for, the multiple physician review mechanism upon the employee doing the following within fifteen days after receipt of the notification of the right to seek a second medical opinion, or receipt of the initial physician's written opinion, whichever is later:

(A) The employee informs the employer of the intention to seek a second medical opinion; and

(B) The employee initiates steps to make an appointment with a second physician.

(iv) If the findings, determinations, or recommendations of the second physician differ from those of the initial physician, then the employer and the employee shall assure that efforts are made for the two physicians to resolve the disagreement. If the two physicians are unable to quickly resolve their disagreement, then the employer and the employee through their respective physicians shall designate a third physician who shall be a specialist in the field at issue:

(A) To review the findings, determinations, or recommendations of the prior physicians; and

(B) To conduct such examinations, consultations, laboratory tests, and discussions with prior physicians as the third physician deems necessary to resolve the disagreement of the prior physicians.

(v) In the alternative, the employer and the employee or authorized employee representative may jointly designate such third physician.

(vi) The employer shall act consistent with the findings, determinations, and recommendations of the third physician, unless the employer and the employee reach an agreement which is otherwise consistent with the recommendations of at least one of the three physicians.

(13) Hazard communication.

(a) General. Notwithstanding any exemption granted in WAC 296-62-05403 (6)(c) for wood products, each employer who has a workplace covered by this standard shall comply with the requirements of WAC 296-62-05409 through 296-62-05419. The definitions of the hazard communication standard shall apply under this standard.

(i) The following shall be subject to the hazard communication requirements of this section: Formaldehyde gas, all mixtures or solutions composed of greater than 0.1 percent formaldehyde, and materials capable of releasing formaldehyde into the air under reasonably foreseeable concentrations reaching or exceeding 0.1 ppm.

(ii) As a minimum, specific health hazards that the employer shall address are: Cancer, irritation and sensitization of the skin and respiratory system, eye and throat irritation, and acute toxicity.

(b) Manufacturers and importers who produce or import formaldehyde or formaldehyde-containing products shall provide downstream employers using or handling these products with an objective determination through the required labels and MSDSs if these items may constitute a health hazard within the meaning of WAC 296-62-05407 under normal conditions of use.

(c) Labels.

(i) The employer shall assure that hazard warning labels complying with the requirements of WAC 296-62-05411 are affixed to all containers of materials listed in (a)(i) of this subsection, except to the extent that (a)(i) of this subsection is inconsistent with this item.

(ii) Information on labels. As a minimum, for all materials listed in (a)(i) of this subsection, capable of releasing formaldehyde at levels of 0.1 ppm to 0.5 ppm, labels shall identify that the product contains formaldehyde: List the name and address of the responsible party; and state that physical and health hazard information is readily

available from the employer and from material safety data sheets.

(iii) For materials listed in (a)(i) of this subsection, capable of releasing formaldehyde at levels above 0.5 ppm, labels shall appropriately address all the hazards as defined in Part C, WAC 296-62-054 through 296-62-05425, and Appendices A and B, including respiratory sensitization, and shall contain the words "Potential Cancer Hazard."

(iv) In making the determinations of anticipated levels of formaldehyde release, the employer may rely on objective data indicating the extent of potential formaldehyde release under reasonably foreseeable conditions of use.

(v) Substitute warning labels. The employer may use warning labels required by other statutes, regulations, or ordinances which impart the same information as the warning statements required by this subitem.

(d) Material safety data sheets.

(i) Any employer who uses formaldehyde-containing materials listed in (a)(i) of this subsection shall comply with the requirements of WAC 296-62-05413 with regard to the development and updating of material safety data sheets.

(ii) Manufacturers, importers, and distributors of formaldehyde containing materials listed in (a)(i) of this subsection shall assure that material safety data sheets and updated information are provided to all employers purchasing such materials at the time of the initial shipment and at the time of the first shipment after a material safety data sheet is updated.

(e) Written hazard communication program. The employer shall develop, implement, and maintain at the workplace, a written hazard communication program for formaldehyde exposures in the workplace, which at a minimum describes how the requirements specified in this section for labels and other forms of warning and material safety data sheets, and subsection (14) of this section for employee information and training, will be met. Employees in multi-employer workplaces shall comply with the requirements of WAC 296-62-05409 (2)(b).

(14) Employee information and training.

(a) Participation. The employer shall assure that all employees who are assigned to workplaces where there is a health hazard from formaldehyde participate in a training program, except that where the employer can show, using objective data, that employees are not exposed to formaldehyde at or above 0.1 ppm, the employer is not required to provide training.

(b) Frequency. Employers shall provide such information and training to employees at the time of their initial assignment and whenever a new exposure to formaldehyde is introduced into their work area. The training shall be repeated at least annually.

(c) Training program. The training program shall be conducted in a manner which the employee is able to understand and shall include:

(i) A discussion of the contents of this regulation and the contents of the material safety data sheet;

(ii) The purpose for and a description of the medical surveillance program required by this standard, including:

(A) A description of the potential health hazards associated with exposure to formaldehyde and a description of the signs and symptoms of exposure to formaldehyde.

(B) Instructions to immediately report to the employer the development of any adverse signs or symptoms that the employee suspects is attributable to formaldehyde exposure.

(iii) Description of operations in the work area where formaldehyde is present and an explanation of the safe work practices appropriate for limiting exposure to formaldehyde in each job;

(iv) The purpose for, proper use of, and limitations of personal protective clothing and equipment;

(v) Instructions for the handling of spills, emergencies, and clean-up procedures;

(vi) An explanation of the importance of engineering and work practice controls for employee protection and any necessary instruction in the use of these controls; and

(vii) A review of emergency procedures including the specific duties or assignments of each employee in the event of an emergency.

(d) Access to training materials.

(i) The employer shall inform all affected employees of the location of written training materials and shall make these materials readily available, without cost, to the affected employees.

(ii) The employer shall provide, upon request, all training materials relating to the employee training program to the director of labor and industries, or his/her designated representative.

(15) Recordkeeping.

(a) Exposure measurements. The employer shall establish and maintain an accurate record of all measurements taken to monitor employee exposure to formaldehyde. This record shall include:

(i) The date of measurement;

(ii) The operation being monitored;

(iii) The methods of sampling and analysis and evidence of their accuracy and precision;

(iv) The number, durations, time, and results of samples taken;

(v) The types of protective devices worn; and

(vi) The names, job classifications, Social Security numbers, and exposure estimates of the employees whose exposures are represented by the actual monitoring results.

(b) Exposure determinations. Where the employer has determined that no monitoring is required under this standard, the employer shall maintain a record of the objective data relied upon to support the determination that no employee is exposed to formaldehyde at or above the action level.

(c) Medical surveillance. The employer shall establish and maintain an accurate record for each employee subject to medical surveillance under this standard. This record shall include:

(i) The name and Social Security number of the employee;

(ii) The physician's written opinion;

(iii) A list of any employee health complaints that may be related to exposure to formaldehyde; and

(iv) A copy of the medical examination results, including medical disease questionnaires and results of any medical tests required by the standard or mandated by the examining physician.

(d) Respirator fit testing.

(i) The employer shall establish and maintain accurate records for employees subject to negative-pressure respirator fit testing required by this standard.

(ii) This record shall include:

(A) A copy of the protocol selected for respirator fit testing;

(B) A copy of the results of any fit testing performed;

(C) The size and manufacturer of the types of respirators available for selection; and

(D) The date of the most recent fit testing, the name and Social Security number of each tested employee, and the respirator type and facepiece selected.

(e) Record retention. The employer shall retain records required by this standard for at least the following periods:

(i) Exposure records and determinations shall be kept for at least thirty years;

(ii) Medical records shall be kept for the duration of employment plus thirty years; and

(iii) Respirator fit testing records shall be kept until replaced by a more recent record.

(f) Availability of records.

(i) Upon request, the employer shall make all records maintained as a requirement of this standard available for examination and copying to the director of labor and industries, or his/her designated representative.

(ii) The employer shall make employee exposure records, including estimates made from representative monitoring and available upon request for examination and copying, to the subject employee, or former employee, and employee representatives in accordance with WAC 296-62-052 through 296-62-05209 and 296-62-05213 through 296-62-05217.

(iii) Employee medical records required by this standard shall be provided upon request for examination and copying, to the subject employee, or former employee, or to anyone having the specific written consent of the subject employee or former employee in accordance with WAC 296-62-05201 through 296-62-05209, and 296-62-05213 through 296-62-05217.

~~((16) Dates.~~

~~(a) Effective dates.~~

~~(i) General. This standard shall become effective December 28, 1992, except as noted below.~~

~~(ii) Laboratories. This standard shall become effective for anatomy, histology, and pathology laboratories February 2, 1988, except as noted in the start-up date subsection. For all other laboratories, subsections (1) and (3) of this section shall become effective on February 2, 1988, and subsections (2) and (4) through (15) of this section shall become effective on September 1, 1988, except as noted in the start-up date subsection.~~

~~(b) Start-up dates.~~

~~(i) Exposure determinations. Initial monitoring or objective determinations that no monitoring is required by the standard shall be completed by April 27, 1993.~~

~~(ii) Medical surveillance. The initial medical surveillance of all eligible employees shall be completed by April 27, 1993.~~

~~(iii) Emergencies. The emergency procedures required by this standard shall be implemented by April 27, 1993.~~

~~(iv) Respiratory protection. Respiratory protection required to meet the amended PEL of 0.75 ppm TWA shall~~

~~be provided as soon as possible, but no later than January 1, 1993.~~

~~(v) Engineering and work practice controls. Engineering and work practice controls required by this standard shall be implemented as soon as possible, but no later than November 26, 1993.~~

~~(vi) Employee training. Written materials for employee training shall be updated as soon as possible, but no later than January 27, 1993.~~

~~(c) Start-up dates of amended sections.~~

~~(i) Respiratory protection. Respiratory protection required to meet the amended PEL of 0.75 ppm TWA shall be provided as soon as possible but no later than March 27, 1993.~~

~~(ii) Engineering and work practice controls. Engineering and work practice controls required to meet the amended PEL of 0.75 ppm TWA shall be implemented as soon as possible, but no later than December 27, 1993.~~

~~(iii) Medical removal protection. The medical removal protection provisions including the multiple physician review mechanism shall be implemented no later than December 26, 1992.~~

~~(iv) Hazard communication. The labeling provisions contained in amended subsection (13) of this section shall be implemented no later than December 28, 1992. Labeling of containers of formaldehyde products shall continue to comply with the provisions of WAC 296-62-054 until that time.~~

~~(v) Training. The periodic training mandated for all employees exposed to formaldehyde between 0.1 ppm and 0.5 ppm shall begin no later than February 28, 1993.)~~

AMENDATORY SECTION (Amending Order 92-13, filed 11/10/92, effective 12/18/92)

**WAC 296-62-07542 Appendix A—Substance technical guideline for formalin.** (1) The following substance technical guideline for formalin provides information on uninhibited formalin solution (thirty-seven percent formaldehyde, no methanol stabilizer). It is designed to inform employees at the production level of their rights and duties under the formaldehyde standard whether their job title defines them as workers or supervisors. Much of the information provided is general; however, some information is specific for formalin. When employee exposure to formaldehyde is from resins capable of releasing formaldehyde, the resin itself and other impurities or decomposition products may also be toxic, and employers should include this information as well when informing employees of the hazards associated with the materials they handle. The precise hazards associated with exposure to formaldehyde depend both on the form (solid, liquid, or gas) of the material and the concentration of formaldehyde present. For example, thirty-seven to fifty percent solutions of formaldehyde present a much greater hazard to the skin and eyes from spills or splashes than solutions containing less than one percent formaldehyde. Individual substance technical guidelines used by the employer for training employees should be modified to properly give information on the material actually being used.

(a) Substance identification.

(i) Chemical name: Formaldehyde.

- (ii) Chemical family: Aldehyde.
- (iii) Chemical formula: HCHO.
- (iv) Molecular weight: 30.03.
- (v) Chemical abstracts service number (CAS number): 50-00-0.

Synonyms: Formalin; Formic Aldehyde; Paraform; Formol; Formalin (Methanol-free); Fyde; Formalith; Methanal; Methyl Aldehyde; Methylene Glycol; Methylene Oxide; Tetraoxymethalene; Oxomethane; Oxymethylene.

- (b) Components and contaminants.
  - (i) Percent: 37.0 Formaldehyde.
  - (ii) Percent: 63.0 water.

Note: Inhibited solutions contain methanol.

- (iii) Other contaminants: Formic acid (alcohol free).

Exposure limits:

(A) WISHA TWA-0.75 ppm.

(B) WISHA STEL-2 ppm.

(c) Physical data.

(i) Description: Colorless liquid, pungent odor.

(ii) Boiling point: 214°F (101°C).

(iii) Specific gravity: 1.08 (H<sub>2</sub>O=1 @ 20 C).

(iv) pH: 2.8-4.0.

(v) Solubility in water: Miscible.

(vi) Solvent solubility: Soluble in alcohol and acetone.

(vii) Vapor density: 1.04 (Air=1 @ 20 C).

(viii) Odor threshold: 0.8-1 ppm.

(d) Fire and explosion hazard.

(i) Moderate fire and explosion hazard when exposed to heat or flame.

(ii) The flash point of thirty-seven percent formaldehyde solutions is above normal room temperature, but the explosion range is very wide, from seven to seventy-three percent by volume in air.

(iii) Reaction of formaldehyde with nitrogen dioxide, nitromethane, perchloric acid and aniline, or peroxyformic acid yields explosive compounds.

(iv) Flash point: 185°F (85°C) closed cup.

(v) Lower explosion limit: Seven percent.

(vi) Upper explosion limit: Seventy-three percent.

(vii) Autoignition temperature: 806°F (430°C).

(viii) Flammable class (WISHA): III A.

Extinguishing media:

(I) Use dry chemical, "alcohol foam," carbon dioxide, or water in flooding amounts as fog. Solid streams may not be effective. Cool fire-exposed containers with water from side until well after fire is out.

(II) Use of water spray to flush spills can also dilute the spill to produce nonflammable mixtures. Water runoff, however, should be contained for treatment.

(ix) National Fire Protection Association Section 325M Designation:

(A) Health: 2-Materials hazardous to health, but areas may be entered with full-faced mask self-contained breathing apparatus which provides eye protection.

(B) Flammability: 2-Materials which must be moderately heated before ignition will occur. Water spray may be used to extinguish the fire because the material can be cooled below its flash point.

(C) Reactivity: D-Materials which (in themselves) are normally stable even under fire exposure conditions and

which are not reactive with water. Normal fire fighting procedures may be used.

(e) Reactivity.

(i) Stability: Formaldehyde solutions may self-polymerize to form paraformaldehyde which precipitates.

(ii) Incompatibility (materials to avoid):

(A) Strong oxidizing agents, caustics, strong alkalies, isocyanates, anhydrides, oxides, and inorganic acids.

(B) Formaldehyde reacts with hydrochloric acid to form the potent carcinogen, bis-chloromethyl ether. Formaldehyde reacts with nitrogen dioxide, nitromethane, perchloric acid and aniline, or peroxyformic acid to yield explosive compounds. A violent reaction occurs when formaldehyde is mixed with strong oxidizers.

(C) Hazardous combustion or decomposition products: Oxygen from the air can oxidize formaldehyde to formic acid, especially when heated. Formic acid is corrosive.

(f) Health hazard data.

(i) Acute effects of exposure.

(A) Ingestion (swallowing): Liquids containing ten to forty percent formaldehyde cause severe irritation and inflammation of the mouth, throat, and stomach. Severe stomach pains will follow ingestion with possible loss of consciousness and death. Ingestion of dilute formaldehyde solutions (0.03-0.04%) may cause discomfort in the stomach and pharynx.

(B) Inhalation (breathing):

(I) Formaldehyde is highly irritating to the upper respiratory tract and eyes. Concentrations of 0.5 to 2.0 ppm may irritate the eyes, nose, and throat of some individuals.

(II) Concentrations of 3 to 5 ppm also cause tearing of the eyes and are intolerable to some persons.

(III) Concentrations of 10 to 20 ppm cause difficulty in breathing, burning of the nose and throat, coughing, and heavy tearing of the eyes, and 25 to 30 ppm causes severe respiratory tract injury leading to pulmonary edema and pneumonitis. A concentration of 100 ppm is immediately dangerous to life and health. Deaths from accidental exposure to high concentrations of formaldehyde have been reported.

(C) Skin (dermal): Formalin is a severe skin irritant and a sensitizer. Contact with formalin causes white discoloration, smarting, drying, cracking, and scaling. Prolonged and repeated contact can cause numbness and a hardening or tanning of the skin. Previously exposed persons may react to future exposure with an allergic eczematous dermatitis or hives.

(D) Eye contact: Formaldehyde solutions splashed in the eye can cause injuries ranging from transient discomfort to severe, permanent corneal clouding and loss of vision. The severity of the effect depends on the concentration of formaldehyde in the solution and whether or not the eyes are flushed with water immediately after the accident.

Note: The perception of formaldehyde by odor and eye irritation becomes less sensitive with time as one adapts to formaldehyde. This can lead to overexposure if a worker is relying on formaldehyde's warning properties to alert him or her to the potential for exposure.

(E) Acute animal toxicity:

(I) Oral, rats: LD<sub>50</sub>=800 mg/kg.

(II) Oral, mouse: LD<sub>50</sub>=42 mg/kg.

(III) Inhalation, rats: LC<sub>50</sub>=250 mg/kg.

(IV) Inhalation, mouse: LC50=900 mg/kg.

(V) Inhalation, rats: LC50=590 mg/kg.

(g) Chronic effects of exposure.

(i) Carcinogenicity: Formaldehyde has the potential to cause cancer in humans. Repeated and prolonged exposure increases the risk. Various animal experiments have conclusively shown formaldehyde to be a carcinogen in rats. In humans, formaldehyde exposure has been associated with cancers of the lung, nasopharynx and oropharynx, and nasal passages.

(ii) Mutagenicity: Formaldehyde is genotoxic in several in vitro test systems showing properties of both an initiator and a promoter.

(iii) Toxicity: Prolonged or repeated exposure to formaldehyde may result in respiratory impairment. Rats exposed to formaldehyde at 2 ppm developed benign nasal tumors and changes of the cell structure in the nose as well as inflamed mucous membranes of the nose. Structural changes in the epithelial cells in the human nose have also been observed. Some persons have developed asthma or bronchitis following exposure to formaldehyde, most often as the result of an accidental spill involving a single exposure to a high concentration of formaldehyde.

(h) Emergency and first-aid procedures.

(i) Ingestion (swallowing): If the victim is conscious, dilute, inactivate, or absorb the ingested formaldehyde by giving milk, activated charcoal, or water. Any organic material will inactivate formaldehyde. Keep affected person warm and at rest. Get medical attention immediately. If vomiting occurs, keep head lower than hips.

(ii) Inhalation (breathing): Remove the victim from the exposure area to fresh air immediately. Where the formaldehyde concentration may be very high, each rescuer must put on a self-contained breathing apparatus before attempting to remove the victim, and medical personnel should be informed of the formaldehyde exposure immediately. If breathing has stopped, give artificial respiration. Keep the affected person warm and at rest. Qualified first-aid or medical personnel should administer oxygen, if available, and maintain the patient's airways and blood pressure until the victim can be transported to a medical facility. If exposure results in a highly irritated upper respiratory tract and coughing continues for more than ten minutes, the worker should be hospitalized for observation and treatment.

(iii) Skin contact: Remove contaminated clothing (including shoes) immediately. Wash the affected area of your body with soap or mild detergent and large amounts of water until no evidence of the chemical remains (at least fifteen to twenty minutes). If there are chemical burns, get first aid to cover the area with sterile, dry dressing, and bandages. Get medical attention if you experience appreciable eye or respiratory irritation.

(iv) Eye contact: Wash the eyes immediately with large amounts of water occasionally lifting lower and upper lids, until no evidence of chemical remains (at least fifteen to twenty minutes). In case of burns, apply sterile bandages loosely without medication. Get medical attention immediately. If you have experienced appreciable eye irritation from a splash or excessive exposure, you should be referred promptly to an ophthalmologist for evaluation.

(i) Emergency procedures.

(i) Emergencies:

(A) If you work in an area where a large amount of formaldehyde could be released in an accident or from equipment failure, your employer must develop procedures to be followed in event of an emergency. You should be trained in your specific duties in the event of an emergency, and it is important that you clearly understand these duties. Emergency equipment must be accessible and you should be trained to use any equipment that you might need. Formaldehyde contaminated equipment must be cleaned before reuse.

(B) If a spill of appreciable quantity occurs, leave the area quickly unless you have specific emergency duties. Do not touch spilled material. Designated persons may stop the leak and shut off ignition sources if these procedures can be done without risk. Designated persons should isolate the hazard area and deny entry except for necessary people protected by suitable protective clothing and respirators adequate for the exposure. Use water spray to reduce vapors. Do not smoke, and prohibit all flames or flares in the hazard area.

(ii) Special fire fighting procedures:

(A) Learn procedures and responsibilities in the event of a fire in your workplace.

(B) Become familiar with the appropriate equipment and supplies and their location.

(C) In fire fighting, withdraw immediately in case of rising sound from venting safety device or any discoloration of storage tank due to fire.

(j) Spill, leak, and disposal procedures.

(i) Occupational spill: For small containers, place the leaking container in a well ventilated area. Take up small spills with absorbent material and place the waste into properly labeled containers for later disposal. For larger spills, dike the spill to minimize contamination and facilitate salvage or disposal. You may be able to neutralize the spill with sodium hydroxide or sodium sulfite. Your employer must comply with EPA rules regarding the clean-up of toxic waste and notify state and local authorities, if required. If the spill is greater than 1,000 lb/day, it is reportable under EPA's superfund legislation.

(ii) Waste disposal: Your employer must dispose of waste containing formaldehyde in accordance with applicable local, state, and federal law and in a manner that minimizes exposure of employees at the site and of the clean-up crew.

(k) Monitoring and measurement procedures.

(i) Monitoring requirements: If your exposure to formaldehyde exceeds the 0.5 ppm action level or the 2 ppm STEL, your employer must monitor your exposure. Your employer need not measure every exposure if a "high exposure" employee can be identified. This person usually spends the greatest amount of time nearest the process equipment. If you are a "representative employee," you will be asked to wear a sampling device to collect formaldehyde. This device may be a passive badge, a sorbent tube attached to a pump, or an impinger containing liquid. You should perform your work as usual, but inform the person who is conducting the monitoring of any difficulties you are having wearing the device.

(ii) Evaluation of 8-hour exposure: Measurements taken for the purpose of determining time-weighted average (TWA) exposures are best taken with samples covering the



full shift. Samples collected must be taken from the employee's breathing zone air.

(iii) Short-term exposure evaluation: If there are tasks that involve brief but intense exposure to formaldehyde, employee exposure must be measured to assure compliance with the STEL. Sample collections are for brief periods, only fifteen minutes, but several samples may be needed to identify the peak exposure.

(iv) Monitoring techniques: WISHA's only requirement for selecting a method for sampling and analysis is that the methods used accurately evaluate the concentration of formaldehyde in employees' breathing zones. Sampling and analysis may be performed by collection of formaldehyde on liquid or solid sorbents with subsequent chemical analysis. Sampling and analysis may also be performed by passive diffusion monitors and short-term exposure may be measured by instruments such as real-time continuous monitoring systems and portable direct reading instruments.

(v) Notification of results: Your employer must inform you of the results of exposure monitoring representative of your job. You may be informed in writing, but posting the results where you have ready access to them constitutes compliance with the standard.

(l) Protective equipment and clothing.

(Material impervious to formaldehyde is needed if the employee handles formaldehyde solutions of one percent or more. Other employees may also require protective clothing or equipment to prevent dermatitis.)

(i) Respiratory protection:

(A) Use NIOSH-approved full facepiece negative pressure respirators equipped with approved cartridges or canisters within the use limitations of these devices. (Present restrictions on cartridges and canisters do not permit them to be used for a full workshift.) In all other situations, use positive pressure respirators such as the positive-pressure air purifying respirator or the self-contained breathing apparatus (SCBA).

(B) If you use a negative pressure respirator, your employer must provide you with fit testing of the respirator at least once a year in accordance with the procedures outlined in WAC 296-62-07550 Appendix E.

(ii) Protective gloves:

(A) Wear protective (impervious) gloves provided by your employer, at no cost, to prevent contact with formalin.

(B) Your employer should select these gloves based on the results of permeation testing and in accordance with the ACGIH guidelines for selection of chemical protective clothing.

(iii) Eye protection:

(A) If you might be splashed in the eyes with formalin, it is essential that you wear goggles or some other type of complete protection for the eye.

(B) You may also need a face shield if your face is likely to be splashed with formalin, but you must not substitute face shields for eye protection. (This section pertains to formaldehyde solutions of one percent or more.)

(iv) Other protective equipment:

(A) You must wear protective (impervious) clothing and equipment provided by your employer at no cost to prevent repeated or prolonged contact with formaldehyde liquids.

(B) If you are required to change into whole-body chemical protective clothing, your employer must provide a

change room for your privacy and for storage of your normal clothing.

(C) If you are splashed with formaldehyde, use the emergency showers and eyewash fountains provided by your employer immediately to prevent serious injury. Report the incident to your supervisor and obtain necessary medical support.

(2) Entry into an IDLH atmosphere. Enter areas where the formaldehyde concentration might be 100 ppm or more only with complete body protection including a self-contained breathing apparatus with a full facepiece operated in a positive pressure mode or a supplied-air respirator with full facepiece and operated in a positive pressure mode. This equipment is essential to protect your life and health under such extreme conditions.

(a) Engineering controls.

(i) Ventilation is the most widely applied engineering control method for reducing the concentration of airborne substances in the breathing zones of workers. There are two distinct types of ventilation.

(ii) Local exhaust: Local exhaust ventilation is designed to capture airborne contaminants as near to the point of generation as possible. To protect you, the direction of contaminant flow must always be toward the local exhaust system inlet and away from you.

(iii) General (mechanical):

(A) General dilution ventilation involves continuous introduction of fresh air into the workroom to mix with the contaminated air and lower your breathing zone concentration of formaldehyde. Effectiveness depends on the number of air changes per hour.

(B) Where devices emitting formaldehyde are spread out over a large area, general dilution ventilation may be the only practical method of control.

(iv) Work practices: Work practices and administrative procedures are an important part of a control system. If you are asked to perform a task in a certain manner to limit your exposure to formaldehyde, it is extremely important that you follow these procedures.

(b) Medical surveillance.

(i) Medical surveillance helps to protect employees' health. You are encouraged strongly to participate in the medical surveillance program.

(ii) Your employer must make a medical surveillance program available at no expense to you and at a reasonable time and place if you are exposed to formaldehyde at concentrations above 0.5 ppm as an 8-hour average or 2 ppm over any fifteen-minute period.

(A) You will be offered medical surveillance at the time of your initial assignment and once a year afterward as long as your exposure is at least 0.5 ppm (~~(TWA))~~ (action level) or 2 ppm (STEL).

(B) Even if your exposure is below these levels, you should inform your employer if you have signs and symptoms that you suspect, through your training, are related to your formaldehyde exposure because you may need medical surveillance to determine if your health is being impaired by your exposure.

(iii) The surveillance plan includes:

(A) A medical disease questionnaire.

(B) A physical examination if the physician determines this is necessary.

(iv) If you are required to wear a respirator, your employer must offer you a physical examination and a pulmonary function test every year.

(v) The physician must collect all information needed to determine if you are at increased risk from your exposure to formaldehyde. At the physician's discretion, the medical examination may include other tests, such as a chest x-ray, to make this determination.

(vi) After a medical examination the physician will provide your employer with a written opinion which includes any special protective measures recommended and any restrictions on your exposure. The physician must inform you of any medical conditions you have which would be aggravated by exposure to formaldehyde. All records from your medical examinations, including disease surveys, must be retained at your employer's expense.

(c) Emergencies.

(i) If you are exposed to formaldehyde in an emergency and develop signs or symptoms associated with acute toxicity from formaldehyde exposure, your employer must provide you with a medical examination as soon as possible.

(ii) This medical examination will include all steps necessary to stabilize your health.

(iii) You may be kept in the hospital for observation if your symptoms are severe to ensure that any delayed effects are recognized and treated.

**AMENDATORY SECTION** (Amending Order 89-03, filed 5/15/89, effective 6/30/89)

**WAC 296-62-07717 Protective work clothing and equipment.** (1) Provision and use. If an employee is exposed to asbestos above the permissible exposure limits, or where the possibility of eye irritation exists, the employer shall provide at no cost to the employee and ensure that the employee uses appropriate protective work clothing and equipment such as, but not limited to:

(a) Coveralls or similar full-body work clothing;

(b) Gloves, head coverings, and foot coverings; and

(c) Face shields, vented goggles, or other appropriate protective equipment which complies with WAC 296-24-07801.

(2) Removal and storage.

(a) The employer shall ensure that employees remove work clothing contaminated with asbestos only in change rooms provided in accordance with WAC 296-62-07719(1).

(b) The employer shall ensure that no employee takes contaminated work clothing out of the change room, except those employees authorized to do so for the purpose of laundering, maintenance, or disposal.

(c) Contaminated work clothing shall be placed and stored in closed containers which prevent dispersion of the asbestos outside the container.

(d) Containers of contaminated protective devices or work clothing which are to be taken out of change rooms or the workplace for cleaning, maintenance, or disposal, shall bear labels in accordance with WAC 296-62-07721((2))

(3).

(3) Cleaning and replacement.

(a) The employer shall clean, launder, repair, or replace protective clothing and equipment required by this paragraph to maintain their effectiveness. The employer shall provide

clean protective clothing and equipment at least weekly to each affected employee.

(b) The employer shall prohibit the removal of asbestos from protective clothing and equipment by blowing or shaking.

(c) Laundering of contaminated clothing shall be done so as to prevent the release of airborne fibers of asbestos in excess of the permissible exposure limits prescribed in WAC 296-62-07705.

(d) Any employer who gives contaminated clothing to another person for laundering shall inform such person of the requirement in (c) of this subsection to effectively prevent the release of airborne fibers of asbestos in excess of the permissible exposure limits.

(e) The employer shall inform any person who launders or cleans protective clothing or equipment contaminated with asbestos of the potentially harmful effects of exposure to asbestos.

(f) Contaminated clothing shall be transported in sealed impermeable bags, or other closed, impermeable containers, and labeled in accordance with WAC 296-62-07721.

(4) Protective clothing for removal, demolition, and renovation operations.

(a) The ~~((competent person))~~ certified asbestos supervisor shall periodically examine worksuits worn by employees for rips or tears that may occur during performance of work.

(b) When rips or tears are detected while an employee is working within a negative-pressure enclosure, rips and tears shall be immediately mended, or the worksuit shall be immediately replaced.

**AMENDATORY SECTION** (Amending Order 87-24, filed 11/30/87)

**WAC 296-62-07749 Appendix H—Medical surveillance guidelines for asbestos—Nonmandatory.** (1) Route of entry inhalation, ingestion.

(2) Toxicology.

Clinical evidence of the adverse effects associated with exposure to asbestos is present in the form of several well-conducted epidemiological studies of occupationally exposed workers, family contacts of workers, and persons living near asbestos mines. These studies have shown a definite association between exposure to asbestos and an increased incidence of lung cancer, pleural and peritoneal ~~((mesothelioma))~~ mesothelioma, gastrointestinal cancer, and asbestosis. The latter is a disabling fibrotic lung disease that is caused only by exposure to asbestos. Exposure to asbestos has also been associated with an increased incidence of esophageal, kidney, laryngeal, pharyngeal, and buccal cavity cancers. As with other known chronic occupational diseases, disease associated with asbestos generally appears about twenty years following the first occurrence of exposure: There are no known acute effects associated with exposure to asbestos.

Epidemiological studies indicate that the risk of lung cancer among exposed workers who smoke cigarettes is greatly increased over the risk of lung cancer among nonexposed smokers or exposed nonsmokers. These studies suggest that cessation of smoking will reduce the risk of lung cancer for a person exposed to asbestos but will not

reduce it to the same level of risk as that existing for an exposed worker who has never smoked.

(3) Signs and symptoms of exposure-related disease.

The signs and symptoms of lung cancer or gastrointestinal cancer induced by exposure to asbestos are not unique, except that a chest x-ray of an exposed patient with lung cancer may show pleural plaques, pleural calcification, or pleural fibrosis. Symptoms characteristic of mesothelioma include shortness of breath, pain in the walls of the chest, or abdominal pain. Mesothelioma has a much longer latency period compared with lung cancer (forty years versus fifteen to twenty years), and mesothelioma is therefore more likely to be found among workers who were first exposed to asbestos at an early age. Mesothelioma is always fatal.

Asbestosis is pulmonary fibrosis caused by the accumulation of asbestos fibers in the lungs. Symptoms include shortness of breath, coughing, fatigue, and vague feelings of sickness. When the fibrosis worsens, shortness of breath occurs even at rest. The diagnosis of asbestosis is based on a history of exposure to asbestos, the presence of characteristic radiologic changes, endinspiratory crackles (rales), and other clinical features of fibrosing lung disease. Pleural plaques and thickening are observed on x-rays taken during the early stages of the disease. Asbestosis is often a progressive disease even in the absence of continued exposure, although this appears to be a highly individualized characteristic. In severe cases, death may be caused by respiratory or cardiac failure.

(4) Surveillance and preventive considerations.

As noted above, exposure to asbestos has been linked to an increased risk of lung cancer, mesothelioma, gastrointestinal cancer, and asbestosis among occupationally exposed workers. Adequate screening tests to determine an employee's potential for developing serious chronic diseases, such as cancer, from exposure to asbestos do not presently exist. However, some tests, particularly chest x-rays and pulmonary function tests, may indicate that an employee has been overexposed to asbestos increasing his or her risk of developing exposure-related chronic diseases. It is important for the physician to become familiar with the operating conditions in which occupational exposure to asbestos is likely to occur. This is particularly important in evaluating medical and work histories and in conducting physical examinations. When an active employee has been identified as having been overexposed to asbestos measures taken by the employer to eliminate or mitigate further exposure should also lower the risk of serious long-term consequences.

The employer is required to institute a medical surveillance program for all employees who are or will be exposed to asbestos at or above the action level (0.1 fiber per cubic centimeter of air). All examinations and procedures must be performed by or under the supervision of a licensed physician, at a reasonable time and place, and at no cost to the employee.

Although broad latitude is given to the physician in prescribing specific tests to be included in the medical surveillance program, WISHA requires inclusion of the following elements in the routine examination:

(a) Medical and work histories with special emphasis directed to symptoms of the respiratory system, cardiovascular system, and digestive tract.

(b) Completion of the respiratory disease questionnaire contained in WAC 296-62-07741, Appendix D.

(c) A physical examination including a chest roentgenogram and pulmonary function test that includes measurement of the employee's forced vital capacity (FVC) and forced expiratory volume at one second (FEV<sub>1</sub>).

(d) Any laboratory or other test that the examining physician deems by sound medical practice to be necessary.

The employer is required to make the prescribed tests available at least annually to those employees covered; more often than specified if recommended by the examining physician; and upon termination of employment.

The employer is required to provide the physician with the following information: A copy of this standard and appendices; a description of the employee's duties as they relate to asbestos exposure; the employee's representative level of exposure to asbestos; a description of any personal protective and respiratory equipment used; and information from previous medical examinations of the affected employee that is not otherwise available to the physician. Making this information available to the physician will aid in the evaluation of the employee's health in relation to assigned duties and fitness to wear personal protective equipment, if required.

The employer is required to obtain a written opinion from the examining physician containing the results of the medical examination; the physician's opinion as to whether the employee has any detected medical conditions that would place the employee at an increased risk of exposure-related disease; any recommended limitations on the employee or on the use of personal protective equipment; and a statement that the employee has been informed by the physician of the results of the medical examination and of any medical conditions related to asbestos exposure that require further explanation or treatment. This written opinion must not reveal specific findings or diagnoses unrelated to exposure to asbestos and a copy of the opinion must be provided to the affected employee.

**AMENDATORY SECTION** (Amending Order 87-24, filed 11/30/87)

**WAC 296-62-07751 Appendix I—Work practices and engineering controls for major asbestos removal, renovation, and demolition operations—Nonmandatory.** This is a nonmandatory appendix designed to provide guidelines to assist employers in complying with the requirements of WAC 296-62-077 through 296-62-07753. Specifically, this appendix describes the equipment, methods, and procedures that should be used in major asbestos removal projects conducted to abate a recognized asbestos hazard or in preparation for building renovation or demolition. These projects require the construction of negative-pressure temporary enclosures to contain the asbestos material and to prevent the exposure of bystanders and other employees at the worksite. WAC 296-62-07712(1) of the standard requires that "~~(. . . . Whenever feasible, the employer shall establish negative-pressure enclosures before commencing asbestos)~~ The employer, wherever feasible, shall establish negative-pressure enclosures having a minimum of one air exchange every fifteen minutes within the enclosure before commencing removal, demolition, or renovation operations."

Employers should also be aware that, when conducting asbestos removal projects, they may be required under the National Emissions Standards for Hazardous Air Pollutants (NESHAPS), 40 CFR Part 61, Subpart M, or EPA regulations under the Clean Water Act.

(1) Introduction. Construction of a negative-pressure enclosure is a simple but time-consuming process that requires careful preparation and execution; however, if the procedures below are followed, contractors should be assured of achieving a temporary barricade that will protect employees and others outside the enclosure from exposure to asbestos and minimize to the extent possible the exposure of asbestos workers inside the barrier as well.

The equipment and materials required to construct these barriers are readily available and easily installed and used. In addition to an enclosure around the removal site, the standard requires employers to provide hygiene facilities that ensure that their asbestos contaminated employees do not leave the worksite with asbestos on their persons or clothing; the construction of these facilities is also described below. The steps in the process of preparing the asbestos removal site, building the enclosure, constructing hygiene facilities, removing the asbestos-containing material, and restoring the site include:

- (a) Planning the removal project;
- (b) Procuring the necessary materials and equipment;
- (c) Preparing the work area;
- (d) Removing the asbestos-containing material;
- (e) Cleaning the work area; and
- (f) Disposing of the asbestos-containing waste.

(2) Planning the removal project. The planning of an asbestos removal project is critical to completing the project safely and cost-effectively. A written asbestos removal plan should be prepared that describes the equipment and procedures that will be used throughout the project. The asbestos abatement plan will aid not only in executing the project but also in complying with the reporting requirements of the USEPA asbestos regulations (40 CFR 61, Subpart M), which call for specific information such as a description of control methods and control equipment to be used and the disposal sites the contractor proposes to use to dispose of the asbestos-containing materials.

The asbestos abatement plan should contain the following information:

- (a) A physical description of the work area;
- (b) A description of the approximate amount of material to be removed;
- (c) A schedule for turning off and sealing existing ventilation systems;
- (d) Personnel hygiene procedures;
- (e) Labeling procedures;
- (f) A description of personal protective equipment and clothing to be worn by employees;
- (g) A description of the local exhaust ventilation systems to be used;
- (h) A description of work practices to be observed by employees;
- (i) A description of the methods to be used to remove the asbestos-containing material;
- (j) The wetting agent to be used;
- (k) A description of the sealant to be used at the end of the project;

- (l) An air monitoring plan;
- (m) A description of the method to be used to transport waste material; and

- (n) The location of the dump site.

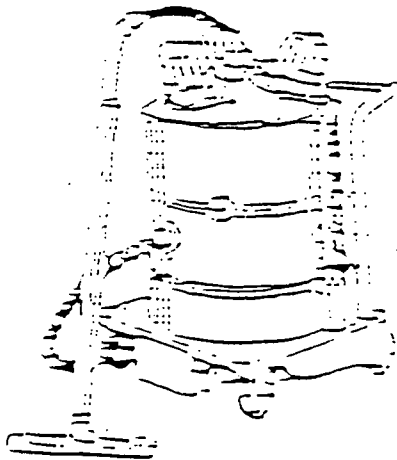
(3) Materials and equipment necessary for asbestos removal. Although individual asbestos removal projects vary in terms of the equipment required to accomplish the removal of the material, some equipment and materials are common to most asbestos removal operations. Equipment and materials that should be available at the beginning of each project are: (a) Rolls of polyethylene sheeting; (b) rolls of gray duct tape or clear plastic tape; (c) HEPA-filtered vacuum(s); (d) HEPA-filtered portable ventilation system(s); (e) a wetting agent; (f) an airless sprayer; (g) a portable shower unit; (h) appropriate respirators; (i) disposable coveralls; (j) signs and labels; (k) preprinted disposal bags; and (l) a manometer or pressure gauge.

(a) and (b) Rolls of polyethylene plastic and tape. Rolls of polyethylene plastic (6 mil in thickness) should be available to construct the asbestos removal enclosure and to seal windows, doors, ventilation systems, wall penetrations, and ceilings and floors in the work area. Gray duct tape or clear plastic tape should be used to seal the edges of the plastic and to seal any holes in the plastic enclosure. Polyethylene plastic sheeting can be purchased in rolls up to twelve to twenty feet in width and up to one hundred feet in length.

(c) HEPA-filtered vacuum. A HEPA-filtered vacuum is essential for cleaning the work area after the asbestos has been removed. Such vacuums are designed to be used with a HEPA (high-efficiency particulate air) filter, which is capable of removing 99.97 percent of the asbestos particles from the air. Various sizes and capacities of HEPA vacuums are available. One manufacturer produces three models that range in capacity from five and one-quarter gallons to seventeen gallons (see Figure I-1). All of these models are portable, and all have long hoses capable of reaching out-of-the-way places, such as areas above ceiling tiles, behind pipes, etc.

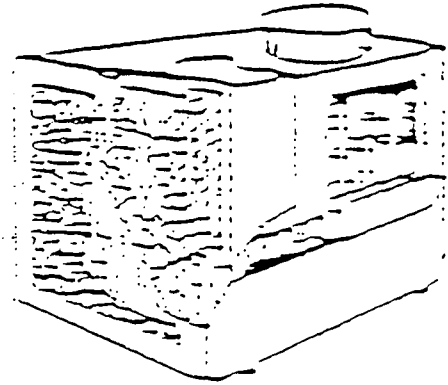
(d) Exhaust air filtration system. A portable ventilation system is necessary to create a negative-pressure within the asbestos removal enclosure. Such units are equipped with a HEPA filter and are designed to exhaust and clean the air inside the enclosure before exhausting it to the outside of the enclosure (see Figure I-2). Systems are available from several manufacturers. One supplier has two ventilation units that range in capacity from six hundred cubic feet per minute (CFM) to one thousand seven hundred CFM. According to the manufacturer's literature, these units filter particles of 0.3 micron in size with an efficiency of 99.99 percent. The number and capacity of units required to ventilate an enclosure depend on the size of the area to be ventilated.

Figure I-1. HEPA-filtered vacuums



Source: Product Catalog, Asbestos Control Technologies, Inc., Maple Shade, N.J., 1985

Figure I-2. Portable exhaust ventilation system with HEPA filter



Source: Product Catalog, Asbestos Control Technologies, Inc., Maple Shade, N.J., 1985

(e) Wetting agents. Wetting agents (surfactants) are added to water (which is then called amended water) and used to soak asbestos-containing materials; amended water penetrates more effectively than plain water and permits more thorough soaking of the asbestos-containing materials. Wetting the asbestos-containing material reduces the number of fibers that will break free and become airborne when the asbestos-containing material is handled or otherwise disturbed. Asbestos-containing materials should be thoroughly soaked before removal is attempted; the dislodged material should feel spongy to the touch. Wetting agents are generally prepared by mixing one to three ounces of wetting agent to five gallons of water.

One type of asbestos, amosite, is relatively resistant to soaking, either with plain or amended water. The work practices of choice when working with amosite-containing material are to soak the material as much as possible and then to bag it for disposal immediately after removal, so that the material has no time to dry and be ground into smaller particles that are more likely to liberate airborne asbestos.

In a very limited number of situations, it may not be possible to wet the asbestos-containing material before removing it. Examples of such rare situations are: (i) Removal of asbestos material from a "live" electrical box that was oversprayed with the material when the rest of the area was sprayed with asbestos-containing coating; and (ii) removing asbestos-containing insulation from a live steam pipe. In both of these situations, the preferred approach would be to turn off the electricity or steam, respectively, to permit wet removal methods to be used. However, where removal work must be performed during working hours, i.e., when normal operations cannot be disrupted, the asbestos-containing material must be removed dry. Immediate bagging is then the only method of minimizing the amount of airborne asbestos generated.

(f) Airless sprayer. Airless sprayers are used to apply amended water to asbestos-containing materials. Airless sprayers allow the amended water to be applied in a fine spray that minimizes the release of asbestos fibers by reducing the impact of the spray on the material to be

PERMANENT

removed. Airless sprayers are inexpensive and readily available.

(g) Portable shower. Unless the site has available a permanent shower facility that is contiguous to the removal area, a portable shower system is necessary to permit employees to clean themselves after exposure to asbestos and to remove any asbestos contamination from their hair and bodies. Taking a shower prevents employees from leaving the work area with asbestos on their clothes and thus prevents the spread of asbestos contamination to areas outside the asbestos removal area. This measure also protects members of the families of asbestos workers from possible exposure to asbestos. Showers should be supplied with warm water and a drain. A shower water filtration system to filter asbestos fibers from the shower water is recommended. Portable shower units are readily available, inexpensive, and easy to install and transport.

(h) Respirators. Employees involved in asbestos removal projects should be provided with appropriate NIOSH-approved respirators. Selection of the appropriate respirator should be based on the concentration of asbestos fibers in the work area. If the concentration of asbestos fibers is unknown, employees should be provided with respirators that will provide protection against the highest concentration of asbestos fibers that can reasonably be expected to exist in the work area. For all work within an enclosure, employees should wear supplied air respirators (see WAC 296-62-07715(3)).

(i) Disposable coveralls. Employees involved in asbestos removal operations should be provided with disposable impervious coveralls that are equipped with head and foot covers. Such coveralls are typically made of Tyvek.<sup>1</sup> The coverall has a zipper front and elastic wrists and ankles.

(j) Signs and labels. Before work begins, a supply of signs to demarcate the entrance to the work area should be obtained. Signs are available that have the wording required by the final WISHA standard. The required labels are also commercially available as press-on labels and preprinted on the 6-mil polyethylene plastic bags used to dispose of asbestos-containing waste material.

(4) Preparing the work area. Preparation for constructing negative-pressure enclosures should begin with the removal of all movable objects from the work area, e.g., desks, chairs, rugs, and light fixtures, to ensure that these objects do not become contaminated with asbestos. When objects or surfaces are contaminated or are suspected of being contaminated, they should be vacuumed with a HEPA vacuum and cleaned with amended water, unless they are made of material that will be damaged by the wetting agent; wiping with plain water is recommended in those cases where amended water will damage the object. Before the asbestos removal work begins, objects that cannot be removed from the work area should be covered with a 6-mil-thick polyethylene plastic sheeting that is securely taped with duct tape or plastic tape to achieve an air-tight seal around the object.

(5) Constructing the enclosure. When all objects have either been removed from the work area or covered with plastic, all penetrations of the floor, walls, and ceiling should be sealed with 6-mil polyethylene plastic and tape to prevent airborne asbestos from escaping into areas outside the work

area or from lodging in cracks around the penetrations. Penetrations that require sealing are typically found around electrical conduits, telephone wires, and water supply and drain pipes. A single entrance to be used for access and egress to the work area should be selected, and all other doors and windows should be sealed with tape or be covered with 6-mil polyethylene plastic sheeting and securely taped. Covering windows and unnecessary doors with a layer of polyethylene before covering the walls provides a second layer of protection and saves time in installation because it reduces the number of edges that must be cut and taped. All other surfaces such as support columns, ledges, pipes, and other surfaces should also be covered with polyethylene plastic sheeting and taped before the walls themselves are completely covered with sheeting.

Next a thin layer of spray adhesive should be sprayed along the top of all walls surrounding the enclosed work area, close to the wall-ceiling interface, and a layer of polyethylene plastic sheeting should be stuck to this adhesive and taped. The entire inside surfaces of all wall areas are covered in this manner, and the sheeting over the walls is extended across the floor area until it meets in the center of the area, where it is taped to form a single layer of material encasing the entire room except for the ceiling. A final layer of plastic sheeting is then laid across the plastic-covered floor area and up the walls to a level of two feet or so; this layer provides a second protective layer of plastic sheeting over the floor, which can then be removed and disposed of easily after the asbestos-containing material that has dropped to the floor has been bagged and removed.

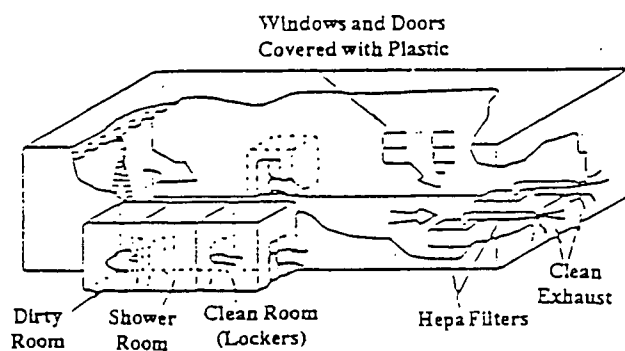
(6) Building hygiene facilities. WAC 296-62-07719 mandates that employers involved in asbestos removal, demolition, or renovation operations provide their employees with hygiene facilities to be used to decontaminate asbestos-exposed workers, equipment, and clothing before such employees leave the work area. These decontamination facilities consist of:

- (a) A clean change room;
- (b) A shower; and
- (c) An equipment room.

The clean change room is an area in which employees remove their street clothes and don their respirators and disposable protective clothing. The clean room should have hooks on the wall or be equipped with lockers for the storage of workers' clothing and personal articles. Extra disposable coveralls and towels can also be stored in the clean change room.

The shower should be contiguous with both the clean and dirty change room (see Figure I-3) and should be used by all workers leaving the work area. The shower should also be used to clean asbestos-contaminated equipment and materials, such as the outsides of asbestos waste bags and hand tools used in the removal process.

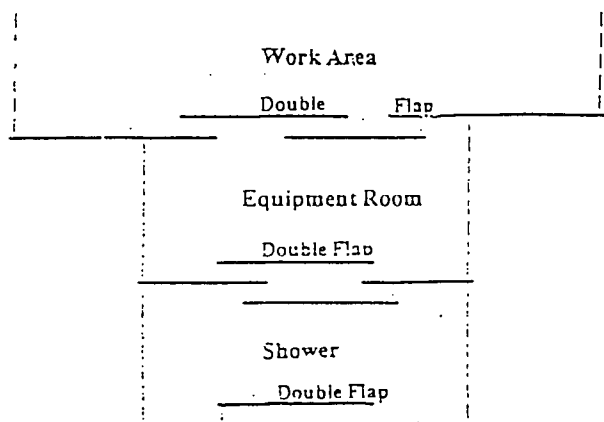
Figure I-3. Cutaway view of enclosure and hygiene facilities



Source: EPA 1985. Asbestos Waste Management Guidance (EPA/530 SW-85-007)

The equipment room (also called the dirty change room) is the area where workers remove their protective coveralls and where equipment that is to be used in the work area can be stored. The equipment room should be lined with 6-mil-thick polyethylene plastic sheeting in the same way as done in the work area enclosure. Two layers of 6-mil polyethylene plastic sheeting that are not taped together form a double flap or barrier between the equipment room and the work area and between the shower and the clean change room (see Figure I-4).

Figure I-4. Typical hygiene facility layout



When feasible, the clean change room, shower, and equipment room should be contiguous and adjacent to the negative-pressure enclosure surrounding the removal area. In the overwhelming number of cases, hygiene facilities can be built contiguous to the negative-pressure enclosure. In some cases, however, hygiene facilities may have to be located on another floor of the building where removal of asbestos-containing materials is taking place. In these instances, the hygiene facilities can in effect be made to be contiguous to the work area by constructing a polyethylene plastic "tunnel" from the work area to the hygiene facilities. Such a tunnel can be made even in cases where the hygiene facilities are located several floors above or below the work area; the tunnel begins with a double flap door at the enclosure, extends through the exit from the floor, continues

down the necessary number of flights of stairs and goes through a double flap entrance to the hygiene facilities, which have been prepared as described above. The tunnel is constructed of two-inch by four-inch lumber or aluminum struts and covered with 6-mil-thick polyethylene plastic sheeting.

In the rare instances when there is not enough space to permit any hygiene facilities to be built at the worksite, employees should be directed to change into a clean disposable worksuit immediately after exiting the enclosure (without removing their respirators) and to proceed immediately to the shower. Alternatively, employees could be directed to vacuum their disposable coveralls with a HEPA-filtered vacuum before proceeding to a shower located a distance from the enclosure.

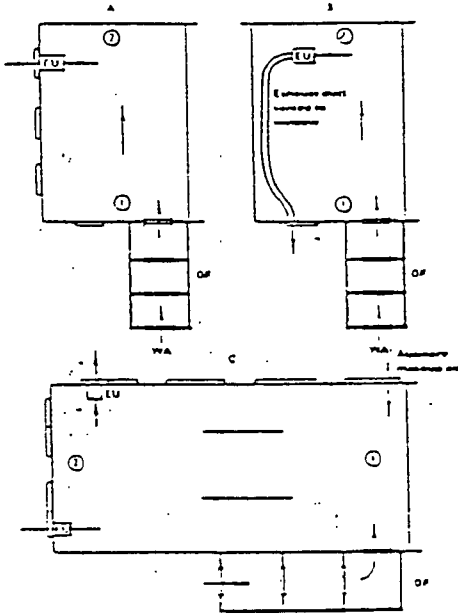
The clean room, shower, and equipment room must be sealed completely to ensure that the sole source of air flow through these areas originates from uncontaminated areas outside the asbestos removal, demolition, or renovation enclosure. The shower must be drained properly after each use to ensure that contaminated water is not released to uncontaminated areas. If waste water is inadvertently released, it should be cleaned up as soon as possible to prevent any asbestos in the water from drying and becoming airborne in areas outside the work area.

(7) Establishing negative-pressure within the enclosure. After construction of the enclosure is completed, a ventilation system(s) should be installed to create a negative-pressure within the enclosure with respect to the area outside the enclosure. Such ventilation systems must be equipped with HEPA filters to prevent the release of asbestos fibers to the environment outside the enclosure and should be operated twenty-four hours per day during the entire project until the final cleanup is completed and the results of final air samples are received from the laboratory. A sufficient amount of air should be exhausted to create a pressure of -0.02 inches of water within the enclosure with respect to the area outside the enclosure.

These ventilation systems should exhaust the HEPA-filtered clean air outside the building in which the asbestos removal, demolition, or renovation is taking place (see Figure I-5). If access to the outside is not available, the ventilation system can exhaust the HEPA-filtered asbestos-free air to an area within the building that is as far away as possible from the enclosure. Care should be taken to ensure that the clean air is released either to an asbestos-free area or in such a way as not to disturb any asbestos-containing materials.



Figure I-5. Examples of negative-pressure systems. DF, decontamination facility; EU, exhaust unit; WA, worker access; A, single-room work area with multiple windows; B, single-room work area with single window near entrance; C, large single-room work area with windows and auxiliary makeup air source (dotted arrow). Arrows denote direction of air flow. Circled numbers indicate progression of removal sequence.



Source: EPA 1985. Guidance for Controlling Asbestos-Containing Materials in Buildings (EPA 560/5-85-024)

A manometer or pressure gauge for measuring the negative pressure within the enclosure should be installed and should be monitored frequently throughout all work shifts during which asbestos removal, demolition, or renovation takes place. Several types of manometers and pressure gauges are available for this purpose.

All asbestos removal, renovation, and demolition operations should have a program for monitoring the concentration of airborne asbestos and employee exposures to asbestos. Area samples should be collected inside the enclosure (approximately four samples for five thousand square feet of enclosure area). At least two samples should be collected outside the work area, one at the entrance to the clean change room and one at the exhaust of the portable ventilation system. In addition, several breathing zone samples should be collected from those workers who can reasonably be expected to have the highest potential exposure to asbestos.

(8) Removing asbestos materials. Employers involved in asbestos removal, demolition, or renovation operations designate a ((~~competent person~~)) certified asbestos supervisor to:

- (a) Set up the enclosure;
- (b) Ensure the integrity of the enclosure;
- (c) Control entry to and exit from the enclosure;
- (d) Supervise all employee exposure monitoring required by this section;
- (e) Ensure the use of protective clothing and equipment;

(f) Ensure that employees are trained in the use of engineering controls, work practices, and personal protective equipment;

(g) Ensure the use of hygiene facilities and the observance of proper decontamination procedures; and

(h) Ensure that engineering controls are functioning properly.

The ((~~competent person~~)) certified asbestos supervisor will generally be a certified industrial hygienist, an industrial hygienist with training and experience in the handling of asbestos, or a person who has such training and experience as a result of on-the-job training and experience.

Ensuring the integrity of the enclosure is accomplished by inspecting the enclosure before asbestos removal work begins and prior to each work shift throughout the entire period work is being conducted in the enclosure. The inspection should be conducted by locating all areas where air might escape from the enclosure; this is best accomplished by running a hand over all seams in the plastic enclosure to ensure that no seams are ripped and the tape is securely in place.

The ((~~competent person~~)) certified asbestos supervisor should also ensure that all unauthorized personnel do not enter the enclosure and that all employees and other personnel who enter the enclosure have the proper protective clothing and equipment. He or she should also ensure that all employees and other personnel who enter the enclosure use the hygiene facilities and observe the proper decontamination procedures (described below).

Proper work practices are necessary during asbestos removal, demolition, and renovation to ensure that the concentration of asbestos fibers inside the enclosure remains as low as possible. One of the most important work practices is to wet the asbestos-containing material before it is disturbed. After the asbestos-containing material is thoroughly wetted, it should be removed by scraping (as in the case of sprayed-on or troweled-on ceiling material) or removed by cutting the metal bands or wire mesh that support the asbestos-containing material on boilers or pipes. Any residue that remains on the surface of the object from which asbestos is being removed should be wire brushed and wet wiped.

Bagging asbestos waste material promptly after its removal is another work practice control that is effective in reducing the airborne concentration of asbestos within the enclosure. Whenever possible, the asbestos should be removed and placed directly into bags for disposal rather than dropping the material to the floor and picking up all of the material when the removal is complete. If a significant amount of time elapses between the time that the material is removed and the time it is bagged, the asbestos material is likely to dry out and generate asbestos-laden dust when it is disturbed by people working within the enclosure. Any asbestos-contaminated supplies and equipment that cannot be decontaminated should be disposed of in pre-labeled bags; items in this category include plastic sheeting, disposable work clothing, respirator cartridges, and contaminated wash water.

A checklist is one of the most effective methods of ensuring adequate surveillance of the integrity of the asbestos removal enclosure. Such a checklist is shown in Figure I-6. Filling out the checklist at the beginning of each

shift in which asbestos removal is being performed will serve to document that all the necessary precautions will be taken during the asbestos removal work. The checklist contains entries for ensuring that:

- The work area enclosure is complete;
- The negative-pressure system is in operation;
- Necessary signs and labels are used;

Asbestos Removal, Renovation, and Demolition Checklist

Date ..... Location .....

Supervisor ..... Project # .....

Work Area (sq. ft.) .....

Yes No

I.	Work site barrier		
	Floor covered	.....	.....
	Walls covered	.....	.....
	Area ventilation off	.....	.....
	All edges sealed	.....	.....
	Penetrations sealed	.....	.....
	Entry curtains	.....	.....
II.	Negative air pressure		
	HEPA Vac ..... Ventilation system .....	.....	.....
	Constant operation	.....	.....
	Negative pressure achieved	.....	.....
III.	Signs		
	Work area entrance	.....	.....
	Bags labeled	.....	.....
IV.	Work practices		
	Removed material promptly bagged	.....	.....
	Material worked wet	.....	.....
	HEPA vacuum used	.....	.....
	No smoking	.....	.....
	No eating, drinking	.....	.....
	Work area cleaned after completion	.....	.....
	Personnel decontaminated each departure	.....	.....
V.	Protective equipment		
	Disposable clothing used one time	.....	.....
	Proper NIOSH-approved respirators	.....	.....
VII.	Showers		
	On site	.....	.....
	Functioning	.....	.....
	Soap and towels	.....	.....
	Used by all personnel	.....	.....

Figure I-6. Checklist

Appropriate work practices are used;  
 Necessary protective clothing and equipment are used;  
 and  
 Appropriate decontamination procedures are being followed.

(9) Cleaning the work area. After all of the asbestos-containing material is removed and bagged, the entire work area should be cleaned until it is free of all visible asbestos dust. All surfaces from which asbestos has been removed should be cleaned by wire brushing the surfaces, HEPA vacuuming these surfaces, and wiping them with amended water. The inside of the plastic enclosure should be vacuumed with a HEPA vacuum and wet wiped until there is no visible dust in the enclosure. Particular attention should be given to small horizontal surfaces such as pipes, electrical conduits, lights, and support tracks for drop ceilings. All such surfaces should be free of visible dust before the final air samples are collected.

Additional sampling should be conducted inside the enclosure after the cleanup of the work area has been completed. Approximately four area samples should be collected for each five thousand square feet of enclosure area. The enclosure should not be dismantled unless the final samples show asbestos concentrations of less than the action level.

A clearance checklist is an effective method of ensuring that all surfaces are adequately cleaned and the enclosure is ready to be dismantled. Figure I-7 shows a checklist that can be used during the final inspection phase of asbestos abatement, removal, or renovation operations.

Final Inspection of Asbestos Removal, Renovation, and Demolition Projects

Date: .....

Project: .....

Location: .....

Building: .....

CHECKLIST:

Residual dust on:	Yes	No	Yes	No
a. Floor	.....	.....	e. Horizontal surfaces	.....
b. Horizontal surfaces	.....	.....	f. Pipes	.....
c. Pipes	.....	.....	g. Ducts	.....
d. Ventilation equipment	.....	.....	h. Register	.....
			i. Lights	.....

FIELD NOTES:

Record any problems encountered here.

.....

.....

FINAL AIR SAMPLE RESULTS:

.....

.....

Figure I-7. Clearance Checklist

<sup>1</sup> Mention of trade names or commercial products does not constitute endorsement or recommendation for use.

AMENDATORY SECTION (Amending Order 91-07, filed 11/22/91, effective 12/24/91)

WAC 296-62-300 Scope, application, and definitions.

(1) Scope. This section covers employers who have employees who work in the following operations:

(a) Clean-up operations required by a governmental body, whether federal, state, local, or other involving hazardous substances that are conducted at uncontrolled hazardous waste sites (including, but not limited to, the EPA's National Priority Site List (NPL), state priority site lists, sites recommended for the EPA NPL, and initial investigations of government identified sites which are conducted before the presence or absence of hazardous substances has been ascertained);

(b) Corrective actions involving clean-up operations at sites covered by the Resource Conservation and Recovery Act of 1976 (RCRA) as amended (42 U.S.C. 6901 et seq.);

(c) Voluntary clean-up operations at sites recognized by federal, state, local, or other governmental bodies as uncontrolled hazardous waste sites;

(d) Operations involving hazardous wastes that are conducted at treatment, storage, and disposal (TSD) facilities regulated by 40 CFR Parts 264 and 265 pursuant to RCRA;

PERMANENT

or by agencies under agreement with U.S.E.P.A. to implement RCRA regulations; and

(e) Emergency response operations for releases of, or substantial threats of releases of, hazardous substances without regard to the location of the hazard.

(2) Application.

(a) All requirements of this chapter and chapters 296-24 and 296-155 WAC apply pursuant to their terms to hazardous waste and emergency response operations whether covered by this part or not. If there is a conflict or overlap, the provision more protective of employee safety and health shall apply.

(b) Hazardous substance clean-up operations within the scope of subsection (1)(a), (b), and (c) of this section must comply with all sections (~~((WAC 296-62-300 through 296-62-3145)))~~ of this part except WAC (~~(296-62-3140, 296-62-3110 (4) and (5), and 296-62-3112))~~ 296-62-3112 and 296-62-3140.

(c) Operations within the scope of subsection (1)(d) of this section must comply only with the requirements of WAC 296-62-3140.

Notes and Exceptions:

(i) All provisions of WAC 296-62-3140 cover any treatment, storage, or disposal (TSD) operation regulated by 40 CFR parts 264 and 265 or by state law authorized under RCRA, and required to have a permit or interim status from EPA pursuant to 40 CFR 270.1 or from a state agency pursuant to RCRA.

(ii) Employers who are not required to have a permit or interim status because they are conditionally exempt small quantity generators under 40 CFR 261.5 or are generators who qualify under 40 CFR 262.34 for exemptions from regulation under 40 CFR parts 264, 265, and 270 ("excepted employers") are not covered by WAC 296-62-3140 (1) through (7). Excepted employers who are required by the EPA or state agency to have their employees engage in emergency response or who direct their employees to engage in emergency response are covered by WAC 296-62-3140(8), and cannot be exempted by WAC 296-62-3140 (8)(a). Excepted employers who are not required to have employees engage in emergency response, who direct their employees to evacuate in the case of such emergencies and who meet the requirements of WAC 296-62-3140 (8)(a) are exempt from the balance of WAC 296-62-3140(8).

(iii) If an area is used primarily for treatment, storage or disposal, any emergency response operations in that area shall comply with WAC 296-62-3140(8). In other areas not used primarily for treatment, storage or disposal, any emergency response operations shall comply with WAC 296-62-3112. Compliance with the requirements of WAC 296-62-3112 shall be deemed to be in compliance with the requirements of WAC 296-62-3140(8).

(d) Emergency response operations for releases of, or substantial threats of releases of hazardous substances which are not covered by subsection (1)(a) through (d) of this section must only comply with the requirements of WAC 296-62-3112.

(3) Definitions.

(a) "Buddy system" means a system of organizing employees into work groups in such a manner that each employee of the work group is designated to be observed by

at least one other employee in the work group. The purpose of the buddy system is to provide rapid assistance to employees in the event of an emergency.

(b) "Clean-up operation" means an operation where hazardous substances are removed, contained, incinerated, neutralized, stabilized, cleared-up, or in any other manner processed or handled with the ultimate goal of making the site safer for people or the environment.

(c) "Contamination reduction zone" means the buffer between the exclusion zone and the outermost clean zone.

(d) "Decontamination" means the removal of hazardous substances from employees and their equipment to the extent necessary to preclude the occurrence of foreseeable adverse health effects.

(e) "Emergency response" or "responding to emergencies" means a response effort by employees from outside the immediate release area or by other designated responders (i.e., mutual aid groups, local fire departments, etc.) to an occurrence which results, or is likely to result, in an uncontrolled release of a hazardous substance. Responses to incidental releases of hazardous substances where the substance can be absorbed, neutralized, or otherwise controlled at the time of release by employees in the immediate release area or by maintenance personnel are not considered to be emergency responses within the scope of this standard. Responses to release of hazardous substances where there is no potential safety or health hazard (i.e., fire, explosion, or chemical exposure) are not considered to be emergency responses.

(f) "Exclusion zone" means the innermost zone at a site where contamination does occur.

(g) "Facility" means (i) any building structure, installation, equipment, pipe or pipeline (including any pipe into a sewer or publicly-owned treatment works), well, pit, pond, lagoon, impoundment, ditch, storage container, motor vehicle, rolling stock, or aircraft, or (ii) any site or area where a hazardous substance has been deposited, stored, disposed of, or placed, or otherwise come to be located; but does not include any consumer product in consumer use or any water-borne vessel.

(h) "Hazardous materials response (HAZMAT) team" means an organized group of employees, designated by the employer, who are expected to perform work, to handle and control actual or potential leaks or spills of hazardous substances requiring possible close approach to the substance. The team members perform responses to releases or potential releases of hazardous substances for the purpose of control or stabilization of the incident. A HAZMAT team is not a fire brigade nor is a typical fire brigade a HAZMAT team. A HAZMAT team, however, may be a separate component of a fire brigade or fire department.

(i) "Hazardous substance" means any substance designated or listed under (i)(i) through (iv) of this subsection, exposure to which results or may result in adverse effects on the health or safety of employees:

(i) Any substance defined under section 101(14) of CERCLA;

(ii) Any biological agent and other disease-causing agent which after release into the environment and upon exposure, ingestion, inhalation, or assimilation into any person, either directly from the environment or indirectly by ingestion through food chains, will or may reasonably be anticipated

to cause death, disease, behavioral abnormalities, cancer, genetic mutation, physiological malfunctions (including malfunctions in reproduction) or physical deformations in such persons or their offspring;

(iii) Any substance listed by the United States Department of Transportation as hazardous materials under WAC 480-12-195; and

(iv) Hazardous waste as herein defined.

(j) "Hazardous waste" means:

A waste or combination of wastes as defined in (m) of this subsection.

(k) "Hazardous waste operation" means any operation conducted within the scope of this standard.

(l) "Hazardous waste site" or "site" means any facility or location within the scope of this standard at which hazardous waste operations take place.

(m) "Health hazard" means a chemical, mixture of chemicals, or a pathogen for which there is statistically significant evidence based on at least one study conducted in accordance with established scientific principles that acute or chronic health effects may occur in exposed employees. The term "health hazard" includes chemicals which are carcinogens, toxic or highly toxic agents, reproductive toxins, irritants, corrosives, sensitizers, hepatotoxins, nephrotoxins, neurotoxins, agents which act on the hematopoietic system, and agents which damage the lungs, skin, eyes, or mucous membranes. It also includes stress due to temperature extremes. Further definition of the terms used above can be found in Appendix A to (~~WAC 296-62-054 through 296-62-05427~~) chapter 296-62 WAC, Part C.

(n) "IDLH" or "immediately dangerous to life or health" means any atmospheric concentration of any toxic, corrosive, or asphyxiant substance that poses an immediate threat to life or would cause irreversible or delayed adverse health effects or would interfere with an individual's ability to escape from a dangerous atmosphere.

(o) "Oxygen deficiency" means that concentration of oxygen by volume below which atmosphere supplying respiratory protection must be provided. It exists in atmospheres where the percentage of oxygen by volume is less than 19.5 percent oxygen.

(p) "Permissible exposure limit" means the exposure, inhalation, or dermal permissible limit specified in WAC 296-62-075 through 296-62-07515.

(q) "Published exposure level" means the exposure limits published in "NIOSH Recommendations for Occupational Health Standards" dated 1986 incorporated by reference, or if none is specified, the exposure limits published in the standards specified by the American Conference of Governmental Industrial Hygienists in their publication "Threshold Limit Values and Biological Exposure Indices for 1988-89" dated 1988 incorporated by reference.

(r) "Post emergency response" means that portion of an emergency response performed after the immediate threat of a release has been stabilized or eliminated and clean-up of the site has begun. If post emergency response is performed by an employer's own employees who were part of the initial emergency response, it is considered to be part of the initial response and not post emergency response. However, if a group of an employer's own employees, separate from the group providing initial response, performs the clean-up operation, then the separate group of employees would be

considered to be performing post-emergency response and subject to WAC 296-62-3112(11).

(s) "Qualified person" means a person with specific training, knowledge, and experience in the area for which the person has responsibility and the authority to control.

(t) "Site safety and health supervisor (or official)" means the individual located on a hazardous waste site who is responsible to the employer and has the authority and knowledge necessary to implement the site safety and health plan and verify compliance with applicable safety and health requirements.

(u) "Site work zones" means an exclusion zone, contamination reduction zone, and a clean zone established at a hazardous waste site before clean-up work begins to prevent or reduce the movement of contaminants from the site to uncontaminated areas and to control public, employee, and equipment exposure to hazardous substances.

(i) The exclusion zone is the innermost of the zones and is where contamination does occur. The contamination reduction zone is the zone between the exclusion zone and the clean zone and serves as a transition and buffer between the contaminated and clean zone to further reduce the physical transfer of contaminating substances to the public, employees, and equipment. The clean zone is the outermost of the zones and is a noncontaminated or clean area. The level of contamination in these zones is not defined and some designated exclusion zones can have very little contamination directly affecting employees.

(ii) The contaminated reduction corridors are the designated areas within the contaminated reduction zone for the decontamination of personnel and equipment.

(v) "Small quantity generator" means a generator of hazardous wastes who in any calendar month generates no more than 1000 kilograms (2205 pounds) of hazardous waste in that month.

(w) "Uncontrolled hazardous waste site" means an area identified as an uncontrolled hazardous waste site by a governmental body, whether federal, state, local, or other where an accumulation of hazardous substances creates a threat to the health and safety of individuals or the environment or both. Some sites are found on public lands, such as those created by former municipal, county, or state landfills where illegal or poorly managed waste disposal has taken place. Other sites are found on private property, often belonging to generators or former generators of hazardous substance waste. Examples of such sites include, but are not limited to, surface impoundments, landfills, dumps, and tank or drum farms. Normal operations at TSD sites are not covered by this definition.

**AMENDATORY SECTION** (Amending Order 90-14, filed 10/1/90, effective 11/15/90)

**WAC 296-62-3060 Engineering controls, work practices, and personal protective equipment for employee protection.** (1) Engineering controls, work practices, personal protective equipment, or a combination of these shall be implemented in accordance with this section to protect employees from exposure to hazardous substances and health hazards.

(a) Engineering controls, work practices, and PPE for substances regulated in chapter 296-62 WAC.

Engineering controls and work practices shall be instituted to reduce and maintain employee exposure to or below the permissible exposure limits for substances regulated by this chapter, except to the extent that such controls and practices are not feasible.

Note: Engineering controls which may be feasible include the use of pressurized cabs or control booths on equipment, and/or the use of remotely operated material handling equipment. Work practices which may be feasible are removing all nonessential employees from potential exposure during opening of drums, wetting down dusty operations, and locating employees upwind of possible hazards.

(b) Whenever engineering controls and work practices are not feasible, or not required, any reasonable combination of engineering controls, work practices, and PPE shall be used to reduce and maintain exposures to or below the permissible exposure limits or dose limits for substances regulated by chapter 296-62 WAC.

(c) The employer shall not implement a schedule of employee rotation as a means of compliance with permissible exposure limits or dose limits except when there is no other feasible way of complying with the airborne or dermal dose limits for ionizing radiation.

(d) The provisions of WAC 296-62-080 through 296-62-09013, 296-62-09015 through 296-62-09055, and 296-62-100 through 296-62-130 shall be followed.

(2) Engineering controls, work practices, and personal protective equipment for substances not regulated in chapter 296-62 WAC. An appropriate combination of engineering controls, work practices, and personal protective equipment shall be used to reduce and maintain employee exposure to or below published exposure levels for hazardous substances and health hazards not regulated by chapter 296-62 WAC. The employer may use the published literature and MSDS as a guide in making the employer's determination as to what level of protection the employer believes is appropriate for hazardous substances and health hazards for which there is no permissible exposure limit or published exposure level.

(3) Personal protective equipment selection.

(a) Personal protective equipment (PPE) shall be selected and used which will protect employees from the hazards and potential hazards they are likely to encounter as identified during the site characterization and analysis.

(b) Personal protective equipment selection shall be based on an evaluation of the performance characteristics of the PPE relative to the requirements and limitations of the site, the task-specific conditions and duration, and the hazards and potential hazards identified at the site.

(c) Positive pressure self-contained breathing apparatus, or positive pressure air-line respirators equipped with an escape air supply shall be used when chemical exposure levels present will create a substantial possibility of immediate death, immediate serious illness or injury, or impair the ability to escape.

(d) Totally-encapsulating chemical protective suits (protection equivalent to Level A protection as recommended in Appendix B) shall be used in conditions where skin absorption of a hazardous substance may result in a substantial possibility of immediate death, immediate serious illness or injury, or impair the ability to escape.

(e) The level of protection provided by PPE selection shall be increased when additional information or site

conditions indicate that increased protection is necessary to reduce employee exposures below permissible exposure limits and published exposure levels for hazardous substances and health hazards. (See WAC 296-62-3170 - Appendix B for guidance on selecting PPE ensembles.)

Note: The level of employee protection provided may be decreased when additional information or site conditions show that decreased protection will not result in increased hazardous exposures to employees.

(f) Personal protective equipment shall be selected and used to meet the requirements of chapter 296-24 WAC, Part ((A-1)) A-2, and additional requirements specified in this part.

(4) Totally-encapsulating chemical protective suits.

(a) Totally-encapsulating suits shall protect employees from the particular hazards which are identified during site characterization and analysis.

(b) Totally-encapsulating suits shall be capable of maintaining positive air pressure. (See WAC 296-62-3160 - Appendix A for a test method which may be used to evaluate this requirement.)

(c) Totally-encapsulating suits shall be capable of preventing inward test gas leakage of more than 0.5 percent. (See WAC 296-62-3160 - Appendix A for a test method which may be used to evaluate this requirement.)

(5) Personal protective equipment (PPE) program. A written personal protective equipment program, which is part of the employer's safety and health program required in WAC 296-62-3010 or 296-62-3140 and which shall be part of the site-specific safety and health plan shall be established. The PPE program shall address the elements listed below. When elements, such as donning and doffing procedures, are provided by the manufacturer of a piece of equipment and are attached to the plan, they need not be rewritten into the plan as long as they adequately address the procedure or element.

(a) PPE selection based on site hazards,

(b) PPE use and limitations of the equipment,

(c) Work mission duration,

(d) PPE maintenance and storage,

(e) PPE decontamination and disposal,

(f) PPE training and proper fitting,

(g) PPE donning and doffing procedures,

(h) PPE inspection procedures prior to, during, and after use,

(i) Evaluation of the effectiveness of the PPE program, and

(j) Limitations during temperature extremes, heat stress, and other appropriate medical considerations.

**AMENDATORY SECTION** (Amending WSR 89-21-018, filed 10/10/89, effective 11/24/89)

**WAC 296-62-3120 Illumination.** Areas accessible to employees shall be lighted to not less than the minimum illumination intensities listed in Table 1 while any work is in progress:

TABLE 1 - 120.1 — MINIMUM ILLUMINATION Intensities in Foot-Candles

Foot-candles	Area or operation
5	General site area.
3	Excavation and waste areas, accessways, active storage areas, loading platforms, refueling, and field maintenance areas.
5	Indoors: Warehouses, corridors, hallways, and exitways.
5	Tunnels, shafts, and general underground work areas; exception: Minimum of ten foot-candles is required at tunnel and shaft heading during drilling, mucking, and scaling. <del>((Bureau of Mines))</del> <u>Mine Safety and Health Administration and the National Institute for Occupational Safety and Health approved cap lights shall be acceptable for use in the tunnel heading.</u>
10	General shops (e.g., mechanical and electrical equipment rooms, active storerooms, barracks or living quarters, locker or dressing rooms, dining areas, and indoor toilets and workrooms).
30	First aid stations, infirmaries, and offices.

**AMENDATORY SECTION** (Amending Order 90-10, filed 8/13/90, effective 9/24/90)

**WAC 296-62-40015 Hazard identification.** (1) With respect to labels and material safety data sheets:

(a) Employers shall ensure that labels on incoming containers of hazardous chemicals are not removed or defaced.

(b) Employers shall maintain any material safety data sheets that are received with incoming shipments of hazardous chemicals, and ensure that they are readily accessible to laboratory employees.

(2) The following provisions shall apply to chemical substances developed in the laboratory:

(a) If the composition of the chemical substance which is produced exclusively for the laboratory's use is known, the employer shall determine if it is a hazardous chemical as defined in ~~((subdivision (b) of this section))~~ the definition section, Part Q of this standard. If the chemical is determined to be hazardous, the employer shall provide appropriate training as required under WAC 296-62-40011.

(b) If the chemical produced is a byproduct whose composition is not known, the employer shall assume that the substance is hazardous and shall implement WAC 296-62-40009.

(c) If the chemical substance is produced for another user outside of the laboratory, the employer shall comply with the hazard communication standard (WAC 296-62-054) including the requirements for preparation of material safety data sheets and labeling.

**AMENDATORY SECTION** (Amending Order 90-10, filed 8/13/90, effective 9/24/90)

**WAC 296-62-40025 Appendix A—National Research Council recommendations concerning chemical hygiene in laboratories (nonmandatory).** (1) Table of contents.

- (a) General principles.
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  - (iv) Laboratory supervisor.
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- (c) The laboratory facility.
  - (i) Design.
  - (ii) Maintenance.
  - (iii) Usage.
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- (d) Components of the chemical hygiene plan.
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  - (ii) Chemical procurement, distribution, and storage.
  - (iii) Environmental monitoring.
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  - (ix) Spills and accidents.
  - (x) Training and information.
  - (xi) Waste disposal.
- (e) General procedures for working with chemicals.
  - (i) General rules for all laboratory work with chemicals.
  - (ii) Allergens and embryotoxins.
  - (iii) Chemicals of moderate chronic or high acute toxicity.
    - (iv) Chemicals of high chronic toxicity.
    - (v) Animal work with chemicals of high chronic toxicity.
  - (f) Safety recommendations.
  - (g) Material safety data sheets.
- (2) Foreword.

(a) As guidance for each employer's development of an appropriate laboratory chemical hygiene plan, the following nonmandatory recommendations are provided. They were extracted from "Prudent Practices for Handling Hazardous Chemicals in Laboratories" (referred to below as "Prudent Practices"), which was published in 1981 by the National Research Council and is available from the National Academy Press, 2101 Constitution Ave., N.W., Washington DC 20418.

(b) "Prudent practices" is cited because of its wide distribution and acceptance and because of its preparation by members of the laboratory community through the sponsorship of the National Research Council. However, none of the recommendations given here will modify any requirements of the laboratory standard. This appendix merely presents pertinent recommendations from "prudent practices," organized into a form convenient for quick reference during operation of a laboratory facility and during development and application of a chemical hygiene plan. Users of this appendix should consult "prudent practices" for a more extended presentation and justification for each recommendation.

(c) "Prudent practices" deals with both safety and chemical hazards while the laboratory standard is concerned

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primarily with chemical hazards. Therefore, only those recommendations directed primarily toward control of toxic exposures are cited in this appendix, with the term "chemical hygiene" being substituted for the word "safety." However, since conditions producing or threatening physical injury often pose toxic risks as well, page references concerning major categories of safety hazards in the laboratory are given in section F.

(d) The recommendations from "prudent practices" have been paraphrased, combined, or otherwise reorganized, and headings have been added. However, their sense has not been changed.

(e) Corresponding sections of the standard and this appendix.

(f) The following table is given for the convenience of those who are developing a chemical hygiene plan which will satisfy the requirements of WAC 296-62-40009. It indicates those sections of this appendix which are most pertinent to each of the sections of WAC 296-62-40009 and related sections.

Subsection and Topic in Laboratory Standard	Relevant Appendix Section
(3)(a) Standard operating procedures for handling toxic chemicals.	(c)(d)(e)
(3)(b) Criteria to be used for implementation of measures to reduce exposures.	(d)
(3)(c) Fume hood performance	(c)(iv)(B)
(3)(d) Employee information and training (including emergency procedures).	(d)(x), (d)(ix)
(3)(e) Requirements for prior approval of laboratory activities.	(e)(ii)(B), (e)(v)(B)
(3)(f) Medical consultation and medical examinations.	(d)(v), (e)(v)(C)
(3)(g) Chemical hygiene responsibilities.	(b)
(3)(h) Special precautions for work with particularly hazardous substances.	(e)(ii)(iii)(v)

(3) In this appendix, those recommendations directed primarily at administrators and supervisors are given in sections (a) through (d). Those recommendations of primary concern to employees who are actually handling laboratory chemicals are given in section E. (Reference to page numbers in "prudent practices" are given in parentheses.)

(a) General principles for work with laboratory chemicals in addition to the more detailed recommendations listed below in sections (b) through (e), "prudent practices" expresses certain general principles, including the following:

(i) It is prudent to minimize all chemical exposures. Because few laboratory chemicals are without hazards, general precautions for handling all laboratory chemicals should be adopted, rather than specific guidelines for particular chemicals (2, 10). Skin contact with chemicals should be avoided as a cardinal rule (198).

(ii) Avoid underestimation of risk. Even for substances of no known significant hazard, exposure should be minimized; for work with substances which present special

hazards, special precautions should be taken (10, 37, 38). One should assume that any mixture will be more toxic than its most toxic component (30, 103) and that all substances of unknown toxicity are toxic (3, 34).

(iii) Provide adequate ventilation. The best way to prevent exposure to airborne substances is to prevent their escape into the working atmosphere by use of hoods and other ventilation devices (32, 198).

(iv) Institute a chemical hygiene program. A mandatory chemical hygiene program designed to minimize exposures is needed; it should be a regular, continuing effort, not merely a standby or short-term activity (6, 11). Its recommendations should be followed in academic teaching laboratories as well as by full-time laboratory workers (13).

(v) Observe the PELs, TLVs. The permissible exposure limits of WISHA and the threshold limit values of the American Conference of Governmental Industrial Hygienists should not be exceeded (13).

(b) Chemical hygiene responsibilities. Responsibility for chemical hygiene rests at all levels (6, 11, 21) including the:

(i) Chief executive officer, who has ultimate responsibility for chemical hygiene within the institution and must, with other administrators, provide continuing support for institutional chemical hygiene (7, 11).

(ii) Supervisor of the department or other administrative unit, who is responsible for chemical hygiene in that unit (7).

(iii) Chemical hygiene officer(s), whose appointment is essential (7) and who must:

(A) Work with administrators and other employees to develop and implement appropriate chemical hygiene policies and practices (7);

(B) Monitor procurement, use, and disposal of chemicals used in the lab (8);

(C) See that appropriate audits are maintained (8);

(D) Help project directors develop precautions and adequate facilities (10);

(E) Know the current legal requirements concerning regulated substances (50); and

(F) Seek ways to improve the chemical hygiene program (8, 11).

(iv) Laboratory supervisor, who has overall responsibility for chemical hygiene in the laboratory (21) including responsibility to:

(A) Ensure that workers know and follow the chemical hygiene rules, that protective equipment is available and in working order, and that appropriate training has been provided (21, 22);

(B) Provide regular, formal chemical hygiene and housekeeping inspections including routine inspections of emergency equipment (21, 171);

(C) Know the current legal requirements concerning regulated substances (50, 231);

(D) Determine the required levels of protective apparel and equipment (156, 160, 162); and

(E) Ensure that facilities and training for use of any material being ordered are adequate (215).

(v) Project director or director of other specific operation, who has primary responsibility for chemical hygiene procedures for that operation (7).

(vi) Laboratory worker, who is responsible for:

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(A) Planning and conducting each operation in accordance with the institutional chemical hygiene procedures (7, 21, 22, 230); and

(B) Developing good personal chemical hygiene habits (22).

(c) The laboratory facility:

(i) Design. The laboratory facility should have:

(A) An appropriate general ventilation system (see C4 below) with air intakes and exhausts located so as to avoid intake of contaminated air (194);

(B) Adequate, well-ventilated stockrooms/storerooms (218, 219);

(C) Laboratory hoods and sinks (12, 162);

(D) Other safety equipment including eyewash fountains and drench showers (162, 169); and

(E) Arrangements for waste disposal (12, 240).

(ii) Maintenance. Chemical-hygiene-related equipment (hoods, incinerator, etc.) should undergo continuing appraisal and be modified if inadequate (11, 12).

(iii) Usage. The work conducted (10) and its scale (12) must be appropriate to the physical facilities available and, especially, to the quality of ventilation (13).

(iv) Ventilation.

(A) General laboratory ventilation. This system should: Provide a source of air for breathing and for input to local ventilation devices (199); it should not be relied on for protection from toxic substances released into the laboratory (198); ensure that laboratory air is continually replaced, preventing increase of air concentrations of toxic substances during the working day (194); direct air flow into the laboratory from nonlaboratory areas and out to the exterior of the building (194).

(B) Hoods. A laboratory hood with 2.5 linear feet of hood space per person should be provided for every 2 workers if they spend most of their time working with chemicals (199); each hood should have a continuous monitoring device to allow convenient confirmation of adequate hood performance before use (200, 209). If this is not possible, work with substances of unknown toxicity should be avoided (13) or other types of local ventilation devices should be provided (199). (See pp. 201-206 for a discussion of hood design, construction, and evaluation.)

(C) Other local ventilation devices. Ventilated storage cabinets, canopy hoods, snorkels, etc., should be provided as needed (199). Each canopy hood and snorkel should have a separate exhaust duct (207).

(D) Special ventilation areas. Exhaust air from glove boxes and isolation rooms should be passed through scrubbers or other treatment before release into the regular exhaust system (208). Cold rooms and warm rooms should have provisions for rapid escape and for escape in the event of electrical failure (209).

(E) Modifications. Any alteration of the ventilation system should be made only if thorough testing indicates that worker protection from airborne toxic substances will continue to be adequate (12, 193, 204).

(F) Performance. Rate: 4-12 room air changes/hour is normally adequate general ventilation if local exhaust systems such as hoods are used as the primary method of control (194).

(G) Quality. General air flow should not be turbulent and should be relatively uniform throughout the laboratory,

with no high velocity or static areas (194, 195); airflow into and within the hood should not be excessively turbulent (200); hood face velocity should be adequate (typically 60-100 fpm) (200, 204).

(H) Evaluation. Quality and quantity of ventilation should be evaluated on installation (202), regularly monitored (at least every 3 months) (6, 12, 14, 195), and reevaluated whenever a change in local ventilation devices is made (12, 195, 207). See pp. 195-198 for methods of evaluation and for calculation of estimated airborne contaminant concentrations.

(d) Components of the chemical hygiene plan:

(i) Basic rules and procedures (recommendations for these are given in section (e), below).

(ii) Chemical procurement, distribution, and storage.

(A) Procurement. Before a substance is received, information on proper handling, storage, and disposal should be known to those who will be involved (215, 216). No container should be accepted without an adequate identifying label (216). Preferably, all substances should be received in a central location (216).

(B) Stockrooms/storerooms. Toxic substances should be segregated in a well-identified area with local exhaust ventilation (221). Chemicals which are highly toxic (227) or other chemicals whose containers have been opened should be in unbreakable secondary containers (219). Stored chemicals should be examined periodically (at least annually) for replacement, deterioration, and container integrity (218-19).

(C) Stockrooms/storerooms should not be used as preparation or repackaging areas, should be open during normal working hours, and should be controlled by one person (219).

(D) Distribution. When chemicals are hand carried, the container should be placed in an outside container or bucket. Freight-only elevators should be used if possible (223).

(E) Laboratory storage. Amounts permitted should be as small as practical. Storage on bench tops and in hoods is inadvisable. Exposure to heat or direct sunlight should be avoided. Periodic inventories should be conducted, with unneeded items being discarded or returned to the storeroom/stockroom (225-6, 229).

(iii) Environmental monitoring. Regular instrumental monitoring of airborne concentrations is not usually justified or practical in laboratories but may be appropriate when testing or redesigning hoods or other ventilation devices (12) or when a highly toxic substance is stored or used regularly (e.g., 3 times/week) (13).

(iv) Housekeeping, maintenance, and inspections.

(A) Cleaning. Floors should be cleaned regularly (24).

(B) Inspections. Formal housekeeping and chemical hygiene inspections should be held at least quarterly (6, 21) for units which have frequent personnel changes and semiannually for others; informal inspections should be continual (21).

(C) Maintenance. Eye wash fountains should be inspected at intervals of not less than 3 months (6). Respirators for routine use should be inspected periodically by the laboratory supervisor (169). Safety showers should be tested routinely (169). Other safety equipment should be inspected regularly. (E.g., every 3-6 months) (6, 24, 171). Procedures

to prevent restarting of out-of-service equipment should be established (25).

(D) Passageways. Stairways and hallways should not be used as storage areas (24). Access to exits, emergency equipment, and utility controls should never be blocked (24).

(v) Medical program.

(A) Compliance with regulations. Regular medical surveillance should be established to the extent required by regulations (12).

(B) Routine surveillance. Anyone whose work involves regular and frequent handling of toxicologically significant quantities of a chemical should consult a qualified physician to determine on an individual basis whether a regular schedule of medical surveillance is desirable (11, 50).

(C) First aid. Personnel trained in first aid should be available during working hours and an emergency room with medical personnel should be nearby (173). See pp. 176-178 for description of some emergency first-aid procedures.

(vi) Protective apparel and equipment. These should include for each laboratory:

(A) Protective apparel compatible with the required degree of protection for substances being handled (158-161);

(B) An easily accessible drench-type safety shower (162, 169);

(C) An eyewash fountain (162);

(D) A fire extinguisher (162-164);

(E) Respiratory protection (164-9), fire alarm and telephone for emergency use (162) should be available nearby; and

(F) Other items designated by the laboratory supervisor (156, 160).

(vii) Records.

(A) Accident records should be written and retained (174).

(B) Chemical hygiene plan records should document that the facilities and precautions were compatible with current knowledge and regulations (7).

(C) Inventory and usage records for high-risk substances should be kept as specified in sections E3e below.

(D) Medical records should be retained by the institution in accordance with the requirements of state and federal regulations (12).

(viii) Signs and labels. Prominent signs and labels of the following types should be posted:

(A) Emergency telephone numbers of emergency personnel/facilities, supervisors, and laboratory workers (28);

(B) Identity labels, showing contents of containers (including waste receptacles) and associated hazards (27, 48);

(C) Location signs for safety showers, eyewash stations, other safety and first aid equipment, exits (27) and areas where food and beverage consumption and storage are permitted (24); and

(D) Warnings at areas or equipment where special or unusual hazards exist (27).

(ix) Spills and accidents.

(A) A written emergency plan should be established and communicated to all personnel; it should include procedures for ventilation failure (200), evacuation, medical care, reporting, and drills (172).

(B) There should be an alarm system to alert people in all parts of the facility including isolation areas such as cold rooms (172).

(C) A spill control policy should be developed and should include consideration of prevention, containment, cleanup, and reporting (175).

(D) All accidents or near accidents should be carefully analyzed with the results distributed to all who might benefit (8, 28).

(x) Information and training program.

(A) Aim: To assure that all individuals at risk are adequately informed about the work in the laboratory, its risks, and what to do if an accident occurs (5, 15).

(B) Emergency and personal protection training: Every laboratory worker should know the location and proper use of available protective apparel and equipment (154, 169).

(C) Some of the full-time personnel of the laboratory should be trained in the proper use of emergency equipment and procedures (6).

(D) Such training as well as first-aid instruction should be available to (154) and encouraged for (176) everyone who might need it.

(E) Receiving and stockroom/storeroom personnel should know about hazards, handling equipment, protective apparel, and relevant regulations (217).

(F) Frequency of training: The training and education program should be a regular, continuing activity—not simply an annual presentation (15).

(G) Literature/consultation: Literature and consulting advice concerning chemical hygiene should be readily available to laboratory personnel, who should be encouraged to use these information resources (14).

(xi) Waste disposal program.

(A) Aim: To assure that minimal harm to people, other organisms, and the environment will result from the disposal of waste laboratory chemicals (5).

(B) Content (14, 232, 233, 240): The waste disposal program should specify how waste is to be collected, segregated, stored, and transported and include consideration of what materials can be incinerated. Transport from the institution must be in accordance with DOT regulations (244).

(C) Discarding chemical stocks: Unlabeled containers of chemicals and solutions should undergo prompt disposal; if partially used, they should not be opened (24, 27).

(D) Before a worker's employment in the laboratory ends, chemicals for which that person was responsible should be discarded or returned to storage (226).

(E) Frequency of disposal: Waste should be removed from laboratories to a central waste storage area at least once per week and from the central waste storage area at regular intervals (14).

(F) Method of disposal: Incineration in an environmentally acceptable manner is the most practical disposal method for combustible laboratory waste (14, 238, 241).

(G) Indiscriminate disposal by pouring waste chemicals down the drain (14, 231, 242) or adding them to mixed refuse for landfill burial is unacceptable (14).

(H) Hoods should not be used as a means of disposal for volatile chemicals (40, 200).

(I) Disposal by recycling (233, 243) or chemical decontamination (40, 230) should be used when possible.

(e) Basic rules and procedures for working with chemicals. The chemical hygiene plan should require that laboratory workers know and follow its rules and procedures. In addition to the procedures of the subprograms mentioned above, these should include the general rules following:

(i) General rules. The following should be used for essentially all laboratory work with chemicals:

(A) Accidents and spills—Eye contact: Promptly flush eyes with water for a prolonged period (15 minutes) and seek medical attention (33, 172).

(B) Ingestion: Encourage the victim to drink large amounts of water (178).

(C) Skin contact: Promptly flush the affected area with water (33, 172, 178) and remove any contaminated clothing (172, 178). If symptoms persist after washing, seek medical attention (33).

(D) Clean-up. Promptly clean up spills, using appropriate protective apparel and equipment and proper disposal (24, 33). See pp. 233-237 for specific clean-up recommendations.

(E) Avoidance of "routine" exposure: Develop and encourage safe habits (23); avoid unnecessary exposure to chemicals by any route (23);

(F) Do not smell or taste chemicals (32). Vent apparatus which may discharge toxic chemicals (vacuum pumps, distillation columns, etc.) into local exhaust devices (199).

(G) Inspect gloves (157) and test glove boxes (208) before use.

(H) Do not allow release of toxic substances in cold rooms and warm rooms, since these have contained recirculated atmospheres (209).

(I) Choice of chemicals: Use only those chemicals for which the quality of the available ventilation system is appropriate (13).

(J) Eating, smoking, etc.: Avoid eating, drinking, smoking, gum chewing, or application of cosmetics in areas where laboratory chemicals are present (22, 24, 32, 40); wash hands before conducting these activities (23, 24).

(K) Avoid storage, handling, or consumption of food or beverages in storage areas, refrigerators, glassware, or utensils which are also used for laboratory operations (23, 24, 226).

(L) Equipment and glassware: Handle and store laboratory glassware with care to avoid damage; do not use damaged glassware (25). Use extra care with Dewar flasks and other evacuated glass apparatus; shield or wrap them to contain chemicals and fragments should implosion occur (25). Use equipment only for its designed purpose (23, 26).

(M) Exiting: Wash areas of exposed skin well before leaving the laboratory (23).

(N) Horseplay: Avoid practical jokes or other behavior which might confuse, startle, or distract another worker (23).

(O) Mouth suction: Do not use mouth suction for pipeting or starting a siphon (23, 32).

(P) Personal apparel: Confine long hair and loose clothing (23, 158). Wear shoes at all times in the laboratory but do not wear sandals, perforated shoes, or sneakers (158).

(Q) Personal housekeeping: Keep the work area clean and uncluttered, with chemicals and equipment being properly labeled and stored; clean up the work area on completion of an operation or at the end of each day (24).

(R) Personal protection: Assure that appropriate eye protection (154-156) is worn by all persons, including visitors, where chemicals are stored or handled (22, 23, 33, 154).

(S) Wear appropriate gloves when the potential for contact with toxic materials exists (157); inspect the gloves before each use, wash them before removal, and replace them periodically (157). (A table of resistance to chemicals of common glove materials is given p. 159.)

(T) Use appropriate (164-168) respiratory equipment when air contaminant concentrations are not sufficiently restricted by engineering controls (164-5), inspecting the respirator before use (169).

(U) Use any other protective and emergency apparel and equipment as appropriate (22, 157-162).

(V) Void use of contact lenses in the laboratory unless necessary; if they are used, inform supervisor so special precautions can be taken (155).

(W) Remove laboratory coats immediately on significant contamination (161).

(X) Planning: Seek information and advice about hazards (7), plan appropriate protective procedures, and plan positioning of equipment before beginning any new operation (22, 23).

(Y) Unattended operations: Leave lights on, place an appropriate sign on the door, and provide for containment of toxic substances in the event of failure of a utility service (such as cooling water) to an unattended operation (27, 128).

(Z) Use of hood: Use the hood for operations which might result in release of toxic chemical vapors or dust (198-9).

(AA) As a rule of thumb, use a hood or other local ventilation device when working with any appreciably volatile substance with a TLV of less than 50 ppm (13).

(BB) Confirm adequate hood performance before use; keep hood closed at all times except when adjustments within the hood are being made (200); keep materials stored in hoods to a minimum and do not allow them to block vents or air flow (200).

(CC) Leave the hood "on" when it is not in active use if toxic substances are stored in it or if it is uncertain whether adequate general laboratory ventilation will be maintained when it is "off" (200).

(DD) Vigilance: Be alert to unsafe conditions and see that they are corrected when detected (22).

(EE) Waste disposal: Assure that the plan for each laboratory operation includes plans and training for waste disposal (230).

(FF) Deposit chemical waste in appropriately labeled receptacles and follow all other waste disposal procedures of the chemical hygiene plan (22, 24).

(GG) Do not discharge to the sewer concentrated acids or bases (231); highly toxic, malodorous, or lachrymatory substances (231); or any substances which might interfere with the biological activity of waste water treatment plants, create fire or explosion hazards, cause structural damage, or obstruct flow (242).

(HH) Working alone: Avoid working alone in a building; do not work alone in a laboratory if the procedures being conducted are hazardous (28).

(ii) Working with allergens and embryotoxins.

(A) Allergens (examples: Diazomethane, isocyanates, bichromates): Wear suitable gloves to prevent hand contact with allergens or substances of unknown allergenic activity (35).

(B) Embryotoxins (34-5) (examples: Organomercurials, lead compounds, formamide): Women of childbearing age shall handle these substances only in a hood whose satisfactory performance has been confirmed, using appropriate protective apparel (especially gloves) to prevent skin contact.

(C) Review each use of these materials with the research supervisor and review continuing uses annually or whenever a procedural change is made.

(D) Store these substances, properly labeled, in an adequately ventilated area in an unbreakable secondary container.

(E) Notify supervisors of all incidents of exposure or spills; consult a qualified physician when appropriate.

(iii) Work with chemicals of moderate chronic or high acute toxicity.

Examples: diisopropylfluorophosphate (41), hydrofluoric acid (43), hydrogen cyanide (45).

(iv) Supplemental rules to be followed in addition to those mentioned above (Procedure B of "prudent practices," pp. 39-41):

(A) Aim: To minimize exposure to these toxic substances by any route using all reasonable precautions (39).

(B) Applicability: These precautions are appropriate for substances with moderate chronic or high acute toxicity used in significant quantities (39).

(C) Location: Use and store these substances only in areas of restricted access with special warning signs (40, 229).

(D) Always use a hood (previously evaluated to confirm adequate performance with a face velocity of at least 60 linear feet per minute) (40) or other containment device for procedures which may result in the generation of aerosols or vapors containing the substance (39); trap released vapors to prevent their discharge with the hood exhaust (40).

(E) Personal protection: Always avoid skin contact by use of gloves and long sleeves (and other protective apparel as appropriate) (39). Always wash hands and arms immediately after working with these materials (40).

(F) Records: Maintain records of the amounts of these materials on hand, amounts used, and the names of the workers involved (40, 229).

(G) Prevention of spills and accidents: Be prepared for accidents and spills (41).

(H) Assure that at least 2 people are present at all times if a compound in use is highly toxic or of unknown toxicity (39).

(I) Store breakable containers of these substances in chemically resistant trays; also work and mount apparatus above such trays or cover work and storage surfaces with removable, absorbent, plastic backed paper (40).

(J) If a major spill occurs outside the hood, evacuate the area; assure that cleanup personnel wear suitable protective apparel and equipment (41).

(K) Waste: Thoroughly decontaminate or incinerate contaminated clothing or shoes (41). If possible, chemically decontaminate by chemical conversion (40).

(L) Store contaminated waste in closed, suitably labeled, impervious containers (for liquids, in glass or plastic bottles half-filled with vermiculite) (40).

(v) Work with chemicals of high chronic toxicity.

Examples: Dimethylmercury and nickel carbonyl (48), benzo-a-pyrene (51), N-nitrosodiethylamine (54), other human carcinogens or substances with high carcinogenic potency in animals (38).

(vi) Further supplemental rules to be followed, in addition to all these mentioned above, for work with substances of known high chronic toxicity (in quantities above a few milligrams to a few grams, depending on the substance) (47). (Procedure A of "Prudent Practices" pp. 47-50).

(A) Access: Conduct all transfers and work with these substances in a "controlled area": A restricted access hood, glove box, or portion of a lab, designated for use of highly toxic substances, for which all people with access are aware of the substances being used and necessary precautions (48).

(B) Approvals: Prepare a plan for use and disposal of these materials and obtain the approval of the laboratory supervisor (48).

(C) Noncontamination/decontamination: Protect vacuum pumps against contamination by scrubbers or HEPA filters and vent them into the hood (49). Decontaminate vacuum pumps or other contaminated equipment, including glassware, in the hood before removing them from the controlled area (49, 50).

(D) Decontaminate the controlled area before normal work is resumed there (50).

(E) Exiting: On leaving a controlled area, remove any protective apparel (placing it in an appropriate, labeled container) and thoroughly wash hands, forearms, face, and neck (49).

(F) Housekeeping: Use a wet mop or a vacuum cleaner equipped with a HEPA filter instead of dry sweeping if the toxic substance was a dry powder (50).

(G) Medical surveillance: If using toxicologically significant quantities of such a substance on a regular basis (e.g., 3 times per week), consult a qualified physician concerning desirability of regular medical surveillance (50).

(H) Records: Keep accurate records of the amounts of these substances stored (229) and used, the dates of use, and names of users (48).

(I) Signs and labels: Assure that the controlled area is conspicuously marked with warning and restricted access signs (49) and that all containers of these substances are appropriately labeled with identity and warning labels (48).

(J) Spills: Assure that contingency plans, equipment, and materials to minimize exposures of people and property in case of accident are available (233-4).

(K) Storage: Store containers of these chemicals only in a ventilated, limited access (48, 227, 229) area in appropriately labeled, unbreakable, chemically resistant, secondary containers (48, 229).

(L) Glove boxes: For a negative pressure glove box, ventilation rate must be at least 2 volume changes/hour and pressure at least 0.5 inches of water (48). For a positive pressure glove box, thoroughly check for leaks before each use (49). In either case, trap the exit gases or filter them through a HEPA filter and then release them into the hood (49).

(M) Waste: Use chemical decontamination whenever possible; ensure that containers of contaminated waste (including washings from contaminated flasks) are transferred from the controlled area in a secondary container under the supervision of authorized personnel (49, 50, 233).

(vii) Animal work with chemicals of high chronic toxicity.

(A) Access: For large scale studies, special facilities with restricted access are preferable (56).

(B) Administration of the toxic substance: When possible, administer the substance by injection or gavage instead of in the diet. If administration is in the diet, use a caging system under negative pressure or under laminar air flow directed toward HEPA filters (56).

(C) Aerosol suppression: Devise procedures which minimize formation and dispersal of contaminated aerosols, including those from food, urine, and feces (e.g., use HEPA filtered vacuum equipment for cleaning, moisten contaminated bedding before removal from the cage, mix diets in closed containers in a hood) (55, 56).

(D) Personal protection: When working in the animal room, wear plastic or rubber gloves, fully buttoned laboratory coat or jumpsuit and, if needed because of incomplete suppression of aerosols, other apparel and equipment (shoe and head coverings, respirator) (56).

(E) Waste disposal: Dispose of contaminated animal tissues and excreta by incineration if the available incinerator can convert the contaminant to nontoxic products (238); otherwise, package the waste appropriately for burial in an EPA-approved site (239).

(f) Safety recommendations. The above recommendations from "prudent practices" do not include those which are directed primarily toward prevention of physical injury rather than toxic exposure. However, failure of precautions against injury will often have the secondary effect of causing toxic exposures. Therefore, we list below page references for recommendations concerning some of the major categories of safety hazards which also have implications for chemical hygiene:

(i) Corrosive agents: (35-6)

(ii) Electrically powered laboratory apparatus: (179-92)

(iii) Fires, explosions: (26, 57-74, 162-4, 174-5, 219-20, 226-7)

(iv) Low temperature procedures: (26, 88)

(v) Pressurized and vacuum operations (including use of compressed gas cylinders): (27, 75-101)

(g) Material safety data sheets. Material safety data sheets are presented in "prudent practices" for the chemicals listed below. (Asterisks denote that comprehensive material safety data sheets are provided.)

\* Acetyl peroxide (105) \* Acrolein (106) \* ~~(Acrylonitrile)~~ Acrylonitrile (107) Ammonia (anhydrous) (91) \* Aniline (109) \* Benzene (110) \* Benzo[a]pyrene (112) \* Bis(chloromethyl) ether (113) Boron trichloride (91) Boron trifluoride (92) Bromine (114) \* Tert-butyl hydroperoxide (148) \* Carbon disulfide (116) Carbon monoxide (92) \* Carbon tetrachloride (118) \* Chlorine (119) Chlorine trifluoride (94) \* Chloroform (121) Chloromethane (93) \* Diethyl ether (122) Diisopropyl fluorophosphate (41) \* Dimethylformamide (123) \* Dimethyl sulfate (125) \* Dioxane (126) \* Ethylene dibromide (128) \* Fluorine (95) \* Formaldehyde (130) \* Hydrazine and salts (132) Hydrofluoric acid

(43) Hydrogen bromide (98) Hydrogen chloride (98) \* Hydrogen cyanide (133) \* Hydrogen sulfide (135) Mercury and compounds (52) \* Methanol (137) \* Morpholine (138) \* Nickel carbonyl (99) \* Nitrobenzene (139) Nitrogen dioxide (100) N-nitrosodiethylamine (54) \* Peracetic acid (141) \* Phenol (142) \* Phosgene (143) \* Pyridine (144) \* Sodium azide (145) \* Sodium cyanide (147) Sulfur dioxide (101) \* Trichloroethylene (149) \* Vinyl chloride (150)

AMENDATORY SECTION (Amending Order 76-29, filed 9/30/76)

**WAC 296-155-001 Foreword.** (1) This chapter has been compiled with the purpose of consolidating (~~the~~ ~~division of industrial~~) safety and health construction safety standards into one chapter of the Washington Administrative Code, by the promulgation of the standards contained herein. It is also the intent that the safety standards of the Washington state department of labor and industries, will be at least as effective as those adopted by the U.S. Department of Labor and administered by the Occupational Safety and Health Administration as published in the Code of Federal Regulations. The (~~division of industrial safety and health~~) department of labor and industries is incorporating many of the preexisting construction safety standards and adding new standards under this chapter.

(2) Attention is called to the fact that certain Washington state standards contain standards and/or regulations applicable to all industries. These include, but are not limited to: The code for boilers and pressure vessels; the code for pressure piping; the general industrial safety and health standards; the general occupational health standards; regulations of the department of social and health services.

AMENDATORY SECTION (Amending Order 74-26, filed 5/7/74, effective 6/6/74)

**WAC 296-155-006 Equipment approval by nonstate agency or organization.** Whenever a provision of this chapter states that only that equipment or those processes approved by an agency or organization other than the department of labor and industries, such as the Underwriters Laboratories or the (~~Bureau of Mines~~) Mine Safety and Health Administration (MSHA) and the National Institute for Occupational Safety and Health (NIOSH), shall be utilized, that provision shall be construed to mean that approval of such equipment or process by the designated agency or group shall be prima facie evidence of compliance with the provisions of this chapter.

AMENDATORY SECTION (Amending Order 86-14, filed 1/21/86)

**WAC 296-155-010 Variance and procedure.** Realizing that conditions may exist in operations under which certain state standards will not have practical application, the director of the department of labor and industries or his/her authorized representative may, pursuant to this section, sections eight or nine of the Washington Industrial Safety and Health Act (chapter 80, Laws of 1973, RCW 49.17.080 and 49.17.090) and appropriate administrative rules of this state and the department of labor and industries and upon receipt of application and after adequate investiga-

tion by the department, permit a variation from these requirements when other means of providing an equivalent measure of protection are afforded. Such variation granted shall be limited to the particular case or cases covered in the application for variance and may be revoked for cause. The order granting a variance shall be conspicuously posted on the premises and shall remain posted during the time it is in effect. A copy of the variance shall be available at the work site. All requests for variances from safety and health standards included in this chapter, shall be made in writing to the director of the department of labor and industries at Olympia, Washington, or his/her duly authorized representative, ~~((the assistant director, division of industrial safety and health,))~~ Department of Labor and Industries, P.O. Box 44600, Olympia, Washington 98504-4600.

**AMENDATORY SECTION** (Amending Order 74-26, filed 5/7/74, effective 6/6/74)

**WAC 296-155-015 Education and first-aid standards.** It shall be the duty of every employer to comply with such standards and systems of education for safety as shall be, from time to time, prescribed for such employer by the director of labor and industries ~~((through the division of industrial safety and health))~~ or by statute. Refer to WAC 296-155-100 through 296-155-135 for additional requirements.

**AMENDATORY SECTION** (Amending Order 74-26, filed 5/7/74, effective 6/6/74)

**WAC 296-155-040 Safe place standards.** (1) Each employer shall furnish to each ~~((of his))~~ employee~~((s))~~ a place of employment free from recognized hazards that are causing or likely to cause serious injury or death to ~~((his))~~ employees.

(2) Every employer shall require safety devices, furnish safeguards, and shall adopt and use practices, methods, operations, and processes which are reasonably adequate to render such employment and place of employment safe. Every employer shall do everything reasonably necessary to protect the life and safety of employees.

(3) No employer shall require any employee to go or be in any employment or place of employment which is hazardous to the employee.

(4) No employer shall fail or neglect:

(a) To provide and use safety devices and safeguards.

(b) To adopt and use methods and processes reasonably adequate to render the employment and place of employment safe.

(c) To do everything reasonably necessary to protect the life and safety of employees.

(5) No employer, owner, or lessee of any real property shall construct or cause to be constructed any place of employment that is hazardous to the employee.

(6) No person shall do any of the following:

(a) Remove, displace, damage, destroy or carry off any safety device, safeguard, notice, or warning, furnished for use in any employment or place of employment.

(b) Interfere in any way with the use thereof by any other person.

(c) Interfere with the use of any method or process adopted for the protection of any employee, including

~~((himself))~~ themselves, in such employment, or place of employment.

(d) Fail or neglect to do everything reasonably necessary to protect the life and safety of employees.

(7) The use of intoxicants or debilitating drugs while on duty is prohibited. Employees under the influence of intoxicants or drugs shall not be permitted in or around worksites. This subsection (7) shall not apply to employees taking prescription drugs or narcotics as directed and prescribed by a physician, provided such use does not endanger the employee or others.

**AMENDATORY SECTION** (Amending Order 91-07, filed 11/22/91, effective 12/24/91)

**WAC 296-155-100 Management's responsibility.** (1) It shall be the responsibility of management to establish, supervise, and enforce, in a manner which is effective in practice:

(a) A safe and healthful working environment.

(b) An accident prevention program as required by these standards.

(c) Training programs to improve the skill and competency of all employees in the field of occupational safety and health.

(2) Employees required to handle or use poisons, caustics, and other harmful substances shall be instructed regarding the safe handling and use, and be made aware of the potential hazards, personal hygiene, and personal protective measures required.

(3) In job site areas where harmful plants or animals are present, employees who may be exposed shall be instructed regarding the potential hazards, and how to avoid injury, and the first aid procedures to be used in the event of injury.

(4) Employees required to handle or use flammable liquids, gases, or toxic materials shall be instructed in the safe handling and use of these materials and made aware of the specific requirements contained in Parts B, D, and other applicable parts of this standard.

(5) Confined spaces. The requirements of chapters 296-24, 296-62 and 296-155 WAC apply.

(6) The employer shall ensure that work assignments place no employee in a position or location not within ordinary calling distance of another employee able to render assistance in case of emergency.

Note: This subsection does not apply to operators of motor vehicles, ~~((watchmen))~~ watchpersons or other jobs which, by their nature, are single employee assignments. However, a definite procedure for checking the welfare of all employees during working hours should be instituted and all employees so advised.

(7) Each employer shall post and keep posted a notice or notices (Job Safety and Health Protection - Form F416-081-000) to be furnished by the ~~((division of industrial safety and health,))~~ department of labor and industries, informing employees of the protections and obligations provided for in the act and that for assistance and information, including copies of the act, and of specific safety and health standards employees should contact the employer or the nearest office of the department of labor and industries. Such notice or notices shall be posted by the employer at each establishment in a conspicuous place or places where notices to employees are customarily posted. Each employer shall take

steps to assure that such notices are not altered, defaced, or covered by other material.

**AMENDATORY SECTION** (Amending Order 92-01, filed 4/22/92, effective 5/25/92)

**WAC 296-155-110 Accident prevention program.**

(1) Exemptions. Workers of employers whose primary business is other than construction, who are engaged solely in maintenance and repair work, including painting and decorating, are exempt from the requirement of this section provided:

(a) The maintenance and repair work, including painting and decorating, is being performed on the employer's premises, or facility.

(b) The length of the project does not exceed one week.

(c) The employer is in compliance with the requirements of WAC 296-24-040 Accident prevention programs, and WAC 296-24-045, Safety and health committee plan.

(2) Each employer shall develop a formal accident-prevention program, tailored to the needs of the particular plant or operation and to the type of hazard involved. The ~~((division))~~ department may be contacted for assistance in developing appropriate programs.

(3) The following are the minimal program elements for all employers:

A safety orientation program describing the employer's safety program and including:

(a) How, where, and when to report injuries, including instruction as to the location of first-aid facilities.

(b) How to report unsafe conditions and practices.

(c) The use and care of required personal protective equipment.

(d) The proper actions to take in event of emergencies including the routes of exiting from areas during emergencies.

(e) Identification of the hazardous gases, chemicals, or materials involved along with the instructions on the safe use and emergency action following accidental exposure.

(f) A description of the employer's total safety program.

(g) An on-the-job review of the practices necessary to perform job assignments in a safe manner.

(4) Each accident-prevention program shall be outlined in written format.

(5) Every employer shall conduct ~~((foreman))~~ crew leader-crew safety meetings as follows:

(a) ~~((Foreman))~~ Crew leader-crew safety meetings shall be held at the beginning of each job, and at least weekly thereafter.

(b) ~~((Foreman))~~ Crew leader-crew meetings shall be tailored to the particular operation.

(6) ~~((Foreman))~~ Crew leader-crew safety meetings shall address the following:

(a) A review of any walk-around safety inspection conducted since the last safety meeting.

(b) A review of any citation to assist in correction of hazards.

(c) An evaluation of any accident investigations conducted since the last meeting to determine if the cause of the unsafe acts or unsafe conditions involved were properly identified and corrected.

(d) Attendance shall be documented.

(e) Subjects discussed shall be documented.

Note: Subcontractors and their employees may, with the permission of the general contractor, elect to fulfill the requirements of subsection (5)(a) and (b) of this section by attending the prime contractors ~~((foreman))~~ crew leader-crew safety meeting. Any of the requirements of subsections (6)(a), (b), (c), and (7) of this section not satisfied by the prime contractors safety meetings shall be the responsibility of the individual employers.

(7) Minutes of each ~~((foreman))~~ crew leader-crew meeting shall be prepared and a copy shall be maintained at the location where the majority of the employees of each construction site report for work each day.

(8) Minutes of ~~((foreman))~~ crew leader-crew safety meetings shall be retained by the employer for at least one year and shall be made available for review by personnel of the ~~((division of industrial safety and health))~~ department, upon request.

(9) Every employer shall conduct walk-around safety inspections as follows:

(a) At the beginning of each job, and at least weekly thereafter, a walk-around safety inspection shall be conducted jointly by one member of management and one employee, elected by the employees, as their authorized representative.

(b) The employer shall document walk-around safety inspections and such documentation shall be available for inspection by personnel of the ~~((division of industrial safety and health))~~ department.

(c) Records of walk-around inspections shall be maintained by the employer until the completion of the job.

**AMENDATORY SECTION** (Amending Order 86-14, filed 1/21/86)

**WAC 296-155-120 First-aid training and certification.** This section is designed to assure that all employees in this state are afforded quick and effective first-aid attention in the event of an on the job injury. To achieve this purpose the presence of personnel trained in first-aid procedures at or near those places where employees are working is required. Compliance with the provisions of this section may require the presence of more than one first-aid trained person.

(1) Each employer shall have available at all worksites, at all times, a person or persons holding a valid certificate of first-aid training from the department of labor and industries or other organization, association or agency that has been approved by the department.

(a) A valid first-aid certificate is one which is less than three years old.

(b) All ~~((foreman))~~ crew leaders, supervisors or persons in direct charge of crews shall have a valid first-aid certificate.

(c) For the purposes of this section, a crew shall mean a group of two or more employees working at any worksite.

Note: In emergencies, ~~((foreman))~~ crew leaders will be permitted to work up to thirty days without having the required certificate, providing an employee in the crew or another ~~((foreman))~~ crew leaders in the immediate work area has the necessary certificate.

(2) Valid certification shall be achieved by passing a course of first-aid instruction and participation in practical application of the following subject matter:

Bleeding control and bandaging.



- Cardio-pulmonary resuscitation "C.P.R."
- Poisons.
- Shock, unconsciousness, stroke.
- Burns, scalds.
- Sunstroke, heat exhaustion.
- Frostbite, freezing, hypothermia.
- Strains, sprains, hernias.
- Fractures, dislocation.
- Proper transportation of the injured.
- Bites, stings.

Over 200 persons

First-aid room

Refer to  
WAC 296-24-070

(7) Employers shall establish a procedure to ensure that first-aid kits and required contents are maintained in a serviceable condition.

(8) First-aid kits shall contain at least the following items, in a weatherproof container with individual sealed packages for each type of item:

**10 package kit**

- 1 Pkg. adhesive bandages, 1" (16 per pkg.)
- 1 Pkg. bandage compress, 4" (1 per pkg.)
- 1 Pkg. scissors\* and tweezers (1 each per pkg.)
- 1 Pkg. triangular bandage, 40" (1 per pkg.)
- 1 Pkg. antiseptic soap or pads (3 per pkg.)
- 5 Pkgs. of consulting physician's choice\*\*

**16 package kit**

- 1 Pkg. absorbent gauze, 24" x 72" (1 per pkg.)
- 1 Pkg. adhesive bandages, 1" (16 per pkg.)
- 2 Pkgs. bandage compresses, 4" (1 per pkg.)
- 1 Pkg. eye dressing (1 per pkg.)
- 1 Pkg. scissors\* and tweezers (1 each per pkg.)
- 2 Pkgs. triangular bandages, 40" (1 per pkg.)
- 1 Pkg. antiseptic soap or pads (3 per pkg.)
- 7 Pkgs. of consulting physician's choice\*\*

**24 package kit**

- 2 Pkgs. absorbent gauze, 24" x 72" (1 per pkg.)
- 2 Pkgs. adhesive bandages, 1" (16 per pkg.)
- 2 Pkgs. bandage compresses, 4" (1 per pkg.)
- 1 Pkg. eye dressing (1 per pkg.)
- 1 Pkg. scissors\* and tweezers (1 each per pkg.)
- 6 Pkgs. triangular bandages, 40" (1 per pkg.)
- 1 Pkg. antiseptic soap or pads (3 per pkg.)
- 9 Pkgs. of consulting physician's choice\*\*

**36 package kit**

- 4 Pkgs. absorbent gauze, 24" x 72" (1 per pkg.)
- 2 Pkgs. adhesive bandages, 1" (16 per pkg.)
- 5 Pkgs. bandage compresses, 4" (1 per pkg.)
- 2 Pkgs. eye dressing (1 per pkg.)
- 1 Pkg. scissors\* and tweezers (1 each per pkg.)
- 8 Pkgs. triangular bandages, 40" (1 per pkg.)
- 1 Pkg. antiseptic soap or pads (3 per pkg.)
- 13 Pkgs. of consulting physicians choice\*\*

\*Scissors shall be capable of cutting 2 layers of 15 oz. cotton cloth or its equivalent.

\*\*First-aid kits shall be maintained at the ten, sixteen, twenty-four or thirty-six package level. In the event the consulting physician chooses not to recommend items, the department shall be contacted for recommended items to complete the kit.

(9) When practical, a poster shall be fastened and maintained either on or in the cover of each first-aid kit and at or near all phones plainly stating worksite address or location, the phone numbers of available doctors, hospitals, and ambulance services within the district of the worksite.

**AMENDATORY SECTION** (Amending Order 86-14, filed 1/21/86)

**WAC 296-155-125 First-aid kit.** (1) All employers who employ men and women covered by the act shall furnish first-aid kits as required by the (~~division of industrial safety and health~~) department of labor and industries, (RCW 51.36.030).

(2) First-aid supplies shall be readily accessible when required by this section.

(3) In the absence of readily accessible first-aid supplies such as first-aid kits, first-aid stations, first-aid rooms or their equivalent, all crew trucks, power shovels, cranes, locomotives, loaders, dozers, logging trucks, speeders, freight trucks and similar equipment shall be equipped with not less than a ten package weather-proof first-aid kit.

(4) All crew vehicles used for transporting workers shall be equipped with not less than a ten package weather-proof first-aid kit. When more than five employees are being transported on any one trip, the kit shall be increased in size to comply with a 16-, 24-, or 36-package kit depending upon the number of personnel normally being transported.

(5) At least one weather-proof first-aid kit shall be available on construction jobs, line crews, and other transient or short duration jobs.

(6) The size and quantity of first-aid kits, required to be located at any site, shall be determined by the number of personnel normally dependent upon each kit as outlined in the following table:

Number of Personnel Normally Assigned To Worksite	Minimum First Aid Supplies Required At Worksite
1 - 50 persons	First-aid kit
1 - 5	10 package kit
6 - 15	16 package kit
16 - 30	24 package kit
31 - 50	36 package kit
51 - 200	First-aid station
51 - 75	One 36 and one 10 package kit
76 - 100	One 36 and one 16 package kit
101 - 150	One 36 and one 24 package kit
151 - 200	Two 36 package kits

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Note: Preprinted Form No. ((SP-900L)) FSPO 900-001-1 is available from all ((safety division)) department offices. First-aid kit Form No. ((SP-900S)) FSPI -005-000 is also available.

(10) Where the eyes or body of any person may be exposed to injurious chemicals and/or materials, suitable facilities for quick drenching or flushing of the eyes and body shall be provided, within the work area, for immediate emergency use.

(11) When required by the department, two wool blankets or two fire ((retardent)) retardant blankets, capable of supporting 250 pounds each, and a stretcher shall be available in addition to first-aid kits.

**AMENDATORY SECTION** (Amending Order 89-03, filed 5/15/89, effective 6/30/89)

**WAC 296-155-140 Sanitation.** (1) Potable water.

(a) An adequate supply of potable water shall be provided in all places of employment.

(b) Portable containers used to dispense drinking water shall be capable of being tightly closed and equipped with a tap. Water shall not be dipped from containers.

(c) Any container used to distribute drinking water shall be clearly marked as to the nature of its contents and not used for any other purpose.

(d) The common drinking cup is prohibited.

(e) Where single service cups (to be used but once) are supplied, both a sanitary container for the unused cups and a receptacle for disposing of the used cups shall be provided.

(f) All water containers used to furnish drinking water shall be thoroughly cleaned at least once each week or more often as conditions require.

(g) The requirements of this subsection do not apply to mobile crews or to normally unattended work locations as long as employees working at these locations have transportation immediately available, within the normal course of their duties, to nearby facilities otherwise meeting the requirements of this section.

(h) The following definitions apply:

(i) Mobile crew: A work crew that routinely moves to a different work location periodically. Normally a mobile crew is not at the same location all day.

(ii) Normally unattended work location: An unattended site that is visited occasionally by one or more employees.

(iii) Nearby facility: A sanitary facility that is within three minutes travel by the transportation provided.

(iv) "Potable water" means water which meets the quality standards for drinking purposes of state or local authority having jurisdiction or water that meets the quality standards prescribed by the United States Environmental Protection Agency's National Interim Primary Drinking Water Regulations, published in 40 CFR Part 141, and 40 CFR 147.2400.

(2) Wash water.

(a) Clean, tepid wash water, between 70 and 100 degrees Fahrenheit, shall be provided at all construction sites.

(b) Individual hand towels shall be provided. Both a sanitary container for the unused towels and a receptacle for disposal of used towels shall be provided.

(c) Hand soap, industrial hand cleaner or similar cleansing agents shall be provided. Cleansing agents shall

be adequate to remove any paints, coatings, herbicides, insecticides or other contaminants.

(d) The requirements of this subsection do not apply to mobile crews or to normally unattended work locations as long as employees working at these locations have transportation immediately available, within the normal course of their duties, to nearby facilities otherwise meeting the requirements of this section.

(e) Gasoline or solvents shall not be used for personal cleaning.

(f) Wash water areas will be maintained in a dry condition. Slipping or other hazards shall be eliminated from the wash water area before it is acceptable for use.

(3) Nonpotable water.

(a) Outlets for nonpotable water, such as water for industrial or fire fighting purposes only, shall be identified by signs meeting the requirements of Part E of this chapter, to indicate clearly that the water is unsafe and is not to be used for drinking, washing or cooking purposes.

(b) There shall be no cross-connection, open or potential, between a system furnishing potable water, a system furnishing nonpotable water or a system furnishing wash water.

(4) Toilets.

(a) The provisions of this section apply to both portable chemical toilets and to flush toilets, except where flush toilets are used the requirements of WAC 296-24-12007 (1)(a) shall apply instead of (b) of this subsection.

(b) Accessible toilets shall be provided for employees according to the following table:

TABLE B-1

<u>Number of Employees</u>	<u>Toilets Required</u>
1 - 10	1
11 - 25	2
26 - 40	3
41 - 60	4
61 - 80	5
Over 80	one additional toilet for each additional twenty employees or any fraction thereof.

(c) When the employer provides both flush and portable chemical toilets, the number of employees allowed to be served by the flush toilets, per WAC 296-24-12007 (1)(a) will be calculated. That number will be subtracted from the total number of employees and the employer will be required to provide an adequate number of portable chemical toilets for the number of remaining employees, as required by (b) of this subsection.

(d) Toilets shall be maintained in clean, sanitary and functional condition. Internal latches shall be provided to secure the units from inadvertent entry. Where there are twenty or more employees consisting of both sexes, facilities shall be provided for each sex.

(i) Each unit shall be properly cleaned on a routine basis.

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(ii) Chemicals, toilet tissue and sanitary seat covers shall be maintained in a supply sufficient for use during the entire shift.

(iii) Any defective or inadequate unit shall be immediately removed from service.

(e) Specifications. The following specifications apply:

(i) A noncaustic chemical toilet (portable chemical toilet is) a self-contained unit equipped with a waste receiving chemical holding container.

(ii) Portable chemical toilets consisting of only a holding tank, commonly referred to as "elevator units" or "elevator toilets" are not acceptable. "Elevator units" may be used if they are individually located in a lockable room which affords privacy. When this type unit is used in a private individual lockable room the entire room will be considered a toilet facility, as such the room will meet all requirements of toilet facilities and be inspected in accordance with subsection (5)(b)(iii) of this section.

(iii) Rooms, buildings or shelters housing toilets shall be of sound construction, easy to clean, provide shelter and provide privacy. The toilet rooms shall be ventilated to the outside and adequately lighted. All openings into the toilet room shall be covered with 16-mesh screen.

(iv) Toilets shall be serviced on a regular schedule. Servicing shall include the use of a disinfectant for cleaning urinals and seats, removing waste from containers, recharging containers with an odor controlling chemical and installing an adequate supply of toilet tissue and seat covers.

(v) Service shall be performed in accordance with local codes by approved servicing organizations. Waste shall be disposed of or discharged in accordance with requirements of local health department regulations.

(vi) Waste containers shall be fabricated from impervious materials, e.g. plastic, steel, fiberglass or their equivalent. Containers shall be water tight and capable of containing the chemical waste in a sanitary manner. The container shall be fitted to the building in a manner so as to prevent insects from entering from the exterior of the building. Containers shall be adequate in size to be used by the number of persons, according to the schedule for minimum requirements, without filling the container to more than half of its volume before regularly scheduled servicing.

(vii) Removal of waste shall be handled in a clean and sanitary manner by means of a vacuum hose and received by a leak-proof tank truck. All valves on the tank shall be leak-proof.

(viii) Provisions shall be made so service trucks have a clear approach and convenient access to the toilets to be serviced.

(ix) Disposal of waste from tank trucks shall be in accordance with local health department requirements. In the absence of provisions by local health departments, waste must be disposed of through municipal or district sanitary sewage systems. Municipal or area sanitary sewage districts shall provide sewage disposal locations and facilities which are adequate and convenient for duly authorized toilet service organizations.

(f) The requirements of this subsection do not apply to mobile crews or to normally unattended work locations as long as employees working at these locations have transportation immediately available, within the normal course of

their duties, to nearby facilities otherwise meeting the requirements of this section.

(5)(a) On multi-employer worksites, the prime contractor shall ensure that the requirements of this section are met. Each employer is responsible for seeing that facilities for their own employees are provided.

(b) Each employer shall ensure, at the beginning of each shift, that the sanitation facilities required by this section are inspected. If any facility or unit fails to meet the following requirements, immediate corrective action shall be taken. Such action shall be documented and maintained at the site for at least 72 hours. Inspection shall establish:

(i) Potable water: Sufficient supply of water, sufficient supply of cups, container integrity, cleanliness of unit and area, capacity of trash receptacle (empty).

(ii) Wash water: Sufficient supply of clean water, proper temperature, sufficient supply of towels, sufficient supply of cleansing agents, container integrity, cleanliness of unit and area without the presence of physical hazards, capacity of trash receptacle (empty).

(iii) Toilets: Sufficient supply of toilet tissue and sanitary seat covers, capacity and condition of chemical agent, capacity and condition of holding tank, cleanliness of unit and area without the presence of physical hazards, physical and structural condition of unit, condition of lock, condition of toilet seat and tissue holder, absence of all foreign debris.

(c) The location of the facilities required by subsections (1), (2) and (4) of this section shall be as close as practical to the highest concentration of employees.

(i) On multistory structures they shall be furnished on every third floor.

(ii) At all sites they shall be located within 200 feet horizontally of all employees.

(iii) The requirements of subsection (5)(c)(i) and (ii) do not apply to mobile crews or to normally unattended work locations as long as employees working at these locations have transportation immediately available, within the normal course of their duties, to nearby facilities otherwise meeting the requirements of this section.

(6) Food handling. All employees' food service facilities and operations shall meet the applicable laws, ordinances and regulations of the jurisdictions in which they are located.

(7) Temporary sleeping quarters. When temporary sleeping quarters are provided, they shall be heated, ventilated and lighted.

AMENDATORY SECTION (Amending Order 74-26, filed 5/7/74, effective 6/6/74)

**WAC 296-155-150 Ionizing radiation.** (1) In construction and related activities involving the use of sources of ionizing radiation, the pertinent provisions of the (~~Atomic Energy~~) Nuclear Regulatory Commission's Standards for Protection Against Radiation, relating to protection against occupational radiation exposure, shall apply.

(2) Any activity which involves the use of radioactive material or x-ray, whether or not under license from the (~~Atomic Energy~~) Nuclear Regulatory Commission, shall be performed by competent persons specially trained in the proper and safe operation of such equipment. In the case of

materials used under commission license, only persons actually licensed, or competent persons under direction and supervision of the licensee shall perform such work.

**AMENDATORY SECTION** (Amending Order 88-11, filed 7/6/88)

**WAC 296-155-160 Gases, vapors, fumes, dusts, and mists.** (1) Exposure of employees to inhalation, ingestion, skin absorption, or contact with any material or substance at a concentration above those specified in the general occupational health standards, WAC 296-62-07515 shall be avoided.

(2) To achieve compliance with subsection (1) of this section, administrative or engineering controls must first be implemented whenever feasible. When such controls are not feasible to achieve full compliance, protective equipment or other protective measures shall be used to keep the exposure of employees to air contaminants within the limits prescribed in WAC 296-62-07515. Any equipment and technical measures used for this purpose must first be approved for each particular use by a competent industrial hygienist or other technically qualified person. Whenever respirators are used, their use shall comply with WAC 296-155-220.

(3) Whenever internal combustion equipment exhausts in enclosed spaces, tests shall be made and recorded to ensure that employees are not exposed to unsafe concentrations of toxic gases or oxygen deficient atmospheres. See chapter 296-62 WAC, the general occupational health standards.

(4) Whenever any employee is exposed to asbestos, the provisions of the general occupational health standards, chapter 296-62 WAC shall apply.

(5) Subsections (1) and (2) of this section do not apply to the exposure of employees to formaldehyde. Whenever any employee is exposed to formaldehyde, the requirements of WAC ((296-62-07530)) 296-62-07540 shall apply.

**AMENDATORY SECTION** (Amending Order 93-06, filed 10/20/93, effective 12/1/93)

**WAC 296-155-174 Cadmium.** (1) Scope. This standard applies to all occupational exposures to cadmium and cadmium compounds, in all forms, in all construction work where an employee may potentially be exposed to cadmium. Construction work is defined as work involving construction, alteration, and/or repair, including but not limited to the following:

(a) Wrecking, demolition, or salvage of structures where cadmium or materials containing cadmium are present;

(b) Use of cadmium containing-paints and cutting, brazing, burning, grinding, or welding on surfaces that were painted with cadmium-containing paints;

(c) Construction, alteration, repair, maintenance, or renovation of structures, substrates, or portions thereof, that contain cadmium, or materials containing cadmium;

(d) Cadmium welding; cutting and welding cadmium-plated steel; brazing or welding with cadmium alloys;

(e) Installation of products containing cadmium;

(f) Electrical grounding with cadmium-welding, or electrical work using cadmium-coated conduit;

(g) Maintaining or retrofitting cadmium-coated equipment;

(h) Cadmium contamination/emergency cleanup; and  
(i) Transportation, disposal, storage, or containment of cadmium or materials containing cadmium on the site or location at which construction activities are performed.

(2) Definitions.

(a) Action level (AL) is defined as an airborne concentration of cadmium of 2.5 micrograms per cubic meter of air ( $2.5 \mu\text{g}/\text{m}^3$ ), calculated as an 8-hour time-weighted average (TWA).

(b) Authorized person means any person authorized by the employer and required by work duties to be present in regulated areas or any person authorized by WISHA or regulations issued under it to be in regulated areas.

(c) Competent person, in accordance with WAC 296-155-012(4), means a person designated by the employer to act on the employer's behalf who is capable of identifying existing and potential cadmium hazards in the workplace and the proper methods to control them in order to protect workers, and has the authority necessary to take prompt corrective measures to eliminate or control such hazards. The duties of a competent person include at least the following: Determining prior to the performance of work whether cadmium is present in the workplace; establishing, where necessary, regulated areas and assuring that access to and from those areas is limited to authorized employees; assuring the adequacy of any employee exposure monitoring required by this standard; assuring that all employees exposed to air cadmium levels above the PEL wear appropriate personal protective equipment and are trained in the use of appropriate methods of exposure control; assuring that proper hygiene facilities are provided and that workers are trained to use those facilities; and assuring that the engineering controls required by this standard are implemented, maintained in proper operating condition, and functioning properly.

(d) Director means the director of the department of labor and industries or authorized representative.

(e) Employee exposure and similar language referring to the air cadmium level to which an employee is exposed means the exposure to airborne cadmium that would occur if the employee were not using respiratory protective equipment.

(f) Final medical determination is the written medical opinion of the employee's health status by the examining physician under subsection (12)(c) through (l) of this section or, if multiple physician review under subsection (12)(m) of this section or the alternative physician determination under subsection (12)(n) of this section is invoked, it is the final, written medical finding, recommendation or determination that emerges from that process.

(g) High-efficiency particulate air (HEPA) filter means a filter capable of trapping and retaining at least 99.97 percent of mono-dispersed particles of 0.3 micrometers in diameter.

(h) Regulated area means an area demarcated by the employer where an employee's exposure to airborne concentrations of cadmium exceeds, or can reasonably be expected to exceed the permissible exposure limit (PEL).

(i) This section means this cadmium standard.

(3) Permissible exposure limit (PEL). The employer shall assure that no employee is exposed to an airborne concentration of cadmium in excess of five micrograms per

cubic meter of air ( $5 \mu\text{g}/\text{m}^3$ ), calculated as an 8-hour time-weighted average exposure (TWA).

(4) Exposure monitoring

(a) General.

(i) Prior to the performance of any construction work where employees may be potentially exposed to cadmium, the employer shall establish the applicability of this standard by determining whether cadmium is present in the workplace and whether there is the possibility that employee exposures will be at or above the action level. The employer shall designate a competent person who shall make this determination. Investigation and material testing techniques shall be used, as appropriate, in the determination. Investigation shall include a review of relevant plans, past reports, material safety data sheets, and other available records, and consultations with the property owner and discussions with appropriate individuals and agencies.

(ii) Where cadmium has been determined to be present in the workplace, and it has been determined that there is a possibility the employee's exposure will be at or above the action level, the competent person shall identify employees potentially exposed to cadmium at or above the action level.

(iii) Determinations of employee exposure shall be made from breathing-zone air samples that reflect the monitored employee's regular, daily 8-hour TWA exposure to cadmium.

(iv) Eight-hour TWA exposures shall be determined for each employee on the basis of one or more personal breathing-zone air samples reflecting full shift exposure on each shift, for each job classification, in each work area. Where several employees perform the same job tasks, in the same job classification, on the same shift, in the same work area, and the length, duration, and level of cadmium exposures are similar, an employer may sample a representative fraction of the employees instead of all employees in order to meet this requirement. In representative sampling, the employer shall sample the employee(s) expected to have the highest cadmium exposures.

(b) Specific.

(i) Initial monitoring. Except as provided for in (b)(iii) of this subsection, where a determination conducted under (a)(i) of this subsection shows the possibility of employee exposure to cadmium at or above the action level, the employer shall conduct exposure monitoring as soon as practicable that is representative of the exposure for each employee in the workplace who is or may be exposed to cadmium at or above the action level.

(ii) In addition, if the employee periodically performs tasks that may expose the employee to a higher concentration of airborne cadmium, the employee shall be monitored while performing those tasks.

(iii) Where the employer has objective data, as defined in subsection (14)(b) of this section, demonstrating that employee exposure to cadmium will not exceed airborne concentrations at or above the action level under the expected conditions of processing, use, or handling, the employer may rely upon such data instead of implementing initial monitoring.

(iv) Where a determination conducted under (a) or (b) of this subsection is made that a potentially exposed employee is not exposed to airborne concentrations of cadmium at or above the action level, the employer shall make a written

record of such determination. The record shall include at least the monitoring data developed under (b)(i) through (iii) of this subsection, where applicable, and shall also include the date of determination, and the name and Social Security number of each employee.

(c) Monitoring frequency (periodic monitoring).

(i) If the initial monitoring or periodic monitoring reveals employee exposures to be at or above the action level, the employer shall monitor at a frequency and pattern needed to assure that the monitoring results reflect with reasonable accuracy the employee's typical exposure levels, given the variability in the tasks performed, work practices, and environmental conditions on the job site, and to assure the adequacy of respiratory selection and the effectiveness of engineering and work practice controls.

(ii) If the initial monitoring or the periodic monitoring indicates that employee exposures are below the action level and that result is confirmed by the results of another monitoring taken at least seven days later, the employer may discontinue the monitoring for those employees whose exposures are represented by such monitoring.

(d) Additional monitoring. The employer also shall institute the exposure monitoring required under (b)(i) and (c) of this subsection whenever there has been a change in the raw materials, equipment, personnel, work practices, or finished products that may result in additional employees being exposed to cadmium at or above the action level or in employees already exposed to cadmium at or above the action level being exposed above the PEL, or whenever the employer or competent person has any reason to suspect that any other change might result in such further exposure.

(e) Employee notification of monitoring results.

(i) No later than five working days after the receipt of the results of any monitoring performed under this section, the employer shall notify each affected employee individually in writing of the results. In addition, within the same time period, the employer shall post the results of the exposure monitoring in an appropriate location that is accessible to all affected employees.

(ii) Wherever monitoring results indicate that employee exposure exceeds the PEL, the employer shall include in the written notice a statement that the PEL has been exceeded and a description of the corrective action being taken by the employer to reduce employee exposure to or below the PEL.

(f) Accuracy of measurement. The employer shall use a method of monitoring and analysis that has an accuracy of not less than plus or minus 25 percent ( $\pm 25\%$ ), with a confidence level of 95 percent, for airborne concentrations of cadmium at or above the action level and the permissible exposure limit.

(5) Regulated areas.

(a) Establishment. The employer shall establish a regulated area wherever an employee's exposure to airborne concentrations of cadmium is, or can reasonably be expected to be in excess of the permissible exposure limit (PEL).

(b) Demarcation. Regulated areas shall be demarcated from the rest of the workplace in any manner that adequately establishes and alerts employees of the boundaries of the regulated area, including employees who are or may be incidentally in the regulated areas, and that protects persons outside the area from exposure to airborne concentrations of cadmium in excess of the PEL.

(c) Access. Access to regulated areas shall be limited to authorized persons.

(d) Provision of respirators. Each person entering a regulated area shall be supplied with and required to use a respirator, selected in accordance with subsection (7)(b) of this section.

(e) Prohibited activities. The employer shall assure that employees do not eat, drink, smoke, chew tobacco or gum, or apply cosmetics in regulated areas, or carry the products associated with any of these activities into regulated areas or store such products in those areas.

(6) Methods of compliance.

(a) Compliance hierarchy.

(i) Except as specified in (a)(ii) of this subsection, the employer shall implement engineering and work practice controls to reduce and maintain employee exposure to cadmium at or below the PEL, except to the extent that the employer can demonstrate that such controls are not feasible.

(ii) The requirement to implement engineering controls to achieve the PEL does not apply where the employer demonstrates the following:

(A) The employee is only intermittently exposed; and

(B) The employee is not exposed above the PEL on 30 or more days per year (12 consecutive months).

(iii) Wherever engineering and work practice controls are not sufficient to reduce employee exposure to or below the PEL, the employer nonetheless shall implement such controls to reduce exposures to the lowest levels achievable. The employer shall supplement such controls with respiratory protection that complies with the requirements of subsection (7) of this section and the PEL.

(iv) The employer shall not use employee rotation as a method of compliance.

(b) Specific operations.

(i) Abrasive blasting. Abrasive blasting on cadmium or cadmium-containing materials shall be conducted in a manner that will provide adequate protection.

(ii) Heating cadmium and cadmium-containing materials. Welding, cutting, and other forms of heating of cadmium or cadmium-containing materials shall be conducted in accordance with the requirements of WAC 296-155-415 and 296-155-420, where applicable.

(c) Prohibitions.

(i) High speed abrasive disc saws and similar abrasive power equipment shall not be used for work on cadmium or cadmium-containing materials unless they are equipped with appropriate engineering controls to minimize emissions, if the exposure levels are above the PEL.

(ii) Materials containing cadmium shall not be applied by spray methods, if exposures are above the PEL, unless employees are protected with supplied-air respirators with full facepiece, hood, helmet, suit, operated in positive pressure mode and measures are instituted to limit overspray and prevent contamination of adjacent areas.

(d) Mechanical ventilation.

(i) When ventilation is used to control exposure, measurements that demonstrate the effectiveness of the system in controlling exposure, such as capture velocity, duct velocity, or static pressure shall be made as necessary to maintain its effectiveness.

(ii) Measurements of the system's effectiveness in controlling exposure shall be made as necessary within five

working days of any change in production, process, or control that might result in a significant increase in employee exposure to cadmium.

(iii) Recirculation of air. If air from exhaust ventilation is recirculated into the workplace, the system shall have a high efficiency filter and be monitored to assure effectiveness.

(iv) Procedures shall be developed and implemented to minimize employee exposure to cadmium when maintenance of ventilation systems and changing of filters is being conducted.

(e) Compliance program.

(i) Where employee exposure to cadmium exceeds the PEL and the employer is required under (a) of this subsection to implement controls to comply with the PEL, prior to the commencement of the job the employer shall establish and implement a written compliance program to reduce employee exposure to or below the PEL. To the extent that engineering and work practice controls cannot reduce exposures to or below the PEL, the employer shall include in the written compliance program the use of appropriate respiratory protection to achieve compliance with the PEL.

(ii) Written compliance programs shall be reviewed and updated as often and as promptly as necessary to reflect significant changes in the employer's compliance status or significant changes in the lowest air cadmium level that is technologically feasible.

(iii) A competent person shall review the comprehensive compliance program initially and after each change.

(iv) Written compliance programs shall be provided upon request for examination and copying to the director, or authorized representatives, affected employees, and designated employee representatives.

(7) Respirator protection.

(a) General. Where respirators are required by this section, the employer shall provide them at no cost to the employee and shall assure that they are used in compliance with the requirements of this section. Respirators shall be used in the following circumstances:

(i) Where exposure levels exceed the PEL, during the time period necessary to install or implement feasible engineering and work practice controls;

(ii) In those maintenance and repair activities and during those brief or intermittent operations where exposures exceed the PEL and engineering and work practice controls are not feasible, or are not required;

(iii) In regulated areas, as prescribed in subsection (5) of this section;

(iv) Where the employer has implemented all feasible engineering and work practice controls and such controls are not sufficient to reduce exposures to or below the PEL;

(v) In emergencies;

(vi) Wherever an employee who is exposed to cadmium at or above the action level requests a respirator; and

(vii) Wherever an employee is exposed to cadmium above the PEL and engineering controls are not required under (a)(ii) of this subsection.

(b) Respirator selection.

(i) Where respirators are required under this section, the employer shall select and provide the appropriate respirator as specified in Table 1. The employer shall select respirators from among those jointly approved as acceptable

protection against cadmium dust, fume, and mist by the Mine Safety and Health Administration (MSHA) and by the National Institute for Occupational Safety and Health (NIOSH) under the provisions of 30 CFR Part 11.

**Table 1**  
**Respiratory Protection for Cadmium**

Airborne concentration or condition of use <sup>a</sup>	Required respirator type <sup>b</sup>
10 x or less	A half-mask, air-purifying respirator equipped with a HEPA <sup>c</sup> filter. <sup>d</sup>
25 x or less	A powered air-purifying respirator ("PAPR") with a loose-fitting hood or helmet equipped with a HEPA filter, or a supplied-air respirator with a loose-fitting hood or helmet facepiece operated in the continuous flow mode.
50 x or less	A full facepiece air-purifying respirator equipped with a HEPA filter, or a powered air-purifying respirator with a tight-fitting half-mask equipped with a HEPA filter, or a supplied air respirator with a tight-fitting half-mask operated in the continuous flow mode.
250 x or less	A powered air-purifying respirator with a tight-fitting full facepiece equipped with a HEPA filter, or a supplied-air respirator with a tight-fitting full facepiece operated in the continuous flow mode.
1000 x or less	A supplied-air respirator with half-mask or full facepiece operated in the pressure demand or other positive pressure mode.
>1000 x or unknown concentrations	A self-contained breathing apparatus with a full facepiece operated in the pressure demand or other positive pressure mode, or a supplied-air respirator with a full facepiece operated in the pressure demand or other positive pressure mode and equipped with an auxiliary escape type self-contained breathing apparatus operated in the pressure demand mode.
Fire fighting	A self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

Note:  
<sup>a</sup> Concentrations expressed as multiple of the PEL.

<sup>b</sup> Respirators assigned for higher environmental concentrations may be used at lower exposure levels. Quantitative fit testing is required for all tight-fitting air purifying respirators where airborne concentration of cadmium exceeds 10 times the TWA PEL ( $10 \times 5 \mu\text{g}/\text{m}^3 = 50 \mu\text{g}/\text{m}^3$ ). A full facepiece respirator is required when eye irritation is experienced.  
<sup>c</sup> HEPA means High Efficiency Particulate Air.  
<sup>d</sup> Fit testing, qualitative or quantitative, is required.  
Source: Respiratory Decision Logic, NIOSH, 1987.

- (ii) The employer shall provide a powered, air-purifying respirator (PAPR) in lieu of a negative pressure respirator wherever:
  - (A) An employee entitled to a respirator chooses to use this type of respirator; and
  - (B) This respirator will provide adequate protection to the employee.
- (c) Respirator program.
  - (i) Where respiratory protection is required, the employer shall institute a respirator protection program in accordance with chapter 296-62 WAC, Part E.
  - (ii) The employer shall permit each employee who is required to use an air purifying respirator to leave the regulated area to change the filter elements or replace the respirator whenever an increase in breathing resistance is detected and shall maintain an adequate supply of filter elements for this purpose.
  - (iii) The employer shall also permit each employee who is required to wear a respirator to leave the regulated area to wash his or her face and the respirator facepiece whenever necessary to prevent skin irritation associated with respirator use.
  - (iv) If an employee exhibits difficulty in breathing while wearing a respirator during a fit test or during use, the employer shall make available to the employee a medical examination in accordance with subsection (12)(f)(ii) of this section to determine if the employee can wear a respirator while performing the required duties.
  - (v) No employee shall be assigned a task requiring the use of a respirator if, based upon his or her most recent examination, an examining physician determines that the employee will be unable to continue to function normally while wearing a respirator. If the physician determines the employee must be limited in, or removed from his or her current job because of the employee's inability to wear a respirator, the limitation or removal shall be in accordance with subsection (12)(k) and (l) of this section.
- (d) Respirator fit testing.
  - (i) The employer shall assure that the respirator issued to the employee is fitted properly and exhibits the least possible facepiece leakage.
  - (ii) For each employee wearing a tight-fitting, air purifying respirator (either negative or positive pressure) who is exposed to airborne concentrations of cadmium that do not exceed 10 times the PEL ( $10 \times 5 \mu\text{g}/\text{m}^3 = 50 \mu\text{g}/\text{m}^3$ ), the employer shall perform either quantitative or qualitative fit testing at the time of initial fitting and at least annually thereafter. If quantitative fit testing is used for a negative pressure respirator, a fit factor that is at least 10 times the protection factor for that class of respirators (Table 1 in (b)(i) of this subsection) shall be achieved at testing.
  - (iii) For each employee wearing a tight-fitting air purifying respirator (either negative or positive pressure) who is exposed to airborne concentrations of cadmium that

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exceed 10 times the PEL ( $10 \times 5 \mu\text{g}/\text{m}^3 = 50 \mu\text{g}/\text{m}^3$ ), the employer shall perform quantitative fit testing at the time of initial fitting and at least annually thereafter. For negative-pressure respirators, a fit factor that is at least ten times the protection factor for that class of respirators (Table 1 in (b)(i) of this subsection) shall be achieved during quantitative fit testing.

(iv) For each employee wearing a tight-fitting, supplied-air respirator or self-contained breathing apparatus, the employer shall perform quantitative fit testing at the time of initial fitting and at least annually thereafter. This shall be accomplished by fit testing an air purifying respirator of identical type facepiece, make, model, and size as the supplied air respirator or self-contained breathing apparatus that is equipped with HEPA filters and tested as a surrogate (substitute) in the negative pressure mode. A fit factor that is at least 10 times the protection factor for that class of respirators (Table 1 in (b)(i) of this subsection) shall be achieved during quantitative fit testing. A supplied-air respirator or self-contained breathing apparatus with the same type facepiece, make, model, and size as the air purifying respirator with which the employee passed the quantitative fit test may then be used by that employee up to the protection factor listed in Table 1 in (b)(i) of this subsection for that class of respirators.

(v) Fit testing shall be conducted in accordance with WAC 296-62-07445. Appendix C.

(8) Emergency situations. The employer shall develop and implement a written plan for dealing with emergency situations involving substantial releases of airborne cadmium. The plan shall include provisions for the use of appropriate respirators and personal protective equipment. In addition, employees not essential to correcting the emergency situation shall be restricted from the area and normal operations halted in that area until the emergency is abated.

(9) Protective work clothing and equipment

(a) Provision and use. If an employee is exposed to airborne cadmium above the PEL or where skin or eye irritation is associated with cadmium exposure at any level, the employer shall provide at no cost to the employee, and assure that the employee uses, appropriate protective work clothing and equipment that prevents contamination of the employee and the employee's garments. Protective work clothing and equipment includes, but is not limited to:

- (i) Coveralls or similar full-body work clothing;
- (ii) Gloves, head coverings, and boots or foot coverings; and
- (iii) Face shields, vented goggles, or other appropriate protective equipment that complies with WAC 296-155-215.

(b) Removal and storage.

(i) The employer shall assure that employees remove all protective clothing and equipment contaminated with cadmium at the completion of the work shift and do so only in change rooms provided in accordance with subsection (10)(a) of this section.

(ii) The employer shall assure that no employee takes cadmium-contaminated protective clothing or equipment from the workplace, except for employees authorized to do so for purposes of laundering, cleaning, maintaining, or disposing of cadmium-contaminated protective clothing and equipment at an appropriate location or facility away from the workplace.

(iii) The employer shall assure that contaminated protective clothing and equipment, when removed for laundering, cleaning, maintenance, or disposal, is placed and stored in sealed, impermeable bags or other closed, impermeable containers that are designed to prevent dispersion of cadmium dust.

(iv) The employer shall assure that containers of contaminated protective clothing and equipment that are to be taken out of the change rooms or the workplace for laundering, cleaning, maintenance or disposal shall bear labels in accordance with subsection (13)(c) of this section.

(c) Cleaning, replacement, and disposal.

(i) The employer shall provide the protective clothing and equipment required by (a) of this subsection in a clean and dry condition as often as necessary to maintain its effectiveness, but in any event at least weekly. The employer is responsible for cleaning and laundering the protective clothing and equipment required by this subsection to maintain its effectiveness and is also responsible for disposing of such clothing and equipment.

(ii) The employer also is responsible for repairing or replacing required protective clothing and equipment as needed to maintain its effectiveness. When rips or tears are detected while an employee is working they shall be immediately mended, or the worksuit shall be immediately replaced.

(iii) The employer shall prohibit the removal of cadmium from protective clothing and equipment by blowing, shaking, or any other means that disperses cadmium into the air.

(iv) The employer shall assure that any laundering of contaminated clothing or cleaning of contaminated equipment in the workplace is done in a manner that prevents the release of airborne cadmium in excess of the permissible exposure limit prescribed in subsection (3) of this section.

(v) The employer shall inform any person who launders or cleans protective clothing or equipment contaminated with cadmium of the potentially harmful effects of exposure to cadmium, and that the clothing and equipment should be laundered or cleaned in a manner to effectively prevent the release of airborne cadmium in excess of the PEL.

(10) Hygiene areas and practices.

(a) General. For employees whose airborne exposure to cadmium is above the PEL, the employer shall provide clean change rooms, handwashing facilities, showers, and lunchroom facilities that comply with WAC 296-155-140.

(b) Change rooms. The employer shall assure that change rooms are equipped with separate storage facilities for street clothes and for protective clothing and equipment, which are designed to prevent dispersion of cadmium and contamination of the employee's street clothes.

(c) Showers and handwashing facilities.

(i) The employer shall assure that employees whose airborne exposure to cadmium is above the PEL shower during the end of the work shift.

(ii) The employer shall assure that employees who are exposed to cadmium above the PEL wash their hands and faces prior to eating, drinking, smoking, chewing tobacco or gum, or applying cosmetics.

(d) Lunchroom facilities.

(i) The employer shall assure that the lunchroom facilities are readily accessible to employees, that tables for

eating are maintained free of cadmium, and that no employee in a lunchroom facility is exposed at any time to cadmium at or above a concentration of 2.5 µg/m<sup>3</sup>.

(ii) The employer shall assure that employees do not enter lunchroom facilities with protective work clothing or equipment unless surface cadmium has been removed from the clothing and equipment by HEPA vacuuming or some other method that removes cadmium dust without dispersing it.

(11) Housekeeping.

(a) All surfaces shall be maintained as free as practicable of accumulations of cadmium.

(b) All spills and sudden releases of material containing cadmium shall be cleaned up as soon as possible.

(c) Surfaces contaminated with cadmium shall, wherever possible, be cleaned by vacuuming or other methods that minimize the likelihood of cadmium becoming airborne.

(d) HEPA-filtered vacuuming equipment or equally effective filtration methods shall be used for vacuuming. The equipment shall be used and emptied in a manner that minimizes the reentry of cadmium into the workplace.

(e) Shoveling, dry or wet sweeping, and brushing may be used only where vacuuming or other methods that minimize the likelihood of cadmium becoming airborne have been tried and found not to be effective.

(f) Compressed air shall not be used to remove cadmium from any surface unless the compressed air is used in conjunction with a ventilation system designed to capture the dust cloud created by the compressed air.

(g) Waste, scrap, debris, bags, containers, personal protective equipment, and clothing contaminated with cadmium and consigned for disposal shall be collected and disposed of in sealed impermeable bags or other closed, impermeable containers. These bags and containers shall be labeled in accordance with subsection (13)(b) of this section.

(12) Medical surveillance.

(a) General.

(i) Scope.

(A) Currently exposed—The employer shall institute a medical surveillance program for all employees who are or may be exposed at or above the action level and all employees who perform the following tasks, operations, or jobs: Electrical grounding with cadmium-welding; cutting, brazing, burning, grinding, or welding on surfaces that were painted with cadmium-containing paints; electrical work using cadmium-coated conduit; use of cadmium containing paints; cutting and welding cadmium-plated steel; brazing or welding with cadmium alloys; fusing of reinforced steel by cadmium welding; maintaining or retrofitting cadmium-coated equipment; and, wrecking and demolition where cadmium is present. A medical surveillance program will not be required if the employer demonstrates that the employee:

(I) Is not currently exposed by the employer to airborne concentrations of cadmium at or above the action level on 30 or more days per year (twelve consecutive months); and

(II) Is not currently exposed by the employer in those tasks on 30 or more days per year (twelve consecutive months).

(B) Previously exposed—The employer shall also institute a medical surveillance program for all employees who might previously have been exposed to cadmium by the employer prior to the effective date of this section in tasks

specified under (a)(i)(A) of this subsection, unless the employer demonstrates that the employee did not in the years prior to the effective date of this section work in those tasks for the employer with exposure to cadmium for an aggregated total of more than 12 months.

(ii) To determine an employee's fitness for using a respirator, the employer shall provide the limited medical examination specified in (f) of this subsection.

(iii) The employer shall assure that all medical examinations and procedures required by this section are performed by or under the supervision of a licensed physician, who has read and is familiar with the health effects WAC 296-62-07441, Appendix A, the regulatory text of this section, the protocol for sample handling and lab selection in WAC 296-62-07451, Appendix F, and the questionnaire of WAC 296-62-07447, Appendix D.

(iv) The employer shall provide the medical surveillance required by this section, including multiple physician review under (m) of this subsection without cost to employees, and at a time and place that is reasonable and convenient to employees.

(v) The employer shall assure that the collecting and handling of biological samples of cadmium in urine (CdU), cadmium in blood (CdB), and beta-2 microglobulin in urine (B<sub>2</sub>-M) taken from employees under this section is done in a manner that assures their reliability and that analysis of biological samples of cadmium in urine (CdU), cadmium in blood (CdB), and beta-2 microglobulin in urine (B<sub>2</sub>-M) taken from employees under this section is performed in laboratories with demonstrated proficiency to perform the particular analysis. (See WAC 296-62-07451, Appendix F.)

(b) Initial examination.

(i) For employees covered by medical surveillance under (a)(i) of this subsection, the employer shall provide an initial medical examination. The examination shall be provided to those employees within 30 days after initial assignment to a job with exposure to cadmium or no later than 90 days after the effective date of this section, whichever date is later.

(ii) The initial medical examination shall include:

(A) A detailed medical and work history, with emphasis on: Past, present, and anticipated future exposure to cadmium; any history of renal, cardiovascular, respiratory, hematopoietic, reproductive, and/or musculo-skeletal system dysfunction; current usage of medication with potential nephrotoxic side-effects; and smoking history and current status; and

(B) Biological monitoring that includes the following tests:

(I) Cadmium in urine (CdU), standardized to grams of creatinine (g/Cr);

(II) Beta-2 microglobulin in urine (B<sub>2</sub>-M), standardized to grams of creatinine (g/Cr), with pH specified, as described in WAC 296-62-07451, Appendix F; and

(III) Cadmium in blood (CdB), standardized to liters of whole blood (lwb).

(iii) Recent examination: An initial examination is not required to be provided if adequate records show that the employee has been examined in accordance with the requirements of (b)(ii) of this subsection within the past 12 months. In that case, such records shall be maintained as part of the employee's medical record and the prior exam shall be

treated as if it were an initial examination for the purposes of (c) and (d) of this subsection.

(c) Actions triggered by initial biological monitoring.

(i) If the results of the biological monitoring tests in the initial examination show the employee's CdU level to be at or below 3 µg/g Cr, B<sub>2</sub>-M level to be at or below 300 µg/g Cr and CdB level to be at or below 5 µg/lwb, then:

(A) For employees who are subject to medical surveillance under (a)(i)(A) of this subsection because of current or anticipated exposure to cadmium, the employer shall provide the minimum level of periodic medical surveillance in accordance with the requirements in (d)(i) of this subsection; and

(B) For employees who are subject to medical surveillance under (a)(i)(B) of this subsection because of prior but not current exposure, the employer shall provide biological monitoring for CdU, B<sub>2</sub>-M, and CdB one year after the initial biological monitoring and then the employer shall comply with the requirements of (d)(vi) of this subsection.

(ii) For all employees who are subject to medical surveillance under (a)(i) of this subsection, if the results of the initial biological monitoring tests show the level of CdU to exceed 3 µg/g Cr, the level of B<sub>2</sub>-M to be in excess of 300 µg/g Cr, or the level of CdB to be in excess of 5 µg/lwb, the employer shall:

(A) Within two weeks after receipt of biological monitoring results, reassess the employee's occupational exposure to cadmium as follows:

(I) Reassess the employee's work practices and personal hygiene;

(II) Reevaluate the employee's respirator use, if any, and the respirator program;

(III) Review the hygiene facilities;

(IV) Reevaluate the maintenance and effectiveness of the relevant engineering controls;

(V) Assess the employee's smoking history and status;

(B) Within 30 days after the exposure reassessment, specified in (c)(ii)(A) of this subsection, take reasonable steps to correct any deficiencies found in the reassessment that may be responsible for the employee's excess exposure to cadmium; and

(C) Within 90 days after receipt of biological monitoring results, provide a full medical examination to the employee in accordance with the requirements of (d)(ii) of this subsection. After completing the medical examination, the examining physician shall determine in a written medical opinion whether to medically remove the employee. If the physician determines that medical removal is not necessary, then until the employee's CdU level falls to or below 3 µg/g Cr, B<sub>2</sub>-M level falls to or below 300 µg/g Cr and CdB level falls to or below 5 µg/lwb, the employer shall:

(I) Provide biological monitoring in accordance with (b)(ii)(B) of this subsection on a semiannual basis; and

(II) Provide annual medical examinations in accordance with (d)(ii) of this subsection.

(iii) For all employees who are subject to medical surveillance under (a)(i) of this subsection, if the results of the initial biological monitoring tests show the level of CdU to be in excess of 15 µg/g Cr, or the level of CdB to be in excess of 15 µg/lwb, or the level of B<sub>2</sub>-M to be in excess of 1,500 µg/g Cr, the employer shall comply with the requirements of (c)(ii)(A) and (B) of this subsection. Within 90

days after receipt of biological monitoring results, the employer shall provide a full medical examination to the employee in accordance with the requirements of (d)(ii) of this subsection. After completing the medical examination, the examining physician shall determine in a written medical opinion whether to medically remove the employee. However, if the initial biological monitoring results and the biological monitoring results obtained during the medical examination both show that: CdU exceeds 15 µg/g Cr; or CdB exceeds 15 µg/lwb; or B<sub>2</sub>-M exceeds 1500 µg/g Cr, and in addition CdU exceeds 3 µg/g Cr or CdB exceeds 5 µg/liter of whole blood, then the physician shall medically remove the employee from exposure to cadmium at or above the action level. If the second set of biological monitoring results obtained during the medical examination does not show that a mandatory removal trigger level has been exceeded, then the employee is not required to be removed by the mandatory provisions of this section. If the employee is not required to be removed by the mandatory provisions of this section or by the physician's determination, then until the employee's CdU level falls to or below 3 µg/g Cr, B<sub>2</sub>-M level falls to or below 300 µg/g Cr and CdB level falls to or below 5 µg/lwb, the employer shall:

(A) Periodically reassess the employee's occupational exposure to cadmium;

(B) Provide biological monitoring in accordance with (b)(ii)(B) of this subsection on a quarterly basis; and

(C) Provide semiannual medical examinations in accordance with (d)(ii) of this subsection.

(iv) For all employees to whom medical surveillance is provided, beginning on January 1, 1999, and in lieu of (c)(iii) of this subsection, whenever the results of initial biological monitoring tests show the employee's CdU level to be in excess of 7 µg/g Cr, or B<sub>2</sub>-M level to be in excess of 750 µg/g Cr, or CdB level to be in excess of 10 µg/lwb, the employer shall comply with the requirements of (c)(ii)(A) and (B) of this subsection. Within 90 days after receipt of biological monitoring results, the employer shall provide a full medical examination to the employee in accordance with the requirements of (d)(ii) of this subsection. After completing the medical examination, the examining physician shall determine in a written medical opinion whether to medically remove the employee. However, if the initial biological monitoring results and the biological monitoring results obtained during the medical examination both show that: CdU exceeds 7 µg/g Cr; or CdB exceeds 10 µg/lwb; or B<sub>2</sub>-M exceeds 750 µg/g Cr, and in addition CdU exceeds 3 µg/g Cr or CdB exceeds 5 µg/liter of whole blood, then the physician shall medically remove the employee from exposure to cadmium at or above the action level. If the second set of biological monitoring results obtained during the medical examination does not show that a mandatory removal trigger level has been exceeded, then the employee is not required to be removed by the mandatory provisions of this section. If the employee is not required to be removed by the mandatory provisions of this section or by the physician's determination, then until the employee's CdU level falls to or below 3 µg/g Cr, B<sub>2</sub>-M level falls to or below 300 µg/g Cr and CdB level falls to or below 5 µg/lwb, the employer shall:

(A) Periodically reassess the employee's occupational exposure to cadmium;

(B) Provide biological monitoring in accordance with (b)(ii)(B) of this subsection on a quarterly basis; and

(C) Provide semiannual medical examinations in accordance with (d)(ii) of this subsection.

(d) Periodic medical surveillance.

(i) For each employee who is covered by medical surveillance under (a)(i)(A) of this subsection because of current or anticipated exposure to cadmium, the employer shall provide at least the minimum level of periodic medical surveillance, which consists of periodic medical examinations and periodic biological monitoring. A periodic medical examination shall be provided within one year after the initial examination required by (b) of this subsection and thereafter at least biennially. Biological sampling shall be provided at least annually either as part of a periodic medical examination or separately as periodic biological monitoring.

(ii) The periodic medical examination shall include:

(A) A detailed medical and work history, or update thereof, with emphasis on: Past, present, and anticipated future exposure to cadmium; smoking history and current status; reproductive history; current use of medications with potential nephrotoxic side-effects; any history of renal, cardiovascular, respiratory, hematopoietic, and/or musculoskeletal system dysfunction; and as part of the medical and work history, for employees who wear respirators, questions 3 through 11 and 25 through 32 in WAC 296-62-07447, Appendix D;

(B) A complete physical examination with emphasis on: Blood pressure, the respiratory system, and the urinary system;

(C) A 14 inch by 17 inch, or a reasonably standard sized posterior-anterior chest x-ray (after the initial x-ray, the frequency of chest x-rays is to be determined by the examining physician);

(D) Pulmonary function tests, including forced vital capacity (FVC) and forced expiratory volume at 1 second (FEV1);

(E) Biological monitoring, as required in (b)(ii)(B) of this subsection;

(F) Blood analysis, in addition to the analysis required under (b)(ii)(B) of this subsection, including blood urea nitrogen, complete blood count, and serum creatinine;

(G) Urinalysis, in addition to the analysis required under (b)(ii)(B) of this subsection, including the determination of albumin, glucose, and total and low molecular weight proteins;

(H) For males over 40 years old, prostate palpation, or other at least as effective diagnostic test(s); and

(I) Any additional tests or procedures deemed appropriate by the examining physician.

(iii) Periodic biological monitoring shall be provided in accordance with (b)(ii)(B) of this subsection.

(iv) If the results of periodic biological monitoring or the results of biological monitoring performed as part of the periodic medical examination show the level of the employee's CdU, B<sub>2</sub>-M, or CdB to be in excess of the levels specified in (c)(ii) and (iii) of this subsection; or, beginning on January 1, 1999, in excess of the levels specified in (c)(ii) or (iv) of this subsection, the employer shall take the appropriate actions specified in (c)(ii) through (iv) of this subsection, respectively.

(v) For previously exposed employees under (a)(i)(B) of this subsection:

(A) If the employee's levels of CdU did not exceed 3 µg/g Cr, CdB did not exceed 5 µg/lwb, and B<sub>2</sub>-M did not exceed 300 µg/g Cr in the initial biological monitoring tests, and if the results of the follow-up biological monitoring required by (c)(i)(B) of this subsection one year after the initial examination confirm the previous results, the employer may discontinue all periodic medical surveillance for that employee.

(B) If the initial biological monitoring results for CdU, CdB, or B<sub>2</sub>-M were in excess of the levels specified in (c)(i) of this subsection, but subsequent biological monitoring results required by (c)(ii) through (iv) of this subsection show that the employee's CdU levels no longer exceed 3 µg/g Cr, CdB levels no longer exceed 5 µg/lwb, and B<sub>2</sub>-M levels no longer exceed 300 µg/g Cr, the employer shall provide biological monitoring for CdU, CdB, and B<sub>2</sub>-M one year after these most recent biological monitoring results. If the results of the follow-up biological monitoring specified in this section, confirm the previous results, the employer may discontinue all periodic medical surveillance for that employee.

(C) However, if the results of the follow-up tests specified in (d)(v)(A) or (B) of this subsection indicate that the level of the employee's CdU, B<sub>2</sub>-M, or CdB exceeds these same levels, the employer is required to provide annual medical examinations in accordance with the provisions of (d)(ii) of this subsection until the results of biological monitoring are consistently below these levels or the examining physician determines in a written medical opinion that further medical surveillance is not required to protect the employee's health.

(vi) A routine, biennial medical examination is not required to be provided in accordance with (c)(i) and (d) of this subsection if adequate medical records show that the employee has been examined in accordance with the requirements of (d)(ii) of this subsection within the past 12 months. In that case, such records shall be maintained by the employer as part of the employee's medical record, and the next routine, periodic medical examination shall be made available to the employee within two years of the previous examination.

(e) Actions triggered by medical examinations. If the results of a medical examination carried out in accordance with this section indicate any laboratory or clinical finding consistent with cadmium toxicity that does not require employer action under (b), (c), or (d) of this subsection, the employer shall take the following steps and continue to take them until the physician determines that they are no longer necessary.

(i) Periodically reassess: The employee's work practices and personal hygiene; the employee's respirator use, if any; the employee's smoking history and status; the respiratory protection program; the hygiene facilities; the maintenance and effectiveness of the relevant engineering controls; and take all reasonable steps to correct the deficiencies found in the reassessment that may be responsible for the employee's excess exposure to cadmium.

(ii) Provide semiannual medical reexaminations to evaluate the abnormal clinical sign(s) of cadmium toxicity

until the results are normal or the employee is medically removed; and

(iii) Where the results of tests for total proteins in urine are abnormal, provide a more detailed medical evaluation of the toxic effects of cadmium on the employee's renal system.

(f) Examination for respirator use.

(i) To determine an employee's fitness for respirator use, the employer shall provide a medical examination that includes the elements specified in (f)(i)(A) through (D) of this subsection. This examination shall be provided prior to the employee's being assigned to a job that requires the use of a respirator or no later than 90 days after this section goes into effect, whichever date is later, to any employee without a medical examination within the preceding 12 months that satisfies the requirements of this section.

(A) A detailed medical and work history, or update thereof, with emphasis on: Past exposure to cadmium; smoking history and current status; any history of renal, cardiovascular, respiratory, hematopoietic, and/or musculoskeletal system dysfunction; a description of the job for which the respirator is required; and questions 3 through 11 and 25 through 32 in WAC 296-62-07447, Appendix D;

(B) A blood pressure test;

(C) Biological monitoring of the employee's levels of CdU, CdB and B<sub>2</sub>-M in accordance with the requirements of (b)(ii)(B) of this subsection, unless such results already have been obtained within the twelve months; and

(D) Any other test or procedure that the examining physician deems appropriate.

(ii) After reviewing all the information obtained from the medical examination required in (f)(i) of this subsection, the physician shall determine whether the employee is fit to wear a respirator.

(iii) Whenever an employee has exhibited difficulty in breathing during a respirator fit test or during use of a respirator, the employer, as soon as possible, shall provide the employee with a periodic medical examination in accordance with (d)(ii) of this subsection to determine the employee's fitness to wear a respirator.

(iv) Where the results of the examination required under (f)(i), (ii), or (iii) of this subsection are abnormal, medical limitation or prohibition of respirator use shall be considered. If the employee is allowed to wear a respirator, the employee's ability to continue to do so shall be periodically evaluated by a physician.

(g) Emergency examinations.

(i) In addition to the medical surveillance required in (b) through (f) of this subsection, the employer shall provide a medical examination as soon as possible to any employee who may have been acutely exposed to cadmium because of an emergency.

(ii) The examination shall include the requirements of (d)(ii), of this subsection, with emphasis on the respiratory system, other organ systems considered appropriate by the examining physician, and symptoms of acute overexposure, as identified in Appendix A, WAC 296-62-07441 (2)(b)(i) and (ii) and (4).

(h) Termination of employment examination.

(i) At termination of employment, the employer shall provide a medical examination in accordance with (d)(ii) of this subsection, including a chest x-ray where necessary, to

any employee to whom at any prior time the employer was required to provide medical surveillance under (a)(i) or (g) of this subsection. However, if the last examination satisfied the requirements of (d)(ii) of this subsection and was less than six months prior to the date of termination, no further examination is required unless otherwise specified in (c) or (e) of this subsection;

(ii) In addition, if the employer has discontinued all periodic medical surveillance under (d)(v) of this subsection, no termination of employment medical examination is required.

(i) Information provided to the physician. The employer shall provide the following information to the examining physician:

(i) A copy of this standard and appendices;

(ii) A description of the affected employee's former, current, and anticipated duties as they relate to the employee's occupational exposure to cadmium;

(iii) The employee's former, current, and anticipated future levels of occupational exposure to cadmium;

(iv) A description of any personal protective equipment, including respirators, used or to be used by the employee, including when and for how long the employee has used that equipment; and

(v) Relevant results of previous biological monitoring and medical examinations.

(j) Physician's written medical opinion.

(i) The employer shall promptly obtain a written, signed, medical opinion from the examining physician for each medical examination performed on each employee. This written opinion shall contain:

(A) The physician's diagnosis for the employee;

(B) The physician's opinion as to whether the employee has any detected medical condition(s) that would place the employee at increased risk of material impairment to health from further exposure to cadmium, including any indications of potential cadmium toxicity;

(C) The results of any biological or other testing or related evaluations that directly assess the employee's absorption of cadmium;

(D) Any recommended removal from, or limitation on the activities or duties of the employee or on the employee's use of personal protective equipment, such as respirators;

(E) A statement that the physician has clearly and carefully explained to the employee the results of the medical examination, including all biological monitoring results and any medical conditions related to cadmium exposure that require further evaluation or treatment, and any limitation on the employee's diet or use of medications.

(ii) The employer shall promptly obtain a copy of the results of any biological monitoring provided by an employer to an employee independently of a medical examination under (b) and (d) of this subsection, and, in lieu of a written medical opinion, an explanation sheet explaining those results.

(iii) The employer shall instruct the physician not to reveal orally or in the written medical opinion given to the employer specific findings or diagnoses unrelated to occupational exposure to cadmium.

(k) Medical removal protection (MRP).

(i) General.

(A) The employer shall temporarily remove an employee from work where there is excess exposure to cadmium on each occasion that medical removal is required under (c), (d), or (f) of this subsection and on each occasion that a physician determines in a written medical opinion that the employee should be removed from such exposure. The physician's determination may be based on biological monitoring results, inability to wear a respirator, evidence of illness, other signs or symptoms of cadmium-related dysfunction or disease, or any other reason deemed medically sufficient by the physician.

(B) The employer shall medically remove an employee in accordance with (k) of this subsection regardless of whether at the time of removal a job is available into which the removed employee may be transferred.

(C) Whenever an employee is medically removed under (k) of this subsection, the employer shall transfer the removed employee to a job where the exposure to cadmium is within the permissible levels specified in subsection (12) of this section as soon as one becomes available.

(D) For any employee who is medically removed under the provisions of (k)(i) of this subsection, the employer shall provide follow-up medical examinations semiannually until, in a written medical opinion, the examining physician determines that either the employee may be returned to his/her former job status or the employee must be permanently removed from excess cadmium exposure.

(E) The employer may not return an employee who has been medically removed for any reason to his/her former job status until a physician determines in a written medical opinion that continued medical removal is no longer necessary to protect the employee's health.

(ii) Where an employee is found unfit to wear a respirator under (f)(ii) of this subsection, the employer shall remove the employee from work where exposure to cadmium is above the PEL.

(iii) Where removal is based upon any reason other than the employee's inability to wear a respirator, the employer shall remove the employee from work where exposure to cadmium is at or above the action level.

(iv) Except as specified in (k)(v) of this subsection, no employee who was removed because his/her level of CdU, CdB and/or B<sub>2</sub>-M exceeded the trigger levels in (c) or (d) of this subsection may be returned to work with exposure to cadmium at or above the action level until the employee's levels of CdU fall to or below 3 µg/g Cr, CdB fall to or below 5 µg/lwb, and B<sub>2</sub>-M fall to or below 300 µg/g Cr.

(v) However, when in the examining physician's opinion continued exposure to cadmium will not pose an increased risk to the employee's health and there are special circumstances that make continued medical removal an inappropriate remedy, the physician shall fully discuss these matters with the employee, and then in a written determination may return a worker to his/her former job status despite what would otherwise be unacceptably high biological monitoring results. Thereafter and until such time as the employee's biological monitoring results have decreased to levels where he/she could have been returned to his/her former job status, the returned employee shall continue medical surveillance as if he/she were still on medical removal. Until such time, the employee is no longer subject to mandatory medical removal. Subsequent questions regarding the employee's medical

removal shall be decided solely by a final medical determination.

(vi) Where an employer, although not required by this section to do so, removes an employee from exposure to cadmium or otherwise places limitations on an employee due to the effects of cadmium exposure on the employee's medical condition, the employer shall provide the same medical removal protection benefits to that employee under (l) of this subsection as would have been provided had the removal been required under (k) of this subsection.

(l) Medical removal protection benefits.

(i) The employer shall provide medical removal protection benefits to an employee for up to a maximum of 18 months each time, and while the employee is temporarily medically removed under (k) of this subsection.

(ii) For purposes of this section, the requirement that the employer provide medical removal protection benefits means that the employer shall maintain the total normal earnings, seniority, and all other employee rights and benefits of the removed employee, including the employee's right to his/her former job status, as if the employee had not been removed from the employee's job or otherwise medically limited.

(iii) Where, after 18 months on medical removal because of elevated biological monitoring results, the employee's monitoring results have not declined to a low enough level to permit the employee to be returned to his/her former job status:

(A) The employer shall make available to the employee a medical examination pursuant to this section in order to obtain a final medical determination as to whether the employee may be returned to his/her former job status or must be permanently removed from excess cadmium exposure; and

(B) The employer shall assure that the final medical determination indicates whether the employee may be returned to his/her former job status and what steps, if any, should be taken to protect the employee's health.

(iv) The employer may condition the provision of medical removal protection benefits upon the employee's participation in medical surveillance provided in accordance with this section.

(m) Multiple physician review.

(i) If the employer selects the initial physician to conduct any medical examination or consultation provided to an employee under this section, the employee may designate a second physician to:

(A) Review any findings, determinations, or recommendations of the initial physician; and

(B) Conduct such examinations, consultations, and laboratory tests as the second physician deems necessary to facilitate this review.

(ii) The employer shall promptly notify an employee of the right to seek a second medical opinion after each occasion that an initial physician provided by the employer conducts a medical examination or consultation pursuant to this section. The employer may condition its participation in, and payment for, multiple physician review upon the employee doing the following within fifteen (15) days after receipt of this notice, or receipt of the initial physician's written opinion, whichever is later:

(A) Informing the employer that he or she intends to seek a medical opinion; and

(B) Initiating steps to make an appointment with a second physician.

(iii) If the findings, determinations, or recommendations of the second physician differ from those of the initial physician, then the employer and the employee shall assure that efforts are made for the two physicians to resolve any disagreement.

(iv) If the two physicians have been unable to quickly resolve their disagreement, then the employer and the employee, through their respective physicians, shall designate a third physician to:

(A) Review any findings, determinations, or recommendations of the other two physicians; and

(B) Conduct such examinations, consultations, laboratory tests, and discussions with the other two physicians as the third physician deems necessary to resolve the disagreement among them.

(v) The employer shall act consistently with the findings, determinations, and recommendations of the third physician, unless the employer and the employee reach an agreement that is consistent with the recommendations of at least one of the other two physicians.

(n) Alternate physician determination. The employer and an employee or designated employee representative may agree upon the use of any alternate form of physician determination in lieu of the multiple physician review provided by (m) of this subsection, so long as the alternative is expeditious and at least as protective of the employee.

(o) Information the employer must provide the employee.

(i) The employer shall provide a copy of the physician's written medical opinion to the examined employee within five working days after receipt thereof.

(ii) The employer shall provide the employee with a copy of the employee's biological monitoring results and an explanation sheet explaining the results within five working days after receipt thereof.

(iii) Within 30 days after a request by an employee, the employer shall provide the employee with the information the employer is required to provide the examining physician under (i) of this subsection.

(p) Reporting. In addition to other medical events that are required to be reported on the OSHA Form No. 200, the employer shall report any abnormal condition or disorder caused by occupational exposure to cadmium associated with employment as specified in Chapter (V)(E) of the Bureau of Labor Statistics Recordkeeping Guidelines for Occupational Injuries and Illnesses.

(13) Communication of cadmium hazards to employees

(a) General. In communications concerning cadmium hazards, employers shall comply with the requirements of WISHA's Hazard Communication Standard, chapter 296-62 WAC, Part C, including but not limited to the requirements concerning warning signs and labels, material safety data sheets (MSDS), and employee information and training. In addition, employers shall comply with the following requirements:

(b) Warning signs.

(i) Warning signs shall be provided and displayed in regulated areas. In addition, warning signs shall be posted at all approaches to regulated areas so that an employee may

read the signs and take necessary protective steps before entering the area.

(ii) Warning signs required by (b)(i) of this subsection shall bear the following information:

Danger, Cadmium, Cancer Hazard, Can Cause Lung and  
Kidney Disease, Authorized Personnel Only, Respirators  
Required in This Area

(iii) The employer shall assure that signs required by this ((~~paragraph~~)) section are illuminated, cleaned, and maintained as necessary so that the legend is readily visible.

(c) Warning labels.

(i) Shipping and storage containers containing cadmium, cadmium compounds, or cadmium contaminated clothing, equipment, waste, scrap, or debris shall bear appropriate warning labels, as specified in (c)(ii) of this subsection.

(ii) The warning labels shall include at least the following information:

Danger, Contains Cadmium, Cancer Hazard, Avoid  
Creating Dust, Can Cause Lung and Kidney Disease

(iii) Where feasible, installed cadmium products shall have a visible label or other indication that cadmium is present.

(d) Employee information and training.

(i) The employer shall institute a training program for all employees who are potentially exposed to cadmium, assure employee participation in the program, and maintain a record of the contents of such program.

(ii) Training shall be provided prior to or at the time of initial assignment to a job involving potential exposure to cadmium and at least annually thereafter.

(iii) The employer shall make the training program understandable to the employee and shall assure that each employee is informed of the following:

(A) The health hazards associated with cadmium exposure, with special attention to the information incorporated in WAC 296-62-07441, Appendix A;

(B) The quantity, location, manner of use, release, and storage of cadmium in the workplace and the specific nature of operations that could result in exposure to cadmium, especially exposures above the PEL;

(C) The engineering controls and work practices associated with the employee's job assignment;

(D) The measures employees can take to protect themselves from exposure to cadmium, including modification of such habits as smoking and personal hygiene, and specific procedures the employer has implemented to protect employees from exposure to cadmium such as appropriate work practices, emergency procedures, and the provision of personal protective equipment;

(E) The purpose, proper selection, fitting, proper use, and limitations of respirators and protective clothing;

(F) The purpose and a description of the medical surveillance program required by subsection (12) of this section;

(G) The contents of this section and its appendices; and

(H) The employee's rights of access to records under chapter 296-62 WAC, Part B.

(iv) Additional access to information and training program and materials.



(A) The employer shall make a copy of this section and its appendices readily available to all affected employees and shall provide a copy without cost if requested.

(B) Upon request, the employer shall provide to the director or authorized representative, all materials relating to the employee information and the training program.

(e) Multi-employer workplace. In a multi-employer workplace, an employer who produces, uses, or stores cadmium in a manner that may expose employees of other employers to cadmium shall notify those employers of the potential hazard in accordance with WAC 296-62-05409 of the hazard communication standard.

(14) Recordkeeping.

(a) Exposure monitoring.

(i) The employer shall establish and keep an accurate record of all air monitoring for cadmium in the workplace.

(ii) This record shall include at least the following information:

(A) The monitoring date, shift, duration, air volume, and results in terms of an 8-hour TWA of each sample taken, and if cadmium is not detected, the detection level;

(B) The name, Social Security number, and job classification of all employees monitored and of all other employees whose exposures the monitoring result is intended to represent, including, where applicable, a description of how it was determined that the employee's monitoring result could be taken to represent other employee's exposures;

(C) A description of the sampling and analytical methods used and evidence of their accuracy;

(D) The type of respiratory protective device, if any, worn by the monitored employee and by any other employee whose exposure the monitoring result is intended to represent;

(E) A notation of any other conditions that might have affected the monitoring results;

(F) Any exposure monitoring or objective data that were used and the levels.

(iii) The employer shall maintain this record for at least thirty (30) years, in accordance with WAC 296-62-05207.

(iv) The employer shall also provide a copy of the results of an employee's air monitoring prescribed in subsection (4) of this section to an industry trade association and to the employee's union, if any, or, if either of such associations or unions do not exist, to another comparable organization that is competent to maintain such records and is reasonably accessible to employers and employees in the industry.

(b) Objective data for exemption from requirement for initial monitoring.

(i) For purposes of this section, objective data are information demonstrating that a particular product or material containing cadmium or a specific process, operation, or activity involving cadmium cannot release dust or fumes in concentrations at or above the action level even under the worst-case release conditions. Objective data can be obtained from an industry-wide study or from laboratory product test results from manufacturers of cadmium-containing products or materials. The data the employer uses from an industry-wide survey must be obtained under workplace conditions closely resembling the processes, types of material, control methods, work practices, and environmental conditions in the employer's current operations.

(ii) The employer shall maintain the record for at least 30 years of the objective data relied upon.

(c) Medical surveillance.

(i) The employer shall establish and maintain an accurate record for each employee covered by medical surveillance under (a)(i) of this subsection.

(ii) The record shall include at least the following information about the employee:

(A) Name, Social Security number, and description of duties;

(B) A copy of the physician's written opinions and of the explanation sheets for biological monitoring results;

(C) A copy of the medical history, and the results of any physical examination and all test results that are required to be provided by this section, including biological tests, x-rays, pulmonary function tests, etc., or that have been obtained to further evaluate any condition that might be related to cadmium exposure;

(D) The employee's medical symptoms that might be related to exposure to cadmium; and

(E) A copy of the information provided to the physician as required by subsection (12)(i) of this section.

(iii) The employer shall assure that this record is maintained for the duration of employment plus thirty (30) years, in accordance with WAC 296-62-05207.

(iv) At the employee's request, the employer shall promptly provide a copy of the employee's medical record, or update as appropriate, to a medical doctor or a union specified by the employee.

(d) Training. The employer shall certify that employees have been trained by preparing a certification record which includes the identity of the person trained, the signature of the employer or the person who conducted the training, and the date the training was completed. The certification records shall be prepared at the completion of training and shall be maintained on file for one (1) year beyond the date of training of that employee.

(e) Availability.

(i) Except as otherwise provided for in this section, access to all records required to be maintained by (a) through (d) of this subsection shall be in accordance with the provisions of WAC 296-62-052.

(ii) Within 15 days after a request, the employer shall make an employee's medical records required to be kept by (c) of this subsection available for examination and copying to the subject employee, to designated representatives, to anyone having the specific written consent of the subject employee, and after the employee's death or incapacitation, to the employee's family members.

(f) Transfer of records. Whenever an employer ceases to do business and there is no successor employer or designated organization to receive and retain records for the prescribed period, the employer shall comply with the requirements concerning transfer of records set forth in WAC 296-62-05215.

(15) Observation of monitoring.

(a) Employee observation. The employer shall provide affected employees or their designated representatives an opportunity to observe any monitoring of employee exposure to cadmium.

(b) Observation procedures. When observation of monitoring requires entry into an area where the use of

protective clothing or equipment is required, the employer shall provide the observer with that clothing and equipment and shall assure that the observer uses such clothing and equipment and complies with all other applicable safety and health procedures.

(16) Dates.

(a) Effective date. This section shall become effective on June 14, 1993.

(b) Start-up dates. All obligations of this section commence on the effective date except as follows:

(i) Exposure monitoring. Except for small businesses (~~((nineteen))~~ fifty or fewer employees), initial monitoring required by subsection (4)(b) of this section shall be completed as soon as possible and in any event no later than 60 days after the effective date of this section. For small businesses, initial monitoring required by subsection (4)(b) of this section shall be completed as soon as possible and in any event no later than 120 days after the effective date of this section.

(ii) The permissible exposure limit (PEL). Except for small businesses, as defined under (b)(i) of this subsection, the employer shall comply with the PEL established by subsection (3) of this section as soon as possible and in any event no later than 90 days after the effective date of this section. For small businesses, the employer shall comply with the PEL established by subsection (3) of this section as soon as possible and in any event no later than 150 days after the effective date of this section.

(iii) Regulated areas. Except for small businesses, as defined under (b)(i) of this subsection, regulated areas required to be established by subsection (5) of this section shall be set up as soon as possible after the results of exposure monitoring are known and in any event no later than 90 days after the effective date of this section. For small businesses, regulated areas required to be established by subsection (5) of this section shall be set up as soon as possible after the results of exposure monitoring are known and in any event no later than 150 days after the effective date of this section.

(iv) Respiratory protection. Except for small businesses, as defined under (b)(i) of this subsection, respiratory protection required by subsection (7) of this section shall be provided as soon as possible and in any event no later than 90 days after the effective date of this section. For small businesses, respiratory protection required by subsection (7) of this section shall be provided as soon as possible and in any event no later than 150 days after the effective date of this section.

(v) Compliance program. Except for small businesses, as defined under (b)(i) of this subsection, written compliance programs required by subsection (6)(b) of this section shall be completed and available as soon as possible and in any event no later than 90 days after the effective date of this section. For small businesses, written compliance programs required by subsection (6)(b) of this section shall be completed and available as soon as possible and in any event no later than 180 days after the effective date of this section.

(vi) Methods of compliance. Except for small businesses, as defined under (b)(i) of this subsection, the engineering controls required by subsection (6)(a) of this section shall be implemented as soon as possible and in any event no later than 120 days after the effective date of this section. For

small businesses, the engineering controls required by subsection (6)(a) of this section shall be implemented as soon as possible and in any event no later than 240 days after the effective date of this section. Work practice controls shall be implemented as soon as possible. Work practice controls that are directly related to engineering controls to be implemented shall be implemented as soon as possible after such engineering controls are implemented.

(vii) Hygiene and lunchroom facilities. Except for small businesses, as defined under (b)(i) of this subsection, handwashing facilities, showers, change rooms and eating facilities required by subsection (10) of this section, whether permanent or temporary, shall be provided as soon as possible and in any event no later than 60 days after the effective date of this section. For small businesses, handwashing facilities, showers, change rooms and eating facilities required by subsection (10) of this section, whether permanent or temporary, shall be provided as soon as possible and in any event no later than 120 days after the effective date of this section.

(viii) Employee information and training. Except for small businesses, as defined under (b)(i) of this subsection, employee information and training required by subsection (13)(d) of this section shall be provided as soon as possible and in any event no later than 90 days after the effective date of this section. For small businesses, employee information and training required by subsection (13)(d) of this section shall be provided as soon as possible and in any event no later than 180 days after the effective date of this section.

(ix) Medical surveillance. Except for small businesses, as defined under (b)(i) of this subsection, initial medical examinations required by subsection (12) of this section shall be provided as soon as possible and in any event no later than 90 days after the effective date of this section. For small businesses, initial medical examinations required by subsection (12) of this section shall be provided as soon as possible and in any event no later than 180 days after the effective date of this section.

(17) Appendices.

(a) WAC 296-62-07445, Appendix C, is a part of this standard, and compliance with its contents is mandatory.

(b) Except where portions of WAC 296-62-07441, 296-62-07443, 296-62-07447, 296-62-07449, and 296-62-07451, Appendices A, B, D, E, and F, respectively, to this section are expressly incorporated in requirements of this section, these appendices are purely informational and are not intended to create any additional obligations not otherwise imposed or to detract from any existing obligations.

**AMENDATORY SECTION** (Amending Order 86-14, filed 1/21/86)

**WAC 296-155-200 General requirements.** (1) Application.

(a) Protective equipment, including personal protective equipment for eyes, face, head, hearing, and extremities, protective clothing, respiratory devices, and protective shields and barriers, shall be used, and maintained in a sanitary and reliable condition wherever it is necessary by reason of hazards of processes or environment, chemical hazards, radiological hazards, or mechanical irritants encoun-

tered in a manner capable of causing injury or impairment in the function of any part of the body through absorption, inhalation or physical contact.

(b) Employee owned equipment. Where employees provide their own protective equipment, the employer shall be responsible to assure its adequacy, including proper maintenance and sanitation of such equipment.

(c) Design. All personal protective equipment shall be of safe design and construction for the work to be performed.

(2) Construction personnel shall comply with plant or job safety practices and procedures, peculiar to particular industries and plants, relating to protective equipment and procedures when engaged in construction work in such plants or job sites.

(3) The employer is responsible for requiring the wearing of appropriate personal protective equipment in all operations where there is an exposure to hazardous conditions or where this part indicates a need for using such equipment to reduce the hazards to the employees.

(4) Where there is a danger of contact with moving parts of machinery, or the work process is such that a hazard exists:

(a) The clothing of employees shall fit closely about the body.

(b) Dangling neck wear, bracelets, wristwatches, rings, or similar articles shall not be worn by employees.

(5) Employees, whose duties are performed in areas and under circumstances where they are exposed to the danger of moving vehicles, shall wear work vests of highly visible materials, or equivalent distinguishing apparel.

(6) Employers shall ensure that employees wear no less than a short sleeved shirt, long pants, and shoes (~~(meeting the requirements of WAC 296-155-212)~~). Employees shall wear no less than a short sleeved shirt, long pants, and shoes (~~(meeting)~~). Shoes shall meet the requirements of WAC 296-155-212.

Note: For additional personal protective and life saving equipment requirements, refer to the general safety and health standards, WAC 296-24-075 through 296-24-092.

AMENDATORY SECTION (Amending Order 86-14, filed 1/21/86)

**WAC 296-155-203 Confined spaces.** All work conducted in a confined space shall comply with the provisions of chapter 296-62 WAC Part M, and the following sections.

AMENDATORY SECTION (Amending Order 86-14, filed 1/21/86)

**WAC 296-155-20307 Confined space work on sewer systems under construction.** New systems under construction or new installations which have not yet been connected to a used system, may substitute forced ventilation for the testing requirements of (~~(WAC 296-62-14523)~~) chapter 296-62 WAC Part M provided:

(1) Ventilation is effectively provided at least five minutes prior to entry into the confined space;

(2) Ventilation is provided, as required by WAC 296-62-110, et seq., which supplies a continuous flow of air;

(3) Ventilation exhaust is discharged so as to present no hazard to other employees;

(4) (~~(A watchman)~~) An attendant is provided at the surface when there are employees in the manhole or pipe. The (~~(watchman)~~) attendant shall not leave the manhole unattended until such time as all employees are out and the cover has been replaced; and

(5) All other requirements for confined spaces are observed. See chapter 296-62 WAC Part M.

AMENDATORY SECTION (Amending Order 89-03, filed 5/15/89, effective 6/30/89)

**WAC 296-155-212 Foot protection.** (1) Substantial footwear, made of leather or other equally firm material, shall be worn by employees in any occupation in which there is a danger of injury to the feet through falling or moving objects, or from burning, scalding, cutting, penetration, or like hazard.

(a) The soles and heels of such footwear shall be of a material that will not create a slipping hazard.

(b) Shoes made of leather or other firm materials that have soft athletic-type soles which would protect employees from foot injuries and at the same time, provide soft and firm footing while working under specialty requirements or with specialty materials are acceptable if meeting safety shoe requirements established by OSHA or ANSI.

(c) Footwear that has deteriorated to a point where it does not provide the required protection shall not be used.

(2) Calks or other suitable footwear, which will afford reasonable protection from slipping, shall be worn while working on logs, poles, pilings, or similar forest products.

(3) Traditional tennis shoes, shoes with canvas tops, or thin or soft soled athletic shoes, open toed sandals, slippers, dress shoes or other similar type shoes shall not be worn. Soft or athletic-type soles with uppers of leather or other substantial material may be used where firm footing is desired and where minimal danger of injury to feet from falling or moving objects.

(4) Safety-toe footwear for employees shall meet the requirements and specifications in American National Standard for Men's Safety-Toe Footwear, Z41.1-1967.

AMENDATORY SECTION (Amending Order 84-24, filed 12/11/84)

**WAC 296-155-215 Eye and face protection.** (1) General.

(a) Employees shall use eye and face protection equipment when machines or operations present potential eye or face injury from physical, chemical, or radiation agents.

(b) Eye and face protection equipment required by this part shall meet the requirements specified in American National Standards Institute, Z87.1-1968, Practice for Occupational and Educational Eye and Face Protection.

(c) Employees whose vision requires the use of corrective lenses in spectacles, when required by this regulation to wear eye protection, shall be protected by goggles or spectacles of one of the following types:

(i) Spectacles whose protective lenses provide optical correction;

(ii) Goggles that can be worn over corrective spectacles without disturbing the adjustment of the spectacles.

(iii) Goggles that incorporate corrective lenses mounted behind the protective lenses.

(d) Face and eye protection equipment shall be kept clean and in good repair. The use of this type equipment with structural or optical defects shall be prohibited.

(e) Table C-1 shall be used as a guide in the selection of face and eye protection for the hazards and operations noted.

(f) Protectors shall meet the following minimum requirements:

(i) They shall provide adequate protection against the particular hazards for which they are designed.

(ii) They shall be reasonably comfortable when worn under the designated conditions.

(iii) They shall fit snugly and shall not unduly interfere with the movements of the wearer.

(iv) They shall be durable.

(v) They shall be capable of being disinfected.

(vi) They shall be easily cleanable.

(g) Every protector shall be distinctly marked to facilitate identification only of the manufacturer.

(h) When limitations or precautions are indicated by the manufacturer, they shall be transmitted to the user and care taken to see that such limitations and precautions are strictly observed.

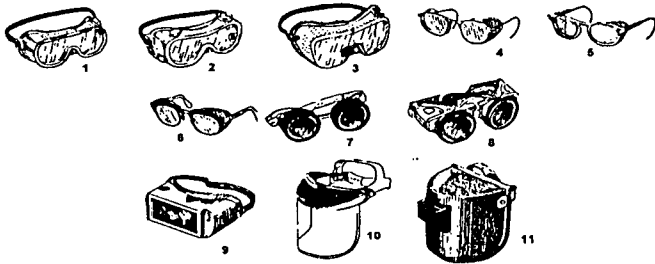


TABLE C-1

EYE AND FACE PROTECTION SELECTION GUIDE

1. GOGGLES, flexible fitting, regular ventilation
2. GOGGLES, flexible fitting, hooded ventilation
3. GOGGLES, cushioned fitting, rigid body
- \*4. SPECTACLES, metal frame, with sideshields
- \*5. SPECTACLES, plastic frame with sideshields
- \*6. SPECTACLES, metal-plastic frame, with sideshields
- \*\*7. WELDING GOGGLES, eyecup type, tinted lenses (illustrated)
- 7A. CHIPPING GOGGLES, eyecup type, clear safety lenses (not illustrated)
- \*\*8. WELDING GOGGLES, coverspec type tinted lenses (illustrated)
- 8A. CHIPPING GOGGLES, coverspec type, clear safety lenses (not illustrated)
- \*\*9. WELDING GOGGLES, coverspec type, tinted plate lens
10. FACE SHIELD (available with plastic or mesh window)
11. WELDING HELMETS

\* Nonside shield spectacles are available for limited hazard use requiring only frontal protection.

\*\* See Table C-2 in (2) of this section, Filter lens shade numbers for protection against radiant energy.

APPLICATIONS

OPERATION	HAZARDS	RECOMMENDED PROTECTORS: Underscored Numbers Signify Preferred Protection
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ACETYLENE-BURNING ACETYLENE-CUTTING ACETYLENE-WELDING	SPARKS, HARMFUL RAYS, MOLTEN METAL, FLYING PARTICLES	<u>7, 8, 9</u>
CHEMICAL HANDLING	SPLASH, ACID BURNS, FUMES	<u>2, 10</u> (for severe exposure add <u>10</u> over 2)
CHIPPING	FLYING PARTICLES	<u>1, 3, 4, 5, 6, 7A, 8A</u>
ELECTRIC (ARC) WELDING	SPARKS, INTENSE RAYS, MOLTEN METAL	<u>9, 11</u> (11 in combination with 4, 5, 6, in tinted lenses, advisable)
FURNACE OPERATIONS	GLARE, HEAT, MOLTEN METAL	<u>7, 8, 9</u> (for severe exposure add <u>10</u> )
GRINDING-LIGHT	FLYING PARTICLES	<u>1, 3, 4, 5, 6, 10</u>
GRINDING-HEAVY	FLYING PARTICLES	<u>1, 3, 7A, 8A</u> (for severe exposure add 10)
LABORATORY	CHEMICAL SPLASH, GLASS BREAKAGE	<u>2</u> (10 when in combination with <u>4, 5, 6</u> )
MACHINING	FLYING PARTICLES	<u>1, 3, 4, 5, 6, 10</u>
MOLTEN METALS	HEAT, GLARE, SPARKS, SPLASH	<u>7, 8</u> (10 in combination with <u>4, 5, 6</u> , in tinted lenses)
SPOT WELDING	FLYING PARTICLES, SPARKS	<u>1, 3, 4, 5, 6, 10</u>

(2) Protection against radiant energy. (a) Selection of shade numbers for welding filter. Table C-2 shall be used as a guide for the selection of the proper shade numbers of filter lenses or plates used in welding. Shades more dense than those listed may be used to suit the individual's needs.

TABLE C-2

FILTER LENS SHADE NUMBERS FOR PROTECTION AGAINST RADIANT ENERGY

Welding Operation	Shade number
Shielded metal-arc welding 1/16-, 3/32-, 1/8-, 5/32-inch diameter electrodes	10
Gas-shielded arc welding (nonferrous) 1/16-, 3/32-, 1/8-, 5/32-inch diameter electrodes	11
Gas-shielded arc welding (ferrous) 1/16-, 3/32-, 1/8-, 5/32-inch diameter electrodes	12
Shielded metal-arc welding 3/16-, 7/32-, 1/4-inch diameter electrodes	12
5/16-, 3/8-inch diameter electrodes	14
Atomic hydrogen welding	10-14
Carbon-arc welding	14
Soldering	2
Torch brazing	3 or 4
Light cutting, up to 1 inch	3 or 4
Medium cutting, 1 inch to 6 inches	4 or 5
Heavy cutting, over 6 inches	5 or 6

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- Gas welding (light), up to 1/8-inch . . . . . 4 or 5
- Gas welding (medium), 1/8-inch to 1/2-inch . . . . . 5 or 6
- Gas welding (heavy), over 1/2-inch . . . . . 6 or 9

(b) Laser protection.

(i) Employees whose occupation or assignment requires potentially hazardous exposure (see WAC 296-62-09005(4)) to laser radiation shall wear suitable laser safety goggles which will protect for the specific wavelength of the laser and be of optical density (O.D.) adequate for the energy involved. Table C-3 lists the maximum power or energy density for which adequate protection is afforded by glasses of optical densities from 5 through 8.

**TABLE C-3**  
SELECTING LASER SAFETY GLASS

INTENSITY	ATTENUATION	
	Optical density (O.D.)	Attenuation factor
CW maximum power density (watts/cm <sup>2</sup> )		
10 <sup>-2</sup>	5	10 <sup>5</sup>
10 <sup>-1</sup>	6	10 <sup>6</sup>
1.0	7	10 <sup>7</sup>
10.0	8	10 <sup>8</sup>

Output levels falling between lines in this table shall require the higher optical density.

- (ii) All protective goggles shall bear a label identifying the following data:
- (a) The laser wavelengths for which use is intended;
  - (b) The optical density of those wavelengths.
  - (c) The visible light transmission.

**AMENDATORY SECTION** (Amending Order 74-26, filed 5/7/74, effective 6/6/74)

**WAC 296-155-235 Working over or adjacent to water.** (1) When an employee is employed under conditions which expose ~~(him)~~ them to a risk of drowning, ~~(he)~~ they shall wear a U.S. Coast Guard approved life saving device, unless it can be shown that conditions, such as shallow water, are such that flotation would not be achieved.

(2) Prior to and after each use, the buoyant life saving device shall be inspected for defects which would alter their strength or buoyancy. Defective units shall not be used.

(3) Ring buoys with at least 90 feet of line shall be provided and readily available for emergency rescue operations. Distance between ring buoys shall not exceed 200 feet.

(4) At least one lifesaving skiff shall be immediately available at locations where employees are working over or adjacent to water. Each skiff, or skiffs, shall:

- (a) Be suitable for conditions where used.
- (b) Be equipped with oar locks securely attached to gunwales, oars, one boat hook, and one cork ring buoy with fifty feet of suitable line attached.

(5) Whenever boats or skiffs cannot be used, due to swift currents, life lines close to the water surface shall be

provided and, wherever practicable, a line shall be stretched across the stream with tag lines.

(6) Where workers are transported by boat or barge, only such number of persons shall be carried that can be safely accommodated on fixed seats. Capacity showing number of persons shall be plainly marked on vessel.

(7) All workers shall be provided with a U.S. Coast Guard approved buoyant life saving device while transported in open boats and/or barges, and where deemed necessary by the department, workers shall wear same while in transport.

**AMENDATORY SECTION** (Amending Order 86-14, filed 1/21/86)

**WAC 296-155-260 Fire protection.** (1) General requirements.

(a) The employer shall be responsible for development of a fire protection program to be followed throughout all phases of construction and demolition work, and ~~(he)~~ the employer shall provide for fire fighting equipment as specified in this part. As fire hazards occur, there shall be no delay in providing necessary equipment.

(b) Access to all available fire fighting equipment shall be maintained at all times.

(c) All fire fighting equipment, provided by the employer, shall be conspicuously located.

(d) All fire fighting equipment shall be periodically inspected by a competent person, and maintained in operating condition. Defective equipment shall be immediately replaced.

(e) As warranted by the project, the employer shall provide a trained and equipped fire fighting organization (fire brigade) to assure adequate protection to life.

(2) Water supply.

(a) A temporary or permanent water supply, of sufficient volume, duration, and pressure, required to properly operate fire fighting equipment shall be made available as soon as combustible materials accumulate.

(b) Where underground water mains are to be provided, they shall be installed, completed, and made available for use as soon as practicable.

(3) Portable fire fighting equipment.

(a) A fire extinguisher, rated not less than 2A, shall be provided for each 3,000 square feet of a combustible building area, or major fraction thereof. Travel distance from any point of the protected area to the nearest fire extinguisher shall not exceed a horizontal distance of 100 feet.

Note: One 55-gallon open drum of water with two fire pails may be substituted for a fire extinguisher having a 2A rating.

(b) A 1/2-inch diameter garden-type hose line, not to exceed 100 feet in length and equipped with a nozzle, may be substituted for a 2A-rated fire extinguisher, provided it is capable of discharging a minimum of 5 gallons per minute with a minimum hose stream range of 30 feet horizontally. The garden-type hose lines shall be mounted on conventional racks or reels. The number and location of hose racks or reels shall be such that at least one hose stream can be applied to all points in the area.

(c) One or more fire extinguishers, rated not less than 2A, shall be provided on each floor. In multistory buildings, where combustibles are present, at least one fire extinguisher shall be located adjacent to a stairway.


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- (d) Extinguishers and water drums, subject to freezing, shall be protected from freezing.
- (e) A fire extinguisher, rated not less than 10B, shall be provided within 50 feet of wherever more than 5 gallons of flammable or combustible liquids or 5 pounds of flammable gas are being used on the jobsite. This requirement does not apply to the integral fuel tanks of motor vehicles.
- (f) Carbon tetrachloride and other toxic vaporizing liquid fire extinguishers are prohibited.

- (g) Portable fire extinguishers shall be inspected periodically and maintained in accordance with Maintenance and Use of Portable Fire Extinguishers, NFPA No. 10A-1981 and the general safety and health standards, ((WAC 296-24-59007)) chapter 296-24 WAC, Part G-3.
- (h) Fire extinguishers which have been listed or approved by a nationally recognized testing laboratory, shall be used to meet the requirements of this part. (See Table D-1)

Table D-1

KNOW YOUR FIRE EXTINGUISHERS

 CLASS A FIRE WOOD, PAPER, RUBBER, HEAVY OILING FABRICS, ETC.	WATER TYPE				FOAM	CARBON DIOXIDE (CO <sub>2</sub> )	DRY CHEMICAL		MULTI-PURPOSE ABC	
	STORED PRESSURE	CARTRIDGE OPERATED	WATER PUMP TANK	WATER PUMP TANK			100% POTASSIUM BICARBONATE	STORED PRESSURE		
CLASS B FIRE FLAMMABLE LIQUIDS, GREASES, OILS, PAINTS, OILS, ETC.	YES	YES	YES	YES	YES	NO	NO	NO	YES	
CLASS C FIRE ELECTRICAL EQUIPMENT	NO	NO	NO	NO	NO	YES	YES	YES	YES	
CLASS D FIRE COMBUSTIBLE METALS	NO	NO	NO	NO	NO	YES	YES	YES	YES	
SPECIAL EXTINGUISHING AGENTS APPROVED BY RECOGNIZED TESTING LABORATORIES										
METHOD OF OPERATION	PULL PIN - SHOULDER HANDLE	TURN UPSIDE DOWN AND PUMP	PUMP HANDLE	TURN UPSIDE DOWN	TURN UPSIDE DOWN	PULL PIN - SHOULDER LEVER	PULL PIN - SHOULDER LEVER	PULL PIN - SHOULDER HANDLE	PULL PIN - SHOULDER HANDLE	PULL PIN - SHOULDER LEVER
RANGE	30' - 40'	30' - 40'	30' - 40'	30' - 40'	30' - 40'	2' - 8'	1' - 30'	1' - 30'	1' - 30'	1' - 30'
MAINTENANCE	CHECK AIR PRESSURE MONTHLY	CHECK GAS CARTRIDGE - ADD WATER IF REQUIRED ANNUALLY	DISCHARGE AND FILL WITH WATER ANNUALLY	DISCHARGE ANNUALLY RECHARGE	DISCHARGE ANNUALLY RECHARGE	CHECK FIRM ANNUALLY	CHECK GAS CARTRIDGE - CHECK CONDITION OF DRY CHEMICAL ANNUALLY	CHECK PRESSURE GASGE AND CONDITION OF DRY CHEMICAL ANNUALLY	CHECK PRESSURE GASGE AND CONDITION OF DRY CHEMICAL ANNUALLY	CHECK GAS CARTRIDGE - CHECK CONDITION OF DRY CHEMICAL ANNUALLY

Note: One hundred feet, or less, of 1-1/2 inch hose, with a nozzle capable of discharging water at 25 gallons or more per minute, may be substituted for a fire extinguisher rated not more than 2A in the designated area provided that the hose line can reach all points in the area.

Note: Modification of sprinkler systems to permit alterations or additional demolition should be expedited so that the automatic protection may be returned to service as quickly as possible. Sprinkler control valves shall be checked daily at close of work to ascertain that the protection is in service.

- (i) If fire hose connections are not compatible with local fire fighting equipment, the contractor shall provide adapters, or equivalent, to permit connections.
- (j) During demolition involving combustible materials, charged hose lines, supplied by hydrants, water tank trucks with pumps, or equivalent, shall be made available.
- (4) Fixed fire fighting equipment.
  - (a) Sprinkler protection.
    - (i) If the facility being constructed includes the installation of automatic sprinkler protection, the installation shall closely follow the construction and be placed in service as soon as applicable laws permit following completion of each story.
    - (ii) During demolition or alterations, existing automatic sprinkler installations shall be retained in service as long as reasonable. The operation of sprinkler control valves shall be permitted only by properly authorized persons.

- (b) Standpipes. In all structures in which standpipes are required, or where standpipes exist in structures being altered, they shall be brought up as soon as applicable laws permit, and shall be maintained as construction progresses in such a manner that they are always ready for fire protection use. The standpipes shall be provided with Siamese fire department connections on the outside of the structure, at the street level, which shall be conspicuously marked. There shall be at least one standard hose outlet at each floor.
- (5) Fire alarm devices.
  - (a) An alarm system, e.g., telephone system, siren, etc., shall be established by the employer whereby employees on the site and the local fire department can be alerted for an emergency.
  - (b) The alarm code and reporting instructions shall be conspicuously posted at phones and at employee entrances.
- (6) Fire cutoffs.
  - (a) Fire walls and exit stairways, required for the completed buildings, shall be given construction priority.

PERMANENT

Fire doors, with automatic closing devices, shall be hung on openings as soon as practical.

(b) Fire cutoffs shall be retained in buildings undergoing alterations or demolition until operations necessitate their removal.

**AMENDATORY SECTION** (Amending Order 76-29, filed 9/30/76)

**WAC 296-155-280 Temporary heating devices.** (1) Ventilation.

(a) Fresh air shall be supplied in sufficient quantities to maintain the health and safety of workers. Where natural means of fresh air supply is inadequate, mechanical ventilation shall be provided.

(b) When heaters are used in confined spaces, special care shall be taken to provide sufficient ventilation in order to ensure proper combustion, maintain the health and safety of workers, and limit temperature rise in the area.

(2) Clearance and mounting.

(a) Temporary heating devices shall be installed to provide clearance to combustible material not less than the amount shown in Table D-4.

(b) Temporary heating devices, which are listed for installation with lesser clearances than specified in Table D-4, may be installed in accordance with their approval.

TABLE D-4

Heating appliances	Minimum clearance, (inches)		
	Sides	Rear	Chimney connector
Room heater, circulating type _____	12	12	18
Room heater, radiant type _____	36	36	18

(c) Heaters not suitable for use on wood floors shall not be set directly upon them or other combustible materials. When such heaters are used, they shall rest on suitable heat insulating material or at least 1-inch concrete, or equivalent. The insulating material shall extend beyond the heater 2 feet or more in all directions.

(d) Heaters used in the vicinity of combustible tarpaulins, canvas, or similar coverings shall be located at least 10 feet from the coverings. The coverings shall be securely fastened to prevent ignition or upsetting of the heater due to wind action on the covering or other material.

(3) Stability. Heaters, when in use, shall be set horizontally level, unless otherwise permitted by the manufacturer's markings.

(4) Oil-fired heaters.

(a) Flammable liquid-fired heaters shall be equipped with a primary safety control to stop the flow of fuel in the event of flame failure. Barometric or gravity oil feed shall not be considered a primary safety control.

(b) Heaters designed for barometric or gravity oil feed shall be used only with the integral tanks.

(c) Heaters specifically designed and approved for use with separate supply tanks may be directly connected for gravity feed, or an automatic pump, from a supply tank.

(5) Salamanders.

(a) Coverage. The use of solid fuel salamanders is prohibited in buildings and on scaffolds.

(b) General requirements.

(i) All solid fuel salamanders shall be designed and constructed for use with solid fuel, that is, coal or coke.

(ii) Solid fuel salamanders shall be equipped with a cover designed as part of the unit, to prevent spillage of burning material in case of tipover.

(iii) Salamanders shall be assembled in accordance with the instructions issued by the manufacturer.

(iv) The safeguards engineered into the product shall be maintained and any replacement shall be equivalent thereto.

(v) Salamanders shall be stored in such a manner as to prevent deterioration or damage to the unit.

(c) Operation.

(i) Manufacturers' instructions shall be followed by the user.

(ii) Each time a salamander is placed in operation it shall be checked to insure that it is functioning properly. Its operation shall be checked periodically thereafter.

(iii) When concentrations of carbon monoxide attain quantities greater than ~~((50))~~ 35 parts per million (~~((0.005))~~ 0.0035 percent) to air volume at employee breathing levels, the salamander shall be extinguished unless additional natural or mechanical ventilation is provided to reduce the carbon monoxide content to permissible limits.

(iv) Tests for presence of carbon monoxide shall be made by a qualified person within 1 hour after the start of each shift and at least every 3 hours thereafter. If concentrations of carbon monoxide reach ~~((30))~~ 20 parts per million to air volume, tests shall be made more frequently to determine if there is a continuing increase of carbon monoxide concentration.

(v) Records of all tests including the date, time, results obtained, and person making tests, shall be maintained for the duration of the project.

(vi) No persons shall be permitted to be within the area being heated by the salamanders except under the following circumstances: When tending the salamanders; when testing the atmosphere; or in emergency situations.

(vii) No employee shall be permitted to enter the heated area until notification is given to another person located outside. Periodic checks shall be made to ensure the health and safety of employees entering the heated area.

(viii) When a salamander is being used, the responsibility for its operation and maintenance shall be assigned to a qualified employee.

(ix) Salamanders shall not be moved, handled, or serviced while hot or burning, or while component parts are hot to the touch.

(x) Salamanders, when in use, shall be set level with the horizontal unless otherwise permitted by the manufacturer's markings. Salamanders shall be designed so as not to tip over when placed on a surface inclined 25° to the horizontal.

(xi) If equivalent protection and safety is afforded by alternative design, the 25° limitation may be reduced.

(xii) Salamanders not suitable for use on wood floors shall not be set directly upon them or other combustible

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materials. When such salamanders are used they shall rest on suitable insulating material or at least 1-inch concrete or equivalent. The insulating material shall extend beyond the salamander 2 feet or more in all directions.

(xiii) Salamanders used in the vicinity of tarpaulins, canvas, or similar coverings shall be located a safe distance from coverings and other combustible materials. The coverings shall be securely fastened to prevent ignition of the covering or upsetting of the salamanders due to wind action on the covering or other material.

(xiv) Salamanders in use shall be protected to prevent flame extinguishment.

(d) Ventilation.

(i) Fresh air shall be supplied in sufficient quantities to maintain the health and safety of employees. Where natural means for fresh air supply is inadequate, mechanical ventilation shall be provided. Particular attention shall be given to confined spaces and pockets where heat and fumes may accumulate and employees may be present (roof areas, peaks, basement).

(ii) When salamanders are used in confined spaces, special care shall be taken to provide sufficient ventilation in order to assure proper combustion, maintain the health and safety of employees, and limit temperature rise in the area.

(e) Fueling.

(i) Salamanders shall be refueled only by a person trained in such operations.

(ii) Only a 1 day's supply of heater fuel shall be stored inside a building in the vicinity of the salamander. General fuel storage shall be outside the structure.

(iii) All fuel storage shall be maintained a minimum of 25 feet from source of ignition.

(f) Maintenance.

(i) The user shall comply with the maintenance instructions as provided by the manufacturer.

(ii) Equipment showing evidence of deterioration or damage that constitutes a safety or health hazard shall be removed from service.

(iii) Salamander repairs shall be performed in accordance with the manufacturer's recommendations, and replacement parts shall be equal to, the equivalent of, or the same as the original salamander equipment.

**AMENDATORY SECTION** (Amending Order 76-6, filed 3/1/76)

**WAC 296-155-315 Definitions applicable to this part.** (1) "Barricade" means an obstruction to deter the passage of persons or vehicles.

(2) "Signs" are the warnings of hazard, temporarily or permanently affixed or placed, at locations where hazards exist.

(3) "Signals" are moving signs, provided by workers, such as (~~flagmen~~) flagger, or by devices, such as flashing lights, to warn of possible or existing hazards.

(4) "Tags" are temporary signs, usually attached to a piece of equipment or part of a structure, to warn of existing or immediate hazards.

**AMENDATORY SECTION** (Amending Order 86-14, filed 1/21/86)

**WAC 296-155-325 General requirements for storage.** (1) General.

(a) All materials stored in tiers shall be stacked, racked, blocked, interlocked, or otherwise secured to prevent sliding, falling or collapse.

(b) Maximum safe load limits of floors within buildings and structures, in pounds per square foot, shall be conspicuously posted in all storage areas, except for floor or slab on grade. Maximum safe loads shall not be exceeded.

(c) Aisles and passageways shall be kept clear to provide for the free and safe movement of material handling equipment or employees. Such areas shall be kept in good repair.

(d) When a difference in road or working levels exist, means such as ramps, blocking, or grading shall be used to ensure the safe movement of vehicles between the two levels.

(2) Material storage.

(a)(i) Material stored inside buildings under construction shall not be placed within 6 feet of any hoistway or inside floor openings, nor within 10 feet of an exterior wall which does not extend above the top of the material stored.

(ii) Temporary floors, used in steel erection, concrete forms and shoring (i.e., stripped forms, shoring jacks, clamps, steel rods or pipes, base plates, etc.) placed within close proximity to an open-sided floor for movement to another tier for placement, shall be considered "in-process equipment and subject to the provisions contained in Parts "O" and "P" of this standard. When this type equipment is to be left overnight or for longer periods of time it shall be anchored and braced to prevent displacement in any direction. In addition this equipment shall be subject to the provisions of this subsection while in "interim storage."

(b) Employees required to work on stored material in silos, hoppers, tanks, and similar storage areas shall be equipped with lifelines and safety belts meeting the requirements of (~~WAC 296-155-225~~) chapter 296-155 WAC, Part C-1.

(c) Noncompatible materials shall be segregated in storage.

(d) Bagged materials shall be stacked by stepping back the layers and cross-keying the bags at least every 10 bags high.

(i) When cement and lime is delivered in paper bags they shall be carefully handled to prevent the bags bursting.

(ii) Cement and lime bags shall not be piled more than ten bags high except when stored in bins or enclosures built for the purpose of storage.

(iii) When bags are removed from the pile, the length of the pile shall be kept at an even height, and the necessary step backs every five bags maintained.

(iv) Persons handling cement and lime bags shall wear eye protection which prevents contact between the substance and the worker's eyes (such as goggles or other sealed eye protection) and shall wear long sleeve shirts with close fitting collar and cuffs.

(v) Persons shall be warned against wearing clothing that has become hard and stiff with cement.

(vi) Persons shall be instructed to report any susceptibility of their skin to cement and lime burns.

(vii) A hand cream or vaseline and eye wash shall be provided and kept ready for use to prevent burns.

(viii) Lime shall be stored in a dry place to prevent a premature slacking action that may cause fire.

(e) Materials shall not be stored on scaffolds or runways in excess of supplies needed for immediate operations.

(f) Brick stacks shall not be more than 7 feet in height. When a loose brick stack reaches a height of 4 feet, it shall be tapered back 2 inches in every foot of height above the 4-foot level.

(i) Brick shall never be stacked, for storage purposes, on scaffolds or runways.

(ii) When delivering brick on scaffolds inside the wall lines in wheelbarrows, they shall be dumped toward the inside of the building and not toward the wall.

(iii) Blocks shall always be stacked and not thrown in a loose pile.

(g) When masonry blocks are stacked higher than 6 feet, the stack shall be tapered back one-half block per tier above the 6-foot level.

(i) When blocks are stacked inside a building, the piles shall be so distributed as not to overload the floor on which they stand.

(ii) Blocks shall not be dropped or thrown from an elevation or delivered through chutes.

(h) Lumber:

(i) Used lumber shall have all nails withdrawn before stacking.

(ii) Lumber shall be stacked on level and solidly supported sills.

(iii) Lumber shall be so stacked as to be stable and self-supporting.

(iv) Lumber stacks shall not exceed 20 feet in height provided that lumber to be handled manually shall not be stacked more than 16 feet high.

(v) All stored lumber shall be stacked on timber sills to keep it off the ground((s)). Sills shall be placed level on solid supports.

(vi) Cross strips shall be placed in the stacks when they are stacked more than four feet high.

(i) Structural steel, poles, pipe, bar stock, and other cylindrical materials, unless racked, shall be stacked and blocked so as to prevent spreading or tilting.

(i) Persons handling reinforcing steel shall wear heavy gloves.

(ii) When bending of reinforcing steel is done on the job, a strong bench shall be provided, set up on even dry ground or a floor for the persons to work on.

(iii) Structural steel shall be carefully piled to prevent danger of members rolling off or the pile toppling over.

(iv) Structural steel shall be kept in low piles, consideration being given to the sequence of use of the members.

(v) Corrugated and flat iron shall be stacked in flat piles, with the piles not more than four feet high and spacing strips shall be placed between each bundle.

(j) Sand, gravel and crushed stone.

(i) Stock piles shall be frequently inspected to prevent their becoming unsafe by continued adding to or withdrawing from the stock.

((i)) (ii) If material becomes frozen, it shall not be removed in a manner that would produce an overhang.

AMENDATORY SECTION (Amending Order 86-14, filed 1/21/86)

**WAC 296-155-330 Rigging equipment for material handling.** (1) General.

(a) Rigging equipment for material handling shall be inspected prior to use on each shift and as necessary during its use to ensure that it is safe. Defective rigging equipment shall be removed from service.

(b) Rigging equipment shall not be loaded in excess of its recommended safe working load, as prescribed in Tables F-1 through F-20 in this part and shall comply with ANSI B 30.9-1984.

(c) Rigging equipment, when not in use, shall be removed from the immediate work area so as not to present a hazard to employees.

(d) Special custom design grabs, hooks, clamps, or other lifting accessories shall be marked to indicate the safe working loads and shall be proof-tested to 125 percent of the rated load prior to use. Such custom devices shall be permanently marked with an identification number and permanent records shall be maintained on the jobsite for each device.

(2) Alloy steel chains. Chains used for overhead lifting shall be proof tested alloy steel.

(a) Welded alloy steel chain slings shall have permanently affixed durable identification stating size, grade, rated capacity, and sling manufacturer.

(b) Hooks, rings, oblong links, pear-shaped links, welded or mechanical coupling links, or other attachments, when used with alloy steel chains, shall have a rated capacity at least equal to that of the chain.

(c) The use of job or shop hooks and links, or makeshift fasteners, formed from bolts, rods, etc., or other such attachments, shall be prohibited.

(d) Rated capacity (working load limit) for alloy steel chain slings shall conform to the values shown in Table F-1.

(e) Whenever wear at any point of any chain link exceeds that shown in Table F-2, the assembly shall be removed from service.

(f) If at any time any three foot length of chain is found to have stretched one-third the length of a link it shall be discarded.

(g) The practice of placing bolts or nails between two links to shorten chains is prohibited.

(h) Splicing broken chains by inserting a bolt between two links with the heads of the bolt and the nut sustaining the load, or passing one link through another and inserting a bolt or nail to hold it, is prohibited.

(i) Wherever annealing of chains is attempted, it shall be done in properly equipped annealing furnaces and under the direct supervision of a competent person.

(3) Wire rope.

(a) Table F-3 through F-14 shall be used to determine the safe working loads of various sizes and classifications of improved plow steel wire rope and wire rope slings with various types of terminals. For sizes, classifications, and grades not included in these tables, the safe working load recommended by the manufacturer for specific, identifiable

products shall be followed, provided that a safety factor of not less than 5 is maintained.

(b) Protruding ends of strands in splices on slings and bridles shall be covered or blunted.

(c) Wire rope shall not be secured by knots.

(d) The following limitations shall apply to the use of wire rope:

(i) An eye splice made in any wire rope shall have not less than three full tucks.

Note: This requirement shall not preclude the use of another form of splice or connection which can be shown to be as efficient and which is not otherwise prohibited.

(ii) Except for eye splices in the ends of wires and for endless rope slings, each wire rope used in hoisting or lowering, or in pulling loads, shall consist of one continuous piece without knot or splice.

(iii) Wire rope shall not be used, if in any length of eight diameters, the total number of visible broken wires exceeds 10 percent of the total number of wires, or if the rope shows other signs of excessive wear, corrosion, or defect.

(e) When U-bolt wire rope clips are used to form eyes, Table F-20 shall be used to determine the number and spacing of clips.

(f) When used for eye splices, the U-bolt shall be applied so that the "U" section is in contact with the dead end of the rope.

(g) U-Bolt wire rope clips shall be made of drop-forged steel.

Note: See Table F-20 for number of clamps and spacing requirements.

**CORRECT METHOD OF ATTACHING WIRE ROPE CLIPS**



U-Bolt of all clips on dead end of rope

(h) Slings shall not be shortened with knots or bolts or other makeshift devices.

(4) Natural rope, and synthetic fiber.

(a) General. When using natural or synthetic fiber rope slings, Tables F-15, F-16, F-17 and F-18 shall apply.

(b) All splices in rope slings provided by the employer shall be made in accordance with fiber rope manufacturers' recommendations.

(i) In manila rope, eye splices shall contain at least three full tucks, and short splices shall contain at least six full tucks (three on each side of the centerline of the splice).

(ii) In layed synthetic fiber rope, eye splices shall contain at least four full tucks, and short splices shall contain at least eight full tucks (four on each side of the centerline of the splice).

(iii) Strand end tails shall not be trimmed short (flush with the surface of the rope) immediately adjacent to the full tucks. This precaution applies to both eye and short splices and all types of fiber rope. For fiber ropes under 1-inch

diameter, the tails shall project at least six rope diameters beyond the last full tuck. For fiber ropes 1-inch diameter and larger, the tails shall project at least 6 inches beyond the last full tuck. In applications where the projecting tails may be objectionable, the tails shall be tapered and spliced into the body of the rope using at least two additional tucks (which will require a tail length of approximately six rope diameters beyond the last full tuck).

(iv) For all eye splices, the eye shall be sufficiently large to provide an included angle of not greater than 60° at the splice when the eye is placed over the load or support.

(v) Knots shall not be used in lieu of splices.

(vi) All fibre rope used for hoisting purposes or for the support of scaffolds, or any part thereof, shall be of high grade Manila hemp (abaca). Fibre rope used for the support of scaffolds, or any part thereof, except rope used for lashing or tying purposes, shall be not less than 3/4-inch in diameter.

(vii) The maximum safe working load for fibre rope shall not exceed the maximum strength as shown in the following table:

**STRENGTH OF HIGH GRADE MANILA (ABACA) ROPE  
COMMON LAY THREE STRAND**

Approximate Diameter in inches	Circumference in inches	Safe Load in Pounds
3/16 (6 yarns)	1/2	98
1/4 (6 yarns)	3/4	116
5/16 (6 yarns)	1	200
3/8 (12 yarns)	1 1/8	241
7/16 (15 yarns)	1 1/4	291
15/32 (18 yarns)	1 3/8	350
1/2 (21 yarns)	1 1/2	408
9/16	1 3/4	526
5/8	2	666
3/4	2 1/4	816
13/16	2 1/2	983
7/8	2 3/4	1,166
1	3	1,366
1 1/16	3 1/4	1,683
1 1/8	3 1/2	1,833
1 1/4	3 3/4	2,083
1 5/16	4	2,365
1 3/8	4 1/4	2,666
1 1/2	4 1/2	2,916

Note: This table is based on data contained in the U.S. Department of Commerce circular of the Bureau of Standards, No. 324.

(5) Synthetic webbing (nylon, polyester, and polypropylene).

(a) The employer shall have each synthetic web sling marked or coded to show:

- (i) Name or trademark of manufacturer.
- (ii) Rated capacities for the type of hitch.
- (iii) Type of material.

(b) Rated capacity shall not be exceeded.

(6) Shackles and hooks.

(a) Table F-19 shall be used to determine the safe working loads of various sizes of shackles, except that higher safe working loads are permissible when recommended by the manufacturer for specific, identifiable products, provided that a safety factor of not less than 5 is maintained.

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(b) The manufacturer's recommendations shall be followed in determining the safe working loads of the various sizes and types of specific and identifiable hooks. All hooks for which no applicable manufacturer's recommendations are available shall be tested to twice the intended safe working load before they are initially put into use. The employer shall maintain a record of the dates and results of such tests.

(c) Hooks shall not be modified by welding and/or drilling unless written approval by the manufacturer has been received.

(7) Slings.

(a) When slings are provided as a part of the hoisting equipment, every precaution shall be taken to keep them in a serviceable condition.

(i) Wire rope slings shall be frequently inspected and oiled.

(ii) Slings shall not be left where they can be damaged by traffic or form stumbling hazards.

(iii) Blocks or heavy bagging shall be used at corners of the load to protect the sling from sharp bending.

(b) When a load is lifted by a multiple rope sling the sling shall be so arranged that the strain can be equalized between the ropes.

(i) When using a sling with both ends engaged in the hoisting block, the sling shall be adjusted so as to equalize the stress.

(ii) Slings shall be placed on the load at safe lifting angles.

(8) Material handling—General.

(a) When necessary to store building material on public thoroughfares, care shall be exercised to see that it is so piled or stacked as to be safe against collapse or falling over.

(b) Material shall be so located as not to interfere with, or present a hazard to employees, traffic or the public.

**AMENDATORY SECTION** (Amending Order 86-14, filed 1/21/86)

**WAC 296-155-34920 Table F-20.**

**TABLE F-20**  
NUMBER AND SPACING OF U-BOLT  
WIRE ROPE CLIPS

Improved plow steel	Number of Clips		Minimum spacing (inches)
	Drop forged		
3/8 and under	((4)) <u>2</u>		3
1/2	3		3
5/8	3		3
3/4	4		4 1/2
7/8	4		5 1/4
1	5		6
1 1/8	6		7
1 1/4	6		8
1 3/8	7		9
1 1/2	7		10

**AMENDATORY SECTION** (Amending Order 86-14, filed 1/21/86)

**WAC 296-155-360 Power-operated hand tools.** (1) Electric Power-operated tools.

(a) Electric power operated tools shall either be of the approved double-insulated type or grounded in accordance with Part I of this chapter.

(b) The use of electric cords for hoisting or lowering tools shall not be permitted.

(2) Pneumatic power tools.

(a) Pneumatic power tools and hose sections shall be secured by threaded couplings, quick disconnect couplings or by 100 pound tensile strength safety chain or equivalent across each connection to prevent the tool or hose connections from becoming accidentally disconnected.

(b) Safety clips or retainers shall be securely installed and maintained on pneumatic impact (percussion) tools to prevent attachments from being accidentally expelled.

(c) All pneumatically driven nailers, staplers, and other similar equipment provided with automatic fastener feed, shall have a safety device on the muzzle to prevent the tool from ejecting fasteners, unless the muzzle is in contact with the work surface.

EXCEPTION: Pneumatic nailers or staplers utilizing "fine wire" brads or staples do not require a muzzle contact safety device, provided:

(1) The overall weight of the fastening device does not exceed the weight of standard 18 gauge wire, 1-1/2 inches long.

(2) The operator and any other person within 12 feet of the point of operation wear approved eye protection.

Note: The normal maximum diameter tolerance for manufacturing standard 18 gauge wire is .045 inches.

(d) Compressed air shall not be used at the nozzle for cleaning purposes except where reduced to less than 30 p.s.i. and then only with effective chip guarding and personal protective equipment which meets the requirements of Part C of this chapter.

Note: The above requirement does not apply to concrete form, mill scale and similar cleaning purposes. Concrete form, mill scale, and similar cleaning may be performed with air pressure exceeding 30 p.s.i. provided the nozzle and/or cleaning pipe is at least three feet long with a quick-closing (deadman) valve between the hose and the nozzle or pipe. The operator and all other employees within range of flying debris shall be protected by eye or face protection as specified in WAC 296-155-215.

(e) The manufacturer's safe operating pressure for hoses, pipes, valves, filters, and other fittings shall not be exceeded.

(f) The use of hoses for hoisting or lowering tools shall not be permitted.

(g) All hoses exceeding 1/2-inch inside diameter shall have a safety device at the source of supply or branch line to reduce pressure in case of hose failure.

(h) Airless spray guns of the type which atomize paints and fluids at high pressures (1,000 pounds or more per square inch) shall be equipped with automatic or visible manual safety devices which will prevent pulling of the trigger to prevent release of the paint or fluid until the safety device is manually released.

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(i) In lieu of the above, a diffuser nut which will prevent high pressure, high velocity release, while the nozzle tip is removed, plus a nozzle tip guard which will prevent the tip from coming into contact with the operator, or other equivalent protection, shall be provided.

(j) Abrasive blast cleaning nozzles. The blast cleaning nozzles shall be equipped with an operating valve which must be held open manually. A support shall be provided on which the nozzle may be mounted when it is not in use.

(3) Fuel powered tools.

(a) All fuel powered tools shall be stopped while being refueled, serviced, or maintained, and fuel shall be transported, handled, and stored in accordance with Part D of this chapter.

(b) When fuel powered tools are used in enclosed spaces, the applicable requirements for concentrations of toxic gases and use of personal protective equipment as outlined in Parts B and C of this chapter shall apply.

(4) Hydraulic power tools.

(a) The fluid used in hydraulic powered tools shall be fire resistant fluid approved under schedule 30 of the Bureau of Mines, U.S. Department of the Interior, and shall retain its operating characteristics at the most extreme temperatures to which it will be exposed.

(b) The manufacturer's safe operating pressures for hoses, valves, pipes, filters, and other fittings shall not be exceeded.

AMENDATORY SECTION (Amending Order 86-14, filed 1/21/86)

**WAC 296-155-36305 Definitions applicable to this section.** (1) Angle control - a safety feature designed to prevent a tool from operating when tilted beyond a predetermined angle.

(2) Approved - meeting the requirements of this standard and acceptable to the department of labor and industries (~~(- division of industrial safety and health)~~).

(3) Cased power load - a power load with the propellant contained in a closed case.

(4) Caseless power load - a power load with the propellant in solid form not requiring containment.

(5) Chamber (noun) - the location in the tool into which the power load is placed and in which it is actuated.

(6) Chamber (verb) - to fit the chamber according to manufacturer's specifications.

(7) Fasteners - any pins (unthreaded heads) or studs (threaded heads) driven by powder actuated tools.

(8) Fixture - a special shield that provides equivalent protection where the standard shield cannot be used.

(9) Head - that portion of a fastener that extends above the work surface after being properly driven.

(10) Misfire - a condition in which the power load fails to ignite after the tool has been operated.

(11) Powder actuated fastening system - a method comprising the use of a powder actuated tool, a power load, and a fastener.

(12) Powder actuated tool (also known as tool) - a tool that utilizes the expanding gases from a power load to drive a fastener.

(13) Power load - the energy source used in powder actuated tools.

(14) Qualified operator - a person who meets the requirements of WAC 296-155-36321 (1) and (2).

(15) Shield - a device, attached to the muzzle end of a tool, which is designed to confine flying particles.

(16) Spalled area - a damaged and nonuniform concrete or masonry surface.

(17) Test velocity - the measurement of fastener velocity performed in accordance with WAC 296-155-36307 (1)(m).

(18) Tools - tools can be divided into two types: Direct acting and indirect acting; and three classes: Low velocity, medium velocity, and high velocity.

(a) Direct acting tool - a tool in which the expanding gas of the power load acts directly on the fastener to be driven.

(b) Indirect acting tool - a tool in which the expanding gas of the power load acts on a captive piston, which in turn drives the fastener.

(c) Low-velocity tool - a tool whose test velocity has been measured ten times while utilizing the highest velocity combination of:

(i) The lightest commercially available fastener designed for that specific tool;

(ii) The strongest commercially available power load that will properly chamber in the tool;

(iii) The piston designed for that tool and appropriate for that fastener; that will produce an average test velocity from the ten tests not in excess of 100 meters per second (328 feet per second) with no single test having a velocity of over 108 m/s (354 ft/s).

(d) Medium-velocity tool - a tool whose test velocity has been measured ten times while utilizing the highest velocity combination of:

(i) The lightest commercially available fastener designed for the tool;

(ii) The strongest commercially available power load that will properly chamber in the tool;

(iii) The piston designed for that tool and appropriate for that fastener; that will produce an average test velocity from ten tests in excess of 100 m/s (328 ft/s) but not in excess of 150 m/s (492 ft/s) with no single test having a velocity of 160 m/s (525 ft/s).

(e) High-velocity tool - a tool whose test velocity has been measured ten times while utilizing the combination of:

(i) The lightest commercially available fastener designed for the tool;

(ii) The strongest commercially available power load which will properly chamber in the tool; that will produce an average velocity from the ten tests in excess of 150 m/s (492 ft/s).

AMENDATORY SECTION (Amending Order 86-14, filed 1/21/86)

**WAC 296-155-36319 Authorized instructor.** (1) Operator qualifications. Only persons trained and authorized by the tool manufacturer or by an authorized representative of the tool manufacturer shall be qualified to instruct and qualify operators for the manufacturer's powder actuated tools.

(2) Instructor qualifications. All authorized instructors shall have read and be familiar with this standard, and shall be capable of:

- (a) Disassembling, servicing, and reassembling the tool.
- (b) Recognizing any worn or damaged parts or defective operation.
- (c) Recognizing and clearly identifying the colors used to identify power load levels.
- (d) Using the tool correctly within the limitations of its use.
- (e) Training and testing operators prior to issuing a qualified operator's card.

(3) Instructor's card. All authorized instructors shall have in their possession a valid authorized instructor's card issued and signed by an authorized representative of the manufacturer. The card shall be wallet size of approximately 6 x 9 cm (2-1/2 x 3-1/2 in), and the face of the card shall bear text similar to that shown in Figure G-1.

(4) List of instructors. A list of all instructors authorized by the manufacturer to instruct and qualify operators shall be maintained by the tool manufacturer and be made available to the department of labor and industries(~~(division of industrial safety and health, upon request)~~).

(5) Revocation of instructor card. (~~A(n)~~) Instructor's card may be revoked by the authorizing agent or the department of labor and industries(~~(division of industrial safety and health)~~), if (~~he~~) the instructor is known to have issued a qualified operator's card in violation of any regulation contained in this standard. When an instructor is no longer authorized to issue qualified operator's cards, (~~he~~) cards shall (~~surrender his card~~) be surrendered to the authorizing agent or the department of labor and industries(~~(division of industrial safety and health)~~).

**AUTHORIZED INSTRUCTOR**

..... Powder Actuated Tools Date ....  
 (MAKE)  
 Card No. .... Social Security No. ....  
 This certifies that .....  
 (NAME OF INSTRUCTOR)  
 has received the prescribed training in the operation and maintenance of  
 powder actuated tools manufactured by .....  
 (NAME OF MANUFACTURER) and is qualified  
 to train and certify operators of .....  
 (MAKE)  
 powder actuated tools.  
 Model(s) .....  
 Authorized by .....  
 I have received instruction by the manufacturer's authorized representative  
 in the training of operators of the above tools and agree to conform to all  
 rules and regulations governing the instruction of tool operators.  
 Date of Birth .....

**Figure G-1**  
 Sample of Authorized Instructor's Card

**AMENDATORY SECTION** (Amending Order 86-14, filed 1/21/86)

**WAC 296-155-36321 Qualified operator.** (1) Operator qualifications. The operator shall be trained by an authorized instructor to be familiar with the provisions of this standard and the instructions provided by the manufacturer for operation and maintenance. The operator shall also be capable of:

- (a) Reading and understanding the manufacturer's instruction manual.
- (b) Cleaning the tool correctly.
- (c) Recognizing any worn or damaged parts or defective operation.
- (d) Recognizing the number-color code system used in this standard to identify power load levels. In the event the operator is unable to distinguish the colors used, (~~he~~) the operator shall be given special instruction (~~(to)~~) which will enable (~~him~~) the operator to avoid error.

(e) Using (~~the~~) a tool correctly within the limitations of its use and (~~demonstrating his~~) demonstrate competence by operating the tool in the presence of the instructor.

(2) Operator examination. After training, the operator shall(~~to~~) substantiate (~~his~~) competency(~~(r)~~) by completing satisfactorily (~~(complete)~~) a written examination provided by the manufacturer of the tool.

(a) The operator's written examination shall consist of questions to establish the operator's competence with respect to:

- (i) The requirements of this standard;
- (ii) The powder actuated fastening system; and
- (iii) The specific details of operation and maintenance of the tool(s) involved.

(b) The examination shall provide a statement, attested to by the instructor, that the applicant can (or cannot) readily distinguish the colors used to identify power load levels (see WAC 296-155-36309).

(3) Operator's card. Each applicant who meets the requirements as set forth in subsections (1) and (2) of this section shall receive a qualified operator's card, issued and signed by both the instructor and applicant. While using the tool, the operator shall (~~have this~~) carry this card (~~(in his possession)~~).

(4) Card features. The qualified operator's card supplied by the manufacturer shall be wallet size of approximately 6 x 9 cm (2-1/2 x 3-1/2 in), and the face of the card shall bear text similar to that shown in Figure G-2.

(5) Revocation notation. There shall be printed on the card a notation reading:

"Revocation of card - Failure to comply with any of the rules and regulations for safe operation of powder actuated fastening tools shall be cause for the immediate revocation of this card."

**QUALIFIED OPERATOR**

..... Powder Actuated Tools Date ....  
 (MAKE)  
 Card No. .... Social Security No. ....  
 This certifies that .....  
 (NAME OF OPERATOR)  
 has received the prescribed training in the operation of powder actuated  
 tools manufactured by .....  
 (NAME OF MANUFACTURER)  
 Model(s) .....  
 Trained and issued by .....  
 (SIGNATURE OF AUTHORIZED INSTRUCTOR)

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I have received instruction in the safe operation and maintenance of powder actuated fastening tools of the makes and models specified and agree to conform to all rules and regulations governing that use  
Date of Birth .....

.....  
(SIGNATURE)

**Figure G-2**  
Sample of Qualified Operator's Card

**AMENDATORY SECTION** (Amending Order 86-14, filed 1/21/86)

**WAC 296-155-365 Abrasive wheels and tools.** (1) Power. All grinding machines shall be supplied with sufficient power to maintain the spindle speed at safe levels under all conditions of normal operation.

(2) Guarding.

(a) Grinding machines shall be equipped with safety guards in conformance with the requirements of American National Standards Institute, B7.1-1978, Safety Code for the Use, Care and Protection of Abrasive Wheels.

(b) Guard design. The safety guard shall cover the spindle end, nut, and flange projections. The safety guard shall be mounted so as to maintain proper alignment with the wheel, and the strength of the fastenings shall exceed the strength of the guard, except:

(i) Safety guards on all operations where the work provides a suitable measure of protection to the operator, may be so constructed that the spindle end, nut, and outer flange are exposed; and where the nature of the work is such as to entirely cover the side of the wheel, the side covers of the guard may be omitted; and

(ii) The spindle end, nut, and outer flange may be exposed on machines designed as portable saws.

(3) Use of abrasive wheels.

(a) Floor stand and bench mounted abrasive wheels, used for external grinding, shall be provided with safety guards (protection hoods). The maximum angular exposure of the grinding wheel periphery and sides shall be not more than 90°, except that when work requires contact with the wheel below the horizontal plane of the spindle, the angular exposure shall not exceed 125°. In either case, the exposure shall begin not more than 65° above the horizontal plane of the spindle. Safety guards shall be strong enough to withstand the effect of a bursting wheel.

(b) Floor and bench-mounted grinders shall be provided with work rests which are rigidly supported and readily adjustable. Such work rests shall be adjusted to a distance not to exceed one-eighth inch from the surface of the wheel. The work rest may be omitted when contacts of the work piece with the grinding surface below the horizontal plane of the spindle are necessary and unavoidable, or where the size or shape of the work piece precludes use of the work rest.

(c) Cup type wheels used for external grinding shall be protected by either a revolving cup guard or a band type guard in accordance with the provisions of the American National Standards Institute, B7.1-1978, Safety Requirements for the Use, Care, and Protection of Abrasive Wheels. Abrasive wheels shall only be used on machines provided with safety guards, except the following:

(i) Wheels used for internal work while within the work being ground.

(ii) Mounted wheels, 2 inches and smaller in diameter used in portable operations.

(iii) Types 16, 17, 18, 18R and 19 cones and plugs, and threaded hole pot balls where the work offers protection or where the size does not exceed 3 inches in diameter by 5 inches in length.

(iv) Metal centered diamond lapidary wheels either notched, segmented or continuous rim used with a coolant deflector, when operated at speeds up to 3500 surface feet per minute (S.F.P.M.).

(v) Type 1 wheels not larger than 2 inches in diameter and not more than 1/2 inch thick, operating at peripheral speeds less than 1800 SFPM when mounted on mandrels driven by portable drills.

(vi) Type 1 reinforced wheels not more than 3 inches in diameter and 1/4 inch in thickness, operating at peripheral speeds not exceeding 9500 SFPM, provided that safety glasses and face shield are worn.

(vii) Valve seat grinding wheels.

(d) Portable abrasive wheels used for internal grinding shall be provided with safety flanges (protection flanges) meeting the requirements of subdivision (f) of this subsection, except as follows:

(i) When wheels 2 inches or less in diameter which are securely mounted on the end of a steel mandrel are used;

(ii) If the wheel is entirely within the work being ground while in use.

(e) When safety guards are required, they shall be so mounted as to maintain proper alignment with the wheel, and the guard and its fastenings shall be of sufficient strength to retain fragments of the wheel in case of accidental breakage.

The maximum angular exposure of the grinding wheel periphery and sides shall not exceed 180°.

(f) When safety flanges are required, they shall be used only with wheels designed to fit the flanges. Only safety flanges, of a type and design and properly assembled so as to ensure that the pieces of the wheel will be retained in case of accidental breakage, shall be used.

(g) All abrasive wheels shall be closely inspected and ring-tested before mounting to ensure that they are free from cracks or defects.

(h) Grinding wheels shall fit freely on the spindle and shall not be forced on. The spindle nut shall be tightened only enough to hold the wheel in place.

(i) All employees using abrasive wheels shall be protected by eye protection equipment in accordance with the requirements of Part C of this chapter, except when adequate eye protection is afforded by eye shields which are permanently attached to the bench or floor stand.

(4) Other requirements. All abrasive wheels and tools used by employees shall meet other applicable requirements of American National Standards Institute, B7.1-1978, Safety Code for the Use, Care and Protection of Abrasive Wheels.

**AMENDATORY SECTION** (Amending Order 92-15, filed 2/3/93, effective 3/15/93)

**WAC 296-155-375 Jacks—Lever and ratchet, screw, and hydraulic.** General requirements.

PERMANENT



(1) The manufacturer's rated capacity shall be legibly marked on all jacks and this capacity shall not be exceeded.

(2) All jacks shall have a positive stop to prevent over-travel.

(3) Specially designed jacks constructed for specific purposes shall meet the approval of the ~~((division of Industrial Safety and Health))~~ department of labor and industries before being placed in service.

(4) Control parts shall be so designed that the operator will not be subjected to hazard.

(5) Blocking. When it is necessary to provide a firm foundation, the base of the jack shall be blocked or cribbed. Where there is a possibility of slippage of the metal cap of the jack, a wood block shall be placed between the cap and the load.

(6) Operation and maintenance.

(a) After the load has been raised, it shall immediately be cribbed, blocked, or otherwise secured.

(b) Hydraulic jacks exposed to freezing temperatures shall be supplied with an adequate antifreeze liquid.

(c) All jacks shall be properly lubricated at regular intervals. The lubricating instructions of the manufacturer should be followed, and only lubricants recommended by the manufacturer should be used.

(7) Each jack shall be thoroughly inspected at times which depend upon the service conditions. Inspections shall be not less frequent than the following:

(a) For constant or intermittent use at one locality, once every six months;

(b) For jacks sent out of shop for special work, when sent out and when returned;

(c) For a jack subjected to abnormal load or shock, immediately before and immediately thereafter.

(8) Repair or replacement parts shall be examined for possible defects.

(9) Jacks which are out of order shall be tagged accordingly, and shall not be used until repairs are made.

NEW SECTION

**WAC 296-155-380 Air receivers.** (1) Application. This section applies to compressed air receivers, and other equipment used in providing and utilizing compressed air for performing operations such as cleaning, drilling, hoisting, and chipping. On the other hand, however, this section does not deal with the special problems created by using compressed air to convey materials nor the problems created when persons work in compressed air as in tunnels and caissons. These standards are not intended to apply to compressed air machinery and equipment used on transportation vehicles such as steam railroad cars, electric railway cars, and automotive equipment.

(2) New and existing equipment.

(a) All new air receivers installed after the effective date of these standards shall be constructed in accordance with the 1968 Edition of the A.S.M.E. Boiler and Pressure Vessel Code, section VIII.

(b) All safety valves used shall be constructed, installed, and maintained in accordance with the A.S.M.E. Boiler and Pressure Vessel Code, section VIII Edition 1968.

(3) Installation. Air receivers shall be so installed that all drains, handholes, and manholes therein are easily

accessible. Air receivers should be supported with sufficient clearance to permit a complete external inspection and to avoid corrosion of external surfaces. Under no circumstances shall an air receiver be buried underground or located in an inaccessible place. The receiver should be located as close to the compressor or after-cooler as is possible in order to keep the discharge pipe short.

(4) Drains and traps. All air receivers having an internal and external operating pressure exceeding 15 psi with no limitation on size, and air receivers having an inside diameter exceeding six inches, with no limitation on pressure, if subject to corrosion, shall be supplied with a drain pipe and valve at the lowest point in the vessel; or a pipe may be used extending inward from any other location to within one-quarter inch of the lowest point. Adequate automatic traps may be installed in addition to drain valves. The drain valve on the air receiver shall be opened and the receiver completely drained frequently and at such intervals as to prevent the accumulation of oil and water in the receiver.

(5) Gages and valves.

(a) Every air receiver shall be equipped with an indicating pressure gage (so located as to be readily visible) and with one or more spring-loaded safety valves. The total relieving capacity of such safety valves shall be such as to prevent pressure in the receiver from exceeding the maximum allowable working pressure of the receiver by more than ten percent.

(b) No valve of any type shall be placed between the air receiver and its safety valve or valves.

(c) Safety appliances, such as safety valves, indicating devices and controlling devices, shall be constructed, located, and installed so that they cannot be readily rendered inoperative by any means, including the elements.

(d) All safety valves shall be tested frequently and at regular intervals to determine whether they are in good operating condition.

AMENDATORY SECTION (Amending Order 86-14, filed 1/21/86)

**WAC 296-155-400 Gas welding and cutting.** (1) Transporting, moving, and storing compressed gas cylinders.

(a) Valve protection caps shall be in place and secured.

(b) When cylinders are hoisted, they shall be secured on a cradle, slingboard, or pallet. They shall not be hoisted or transported by means of magnets or choker slings.

(c) Cylinders shall be moved by tilting and rolling them on their bottom edges. They shall not be intentionally dropped, struck, or permitted to strike each other violently.

(d) When cylinders are transported by powered vehicles, they shall be secured in a vertical position.

(e) Valve protection caps shall not be used for lifting cylinders from one vertical position to another. Bars shall not be used under valves or valve protection caps to pry cylinders loose when frozen. Warm, not boiling, water shall be used to thaw cylinders loose.

(f) Unless cylinders are firmly secured on a special carrier intended for this purpose, regulators shall be removed and valve protection caps put in place before cylinders are moved.

(g) A suitable cylinder truck, chain, or other steadying device shall be used to keep cylinders from being knocked over while in use. Such cylinders are not considered to be "in storage."

(h) When a job is finished, when cylinders are empty or when cylinders are moved at any time, the cylinder valve shall be closed.

(i) Compressed gas cylinders shall be secured in an upright position at all times except, if necessary, for short periods of time while cylinders are actually being hoisted or carried.

(j) Oxygen. Oxygen cylinders in storage shall be separated from fuel-gas cylinders or combustible materials (especially oil or grease), a minimum distance of 20 feet or by a noncombustible barrier at least 5 feet high having a fire-resistance rating of at least one-half hour.

(2) Placing cylinders.

(a) Cylinders shall be kept far enough away from the actual welding or cutting operation so that sparks, hot slag, or flame will not reach them. When this is impractical, fire resistant shields shall be provided.

(b) Cylinders shall be placed where they cannot become part of an electrical circuit. Electrodes shall not be struck against a cylinder to strike an arc.

(c) Fuel gas cylinders shall be placed with valve end up whenever they are in use. They shall not be placed in a location where they would be subject to open flame, hot metal, or other sources of artificial heat.

(d) Cylinders containing oxygen or acetylene or other fuel gas shall not be taken into confined spaces.

(3) Treatment of cylinders.

(a) Cylinders, whether full or empty, shall not be used as rollers or supports.

(b) No person other than the gas supplier shall attempt to mix gases in a cylinder. No one except the owner of the cylinder or person authorized by ~~((him))~~ the owner, shall refill a cylinder. No one shall use a cylinder's contents for purposes other than those intended by the supplier. All cylinders used shall meet the department of transportation requirements, Specification for Cylinders, (49 CFR Part 178, Subpart C).

(c) No damaged or defective cylinder shall be used.

(4) Use of fuel gas. The employer shall thoroughly instruct employees in the safe use of fuel gas, as follows:

(a) Before a regulator to a cylinder valve is connected, the valve shall be opened slightly and closed immediately. (This action is generally termed "cracking" and is intended to clear the valve of dust or dirt that might otherwise enter the regulator.) The person cracking the valve shall stand to one side of the outlet, not in front of it. The valve of a fuel gas cylinder shall not be cracked where the gas would reach welding work, sparks, flame, or other possible sources of ignition.

(b) The cylinder valve shall always be opened slowly to prevent damage to the regulator. For quick closing, valves on fuel gas cylinders shall not be opened more than 1 1/2 turns. When a special wrench is required, it shall be left in position on the stem of the valve while the cylinder is in use so that the fuel gas flow can be shut off quickly in case of an emergency. In the case of manifolded or coupled cylinders, at least one such wrench shall always be available for immediate use. Nothing shall be placed on top of a fuel

gas cylinder, when in use, which may damage the safety device or interfere with the quick closing of the valve.

(c) Fuel gas shall not be used from cylinders through torches or other devices which are equipped with shutoff valves without reducing the pressure through a suitable regulator attached to the cylinder valve or manifold.

(d) Before a regulator is removed from a cylinder valve, the cylinder valve shall always be closed and the gas released from the regulator.

(e) If, when the valve on a fuel gas cylinder is opened, there is found to be a leak around the valve stem, the valve shall be closed and the gland nut tightened. If this action does not stop the leak, the use of the cylinder shall be discontinued, and it shall be properly tagged and removed from the work area. In the event that fuel gas should leak from the cylinder valve, rather than from the valve stem, and the gas cannot be shut off, the cylinder shall be properly tagged and removed from the work area. If a regulator attached to a cylinder valve will effectively stop a leak through the valve seat, the cylinder need not be removed from the work area.

(f) If a leak should develop at a fuse plug or other safety device, the cylinder shall be removed from the work area.

(g) Cylinders not having fixed hand wheels shall have keys, handles, or nonadjustable wrenches on valve stems while in service. In multiple cylinder installations one and only one key or handle is required for each manifold.

(5) Fuel gas and oxygen manifolds.

(a) Fuel gas and oxygen manifolds shall bear the name of the substance they contain in letters at least 1-inch high which shall be either painted on the manifold or on a sign permanently attached to it.

(b) Fuel gas and oxygen manifolds shall be placed in safe, well ventilated, and accessible locations. They shall not be located within enclosed spaces.

(c) Manifold hose connections, including both ends of the supply hose that lead to the manifold, shall be such that the hose cannot be interchanged between fuel gas and oxygen manifolds and supply header connections. Adapters shall not be used to permit the interchange of hose. Hose connections shall be kept free of grease and oil.

(d) When not in use, manifold and header hose connections shall be capped.

(e) Nothing shall be placed on top of a manifold, when in use, which will damage the manifold or interfere with the quick closing of the valves.

(6) Hose.

(a) Fuel gas hose and oxygen hose shall be easily distinguishable from each other. The contrast may be made by different colors or by surface characteristics readily distinguishable by the sense of touch. Oxygen and fuel gas hoses shall not be interchangeable. A single hose having more than one gas passage shall not be used.

(b) When parallel sections of oxygen and fuel gas hose are taped together, not more than 4 inches out of 12 inches shall be covered by tape.

(c) All hose in use, carrying acetylene, oxygen, natural or manufactured fuel gas, or any gas or substance which may ignite or enter into combustion, or be in any way harmful to employees, shall be inspected at the beginning of

each working shift. Defective hose shall be removed from service.

(d) Hose which has been subject to flashback, or which shows evidence of severe wear or damage, shall be tested to twice the normal pressure to which it is subject, but in no case less than 300 p.s.i. Defective hose, or hose in doubtful condition, shall not be used.

(e) Hose couplings shall be of the type that cannot be unlocked or disconnected by means of a straight pull without rotary motion.

(f) Boxes used for the storage of gas hose shall be ventilated.

(g) Hoses, cables, and other equipment shall be kept clear of passageways, ladders and stairs.

(7) Torches.

(a) Clogged torch tip openings shall be cleaned with suitable cleaning wires, drills, or other devices designed for such purpose.

(b) Torches in use shall be inspected at the beginning of each working shift for leaking shutoff valves, hose couplings, and tip connections. Defective torches shall not be used.

(c) Torches shall be lighted by friction lighters or other approved devices, and not by matches or from hot work.

(8) Regulators and gauges. Oxygen and fuel gas pressure regulators, including their related gauges, shall be in proper working order while in use.

(9) Oil and grease hazards. Oxygen cylinders and fittings shall be kept away from oil or grease. Cylinders, cylinder caps and valves, couplings, regulators, hose, and apparatus shall be kept free from oil or greasy substances and shall not be handled with oily hands or gloves. Oxygen shall not be directed at oily surfaces, greasy clothes, or within a fuel oil or other storage tank or vessel.

(10) Additional rules. For additional details not covered in this Part, applicable portions of American National Standards Institute, Z49.1-1973, Safety in Welding and Cutting, shall apply.

**AMENDATORY SECTION** (Amending Order 88-25, filed 11/14/88)

**WAC 296-155-405 Arc welding and cutting.** (1) Manual electrode holders.

(a) Only manual electrode holders which are specifically designed for arc welding and cutting, and are of a capacity capable of safely handling the maximum rated current required by the electrodes, shall be used.

(b) Any current-carrying parts passing through the portion of the holder which the arc welder or cutter grips in ~~(his)~~ the hand, and the outer surfaces of the jaws of the holder, shall be fully insulated against the maximum voltage encountered to ground.

(2) Welding cables and connectors.

(a) All arc welding and cutting cables shall be of the completely insulated, flexible type, capable of handling the maximum current requirements of the work in progress, taking into account the duty cycle under which the arc welder or cutter is working.

(b) Only cable free from repair or splices for a minimum distance of 10 feet from the cable end to which the electrode holder is connected shall be used, except that

cables with standard insulated connectors or with splices whose insulating quality is equal to that of the cable are permitted.

(c) When it becomes necessary to connect or splice lengths of cable one to another, substantial insulated connectors of a capacity at least equivalent to that of the cable shall be used. If connections are effected by means of cable lugs, they shall be securely fastened together to give good electrical contact, and the exposed metal parts of the lugs shall be completely insulated.

(d) Cables in need of repair shall not be used. When a cable, other than the cable lead referred to in subdivision (b) of this subsection, becomes worn to the extent of exposing bare conductors, the portion thus exposed shall be protected by means of rubber and friction tape or other equivalent insulation.

(3) Ground returns and machine grounding.

(a) A ground return cable shall have a safe current carrying capacity equal to or exceeding the specified maximum output capacity of the arc welding or cutting unit which it services. When a single ground return cable services more than one unit, its safe current-carrying capacity shall equal or exceed the total specified maximum output capacities of all the units which it services.

(b) Pipelines containing gases or flammable liquids, or conduits containing electrical circuits, shall not be used as a ground return. For welding on natural gas pipelines, the technical portions of regulations issued by the Department of Transportation, Office of Pipeline Safety, Minimum Federal Safety Standards for Gas Pipelines shall apply. (49 CFR Part 192, Subpart C.)

(c) When a structure or pipeline is employed as a ground return circuit, it shall be determined that the required electrical contact exist at all joints. The generation of an arc, sparks, or heat at any point shall cause rejection of the structures as a ground circuit.

(d) When a structure or pipeline is continuously employed as a ground return circuit, all joints shall be bonded, and periodic inspections shall be conducted to ensure that no condition of electrolysis or fire hazard exists by virtue of such use.

(e) The frames of all arc welding and cutting machines shall be grounded either through a third wire in the cable containing the circuit conductor or through a separate wire which is grounded at the source of the current. Grounding circuits, other than by means of the structure, shall be checked to ensure that the circuit between the ground and the grounded power conductor has resistance low enough to permit sufficient current to flow to cause the fuse or circuit breaker to interrupt the current.

(f) All ground connections shall be inspected to ensure that they are mechanically strong and electrically adequate for the required current.

(4) Operating instructions. Employers shall instruct employees in the safe means of arc welding and cutting as follows:

(a) When electrode holders are to be left unattended, the electrodes shall be removed and the holders shall be so placed or protected that they cannot make electrical contact with employees or conducting objects.

(b) Hot electrode holders shall not be dipped in water; to do so may expose the arc welder or cutter to electric shock.

(c) When the arc welder or cutter has occasion to leave ~~(his)~~ work or to stop work for any appreciable length of time, or when the arc welding or cutting machine is to be moved, the power supply switch to the equipment shall be opened.

(d) Any faulty or defective equipment shall be reported to the supervisor.

(e) See WAC 296-155-452 for additional requirements.

(5) Shielding. Whenever practical, all arc welding and cutting operations shall be shielded by noncombustible or flameproof screens which will protect employees and other persons working in the vicinity from the direct rays of the arc.

(6) Employee protection. Where welding or cutting operations are being performed in areas where it is possible for molten slag to contact other employees, those employees shall be protected from being burned by providing overhead protection, barricading the impact area, or other effective means.

**AMENDATORY SECTION** (Amending Order 92-13, filed 11/10/92, effective 12/18/92)

**WAC 296-155-428 General requirements.** (1) Protection of employees.

(a) No employer shall permit an employee to work in such proximity to any part of an electric power circuit that the employee could contact the electric power circuit in the course of work, unless the employee is protected against electric shock by de-energizing the circuit and grounding it or by guarding it effectively by insulation or other means.

(b) No person, firm, corporation, or agent of same, shall require or permit any employee to perform any function in proximity to electrical conductors or to engage in any excavation, construction, demolition, repair, or other operation, unless and until danger from accidental contact with said electrical conductors has been effectively guarded by de-energizing the circuit and grounding it or by guarding it by effective insulation or other effective means.

(c) In work areas where the exact location of underground electric powerlines is unknown, no activity which may bring employees into contact with those powerlines shall begin until the powerlines have been positively and unmistakably de-energized and grounded.

(d) Before work is begun the employer shall ascertain by inquiry or direct observation, or by instruments, whether any part of an energized electric power circuit, exposed or concealed, is so located that the performance of the work may bring any person, tool, or machine into physical or electrical contact with the electric power circuit. The employer shall post and maintain proper warning signs where such a circuit exists. The employer shall advise employees of the location of such lines, the hazards involved, and the protective measures to be taken.

(e) No work shall be performed, no material shall be piled, stored or otherwise handled, no scaffolding, commercial signs, or structures shall be erected or dismantled, nor any tools, machinery or equipment operated within the specified minimum distances from any energized high

voltage electrical conductor capable of energizing the material or equipment; except where the electrical distribution and transmission lines have been de-energized and visibly grounded at point of work, or where insulating barriers not a part of or an attachment to the equipment have been erected, to prevent physical contact with the lines, equipment shall be operated proximate to, under, over, by, or near energized conductors only in accordance with the following:

(i) For lines rated 50 kV. or below, minimum clearance between the lines and any part of the equipment or load shall be ten feet.

(ii) For lines rated over 50 kV. minimum, clearance between the lines and any part of the equipment or load shall be ten feet plus 0.4 inch or each 1 kV. over 50 kV., or twice the length of the line insulator but never less than ten feet.

(f) Work on energized equipment. Only qualified persons shall work on electric circuit parts of equipment that have not been deenergized under the procedures of WAC 296-155-429(4). Such persons shall be capable of working safely on energized circuits and shall be familiar with the proper use of special precautionary techniques, personal protective equipment, insulating and shielding materials, and insulated tools.

(g) Overhead electric lines. Where overhead electric conductors are encountered in proximity to a work area, the employer shall be responsible for:

(i) Ascertaining the voltage and minimum clearance distance required; and

(ii) Maintaining the minimum clearance distance; and

(iii) Ensuring that the requirements of this section are complied with.

(h) If relocation of the electrical conductors is necessary, arrangements shall be made with the owners of the lines for such relocation.

~~((g))~~ (i) Barriers.

(i) Barriers shall be of such character and construction as to effectively provide the necessary protection without creating other hazards or jeopardizing the operation of the electrical circuits.

(ii) Barriers installed within the ten feet clearance from conductors shall be installed only under the supervision of authorized and qualified persons and this shall include a representative of the electrical utility or owner involved.

~~((h))~~ (i) Exceptions.

(i) These rules do not apply to the construction, reconstruction, operation, and maintenance, of overhead electrical lines, structures, and associated equipment by authorized and qualified electrical workers.

(ii) These rules do not apply to authorized and qualified employees engaged in the construction, reconstruction, operation, and maintenance, of overhead electrical circuits or conductors and associated equipment of rail transportation systems or electrical generating, transmission, distribution and communication systems which are covered by chapters 296-45 and 296-32 WAC.

~~((i))~~ (k) Special precautions must be taken.

(i) When handling any winch lines, guy wires, or other free cable, wire or rope in the vicinity of any electrical conductors.

(ii) When pulling a winch line, or other cable or rope under energized electrical conductors from a boom, mast,

pile driver, etc., in such a manner as to make possible an approach to within ten feet of a conductor.

(iii) When there is possibility of a winch line, cable, etc., either becoming disconnected or breaking under load because of excessive strain and flipping up into overhead conductors.

(iv) When placing steel, concrete reinforcement, wire mesh, etc.

(v) When handling pipe or rod sections in connection with digging wells or test holes.

(vi) When moving construction equipment, apparatus, machinery, etc., all such movements must avoid striking supporting structures, guy wires, or other elements of the electrical utility system causing the conductors to so swing or move as to decrease clearances to less than ten feet from construction equipment, or to cause them to come together.

((f)) (l) Warning sign required.

(i) An approved durable warning sign legible at twelve feet, reading "It is unlawful to operate this equipment within ten feet of electrical conductors" shall be posted and maintained in plain view of the operator at the controls of each crane, derrick, shovel, drilling rig, pile driver or similar apparatus which is capable of vertical, lateral or swinging motion.

(ii) A similar sign shall be installed on the outside of the equipment and located as to be readily visible to mechanics or other persons engaged in the work operation.

(iii) Signs shall be not less than 6" x 8" dimensions with the word "WARNING" or "DANGER" in large letters and painted red across the top and the other letters in black painted on yellow background.

((h)) (m) Any overhead wire shall be considered to be an energized line until the owner of such line or the electrical utility authorities indicate that it is not an energized line and it has been visibly grounded.

(2) Passageways and open spaces.

(a) Barriers or other means of guarding shall be provided to ensure that workspace for electrical equipment will not be used as a passageway during periods when energized parts of electrical equipment are exposed.

(b) Working spaces, walkways, and similar locations shall be kept clear of cords so as not to create a tripping hazard to employees.

(3) Load ratings. In existing installations, no changes in circuit protection shall be made to increase the load in excess of the load rating of the circuit wiring.

(4) Fuses. When fuses are installed or removed with one or both terminals energized, special tools insulated for the voltage shall be used.

(5) Cords and cables.

(a) Worn or frayed electric cords or cables shall not be used.

(b) Extension cords shall not be fastened with staples, hung from nails, or suspended by wire.

(6) Interlocks. Only a qualified person following the requirements of this section may defeat an electrical safety interlock, and then only temporarily while they are working on the equipment. The interlock systems shall be returned to its operable condition when this work is completed.

(7) Portable electric equipment—Handling. Portable equipment shall be handled in a manner which will not cause damage. Flexible electric cords connected to equipment

shall not be used for raising or lowering the equipment. Flexible cords shall not be fastened with staples or otherwise hung in such a fashion as could damage the outer jacket or insulation.

(8) Visual inspection. When an attachment plug is to be connected to a receptacle (including any on a cord set), the relationship of the plug and receptacle contacts shall first be checked to ensure they are of proper mating configurations.

(9) Connecting attachment plugs.

(a) Employees' hands shall not be wet when plugging and unplugging flexible cords and cord- and plug-connected equipment, if energized equipment is involved.

(b) Energized plug and receptacle connections shall be handled only with insulating protective equipment if the condition of the connection could provide a conducting path to the employee's hand (if, for example, a cord connector is wet from being immersed in water).

(c) Locking-type connectors shall be properly secured after connection.

(10) Routine opening and closing circuits. Load rated switches, circuit breakers, or other devices specifically designed as disconnecting means shall be used for the opening, reversing, or closing of circuits under load conditions. Cable connectors not of the load-break type, fuses, terminal lugs, and cable splice connections shall not be used for such purposes, except in an emergency.

(11) Reclosing circuits after protective device operation. After a circuit is deenergized by a circuit protective device, the circuit shall not be manually reenergized until it has been determined that the equipment and circuit can be safely energized. This repetitive manual reclosing of circuit breakers or reenergizing circuits through replaced fuses is prohibited.

Note: When it can be determined from the design of the circuit and the overcurrent devices involved that the automatic operation of a device was caused by an overload rather than a fault connection, no examination of the circuit or connected equipment is needed before the circuit is reenergized.

(12) Test instruments and equipment—Use. Only qualified persons shall perform testing work on electric circuits or equipment.

(13) Visual inspection. Test instruments and equipment and all associated test leads, cables, power cords, probes, and connectors shall be visually inspected for external defects and damage before the equipment is used. If there is a defect or evidence of damage that might expose an employee to injury, the defective or damaged item shall be removed from service, and no employee shall use it until necessary repairs and tests to render the equipment safe have been made.

(14) Rating of equipment. Test instruments and equipment and their accessories shall be rated for the circuits and equipment to which they will be connected and shall be designed for the environment in which they will be used.

(15) Occasional use of flammable or ignitable materials. Where flammable materials are present only occasionally, electric equipment capable of igniting them shall not be used, unless measures are taken to prevent hazardous conditions from developing. Such materials include, but are not limited to: Flammable gases, vapors, or liquids; combustible dust; and ignitable fibers or flyings.

(16) Work on energized equipment. Only qualified persons shall work on electric circuit parts of equipment that have not been deenergized under the procedures of WAC 296-155-429(4). Such persons shall be capable of working safely on energized circuits and shall be familiar with the proper use of special precautionary techniques, personal protective equipment, insulating and shielding materials, and insulated tools.

(17) Overhead lines. If work is to be performed near overhead lines, the lines shall be deenergized and grounded, or other protective measures shall be provided before work is started. If the lines are to be deenergized, arrangements shall be made with the person or organization that operates or controls the electric circuits involved to deenergize and ground them. If protective measures, such as guarding, isolating, or insulating, these precautions shall prevent employees from contacting such lines directly with any part of their body or indirectly through conductive materials, tools, or equipment.

(18) Unqualified persons. When an unqualified person is working in an elevated position, or on the ground, near overhead lines, the location shall be such that the person and the longest conductive object they may contact cannot come closer to any unguarded, energized overhead line than the following distances:

(a) For voltages to ground 50kV or below—10 ft.;

(b) For voltages to ground over 50kV—10 ft. plus 0.4 inch for every 1kV over 50kV.

(19) Qualified persons. When a qualified person is working in the vicinity of overhead lines, whether in an elevated position or on the ground, the person shall not approach or take any conductive object without an approved insulating handle closer to exposed energized parts that are shown in subsection (1)(e) of this section unless:

(a) The person is insulated from the energized part (gloves, with sleeves if necessary), rated for the voltage involved are considered to be insulation of the person from the energized part on which work is performed; or

(b) The energized part is insulated both from all other conductive objects at a different potential and from the person; or

(c) The person is insulated from all conductive objects at a potential different from that of the energized part.

(20) Vehicular and mechanical equipment.

(a) Any vehicle or mechanical equipment capable of having parts of its structure elevated near energized overhead lines shall be operated so that a clearance of 10 ft. is maintained. If the voltage is higher than 50kV, the clearance shall be increased 0.4 inch for every 1kV over the voltage. However, under any of the following conditions, the clearance may be reduced:

(i) If the vehicle is in transit with its structure lowered, the clearance may be reduced to 4 ft. If the voltage is higher than 50kV, the clearance shall be increased 0.4 inch for every 1kV over that voltage.

(ii) If insulating barriers are installed to prevent contact with the lines, and if the barriers are rated for the voltage of the line being guarded and are not a part of or an attachment to the vehicle or its raised structure, the clearance may be reduced to a distance within the designed working dimensions of the insulating barrier.

(b) If the equipment is an aerial lift insulated for the voltage involved, and if the work is performed by a qualified person, the clearance (between the uninsulated portion of the aerial lift and the power line) may be reduced to the distance given in (a) through (d) of this subsection.

(c) Employees standing on the ground shall not contact the vehicle or mechanical equipment or any of its attachments, unless:

(i) The employee is using protective equipment rated for the voltage; or

(ii) The equipment is located so that no uninsulated part of its structure (that portion of the structure that provides a conductive path to employees on the ground) can come closer to the line than permitted in this section.

(d) If any vehicle or mechanical equipment capable of having parts of its structure elevated near energized overhead lines is of grounding shall not stand at the grounding location whenever there is a possibility of overhead line contact. Additional precautions, such as the use of barricades or insulation, shall be taken to protect employees from hazardous ground potentials, depending on earth resistivity and fault currents, which can develop within the first few feet or more outward from the grounding point.

(21) Illumination.

(a) Employees shall not enter spaces containing exposed energized parts, unless illumination is provided that enables the employees to perform the work safely.

(b) Where lack of illumination or an obstruction precludes observation of the work to be performed, employees shall not perform tasks near exposed energized parts. Employees shall not reach blindly into areas which may contain energized parts.

(22) Confined or enclosed space (such as a manhole or vault) that contains exposed energized parts, the employer shall provide, and the employee shall use, protective shields, protective barriers, or insulating materials as necessary to avoid inadvertent contact with these parts. Doors, hinged panels, and the like shall be secured to prevent their swinging into an employee and causing the employee to contact exposed energized parts.

(23) Conductive materials and equipment. Conductive materials and equipment that are in contact with any part of an employee's body shall be handled in a manner that will prevent them from contacting exposed energized conductors or circuit parts. If an employee handle long dimensional conductive objects (such as ducts and pipes) practices (such as the use of insulation, guarding, and material handling techniques) which will minimize the hazard.

(24) Portable ladders. Portable ladders shall have nonconductive siderails if they are used where the employee or the ladder could contact exposed energized parts.

(25) Conductive apparel. Conductive articles of jewelry and clothing (such as watch bands, bracelets, rings, key chains, necklaces, metalized aprons, cloth with conductive thread, or metal headgear) shall not be worn if they might contact exposed energized parts.

(26) Housekeeping duties.

(a) Where live parts present an electrical contact hazard, employees shall not perform housekeeping duties at such close distances to the parts that there is a possibility of contact, unless adequate safeguards (such as insulating equipment or barriers) are provided.

(b) Electrically conductive cleaning materials (including conductive solids such as steel wool, metalized cloth, and silicon carbide, as well as conductive liquid solutions) shall not be used in proximity to energized parts unless procedures are followed which will prevent electrical contact.

AMENDATORY SECTION (Amending Order 88-04, filed 5/11/88)

**WAC 296-155-429 Lockout and tagging of circuits.**

(1) Controls. Controls that are deactivated during the course of work on energized or deenergized equipment or circuits shall be tagged and padlocked in the open position.

(2) Equipment and circuits. Equipment or circuits that are de-energized shall be rendered inoperative and have tags and locked padlocks attached at all points where such equipment or circuits can be energized.

(3) Tags. Tags shall be placed to identify plainly the equipment or circuits being worked on.

(4) Lockout and tagging. While any employee is exposed to contact with parts of fixed electric equipment or circuits which have been deenergized, the circuits energizing the parts shall be locked out or tagged or both according to the requirements of this section. The requirements shall be followed in the order in which they are presented (i.e., (a) of this subsection first, then (b) of this subsection).

Note 1: As used in this section, fixed equipment refers to equipment fastened in connected by permanent wiring methods.

Note 2: Lockout and tagging procedures that comply with chapter 296-24 WAC, Part A-4 will also be deemed to comply with this subsection provided that:

1. The procedures address the electrical safety hazards covered by this part; and
2. The procedures also incorporate the requirements of (c)(iv) and (d)(ii) of this subsection.

(a) Procedures. The employer shall maintain a written copy of the procedures outlined in this subsection and shall make it available for inspection by employees and by the director and his/her authorized representative.

Note: The written procedures may be in the form of a copy of WAC 296-155-975(2).

(b) Deenergizing equipment.

(i) Safe procedures for deenergizing circuits and equipment shall be determined before circuits or equipment are deenergized.

(ii) The circuits and equipment to be worked on shall be disconnected from all electric energy sources. Control circuit devices, such as push buttons, selector switches, and interlocks, shall not be used as the sole means for deenergizing circuits or equipment. Interlocks for electric equipment shall not be used as a substitute for lockout and tagging procedures.

(iii) Stored electric energy which might endanger personnel shall be released. Capacitors shall be discharged and high capacitance elements shall be short-circuited and grounded, if the stored electric energy might endanger personnel.

Note: If the capacitors or associated equipment are handled in meeting this requirement, they shall be treated as energized.

(iv) Stored nonelectrical energy in devices that could reenergize electric circuit parts shall be blocked or relieved

to the extent that the circuit parts could not be accidentally energized by the device.

(c) Application of locks and tags.

(i) A lock and a tag shall be placed on each disconnecting means used to deenergize circuits and equipment on which work is to be performed, except as provided in (c)(iii) and (v) of this subsection. The lock shall be attached to prevent persons from operating the disconnecting means unless they resort to undue force or the use of tools.

(ii) Each tag shall contain a statement prohibiting unauthorized operation of the disconnecting means and removal of the tag.

(iii) If a lock cannot be applied, or if the employer can demonstrate that tagging procedures will provide a level of safety equivalent to that obtained by the use of a lock, a tag may be used without a lock.

(iv) A tag used without a lock, as permitted by item (iii) of this subsection, shall be supplemented by at least one additional safety measure that provides a level of safety equivalent to that obtained by the use of a lock. Examples of additional safety measures include the removal of an isolating circuit element, blocking of a controlling switch, or opening of an extra disconnecting device.

(v) A lock may be placed without a tag only under the following conditions:

(A) Only one circuit or piece of equipment is deenergized; and

(B) The lockout period does not extend beyond the work shifts; and

(C) Employees exposed to the hazards associated with reenergizing the circuit or equipment are familiar with this procedure.

(d) Verification of deenergized condition. The requirements of this subsection shall be met before any circuits or equipment can be considered and worked as deenergized.

(i) A qualified person shall operate the equipment operating controls or otherwise verify that the equipment cannot be restarted.

(ii) A qualified person shall use test equipment to test the circuit elements and electrical parts of equipment to which employees will be exposed and shall verify that the circuit elements and equipment parts are deenergized. The test shall also determine if any energized conditions exist as a result of inadvertently induced voltage or unrelated voltage backfeed even though specific parts of the circuit have been deenergized and presumed to be safe. If the circuit to be tested is over 600 volts, nominal, the test equipment shall be checked for proper operation immediately before and immediately after this test.

(e) Reenergizing equipment. These requirements shall be met, in the order given, before circuits or equipment are reenergized, even temporarily.

(i) A qualified person shall conduct tests and visual inspections, as necessary, to verify that all tools, electrical jumpers, shorts, grounds, and other such devices have been removed, so that the circuits and equipment can be safely energized.

(ii) Employees exposed to the hazards associated with reenergizing the circuit or equipment shall be warned to stay clear of circuits and equipment.

(iii) Each lock and tag shall be removed by the employee who applied it or under his or her direct supervision.



However, if this employee is absent from the work place, then the lock or tag may be removed by a qualified person designated to perform this task provided that:

(A) The employer ensures that the employee who applied the lock or tag is not available at the work place; and

(B) The employer ensures that the employee is aware that the lock or tag has been removed before he or she resumes work at that work place.

(iv) There shall be a visual determination that all employees are clear of the circuits and equipment.

**AMENDATORY SECTION** (Amending Order 93-04, filed 9/22/93, effective 11/1/93)

**WAC 296-155-462 Definitions applicable to this part.** The definitions given in this section apply to the terms used in Part I. The definitions given here for "approved" and "qualified person" apply, instead of the definitions given in WAC 296-155-012, to the use of these terms in Part I.

(1) "Acceptable." An installation or equipment is acceptable to the director, and approved within the meaning of this Part I:

(a) If it is accepted, certified, listed, labeled, or otherwise determined to be safe by a qualified testing laboratory capable of determining the suitability of materials and equipment for installation and use in accordance with this standard; or

(b) With respect to an installation or equipment of a kind which no qualified testing laboratory accepts, certifies, lists, labels, or determines to be safe, if it is inspected or tested by another state agency, or by a federal, municipal, or other local authority responsible for enforcing occupational safety provisions of the National Electrical Code, and found in compliance with those provisions; or

(c) With respect to custom-made equipment or related installations which are designed, fabricated for, and intended for use by a particular customer, if it is determined to be safe for its intended use by its manufacturer on the basis of test data which the employer keeps and makes available for inspection to the director and his/her authorized representatives.

(2) "Accepted." An installation is "accepted" if it has been inspected and found to be safe by a qualified testing laboratory.

(3) "Accessible." (As applied to wiring methods.) Capable of being removed or exposed without damaging the building structure or finish, or not permanently closed in by the structure or finish of the building. (See "concealed" and "exposed.")

(4) "Accessible." (As applied to equipment.) Admitting close approach; not guarded by locked doors, elevation, or other effective means. (See "readily accessible.")

(5) "Ampacity." The current in amperes a conductor can carry continuously under the conditions of use without exceeding its temperature rating.

(6) "Appliances." Utilization equipment, generally other than industrial, normally built in standardized sizes or types, which is installed or connected as a unit to perform one or more functions.

(7) "Approved." Approved by the director of the department of labor and industries or his/her authorized representative: *Provided, however,* That should a provision of this chapter state that approval by an agency or organization other than the department of labor and industries is required, such as Underwriters' Laboratories ((~~or~~)), the Bureau of Mines, or Mine Safety and Health Administration (MSHA) and the National Institute for Occupational Safety and Health (NIOSH) the provisions of WAC 296-155-006 shall apply.

(8) "Askarel." A generic term for a group of nonflammable synthetic chlorinated hydrocarbons used as electrical insulating media. Askarels of various compositional types are used. Under arcing conditions the gases produced, while consisting predominantly of noncombustible hydrogen chloride, can include varying amounts of combustible gases depending upon the askarel type.

(9) "Attachment plug (plug cap) (cap)." A device which, by insertion in a receptacle, establishes connection between the conductors of the attached flexible cord and the conductors connected permanently to the receptacle.

(10) "Automatic." Self-acting, operating by its own mechanism when actuated by some impersonal influence, as for example, a change in current strength, pressure, temperature, or mechanical configuration.

(11) "Bare conductor." See "conductor."

(12) "Bonding." The permanent joining of metallic parts to form an electrically conductive path which will assure electrical continuity and the capacity to conduct safely any current likely to be imposed.

(13) "Bonding jumper." A reliable conductor to assure the required electrical conductivity between metal parts required to be electrically connected.

(14) "Branch circuits." That portion of a wiring system extending beyond the final overcurrent device protecting the circuit. (A device not approved for branch circuit protection, such as thermal cutout or motor overload protective device, is not considered as the overcurrent device protecting the circuit.)

(15) "Building." A structure which stands alone or which is cut off from adjoining structures by fire walls with all openings therein protected by approved fire doors.

(16) "Cabinet." An enclosure designed either for surface or flush mounting, and provided with a frame, mat, or trim in which a swinging door or doors are or may be hung.

(17) "Certified." Equipment is "certified" if it:

(a) Has been tested and found by a qualified testing laboratory to meet applicable test standards or to be safe for use in a specified manner; and

(b) Is of a kind whose production is periodically inspected by a qualified testing laboratory. Certified equipment must bear a label, tag, or other record of certification.

(18) "Circuit breaker."

(a) (600 volts nominal, or less.) A device designed to open and close a circuit by nonautomatic means and to open the circuit automatically on a predetermined overcurrent without injury to itself when properly applied within its rating.

(b) (Over 600 volts, nominal.) A switching device capable of making, carrying, and breaking currents under

normal circuit conditions, and also making, carrying for a specified time, and breaking currents under specified abnormal circuit conditions, such as those of short circuit.

(19) "Class I locations." Class I locations are those in which flammable gases or vapors are or may be present in the air in quantities sufficient to produce explosive or ignitable mixtures. Class I locations include the following:

(a) Class I, Division 1. A Class I, Division 1 location is a location:

(i) In which ignitable concentrations of flammable gases or vapors may exist under normal operating conditions; or

(ii) In which ignitable concentrations of such gases or vapors may exist frequently because of repair or maintenance operations or because of leakage; or

(iii) In which breakdown or faulty operation of equipment or processes might release ignitable concentrations of flammable gases or vapors, and might also cause simultaneous failure of electric equipment.

Note: This classification usually includes locations where volatile flammable liquids or liquefied flammable gases are transferred from one container to another; interiors of spray booths and areas in the vicinity of spraying and painting operations where volatile flammable solvents are used; locations containing open tanks or vats of volatile flammable liquids; drying rooms or compartments for the evaporation of flammable solvents; inadequately ventilated pump rooms for flammable gas or for volatile flammable liquids; and all other locations where ignitable concentrations of flammable vapors or gases are likely to occur in the course of normal operations.

(b) Class I, Division 2. A Class I, Division 2 location is a location:

(i) In which volatile flammable liquids or flammable gases are handled, processed, or used, but in which the hazardous liquids, vapors, or gases will normally be confined within closed containers or closed systems from which they can escape only in case of accidental rupture or breakdown of such containers or systems, or in case of abnormal operation of equipment; or

(ii) In which ignitable concentrations of gases or vapors are normally prevented by positive mechanical ventilation, and which might become hazardous through failure or abnormal operations of the ventilating equipment; or

(iii) That is adjacent to a Class I, Division 1 location, and to which ignitable concentrations of gases or vapors might occasionally be communicated unless such communication is prevented by adequate positive-pressure ventilation from a source of clean air, and effective safeguards against ventilation failure are provided.

Note: This classification usually includes locations where volatile flammable liquids or flammable gases or vapors are used, but which would become hazardous only in case of an accident or of some unusual operating condition. The quantity of flammable material that might escape in case of accident, the adequacy of ventilating equipment, the total area involved, and the record of the industry or business with respect to explosions or fires are all factors that merit consideration in determining the classification and extent of each location.

Piping without valves, checks, meters, and similar devices would not ordinarily introduce a hazardous condition even though used for flammable liquids or gases. Locations used for the storage of flammable liquids or of liquefied or compressed gases in sealed containers would not normally be

considered hazardous unless also subject to other hazardous conditions.

Electrical conduits and their associated enclosures separated from process fluids by a single seal or barrier are classed as a Division 2 location if the outside of the conduit and enclosures is a nonhazardous location.

(20) "Class II locations." Class II locations are those that are hazardous because of the presence of combustible dust. Class II locations include the following:

(a) Class II, Division 1. A Class II, Division 1 location is a location:

(i) In which combustible dust is or may be in suspension in the air under normal operating conditions, in quantities sufficient to produce explosive or ignitable mixtures; or

(ii) Where mechanical failure or abnormal operation of machinery or equipment might cause such explosive or ignitable mixtures to be produced, and might also provide a source of ignition through simultaneous failure of electric equipment, operation of protection devices, or from other causes; or

(iii) In which combustible dusts of an electrically conductive nature may be present.

Note: Combustible dusts which are electrically nonconductive include dusts produced in the handling and processing of grain and grain products, pulverized sugar and cocoa, dried egg and milk powders, pulverized spices, starch and pastes, potato and woodflour, oil meal from beans and seed, dried hay, and other organic materials which may produce combustible dusts when processed or handled. Dusts containing magnesium or aluminum are particularly hazardous and the use of extreme caution is necessary to avoid ignition and explosion.

(b) Class II, Division 2. A Class II, Division 2 location is a location in which:

(i) Combustible dust will not normally be in suspension in the air in quantities sufficient to produce explosive or ignitable mixtures, and dust accumulations are normally insufficient to interfere with the normal operation of electrical equipment or other apparatus; or

(ii) Dust may be in suspension in the air as a result of infrequent malfunctioning of handling or processing equipment, and dust accumulations resulting therefrom may be ignitable by abnormal operation or failure of electrical equipment or other apparatus.

Note: This classification includes locations where dangerous concentrations of suspended dust would not be likely but where dust accumulations might form on or in the vicinity of electric equipment. These areas may contain equipment from which appreciable quantities of dust would escape under abnormal operating conditions or be adjacent to a Class II, Division 1 location, as described above, into which an explosive or ignitable concentration of dust may be put into suspension under abnormal operating conditions.

(21) "Class III locations." Class III locations are those that are hazardous because of the presence of easily ignitable fibers or flyings but in which such fibers or flyings are not likely to be in suspension in the air in quantities sufficient to produce ignitable mixtures. Class III locations include the following:

(a) Class III, Division 1. A Class III, Division 1 location is a location in which easily ignitable fibers or materials producing combustible flyings are handled, manufactured, or used.

Note: Easily ignitable fibers and flyings include rayon, cotton (including cotton linters and cotton waste), sisal or henequen, istle, jute, hemp, tow, cocoa fiber, oakum, baled waste kapok, Spanish moss, excelsior, sawdust, woodchips, and other material of similar nature.

(b) Class III, Division 2. A Class III, Division 2 location is a location in which easily ignitable fibers are stored or handled, except in process of manufacture. Collector ring. A collector ring is an assembly of slip rings for transferring electrical energy from a stationary to a rotating member.

(22) "Collector ring." A collector ring is an assembly of slip rings for transferring electrical energy from a stationary to a rotating member.

(23) "Concealed." Rendered inaccessible by the structure or finish of the building. Wires in concealed raceways are considered concealed, even though they may become accessible by withdrawing them. See "accessible. (As applied to wiring methods.)"

(24) "Conductor."

(a) Bare. A conductor having no covering or electrical insulation whatsoever.

(b) Covered. A conductor encased within material of composition or thickness that is not recognized as electrical insulation.

(c) Insulated. A conductor encased within material of composition and thickness that is recognized as electrical insulation.

(25) "Controller." A device or group of devices that serves to govern, in some predetermined manner, the electric power delivered to the apparatus to which it is connected.

(26) "Covered conductor." See "conductor."

(27) "Cutout." (Over 600 volts, nominal.) An assembly of a fuse support with either a fuseholder, fuse carrier, or disconnecting blade. The fuseholder or fuse carrier may include a conducting element (fuse link), or may act as the disconnecting blade by the inclusion of a nonfusible member.

(28) "Cutout box." An enclosure designed for surface mounting and having swinging doors or covers secured directly to and telescoping with the walls of the box proper. (See "cabinet.")

(29) "Damp location." See "location."

(30) "Dead front." Without live parts exposed to a person on the operating side of the equipment.

(31) "Device." A unit of an electrical system which is intended to carry but not utilize electric energy.

(32) "Disconnecting means." A device, or group of devices, or other means by which the conductors of a circuit can be disconnected from their source of supply.

(33) "Disconnecting (or isolating) switch." (Over 600 volts, nominal.) A mechanical switching device used for isolating a circuit or equipment from a source of power.

(34) "Dry location." See "location."

(35) "Enclosed." Surrounded by a case, housing, fence or walls which will prevent persons from accidentally contacting energized parts.

(36) "Enclosure." The case or housing of apparatus, or the fence or walls surrounding an installation to prevent personnel from accidentally contacting energized parts, or to protect the equipment from physical damage.

(37) "Equipment." A general term including material, fittings, devices, appliances, fixtures, apparatus, and the like,

used as a part of, or in connection with, an electrical installation.

(38) "Equipment grounding conductor." See "grounding conductor, equipment."

(39) "Explosion-proof apparatus." Apparatus enclosed in a case that is capable of withstanding an explosion of a specified gas or vapor which may occur within it and of preventing the ignition of a specified gas or vapor surrounding the enclosure by sparks, flashes, or explosion of the gas or vapor within, and which operates at such an external temperature that it will not ignite a surrounding flammable atmosphere.

(40) "Exposed. (As applied to live parts.)" Capable of being inadvertently touched or approached nearer than a safe distance by a person. It is applied to parts not suitably guarded, isolated, or insulated. (See "accessible" and "concealed.")

(41) "Exposed. (As applied to wiring methods.)" On or attached to the surface or behind panels designed to allow access. See "accessible. (As applied to wiring methods.)"

(42) "Exposed. (For the purposes of WAC 296-155-459(((4))) (3), Communications systems.)" Where the circuit is in such a position that in case of failure of supports or insulation, contact with another circuit may result.

(43) "Externally operable." Capable of being operated without exposing the operator to contact with live parts.

(44) "Feeder." All circuit conductors between the service equipment, or the generator switchboard of an isolated plant, and the final branch-circuit overcurrent device.

(45) "Festoon lighting." A string of outdoor lights suspended between two points more than 15 feet (4.57 m) apart.

(46) "Fitting." An accessory such as a locknut, bushing, or other part of a wiring system that is intended primarily to perform a mechanical rather than an electrical function.

(47) "Fuse." (Over 600 volts, nominal.) An overcurrent protective device with a circuit opening fusible part that is heated and severed by the passage of overcurrent through it. A fuse comprises all the parts that form a unit capable of performing the prescribed functions. It may or may not be the complete device necessary to connect it into an electrical circuit.

(48) "Ground." A conducting connection, whether intentional or accidental, between an electrical circuit or equipment and the earth, or to some conducting body that serves in place of the earth.

(49) "Grounded." Connected to earth or to some conducting body that serves in place of the earth.

(50) "Grounded, effectively." (Over 600 volts, nominal.) Permanently connected to earth through a ground connection of sufficiently low impedance and having sufficient ampacity that ground fault current which may occur cannot build up to voltages dangerous to personnel.

(51) "Grounded conductor." A system or circuit conductor that is intentionally grounded.

(52) "Grounding conductor." A conductor used to connect equipment or the grounded circuit of a wiring system to a grounding electrode or electrodes.

(53) "Grounding conductor, equipment." The conductor used to connect the noncurrent-carrying metal parts of equipment, raceways, and other enclosures to the system grounded conductor and/or the grounding electrode conduc-

tor at the service equipment or at the source of a separately derived system.

(54) "Grounding electrode conductor." The conductor used to connect the grounding electrode to the equipment grounding conductor and/or to the grounded conductor of the circuit at the service equipment or at the source of a separately derived system.

(55) "Ground-fault circuit interrupter." A device for the protection of personnel that functions to deenergize a circuit or portion thereof within an established period of time when a current to ground exceeds some predetermined value that is less than that required to operate the overcurrent protective device of the supply circuit.

(56) "Guarded." Covered, shielded, fenced, enclosed, or otherwise protected by means of suitable covers, casings, barriers, rails, screens, mats, or platforms to remove the likelihood of approach to a point of danger or contact by persons or objects.

(57) "Hazard." That condition, potential or inherent, which is likely to cause injury, death, or occupational disease.

(58) "Hoistway." Any shaftway, hatchway, well hole, or other vertical opening or space in which an elevator or dumbwaiter is designed to operate.

(59) "Identified (conductors or terminals)." Identified, as used in reference to a conductor or its terminal, means that such conductor or terminal can be recognized as grounded.

(60) "Identified (for the use)." Recognized as suitable for the specific purpose, function, use, environment, application, etc., where described as a requirement in this standard. Suitability of equipment for a specific purpose, environment, or application is determined by a qualified testing laboratory where such identification includes labeling or listing.

(61) "Insulated conductor." See "conductor."

(62) "Interrupter switch." (Over 600 volts, nominal.) A switch capable of making, carrying, and interrupting specified currents.

(63) "Intrinsically safe equipment and associated wiring." Equipment and associated wiring in which any spark or thermal effect, produced either normally or in specified fault conditions, is incapable, under certain prescribed test conditions, of causing ignition of a mixture of flammable or combustible material in air in its most easily ignitable concentration.

(64) "Isolated." Not readily accessible to persons unless special means for access are used.

(65) "Isolated power system." A system comprising an isolating transformer or its equivalent, a line isolation monitor, and its ungrounded circuit conductors.

(66) "J-Box (junction box)." An electrical sheet metal enclosure with openings for conduit or cable with sheet metal cover. The primary purpose is for joining conductors for splicing.

(67) "Labeled." Equipment or materials to which has been attached a label, symbol or other identifying mark of a qualified testing laboratory which indicates compliance with appropriate standards or performance in a specified manner.

(68) "Lighting outlet." An outlet intended for the direct connection of a lampholder, a lighting fixture, or a pendant cord terminating in a lampholder.

(69) "Listed." Equipment or materials included in a list published by a qualified testing laboratory whose listing states either that the equipment or material meets appropriate standards or has been tested and found suitable for use in a specified manner.

(70) "Location."

(a) Damp location. Partially protected locations under canopies, marquees, roofed open porches, and like locations, and interior locations subject to moderate degrees of moisture, such as some basements.

(b) Dry location. A location not normally subject to dampness or wetness. A location classified as dry may be temporarily subject to dampness or wetness, as in the case of a building under construction.

(c) Wet location. Installations underground or in concrete slabs or masonry in direct contact with the earth, and locations subject to saturation with water or other liquids, such as locations exposed to weather and unprotected.

(71) "Mobile x-ray." X-ray equipment mounted on a permanent base with wheels and/or casters for moving while completely assembled.

(72) "Motor control center." An assembly of one or more enclosed sections having a common power bus and principally containing motor control units.

(73) "Outlet." A point on the wiring system at which current is taken to supply utilization equipment.

(74) "Overcurrent." Any current in excess of the rated current of equipment or the ampacity of a conductor. It may result from overload (see definition), short circuit, or ground fault. A current in excess of rating may be accommodated by certain equipment and conductors for a given set of conditions. Hence the rules for overcurrent protection are specific for particular situations.

(75) "Overload." Operation of equipment in excess of normal, full load rating, or of a conductor in excess of rated ampacity which, when it persists for a sufficient length of time, would cause damage or dangerous overheating. A fault, such as a short circuit or ground fault, is not an overload. (See "overcurrent.")

(76) "Panelboard." A single panel or group of panel units designed for assembly in the form of a single panel; including buses, automatic overcurrent devices, and with or without switches for the control of light, heat, or power circuits; designed to be placed in a cabinet or cutout box placed in or against a wall or partition and accessible only from the front. (See "switchboard.")

(77) "Portable x-ray." X-ray equipment designed to be hand-carried.

(78) "Power fuse." (Over 600 volts, nominal.) See "fuse."

(79) "Power outlet." An enclosed assembly which may include receptacles, circuit breakers, fuseholders, fused switches, buses and watt-hour meter mounting means; intended to serve as a means for distributing power required to operate mobile or temporarily installed equipment.

(80) "Premises wiring system." That interior and exterior wiring, including power, lighting, control, and signal circuit wiring together with all of its associated hardware, fittings, and wiring devices, both permanently and temporarily installed, which extends from the load end of the service drop, or load end of the service lateral conductors to the

outlet(s). Such wiring does not include wiring internal to appliances, fixtures, motors, controllers, motor control centers, and similar equipment.

(81) "Qualified person." One familiar with the construction and operation of the equipment and the hazards involved.

(82) "Qualified testing laboratory." A properly equipped and staffed testing laboratory which has capabilities for and which provides the following services:

(a) Experimental testing for safety of specified items of equipment and materials referred to in this standard to determine compliance with appropriate test standards or performance in a specified manner;

(b) Inspecting the run of such items of equipment and materials at factories for product evaluation to assure compliance with the test standards;

(c) Service-value determinations through field inspections to monitor the proper use of labels on products and with authority for recall of the label in the event a hazardous product is installed;

(d) Employing a controlled procedure for identifying the listed and/or labeled equipment or materials tested; and

(e) Rendering credible reports or findings that are objective and without bias of the tests and test methods employed.

(83) "Raceway." A channel designed expressly for holding wires, cables, or busbars, with additional functions as permitted in this part. Raceways may be of metal or insulating material, and the term includes rigid metal conduit, rigid nonmetallic conduit, intermediate metal conduit, liquidtight flexible metal conduit, flexible metallic tubing, flexible metal conduit, electrical metallic tubing, underfloor raceways, cellular concrete floor raceways, cellular metal floor raceways, surface raceways, wireways, and busways.

(84) "Readily accessible." Capable of being reached quickly for operation, renewal, or inspections, without requiring those to whom ready access is requisite to climb over or remove obstacles or to resort to portable ladders, chairs, etc. (See "accessible.")

(85) "Receptacle." A receptacle is a contact device installed at the outlet for the connection of a single attachment plug. A single receptacle is a single contact device with no other contact device on the same yoke. A multiple receptacle is a single device containing two or more receptacles.

(86) "Receptacle outlet." An outlet where one or more receptacles are installed.

(87) "Remote-control circuit." Any electric circuit that controls any other circuit through a relay or an equivalent device.

(88) "Sealable equipment." Equipment enclosed in a case or cabinet that is provided with a means of sealing or locking so that live parts cannot be made accessible without opening the enclosure. The equipment may or may not be operable without opening the enclosure.

(89) "Separately derived system." A premises wiring system whose power is derived from generator, transformer, or converter windings and has no direct electrical connection, including a solidly connected grounded circuit conductor, to supply conductors originating in another system.

(90) "Service." The conductors and equipment for delivering energy from the electricity supply system to the wiring system of the premises served.

(91) "Service conductors." The supply conductors that extend from the street main or from transformers to the service equipment of the premises supplied.

(92) "Service drop." The overhead service conductors from the last pole or other aerial support to and including the splices, if any, connecting to the service-entrance conductors at the building or other structure.

(93) "Service-entrance conductors, overhead system." The service conductors between the terminals of the service equipment and a point usually outside the building, clear of building walls, where joined by tap or splice to the service drop.

(94) "Service-entrance conductors, underground system." The service conductors between the terminals of the service equipment and the point of connection to the service lateral. Where service equipment is located outside the building walls, there may be no service-entrance conductors, or they may be entirely outside the building.

(95) "Service equipment." The necessary equipment, usually consisting of a circuit breaker or switch and fuses, and their accessories, located near the point of entrance of supply conductors to a building or other structure, or an otherwise defined area, and intended to constitute the main control and means of cutoff of the supply.

(96) "Service raceway." The raceway that encloses the service-entrance conductors.

(97) "Shock hazard." To exist at an accessible part in a circuit between the part and ground, or other accessible parts if the potential is more than 42.4 volts peak and the current through a 1,500-ohm load is more than 5 milliamperes.

(98) "Signaling circuit." Any electric circuit that energizes signaling equipment.

(99) "Switchboard." A large single panel, frame, or assembly of panels which have switches, buses, instruments, overcurrent and other protective devices mounted on the face or back or both. Switchboards are generally accessible from the rear as well as from the front and are not intended to be installed in cabinets. (See "panelboard.")

(100) "Switches."

(a) General-use switch. A switch intended for use in general distribution and branch circuits. It is rated in amperes, and it is capable of interrupting its rated current at its rated voltage.

(b) General-use snap switch. A form of general-use switch so constructed that it can be installed in flush device boxes or on outlet box covers, or otherwise used in conjunction with wiring systems recognized by this part.

(c) Isolating switch. A switch intended for isolating an electric circuit from the source of power. It has no interrupting rating, and it is intended to be operated only after the circuit has been opened by some other means.

(d) Motor-circuit switch. A switch, rated in horsepower, capable of interrupting the maximum operating overload current of a motor of the same horsepower rating as the switch at the rated voltage.

(101) "Switching devices." (Over 600 volts, nominal.) Devices designed to close and/or open one or more electric circuits. Included in this category are circuit breakers,

cutouts, disconnecting (or isolating) switches, disconnecting means, and interrupter switches.

(102) "Transformer." A transformer is an apparatus for converting electrical power in an a-c system at one voltage or current into electrical power at some other voltage or current without the use of rotating parts.

(103) "Transportable x-ray." X-ray equipment installed in a vehicle or that may readily be disassembled for transport in a vehicle.

(104) "Utilization equipment." Utilization equipment means equipment which utilizes electric energy for mechanical, chemical, heating, lighting, or similar useful purpose.

(105) "Utilization system." A utilization system is a system which provides electric power and light for employee workplaces, and includes the premises wiring system and utilization equipment.

(106) "Ventilated." Provided with a means to permit circulation of air sufficient to remove an excess of heat, fumes, or vapors.

(107) "Volatile flammable liquid." A flammable liquid having a flash point below 38°C (100°F) or whose temperature is above its flash point, or a Class II combustible liquid having a vapor pressure not exceeding 40 psia (276 kPa) at 38°C (100°F) whose temperature is above its flash point.

(108) "Voltage." (Of a circuit.) The greatest root-mean-square (effective) difference of potential between any two conductors of the circuit concerned.

(109) "Voltage, nominal." A nominal value assigned to a circuit or system for the purpose of conveniently designating its voltage class (as 120/240, 480Y/277, 600, etc.). The actual voltage at which a circuit operates can vary from the nominal within a range that permits satisfactory operation of equipment.

(110) "Voltage to ground." For grounded circuits, the voltage between the given conductor and that point or conductor of the circuit that is grounded; for ungrounded circuits, the greatest voltage between the given conductor and any other conductor of the circuit.

(111) "Watertight." So constructed that moisture will not enter the enclosure.

(112) "Weatherproof." So constructed or protected that exposure to the weather will not interfere with successful operation. Rainproof, raintight, or watertight equipment can fulfill the requirements for weatherproof where varying weather conditions other than wetness, such as snow, ice, dust, or temperature extremes, are not a factor.

(113) "Wet location." See "location."

**AMENDATORY SECTION** (Amending Order 91-07, filed 11/22/91, effective 12/24/91)

**WAC 296-155-480 Ladders.** (1) General. The following requirements apply to all ladders as indicated, including job-made ladders.

(a) Ladders shall be capable of supporting the following loads without failure:

(i) Each self-supporting portable ladder: At least four times the maximum intended load, except that each extra-heavy-duty type 1A metal or plastic ladder shall sustain at least 3.3 times the maximum intended load. The ability of a ladder to sustain the loads indicated in this ~~((paragraph))~~ section shall be determined by applying or transmitting the

requisite load to the ladder in a downward vertical direction. Ladders built and tested in conformance with the applicable provisions of appendix A of this part will be deemed to meet this requirement.

(ii) Each portable ladder that is not self-supporting: At least four times the maximum intended load, except that each extra-heavy-duty type 1A metal or plastic ladders shall sustain at least 3.3 times the maximum intended load. The ability of a ladder to sustain the loads indicated in this ~~((paragraph))~~ section shall be determined by applying or transmitting the requisite load to the ladder in a downward vertical direction when the ladder is placed at an angle of 75 1/2 degrees from the horizontal. Ladders built and tested in conformance with the applicable provisions of appendix A will be deemed to meet this requirement.

(iii) Each fixed ladder: At least two loads of 250 pounds (114 kg) each, concentrated between any two consecutive attachments (the number and position of additional concentrated loads of 250 pounds (114 kg) each, determined from anticipated usage of the ladder, shall also be included), plus anticipated loads caused by ice buildup, winds, rigging, and impact loads resulting from the use of ladder safety devices. Each step or rung shall be capable of supporting a single concentrated load of at least 250 pounds (114 kg) applied in the middle of the step or rung. Ladders built in conformance with the applicable provisions of appendix A will be deemed to meet this requirement.

(b) Ladder rungs, cleats, and steps shall be parallel, level, and uniformly spaced when the ladder is in position for use.

(c)(i) Rungs, cleats, and steps of portable ladders (except as provided below) and fixed ladders (including individual-rung/step ladders) shall be spaced not less than 10 inches (25 cm) apart, nor more than 14 inches (36 cm) apart, as measured between centerlines of the rungs, cleats, and steps.

(ii) Rungs, cleats, and steps of step stools shall be not less than 8 inches (20 cm) apart, nor more than 12 inches (31 cm) apart, as measured between centerlines of the rungs, cleats, and steps.

(iii) Rungs, cleats, and steps of the base section of extension trestle ladders shall be not less than 8 inches (20 cm) nor more than 18 inches (46 cm) apart, as measured between centerlines of the rungs, cleats, and steps. The rung spacing on the extension section of the extension trestle ladder shall be not less than 6 inches (15 cm) nor more than 12 inches (31 cm), as measured between centerlines of the rungs, cleats, and steps.

(iv) Cleats on job-made ladders shall be inset into the edges of the side-rails one-half inch, or filler blocks shall be used on the side-rails between the cleats.

(v) Cleats on job-made ladders shall be secured to each rail with three 10d common wire nails or other fasteners of equivalent strength.

(d)(i) The minimum clear distance between the sides of individual-rung/step ladders and the minimum clear distance between the side rails of other fixed ladders shall be 16 inches (41 cm).

(ii) The minimum clear distance between side rails for all portable ladders shall be 11 1/2 inches (29 cm).

(e) The rungs of individual-rung/step ladders shall be shaped such that employees' feet cannot slide off the end of the rungs.

(f)(i) The rungs and steps of fixed metal ladders manufactured after the effective date of this standard, shall be corrugated, knurled, dimpled, coated with skid-resistant material, or otherwise treated to minimize slipping.

(ii) The rungs and steps of portable metal ladders shall be corrugated, knurled, dimpled, coated with skid-resistant material, or otherwise treated to minimize slipping.

(g) Ladders shall not be tied or fastened together to provide longer sections unless they are specifically designed for such use.

(h) A metal spreader or locking device shall be provided on each stepladder to hold the front and back sections in an open position when the ladder is being used.

(i) When splicing is required to obtain a given length of side rail, the resulting side rail must be at least equivalent in strength to a one-piece side rail made of the same material.

(j) Except when portable ladders are used to gain access to fixed ladders (such as those on utility towers, billboards, and other structures where the bottom of the fixed ladder is elevated to limit access), when two or more separate ladders are used to reach an elevated work area, the ladders shall be offset with a platform or landing between the ladders. (The requirements to have guardrail systems with toeboards for falling object and overhead protection on platforms and landings are set forth in chapter 296-155 WAC, Part K.)

(k) Ladder components shall be surfaced so as to prevent injury to an employee from punctures or lacerations, and to prevent snagging of clothing.

(l) Wood ladders shall not be coated with any opaque covering, except for identification or warning labels which may be placed on one face only of a side rail.

(m) The minimum perpendicular clearance between fixed ladder rungs, cleats, and steps, and any obstruction behind the ladder shall be 7 inches (18 cm), except in the case of an elevator pit ladder, for which a minimum perpendicular clearance of 4 1/2 inches (11 cm) is required.

(n) The minimum perpendicular clearance between the center line of fixed ladder rungs, cleats, and steps, and any obstruction on the climbing side of the ladder shall be 30 inches (76 cm), except as provided in (o) of this subsection.

(o) When unavoidable obstructions are encountered, the minimum perpendicular clearance between the centerline of fixed ladder rungs, cleats, and steps, and the obstruction on the climbing side of the ladder may be reduced to 24 inches (61 cm), provided that a deflection device is installed to guide employees around the obstruction.

(p) Through fixed ladders at their point of access/egress shall have a step-across distance of not less than 7 inches (18 cm) nor more than 12 inches (30 cm) as measured from the centerline of the steps or rungs to the nearest edge of the landing area. If the normal step-across distance exceeds 12 inches (30 cm), a landing platform shall be provided to reduce the distance to the specified limit.

(q) Fixed ladders without cages or wells shall have a clear width to the nearest permanent object of at least 15 inches (38 cm) on each side of the centerline of the ladder.

(r) Fixed ladders shall be provided with cages, wells, ladder safety devices, or self-retracting lifelines where the length of climb is less than 24 feet (7.3 m) but the top of the

ladder is at a distance greater than 24 feet (7.3 m) above lower levels.

(s) Where the total length of a climb equals or exceeds 24 feet (7.3 m), fixed ladders shall be equipped with one of the following:

(i) Ladder safety devices; or

(ii) Self-retracting lifelines, and rest platforms at intervals not to exceed 150 feet (45.7 m); or

(iii) A cage or well, and multiple ladder sections, each ladder section not to exceed 50 feet (15.2 m) in length. Ladder sections shall be offset from adjacent sections, and landing platforms shall be provided at maximum intervals of 50 feet (15.2 m).

(t) Cages for fixed ladders shall conform to all of the following:

(i) Horizontal bands shall be fastened to the side rails of rail ladders, or directly to the structure, building, or equipment for individual-rung ladders;

(ii) Vertical bars shall be on the inside of the horizontal bands and shall be fastened to them;

(iii) Cages shall extend not less than 27 inches (68 cm), or more than 30 inches (76 cm) from the centerline of the step or rung (excluding the flare at the bottom of the cage), and shall not be less than 27 inches (68 cm) in width;

(iv) The inside of the cage shall be clear of projections;

(v) Horizontal bands shall be spaced not more than 4 feet (1.2 m) on center vertically;

(vi) Vertical bars shall be spaced at intervals not more than 9 1/2 inches (24 cm) on center horizontally;

(vii) The bottom of the cage shall be at a level not less than 7 feet (2.1 m) nor more than 8 feet (2.4 m) above the point of access to the bottom of the ladder. The bottom of the cage shall be flared not less than 4 inches (10 cm) all around within the distance between the bottom horizontal band and the next higher band;

(viii) The top of the cage shall be a minimum of 42 inches (1.1 m) above the top of the platform, or the point of access at the top of the ladder, with provision for access to the platform or other point of access.

(u) Wells for fixed ladders shall conform to all of the following:

(i) They shall completely encircle the ladder;

(ii) They shall be free of projections;

(iii) Their inside face on the climbing side of the ladder shall extend not less than 27 inches (68 cm) nor more than 30 inches (76 cm) from the centerline of the step or rung;

(iv) The inside clear width shall be at least 30 inches (76 cm);

(v) The bottom of the wall on the access side shall start at a level not less than 7 feet (2.1 m) nor more than 8 feet (2.4 m) above the point of access to the bottom of the ladder.

(v) Ladder safety devices, and related support systems, for fixed ladders shall conform to all of the following:

(i) They shall be capable of withstanding without failure a drop test consisting of an 18-inch (41 cm) drop of a 500-pound (226 kg) weight;

(ii) They shall permit the employee using the device to ascend or descend without continually having to hold, push or pull any part of the device, leaving both hands free for climbing;



(iii) They shall be activated within 2 feet (.61 m) after a fall occurs, and limit the descending velocity of an employee to 7 feet/sec. (2.1 m/sec.) or less;

(iv) The connection between the carrier or lifeline and the point of attachment to the body belt or harness shall not exceed 9 inches (23 cm) in length.

(w) The mounting of ladder safety devices for fixed ladders shall conform to the following:

(i) Mountings for rigid carriers shall be attached at each end of the carrier, with intermediate mountings, as necessary, spaced along the entire length of the carrier, to provide the strength necessary to stop employees' falls.

(ii) Mountings for flexible carriers shall be attached at each end of the carrier. When the system is exposed to wind, cable guides for flexible carriers shall be installed at a minimum spacing of 25 feet (7.6 m) and maximum spacing of 40 feet (12.2 m) along the entire length of the carrier, to prevent wind damage to the system.

(iii) The design and installation of mountings and cable guides shall not reduce the design strength of the ladder.

(x) The side rails of through or side-step fixed ladders shall extend 42 inches (1.1 m) above the top of the access level or landing platform served by the ladder. For a parapet ladder, the access level shall be the roof if the parapet is cut to permit passage through the parapet; if the parapet is continuous, the access level shall be the top of the parapet.

(y) For through-fixed-ladder extensions, the steps or rungs shall be omitted from the extension and the extension of the side rails shall be flared to provide not less than 24 inches (61 cm) nor more than 30 inches (76 cm) clearance between side rails. Where ladder safety devices are provided, the maximum clearance between side rails of the extensions shall not exceed 36 inches (91 cm).

(z) For side-step fixed ladders, the side rails and the steps or rungs shall be continuous in the extension.

(aa) Individual-rung/step ladders, except those used where their access openings are covered with manhole covers or hatches, shall extend at least 42 inches (1.1 m) above an access level or landing platform either by the continuation of the rung spacings as horizontal grab bars or by providing vertical grab bars that shall have the same lateral spacing as the vertical legs of the rungs.

(2) Use. The following requirements apply to the use of all ladders, including job-made ladders, except as otherwise indicated:

(a) When portable ladders are used for access to an upper landing surface, the ladder side rails shall extend at least 3 feet (.9 m) above the upper landing surface to which the ladder is used to gain access; or, when such an extension is not possible because of the ladder's length, then the ladder shall be secured at its top to a rigid support that will not deflect, and a grasping device, such as a grabrail, shall be provided to assist employees in mounting and dismounting the ladder. In no case shall the extension be such that ladder deflection under a load would, by itself, cause the ladder to slip off its support.

(b) Ladders shall be maintained free of oil, grease, and other slipping hazards.

(c) Ladders shall not be loaded beyond the maximum intended load for which they were built, nor beyond their manufacturer's rated capacity.

(d) Ladders shall be used only for the purpose for which they were designed.

(e)(i) Nonself-supporting ladders shall be used at an angle such that the horizontal distance from the top support to the foot of the ladder is approximately one-quarter of the working length of the ladder (the distance along the ladder between the foot and the top support).

(ii) Wood job-made ladders with spliced side rails shall be used at an angle such that the horizontal distance is one-eighth the working length of the ladder.

(iii) Fixed ladders shall be used at a pitch no greater than 90 degrees from the horizontal, as measured to the back side of the ladder.

(f) Ladders shall be used only on stable and level surfaces unless secured to prevent accidental displacement.

(g) Ladders shall not be used on slippery surfaces unless secured or provided with slip-resistant feet to prevent accidental displacement. Slip-resistant feet shall not be used as a substitute for care in placing, lashing, or holding a ladder that is used upon slippery surfaces including, but not limited to, flat metal or concrete surfaces that are constructed so they cannot be prevented from becoming slippery.

(h) Ladders placed in any location where they can be displaced by workplace activities or traffic, such as in passageways, doorways, or driveways, shall be secured to prevent accidental displacement, or a barricade shall be used to keep the activities or traffic away from the ladder.

(i) The area around the top and bottom of ladders shall be kept clear.

(j) The top of a nonself-supporting ladder shall be placed with the two rails supported equally unless it is equipped with a single support attachment.

(k) Ladders shall not be moved, shifted, or extended while occupied.

(l) Ladders shall have nonconductive side rails if they are used where the employee or the ladder could contact exposed energized electrical equipment, except as provided in the following:

(i) Portable metal or other portable conductive ladders shall not be used on or near energized line or equipment except where nonconductive ladders present a greater electrical hazard than conductive ladders. A greater electrical hazard would be static electricity such as might be found in extra high voltage substations.

(ii) All conductive or metal ladders shall be prominently marked and identified as being conductive.

(iii) All conductive or metal ladders shall be grounded when used near energized lines or equipment.

(m) The top or top step of a stepladder shall not be used as a step.

(n) Cross-bracing on the rear section of stepladders shall not be used for climbing unless the ladders are designed and provided with steps for climbing on both front and rear sections.

(o) Ladders shall be inspected by a competent person for visible defects on a periodic basis and after any occurrence that could affect their safe use.

(p) Portable ladders with structural defects, such as, but not limited to, broken or missing rungs, cleats, or steps, broken or split rails, corroded components, or other faulty or defective components, shall either be immediately marked in a manner that readily identifies them as defective, or be

tagged with "do not use" or similar language, and shall be withdrawn from service until repaired.

(q) Fixed ladders with structural defects, such as, but not limited to, broken or missing rungs, cleats, or steps, broken or split rails, or corroded components, shall be withdrawn from service until repaired. The requirement to withdraw a defective ladder from service is satisfied if the ladder is either:

(i) Immediately tagged with "do not use" or similar language;

(ii) Marked in a manner that readily identifies it as defective;

(iii) Or blocked (such as with a plywood attachment that spans several rungs).

(r) Ladder repairs shall restore the ladder to a condition meeting its original design criteria, before the ladder is returned to use.

(s) Single-rail ladders shall not be used.

(t) When ascending or descending a ladder, the user shall face the ladder.

(u) Employees shall not ascend or descend ladders while carrying tools or materials that might interfere with the free use of both hands.

(v) When working from a ladder, the ladder shall be secured at both top and bottom.

(w) No type of work shall be performed on a ladder over twenty-five feet from the ground or floor that requires the use of both hands to perform the work, unless a safety belt is worn and the safety lanyard is secured to the ladder.

(x) Any work that requires wearing eye protection, respirators, or handling of pressure equipment shall not be performed from a ladder more than twenty-five feet above the surrounding surface.

**AMENDATORY SECTION** (Amending Order 91-07, filed 11/22/91, effective 12/24/91)

**WAC 296-155-485 Scaffolding.** (1) General requirements. Scaffolds shall be furnished and erected in accordance with this standard for persons engaged in work that cannot be done safely from the ground or from solid construction, except that ladders used for such work shall conform to Part J chapter 296-155 WAC.

(a) All rules for design, construction, maintenance, operation, testing, and use of scaffolds contained in Part J-1 chapter 296-24 WAC apply within the construction industry.

(b) Scaffolds shall be erected in accordance with requirements of this section.

(c) The footing or anchorage for scaffolds shall be sound, rigid, and capable of carrying the maximum intended load without settling or displacement. Unstable objects such as barrels, boxes, loose brick, or concrete blocks, shall not be used to support scaffolds or planks.

(d) No scaffold shall be erected, moved, dismantled, or altered except under the supervision of competent persons.

(e) Standard guardrails and toeboards shall be installed on all open sides and ends of platforms more than 10 feet above the ground or floor, except needle beam scaffolds and floats. Scaffolds 4 feet to 10 feet in height, having a minimum horizontal dimension in either direction of less than 45 inches, shall have standard guardrails and toeboards installed on all open sides and ends of the scaffold platform.

(f) Where persons are required to work or pass under the scaffold, scaffolds shall be provided with a screen between the toeboard and the guardrail, extending along the entire opening, consisting of No. 18 gauge U.S. Standard wire 1/2-inch mesh, or the equivalent.

(g) Scaffolds and their components shall be capable of supporting without failure at least 4 times the maximum intended load.

(h) Any scaffold including accessories such as braces, brackets, trusses, screw legs, ladders, etc. damaged or weakened from any cause shall be immediately repaired or replaced.

(i) All load-carrying timber members of scaffold framing shall be a minimum of 1,500 fiber (stress grade) construction grade lumber. All dimensions are nominal sizes as provided in the American Lumber Standards, except that where rough sizes are noted, only rough or undressed lumber of the size specified will satisfy minimum requirements.

(j) All planking shall be scaffold grades, or equivalent, as recognized by approved grading rules for the species of wood used. The maximum permissible spans for 2- x 10-inch or wider planks shall be as shown in Table J-1.

(k) The maximum permissible span for 1 1/4- x 9-inch or wider plank of full thickness shall be 4 feet with medium duty loading of 50 p.s.f.

(l) Platforms shall be level. All planking or platforms shall be overlapped (minimum 12 inches), or secured from movement. The platform shall be a minimum of two 2-inch by 10-inch planks in width or a minimum of 18 inches.

(m) An access ladder or equivalent safe access shall be provided.

(n) Scaffold planks shall extend over their end supports not less than 6 inches nor more than 12 inches.

(o) The poles, legs, or uprights of scaffolds shall be plumb, and securely and rigidly braced to prevent swaying and displacement.

(p) Overhead protection shall be provided for persons on a scaffold exposed to overhead hazards.

(q) Slippery conditions on scaffolds shall be eliminated as soon as possible after they occur.

(r) Welding, burning, riveting, or open flame work shall not be performed on any staging suspended by means of fiber or synthetic rope unless suspended components are well insulated to protect against damaging contacts. Only treated or protected fiber or synthetic ropes shall be used for or near any work involving the use of corrosive substances or chemicals. Specific requirements for boatswain's chairs and float or ship scaffolds are contained in subsections ~~((12))~~ (10) and (21) of this section.

(s) Wire, synthetic, or fiber rope used for scaffold suspension shall be capable of supporting at least 6 times the rated load.

(t) The use of shore or lean-to scaffolds is prohibited.

(u) The height of freestanding scaffold towers shall not exceed four times the minimum base dimension.

(v) Factory-built (laminated) scaffold planks meeting the requirements of wood scaffold planks may be substituted for wood scaffold planks.

(w) Materials being hoisted onto a scaffold shall have a tag line.

(x) Employees shall not work on scaffolds during storms or high winds.

(y) Tools, materials, and debris shall not be allowed to accumulate in quantities to cause a hazard.

(2) Wood pole scaffolds.

(a) Scaffold poles shall bear on a foundation of sufficient size and strength to spread the load from the pole over a sufficient area to prevent settlement. All poles shall be set plumb.

(b) Where wood poles are spliced, the ends shall be squared and the upper section shall rest squarely on the lower section. Wood splice plates shall be provided on at least two adjacent sides and shall be not less than 4 feet in length, overlapping the abutted ends equally, and have the same width and not less than the cross-sectional area of the pole. Splice plates or other materials of equivalent strength may be used.

(c) Independent pole scaffolds shall be set as near to the wall of the building as practicable.

(d) All pole scaffolds shall be securely guyed or tied to the building or structure. Where the height or length exceeds 25 feet, the scaffold shall be secured at intervals not greater than 25 feet vertically and horizontally.

(e) Putlogs or bearers shall be set with their greater dimension vertical, and long enough to project over the ledgers of the inner and outer rows of poles at least 3 inches for proper support.

(f) Every wooden putlog on single pole scaffolds shall be reinforced with a 3/16- x 2-inch steel strip, or equivalent, secured to its lower edge throughout its entire length.

(g) Ledgers shall be long enough to extend over two pole spaces. Ledgers shall not be spliced between the poles. Ledgers shall be reinforced by bearing blocks securely nailed to the side of the pole to form a support for the ledger.

(h) Diagonal bracing shall be provided to prevent the poles from moving in a direction parallel with the wall of the building, or from buckling

(i) Cross bracing shall be provided between the inner and outer sets of poles in independent pole scaffolds. The free ends of pole scaffolds shall be cross braced.

(j) Full diagonal face bracing shall be erected across the entire face of pole scaffolds in both directions. The braces shall be spliced only at the poles. The inner row of poles on medium and heavy duty scaffolds shall be braced in a similar manner.

(k) Platform planks shall be laid with their edges close together so the platform will be tight with no spaces through which tools or fragments of material can fall.

(l) Where planking is lapped, each plank shall lap its end supports at least 12 inches. Where the ends of planks abut each other to form a flush floor, the butt joint shall be at the centerline of a pole. The abutted ends shall rest on separate bearers. Intermediate beams shall be provided where necessary to prevent dislodgment of planks due to deflection, and the ends shall be secured to prevent their dislodgment.

(m) When a scaffold materially changes its direction, the platform planks shall be laid to prevent tipping. The planks that meet the corner putlog at an angle shall be laid first, extending over the diagonally placed putlog far enough to have a good safe bearing, but not far enough to involve any danger from tipping. The planking running in the opposite direction at an angle shall be laid so as to extend over and rest on the first layer of planking.

(n) When moving platforms to the next level, the old platform shall be left undisturbed until the new putlogs or bearers have been set in place, ready to receive the platform planks.

(o) All wood pole scaffolds 60 feet or less in height shall be constructed and erected in accordance with Tables J-2 to J-8. If they are over 60 feet in height, they shall be designed by a qualified engineer competent in this field, and shall be constructed and erected in accordance with such design. Design drawings shall be available at the jobsite.

(3) Tube and coupler scaffolds.

(a) A light duty tube and coupler scaffold shall have all posts, bearers, runners, and bracing of nominal 2-inch O.D. steel tubing. The posts shall be spaced no more than 6 feet apart by 10 feet along the length of the scaffold. Other structural metals when used must be designed to carry an equivalent load. No dissimilar metals shall be used together.

(b) A medium duty tube and coupler scaffold shall have all posts, runners, and bracing of nominal 2-inch O.D. steel tubing. Posts spaced not more than 6 feet apart by 8 feet along the length of the scaffold shall have bearers of nominal 2 1/2-inch O.D. steel tubing. Posts spaced not more than 5 feet apart by 8 feet along the length of the scaffold shall have bearers of nominal 2-inch O.D. steel tubing. Other structural metals, when used, must be designed to carry an equivalent load. No dissimilar metals shall be used together.

(c) A heavy duty tube and coupler scaffold shall have all posts, runners, and bracing of nominal 2-inch O.D. steel tubing, with the posts spaced not more than 6 feet by 6 feet-6 inches. Other structural metals, when used, must be designed to carry an equivalent load. No dissimilar metals shall be used together.

(d) Tube and coupler scaffolds shall be limited in heights and working levels to those permitted in Tables J-8, J-9 and J-10. Drawings and specifications of all tube and coupler scaffolds above the limitations in Tables J-8, J-9 and J-10 shall be designed by a qualified engineer competent in this field. Design drawings shall be available at the jobsite.

(e) All tube and coupler scaffolds shall be constructed and erected to support four times the maximum intended loads, as set forth in Tables J-8, J-9 and J-10, or as set forth in the specifications by a licensed professional engineer competent in this field.

(f) Posts shall be accurately spaced, erected on suitable bases, and maintained plumb.

(g) Runners shall be erected along the length of the scaffold, located on both the inside and the outside posts at even height. Runners shall be interlocked to the inside and the outside posts at even heights. Runners shall be interlocked to form continuous lengths and coupled to each post. The bottom runners shall be located as close to the base as possible. Runners shall be placed not more than 6 feet-6 inches on centers. When tube and coupler guardrails and midrails are used on outside posts, they may be used in lieu of outside runners.

(h) Bearers shall be installed transversely between posts and shall be securely coupled to the posts with the inboard coupler bearing on the runner coupler. Where guardrails and midrails are required, no outboard runner is required.

(i) The length of the bearer shall exceed the post spacing of the width of the scaffold by the amount necessary

to have full contact with the coupler. Bearers used to provide a cantilever support for use as brackets for light and medium-duty scaffolds shall not carry more than two ten-inch planks unless knee braced.

(j) Bracing across the width of the scaffold shall be installed at the ends of the scaffold at least at every fourth level. Such bracing shall extend diagonally from the outer post or runner at this level upward to the inner post or runner at the next level.

(k) Longitudinal diagonal bracing shall be installed on the outer rows of poles at approximately forty degrees to fifty degrees angle from near the base of the first and last outer post upward to the top center of the scaffold. If the scaffold is long, the above diagonal bracing shall be repeated. On short but high runs, the diagonal bracing shall be installed at forty degrees to fifty degrees from the base of the first outer post to the last outer post alternating directions to the top of the scaffold. When conditions preclude the attachment of this bracing to the posts, it may be attached to the runners.

(l) When a scaffold exceeds either 30 feet horizontally or 26 feet vertically, the entire scaffold shall be tied to and securely braced against the building at intervals not to exceed 30 feet horizontally and 26 feet vertically.

(4) Fabricated tubular welded frame scaffolds.

(a) Metal tubular frame scaffolds, including accessories such as braces, brackets, trusses, screw legs, ladders, etc., shall safely support four times the maximum rated load. The maximum rated load shall not be exceeded.

(b) Spacing of panels or frames shall be consistent with the loads imposed.

(c) Scaffolds shall be properly braced by cross bracing or diagonal braces, or both, for securing vertical members together laterally, and the cross braces shall be of such length as will automatically square and align vertical members so that the erected scaffold is always plumb, level, square, and rigid. All brace connections shall be made secure.

(d) Panel or frame legs shall be set on adjustable bases or plain bases placed on mud sills or other foundations adequate to support the maximum rated load.

(e) The panels or frames shall be placed one on top of the other with coupling or stacking pins to provide proper vertical alignment of the legs.

(f) Where uplift may occur, panels shall be locked together vertically by pins or equivalent method.

(g) To prevent movement, the scaffold shall be secured to the building or structure at intervals not to exceed 30 feet horizontally and 26 feet vertically.

(h) Maximum permissible spans or planking shall be in conformity with (1)(j) of this section.

(i) Fabricated tubular frame scaffolds over 125 feet in height above the base plates shall be designed by a registered professional engineer. Copies of the drawings and specifications shall be available at the jobsite.

(j) Guardrails, midrails, and toeboards shall be installed as required by subsection (1)(e) of this section. Wire mesh shall be provided between the top rail and toeboard when persons are working below.

(k) All fabricated tubular frame scaffolds shall be erected by competent and experienced personnel.

(l) All brackets shall be seated correctly with side brackets parallel to the frames and end brackets at ninety degrees to the frames. Brackets shall not be bent or twisted from normal position. Brackets (except mobile brackets designed to carry materials) are to be used as work platforms only and shall not be used for storage of material or equipment.

(m) Scaffold frames and their components manufactured by different companies shall not be intermixed unless they are compatible and the manufacturer has given written approval. The manufacturer's letter of approval shall be available at the jobsite.

(n) Periodic inspections by the employer shall be made of all fabricated tubular frames and accessories. Any maintenance required shall be made before further use.

(5) Outrigger scaffolds, general.

(a) Outrigger beams shall extend not more than 6 feet beyond the face of the building. The inboard end of outrigger beams, measured from the fulcrum point to the inboard point of support, shall be not less than 1 1/2 times the outboard end in length. The beams shall rest on edge, the sides shall be plumb, and the edges shall be horizontal. The fulcrum point of the beam shall rest on a secure bearing at least 6 inches in each horizontal dimension. The beam shall be secured in place against movement and shall be securely braced at the fulcrum point against tipping.

(b) The inboard ends of outrigger beams shall be positively secured either by means of struts bearing against sills in contact with the overhead beams or ceiling, or by means of tension members secured to the floor joists underfoot, or by both if necessary, or by a securely fastened solid body counterweight. (Water in an open container or loose material in bags shall not be permitted.) The inboard ends of outrigger beams shall be secured against tipping and the entire supporting structure shall be securely braced in both directions to prevent any horizontal movement.

(c) Unless outrigger scaffolds are designed by a registered professional engineer competent in this field, they shall by [be] constructed and erected in accordance with Table J-11. Outrigger scaffolds, designed by a registered professional engineer, shall be constructed and erected in accordance with such design. A copy of the drawings and specifications shall be available at the jobsite.

(d) Planking shall be laid tight and shall extend to within 3 inches of the building wall. Planking shall be secured to the beams.

(6) Masons' adjustable multiple-point suspension scaffolds.

(a) The scaffold shall be capable of sustaining a working load of 50 pounds per square foot and shall not be loaded in excess of that figure.

(b) The scaffold shall be provided with hoisting machines that meet the requirements of Underwriters' Laboratories, Factory Mutual Engineering Corporation, or other agency or laboratory approved by the department of labor and industries.

(c) The platform shall be supported by wire ropes, capable of supporting at least 6 times the intended load, suspended from overhead outrigger beams.

(d) The scaffold outrigger beams shall consist of structural metal securely fastened or anchored to the frame or floor system of the building or structure.

(e) Each outrigger beam shall be equivalent in strength to at least a standard 7-inch, 15.3-pound steel I-beam, at least 15 feet long, and shall not project more than 6 feet 6 inches beyond the bearing point.

(f) Where the overhang exceeds 6 feet 6 inches, outrigger beams shall be composed of stronger beams or multiple beams and be installed under the supervision of a competent person.

(g) All outrigger beams shall be set and maintained with their webs in a vertical position.

(h) A stop bolt shall be placed at each end of every outrigger beam.

(i) The outrigger beam shall rest on suitable wood bearing blocks.

(j) The free end of the suspension wire ropes shall be equipped with proper size thimbles and secured by splicing or other equivalent means. The running ends shall be securely attached to the hoisting drum. At least four turns of wire rope shall remain on the drum when the platform is at ground level. The use of fiber rope is prohibited.

(k) Where a single outrigger beam is used, the steel shackles or clevises with which the wire ropes are attached to the outrigger beams shall be placed directly over the hoisting drums.

(l) The scaffold platform shall be equivalent in strength to at least 2-inch planking. (For maximum planking spans, see subsection (1)(j) of this section.)

(m) When employees are at work on the scaffold and an overhead hazard exists, overhead protection shall be provided on the scaffold, not more than 9 feet above the platform, consisting of 2-inch planking, or material of equivalent strength, laid tight, and extending not less than the width of the scaffold.

(n) Each scaffold shall be installed or relocated under the supervision of a competent person.

(o) When channel iron outrigger beams are used instead of I-beams, they shall be securely fastened together with the flanges turned out.

(p) All parts of the scaffold, such as bolts, nuts, fittings, clamps, wire rope, outrigger beams and their fastenings shall be maintained in sound condition and shall be inspected before each installation and periodically thereafter. All parts shall be of the grade specified by the manufacturer.

(7) Two-point suspension scaffolds.

(a) Two-point suspension scaffold platforms shall be not less than 20 inches nor more than 36 inches wide overall. The platform shall be securely fastened to the hangers by U-bolts or by other equivalent means.

(b) The hangers of two-point suspension scaffolds shall be made of wrought iron, mild steel, or other equivalent material, having a cross-sectional area capable of sustaining 4 times the maximum rated load, and shall be designed with a support for guardrail, intermediate rail, and toeboard.

(c) When hoisting machines are used on two-point suspension scaffolds, such machines shall be of a design tested and approved by Underwriters' Laboratories, Factory Mutual Engineering Corporation, or by an agency or laboratory approved by the department of labor and industries.

(d) The roof irons or hooks shall be of mild steel, or other equivalent material, of proper size and design, securely installed and anchored. The roof irons or hooks and any other devices shall have tiebacks of 3/4-inch manila rope, or

the equivalent, to serve as a secondary means of anchorage, installed at right angles to the face of the building, whenever possible, and secured to a structurally sound portion of the building.

(e) Two-point suspension scaffolds shall be suspended by wire, synthetic or fiber ropes capable of supporting at least 6 times the rated load. All other components shall be capable of supporting at least four times the rated load.

(f) The sheaves of all blocks, consisting of at least one double and one single block, shall fit the size and type of rope used and shall be a minimum of six inches in diameter.

(g) All wire ropes, fiber and synthetic ropes, slings, hangers, platforms, and other supporting parts shall be inspected before every installation. Periodic inspections shall be made while the scaffold is in use.

(h) On suspension scaffolds designed for a working load of 500 pounds, no more than two persons shall be permitted to work at one time. On suspension scaffolds with a working load of 750 pounds, no more than three persons shall be permitted to work at one time. On suspension scaffolds with a working load of 1,000 pounds, no more than four persons shall be permitted to work at one time. Each employee shall be protected by an approved full body harness attached to a dropline. The droplines shall be securely attached to substantial members of the structure (not scaffold), or to securely rigged lines, which will safely suspend the employee in case of a fall. In order to keep the dropline continuously attached, with a minimum of slack, to a fixed structure, the attachment point of the dropline shall be appropriately changed as the work progresses.

(i) When a multi-tiered two-point suspension scaffold is used, it shall be provided with safety droplines that attach to each end of the scaffold through an approved quick acting safety device, in case either or both of the main suspension lines should break. The lanyard of the full body harness shall be tied off to a substantial member of the scaffold itself or to a horizontal lifeline attached to each end of the scaffold or a sliding device on the horizontal lifeline. The two additional safety droplines shall be individually suspended from roof irons, hooks, or other approved devices and shall be near the suspension droplines to prevent unnecessary side impact. The safety dropline shall have a 6 to 1 safety factor. Such scaffolds shall be designed by a licensed professional engineer and a copy of the drawings and specifications shall be available at the jobsite.

(j) Two-point suspension scaffolds shall be securely lashed to the building or structure to prevent the scaffolds from swaying. Window cleaners' anchors shall not be used for this purpose.

(k) The platform of every two-point suspension scaffold shall be one of the following types:

(i) Ladder-type platforms. The side stringer shall be of clear straight-grained spruce or materials of equivalent strength and durability. The rungs shall be of straight-grained oak, ash, or hickory, at least 1 1/8 inch in diameter, with 7/8-inch tenons mortised into the side stringers at least 7/8-inch. The stringers shall be tied together with the tie rods not less than one-quarter inch in diameter, passing through the stringers and riveted up tight against washers on both ends. The flooring strips shall be spaced not more than five-eighths inch apart except at the side rails where the

space may be 1 inch. Ladder-type platforms shall be constructed in accordance with Table J-12.

(ii) Plank-type platforms. Plank-type platforms shall be composed of not less than two nominal 2- x 10-inch unspliced planks, properly cleated together on the underside, starting 6 inches from each end; intervals in between shall not exceed 4 feet. The plank-type platform shall not extend beyond the hangers more than 12 inches. A bar or other effective means shall be securely fastened to the platform at each end to prevent its slipping off the hanger. The span between hangers for plank-type platforms shall not exceed 8 feet.

(iii) Beam-type platforms. Beam platforms shall have side stringers of lumber not less than 2 x 6 inches set on edge. The span between hangers shall not exceed 12 feet when beam platforms are used. The flooring shall be supported on 2- x 6-inch cross beams, laid flat and set into the upper edge of the stringers with a snug fit, at intervals of not more than 4 feet, securely nailed in place. The flooring shall be of 1- x 6-inch material properly nailed. Floor boards shall not be spaced more than one-half inch apart.

(iv) Light metal-type platforms, when used, shall be tested and listed according to Underwriters' Laboratories, Factory Mutual Engineering Corporation, or the department of labor and industries.

(l) In addition to the normal operating brake, all power-driven units shall have an emergency brake which engages automatically when the normal speed of descent is exceeded.

(m) When acid solutions are used, natural or synthetic fiber rope shall not be used.

(n) Every swinging scaffold shall be tested before using by raising the platform one foot from the ground and loading it with at least four times the maximum weight to be imposed when aloft.

(8) Stone setters' adjustable multiple-point suspension scaffolds.

(a) The scaffold shall be capable of sustaining a working load of 25 pounds per square foot and shall not be overloaded. Scaffolds shall not be used for storage of stone or other heavy materials.

(b) When used, the hoisting machine and its supports shall be of a type tested and listed by Underwriters' Laboratories, Factory Mutual Engineering Corporation or the department of labor and industries.

(c) The platform shall be securely fastened to the hangers by U-bolts or other equivalent means. (For materials and spans, see item (ii) of subsection (7)(k), Plank-type Platforms and Table J-12 of this section.)

(d) The scaffold unit shall be suspended from metal outriggers, iron brackets, wire rope slings, or iron hooks.

(e) Outriggers, when used, shall be set with their webs in a vertical position, securely anchored to the building or structure and provided with stop bolts at each end.

(f) The scaffold shall be supported by wire rope capable of supporting at least 6 times the rated load. All other components shall be capable of supporting at least 4 times the rated load.

(g) The free ends of the suspension wire ropes shall be equipped with proper size thimbles, secured by splicing or other equivalent means. The running ends shall be securely attached to the hoisting drum and at least four turns of wire rope shall remain on the drum at all times.

(h) When two or more scaffolds are used on a building or structure, they shall not be bridged one to the other; but shall be maintained at even height with platforms abutting closely.

(i) In addition to the normal operating brake, all power-driven units shall have an emergency brake which engages automatically when the normal speed of descent is exceeded.

(j) Each scaffold shall be installed or relocated in accordance with approved designs and instructions under the supervision of a competent designated person.

(k) Where additional working levels are required to be supported, the plans and specifications of the support and scaffold components shall be designed by a licensed professional engineer. These plans and specifications shall be available at the site.

(9) Single-point adjustable suspension scaffolds.

(a) The scaffolding, including power units or manually operated winches, shall be of a type tested and listed by Underwriters' Laboratories, Factory Mutual Engineering Corporation or the department of labor and industries.

(b) The power units may be either electrically or air motor driven.

(c) All power-operated gears and brakes shall be enclosed.

(d) In addition to the normal operating brake, all power-driven units shall have an emergency brake which engages automatically when the normal speed of descent is exceeded.

(e) The hoisting machines, cables, and equipment shall be regularly serviced and inspected.

(f) The units may be combined to form a two-point suspension scaffold. Such scaffold shall comply with subsection (7) of this section.

(g) When the supporting wire rope is not plumb for its entire length, supports shall be designed to sustain any additional load or stress upon the line.

(h) Suspension methods and employee safeguards shall conform to the provisions of subsections (6) and (7) of this section.

(i) For additional details not covered in this subsection applicable technical portions of American National Standards Institute, A120.1-1970, Power-Operated Devices for Exterior Building Maintenance Powered Platforms, shall be used.

(10) Boatswain's chairs.

(a) The chair seat shall not be less than 12 x 24 inches, and 1-inch thick. The seat shall be reinforced on the underside by cleats securely fastened to prevent the board from splitting. Specially designed seats having dimensions other than those specified in this subsection may be used provided they have been designed and tested (with a safety factor of four) to sustain a load of two hundred fifty pounds.

(b) The two fiber rope seat slings shall be of 5/8-inch diameter, reeved through the four seat holes so as to cross each other on the underside of the seat.

(c) Seat slings shall be of at least 3/8-inch wire rope when an employee is conducting a heat-producing process, such as gas welding.

(d) The employee shall be protected by a full body harness and lifeline in accordance with WAC 296-155-24510 (3)(a)(i). The attachment point of the lifeline to the structure shall be appropriately changed as the work progresses.

(e) The tackle shall consist of correct size ball bearing or bushed blocks and properly spliced 5/8-inch diameter first grade manila rope, or equivalent.

(f) The roof irons, hooks, or the object to which the tackle is anchored, shall be securely installed. Tiebacks, when used, shall be installed at right angles to the face of the building and securely fastened.

(g) The scaffolding, including power units shall be of tested design.

(h) All power operated gears and brakes shall be enclosed.

(i) In addition to the normal operating brake, all power-driven units shall have an emergency brake which engages automatically when the normal speed of descent is exceeded.

(11) Carpenters' bracket scaffolds.

(a) The brackets shall consist of a triangular wood frame not less than 2 x 3 inches in cross section, or of metal of equivalent strength. Each member shall be properly fitted and securely joined.

(b) Each bracket shall be attached to the structure by means of one of the following:

(i) A bolt, no less than 5/8-inch in diameter, which shall extend through to the inside of the building wall;

(ii) A metal stud attachment device;

(iii) Welding to steel tanks;

(iv) Hooking over a well-secured and adequately strong supporting member.

(c) The brackets shall be spaced no more than 8 feet apart.

(d) No more than two employees shall occupy any given 8 feet of a bracket scaffold at any one time. Tools and materials shall not exceed 75 pounds in addition to the occupancy.

(e) The platform shall consist of not less than two 2- x 10-inch planks extending not more than 12 inches or less than 6 inches beyond each end support. Fabricated planking may be used if properly engineered and tested.

(12) Bricklayers' square scaffolds.

(a) The squares shall not exceed 5 feet in width and 5 feet in height.

(b) Members shall be not less than those specified in Table J-13.

(c) The squares shall be reinforced on both sides of each corner with 1- x 6-inch gusset pieces. They shall also have diagonal braces 1 x 8 inches on both sides running from center to center of each member, or other means to secure equivalent strength and rigidity.

(d) The squares shall be set not more than 5 feet apart for medium duty scaffolds, and not more than 8 feet apart for light duty scaffolds. Bracing, 1 x 8 inches, extending from the bottom of each square to the top of the next square, shall be provided on both front and rear sides of the scaffold.

(e) Platform planks shall be at least 2 x 10-inch. The ends of the planks shall overlap the bearers of the squares and each plank shall be supported by not less than three squares. Fabricated planking may be used if properly engineered and tested.

(f) Bricklayers' square scaffolds shall not exceed three tiers in height and shall be so constructed and arranged that one square shall rest directly above the other. The upper tiers shall stand on a continuous row of planks laid across

the next lower tier and be nailed down or otherwise secured to prevent displacement.

(g) Scaffolds shall be level and set upon a firm foundation.

(13) Horse scaffolds.

(a) Horse scaffolds shall not be constructed or arranged more than two tiers or 10 feet in height.

(b) The members of the horses shall be not less than those specified in Table J-14.

(c) Horses shall be spaced not more than 5 feet for medium duty and not more than 8 feet for light duty.

(d) When arranged in tiers, each horse shall be placed directly over the horse in the tier below.

(e) On all scaffolds arranged in tiers, the legs shall be nailed down or otherwise secured to the planks to prevent displacement or thrust and each tier shall be substantially cross braced.

(f) Horses or parts which have become weak or defective shall not be used.

(14) Needle beam scaffold.

(a) Wood needle beams shall be not less than 4 x 6 inches in size, with the greater dimension placed in a vertical direction. Metal beams or the equivalent, conforming to subsections (1)(h) and (j) of this section, may be used and shall not be altered or moved horizontally while they are in use.

(b) Ropes or hangers shall be provided for supports. The span between supports on the needle beam shall not exceed 10 feet for 4- x 6-inch timbers. Rope supports shall be equivalent in strength to 1-inch diameter first-grade manila rope.

(c) The ropes shall be attached to the needle beams by a scaffold hitch or a properly made eye splice. The loose end of the rope shall be tied by a bowline knot or by a round turn and a half hitch.

(d) The scaffold hitch shall be arranged so as to prevent the needle beam from rolling or becoming otherwise displaced.

(e) The platform span between the needle beams shall not exceed 8 feet when using 2-inch scaffold plank. For spans greater than 8 feet, platforms shall be designed based on design requirements for the special span. The overhang of each end of the platform planks shall be not less than 6 inches and not more than 12 inches.

(f) When needle beam scaffolds are used, the planks shall be secured against slipping.

(g) All unattached tools, bolts, and nuts used on needle beam scaffolds shall be kept in suitable containers, properly secured.

(h) One end of a needle beam scaffold may be supported by a permanent structural member conforming to subsections (1)(h) and (j) of this section.

(i) Each employee working on a needle beam scaffold shall be protected by a full body harness and lifeline in accordance with WAC 296-155-24510 (3)(a)(i).

(15) Plasterers', decorators', and large area scaffolds.

(a) Plasters', lathers', and ceiling workers' inside scaffolds shall be constructed in accordance with the general requirements set forth for independent wood pole scaffolds. (See subsection (2) of this section and Tables J-5, J-6 and J-7.)



(b) All platform planks shall be laid with the edges close together.

(c) When independent pole scaffold platforms are erected in sections, such sections shall be provided with connecting runways equipped with substantial guardrails.

(16) Interior hung scaffolds.

(a) An interior hung scaffold shall be hung or suspended from the roof structure or ceiling beams.

(b) The suspending wire or fiber rope shall be capable of supporting at least 6 times the rated load. The rope shall be wrapped at least twice around the supporting members and twice around the bearers of the scaffold, with each end of the wire rope secured by at least three standard wire-rope clips properly installed.

(c) For hanging wood scaffolds, the following minimum nominal size material shall be used:

(i) Supporting bearers 2 x 10 inches on edge;

(ii) Planking 2 x 10 inches, with maximum span 7 feet for heavy duty and 10 feet for light duty or medium duty.

(d) Steel tube and coupler members may be used for hanging scaffolds with both types of scaffold designed to sustain a uniform distributed working load up to heavy duty scaffold loads with a safety factor of four.

(e) All overhead supporting members shall be inspected and have required strength assured before the scaffold is erected.

(17) Ladder jack scaffolds.

(a) All ladder jack scaffolds shall be limited to light duty and shall not exceed a height of 20 feet above the floor or ground.

(b) All ladders used in connection with ladder jack scaffolds shall be Type I heavy-duty ladders and shall be designed and constructed in accordance with American National Standards Institute A14.1-1982, Safety Code for Portable Wood Ladders, and A14.2-1982, Safety Code for Portable Metal Ladders. Cleated ladders shall not be used for this purpose.

(c) The ladder jack shall be so designed and constructed that it will bear on the side rails in addition to the ladder rungs, or if bearing on rungs only, the bearing area shall be at least 10 inches on each rung.

(d) Ladders used in conjunction with ladder jacks shall be so placed, fastened, held, or equipped with devices so as to prevent slipping.

(e) The wood platform planks shall be not less than 2 inches in thickness. Both metal and wood platform planks shall overlap the bearing surface not less than 12 inches and shall be secured to prevent movement. The span between supports for wood shall not exceed 8 feet. Platform width shall be not less than 18 inches.

(f) No more than two persons shall be within any 8 feet section of any ladder jack scaffold at any one time. When the use of standard guardrails as required by subsection (1)(e) of this section is impractical, full body harnesses and lifelines shall be used in accordance with WAC 296-155-24510 (3)(a)(i).

(18) Window jack scaffolds.

(a) Window jack scaffolds shall be used only for the purpose of working at the window opening through which the jack is placed.

(b) Window jacks shall not be used to support planks placed between one window jack and another or for other elements of scaffolding.

(c) Window jack scaffolds shall be provided with guardrails unless full body harnesses with lifelines are attached and used by the employee.

(d) Not more than one employee shall occupy a window jack scaffold at any one time.

(e) Window jacks shall be designed and constructed so as to provide a secure anchorage on the window opening and be capable of supporting the design load.

(19) Roofing brackets.

All roofing brackets must be installed and used in accordance with the requirements of Part K chapter 296-155 WAC.

(20) Crawling boards or chicken ladders.

All crawling boards or chicken ladders shall be installed and used in accordance with the requirements of WAC 296-155-50503((2)) (3).

(21) Float or ship scaffolds.

(a) Float or ship scaffolds shall not be used to support more than three persons and a few light tools, such as those needed for riveting, bolting, and welding. They shall be constructed as designed in subdivisions (b) through (f) of this subsection, unless substitute designs and materials provide equivalent strength, stability, and safety.

(b) The platform shall be not less than 3 feet wide and 6 feet long, made of 3/4-inch plywood, equivalent to American Plywood Association Grade B-B, Group I, Exterior, or other similar material.

(c) Under the platform, there shall be two supporting bearers made from 2- x 4-inch, or 1- x 10-inch rough, "selected lumber," or better. They shall be free of knots or other flaws and project 6 inches beyond the platform on both sides. The ends of the platform shall extend 6 inches beyond the outer edges of the bearers. Each bearer shall be securely fastened to the platform.

(d) An edging of wood not less than 3/4 x 1 1/2 inches or equivalent shall be placed around all sides of the platform to prevent tools from rolling off.

(e) Supporting ropes shall be 1-inch diameter manila rope or equivalent, free from deterioration, chemical damage, flaws, or other imperfections and shall be well insulated to protect against damaging contacts of arcs, flames, or other mechanical objects. Rope connections shall be such that the platform cannot shift or slip. If two ropes are used with each float, they shall be arranged so as to provide four ends which are to be securely fastened to an overhead support. Each of the two supporting ropes shall be hitched around one end of bearer and pass under the platforms to the other end of the bearer where it is hitched again, leaving sufficient rope at each end for the supporting ties.

(f) Each employee shall be protected by an approved safety lifebelt and lifeline, in accordance with WAC 296-155-245.

(22) Form scaffolds.

(a) Form scaffolds shall be constructed of wood or other suitable materials, such as steel or aluminum members of known strength characteristics. All scaffolds shall be designed and erected with a minimum safety factor of 4, computed on the basis of the maximum rated load.

(b) All scaffold planking shall be a minimum of 2- x 10-inch nominal scaffold grade, as recognized by approved grading rules for the species of lumber used, or equivalent material. Maximum permissible spans shall not exceed 8 feet on centers for 2- x 10-inch nominal planking. Scaffold planks shall be either nailed or bolted to the ledgers or of such length that they overlap the ledgers at least 6 inches. Unsupported projecting ends of scaffolding planks shall be limited to a maximum overhang of 12 inches.

(c) Scaffolds shall not be loaded in excess of the working load for which they were designed.

(d) Figure-four form scaffolds:

(i) Figure-four scaffolds are intended for light duty and shall not be used to support loads exceeding 25 pounds per square foot unless specifically designed for heavier loading. For minimum design criteria, see Table J-15.

(ii) Figure-four form scaffold frames shall be spaced not more than 8 feet on centers and constructed from sound lumber, as follows: The outrigger ledger shall consist of two pieces of 1- x 6-inch or heavier material nailed on opposite sides of the vertical form support. Ledgers shall project not more than 3 feet 6 inches from the outside of the form support and shall be substantially braced and secured to prevent tipping or turning. The knee or angle brace shall intersect the ledger at least 3 feet from the form at an angle of approximately 45°, and the lower end shall be nailed to a vertical support. The platform shall consist of two or more 2- x 10-inch planks, which shall be of such length that they extend at least 6 inches beyond ledgers at each end unless secured to the ledgers. When planks are secured to the ledgers (nailed or bolted), a wood filler strip shall be used between the ledgers. Unsupported projecting ends of planks shall be limited to an overhang of 12 inches.

(e) Metal bracket form scaffolds:

(i) Metal brackets or scaffold jacks which are an integral part of the form shall be securely bolted or welded to the form. Folding type brackets shall be either bolted or secured with a locking-type pin when extended for use.

(ii) "Clip-on" or "hook-over" brackets may be used, provided the form walers are bolted to the form or secured by snap ties or shea-bolt extending through the form and securely anchored.

(iii) Metal brackets shall be spaced not more than 8 feet on centers.

(iv) Scaffold planks shall be either bolted to the metal brackets or of such length that they overlap the brackets at each end by at least 6 inches. Unsupported projecting ends of scaffold planks shall be limited to a maximum overhang of 12 inches.

(v) Metal bracket form scaffolds shall be equipped with wood guardrails, intermediate rails, toeboards, and scaffold planks meeting the minimum dimensions shown in Table J-16. (Metal may be substituted for wood, providing it affords equivalent or greater design strength.)

(f) Wooden bracket form scaffolds:

(i) Wooden bracket form scaffolds shall be an integral part of the form panel. The minimum design criteria set forth herein and in Table J-17 cover scaffolding intended for light duty and shall not be used to support loads exceeding 25 pounds per square foot, unless specifically designed for heavier loading.

(ii) Scaffold planks shall be either nailed or bolted to the ledgers or of such length that they overlap the ledgers at each end by at least 6 inches. Unsupported projecting ends of scaffold planks shall be limited to a maximum overhang of 12 inches.

(23) Pump jack scaffolds.

(a) Pump jack scaffolds shall:

(i) Not carry a working load exceeding 500 pounds;

(ii) Be capable of supporting without failure at least four times the maximum intended load; and

(iii) Shall not have components loaded in excess of the manufacturer's recommended limits.

(b) Pump jack brackets, braces, and accessories shall be fabricated from metal plates and angles. Each pump jack bracket shall have two positive gripping mechanisms to prevent any failure or slippage.

(c) The platform bracket shall be fully docked and the planking secured. Planking, or equivalent, shall conform with subsection (1) of this section.

(d)(i) When wood scaffold planks are used as platforms, poles used for pump jacks shall not be spaced more than 10 feet center to center. When fabricated platforms are used that fully comply with all other provisions of this subsection, pole spacing may exceed 10 feet center to center.

(ii) Poles shall not exceed 30 feet in height.

(iii) Poles shall be secured to the work wall by rigid triangular bracing, or equivalent, at the bottom, top, and other points as necessary, to provide a maximum vertical spacing of not more than 10 feet between braces. Each brace shall be capable of supporting a minimum of 225 pounds tension or compression.

(iv) For the pump jack bracket to pass bracing already installed, an extra brace shall be used approximately 4 feet above the one to be passed until the original brace is reinstalled.

(e) All poles shall bear on mud sills or other adequate firm foundations.

(f) Pole lumber shall be two 2 x 4's, of Douglas fir or equivalent, straight-grained, clear, free of cross-grain, shakes, large loose or dead knots, and other defects which might impair strength.

(g) When poles are constructed of two continuous lengths, they shall be two by fours, spiked together with the seam parallel to the bracket, and with 10d common nails, no more than 12 inches center to center, staggered uniformly from opposite outside edges.

(h) If two by fours are spliced to make up the pole, the splices shall be so constructed as to develop the full strength of the member. Three-eighths inch or one-half inch exterior grade plywood shall be used for a spacer between the two by fours. The joints for the splices shall be staggered on opposite sides of the pole at least four feet apart. Joints shall be no less than four feet from either end of the pole.

(i) A ladder, in accordance with WAC 296-155-480, shall be provided for access to the platform during use.

(j) Not more than two persons shall be permitted at one time upon a pump jack scaffold between any two supports.

(k) Pump jack scaffolds shall be provided with standard guardrails, unless full body harnesses with lifelines are used by employees.

(l) When a work bench is used at an approximate height of 42 inches, the top guardrail may be eliminated, if the

work bench is fully decked, the planking secured, and is capable of withstanding 200 pounds pressure in any direction.

(m) Employees shall not be permitted to use a work bench as a scaffold platform.

(24) Factory-built scaffold units. Factory-built or prefabricated scaffold units intended for assembly on the job, prefabricated plank, staging, etc., mechanical hoisting units, or other devices for use on or in connection with any type scaffolds, shall be approved by an agency or laboratory approved by the department before being used.

(25) Waler bracket scaffolds.

(a) Waler brackets shall be constructed of 1 5/8" x 1 1/2" x 3/16" angle iron minimum size, or material of equivalent strength.

(b) All steel connections shall be welded and riveted or bolted, except where detrimental to strength of materials.

(c) The maximum length of horizontal leg shall not be more than 36" between bracket hook and railing standard.

(d) A 4" x 4" x 3/16" gusset plate shall be securely welded at inside of leg angle.

(e) Nailing holes shall be provided in lower end of vertical leg for purpose of securing bracket against lifting or shifting.

(f) Waler hook or hooks shall be a minimum of 4-inch depth and be constructed of material of a strength to support a minimum of 400 pounds at extreme outer end of bracket.

(26) Chimney, stack and tank bracket scaffolds.

(a) General. A chimney, stack or tank bracket scaffold shall be composed of a platform supported by brackets which are hooked over a steel cable which surrounds the circumference of the chimney, stack or tank approximately in a horizontal plane. The platform shall be not less than two 2 x 10 inch planks. For a minimum width of eighteen inches wide and be designed with a safety factor of not less than 4.

(b) All brackets shall have a mild steel suspension hook 2 inches by 1/4-inch with at least 3 inches projecting beyond the throat of the hook. Hooks shall be integral with or securely attached to the bracket.

(c) Wood spacer blocks shall be provided to hold the suspending cable away from the structure at the points where brackets are hooked on. These spacer blocks shall be not less than 2 inches by 4 inches by 12 inches.

(d) All suspending cables shall be improved plow steel 6 x 19 wire rope or equivalent. In no case shall less than 1/2-inch diameter wire rope be used.

(e) The turnbuckle used to tighten suspending cables shall be not less than 1 inch drop forged steel. The cables shall be provided with thimbles and not less than 3 U-bolt type clips at each end and be attached to the turnbuckles by means of shackles. Open hooks shall not be used.

(f) All chimney, stack and tank bracket scaffolds shall be provided with standard guard rails, intermediate rails and toeboards.

(g) For access to a chimney, stack or tank bracket scaffold, ladders or a boatswain's chair shall be used.

(h) All chimney, stack or tank brackets for scaffolds shall be welded and riveted or bolted.

(27) Scaffold platforms supported by catenary or stretch cables.

(a) When a scaffold platform is supported by cables at least 4 cables shall be used, two near each end of the scaffold.

(b) The cables shall be attached to the scaffold by means of U-bolts or the equivalent through which the cables pass.

(c) Cables shall not be tightened beyond their safe working load. A hanger or set of falls shall be used approximately every 50 feet to pick up the sag in the cable.

**AMENDATORY SECTION** (Amending Order 86-14, filed 1/21/86)

**WAC 296-155-48523 Manually propelled mobile ladder stands and scaffolds (towers).** (1) All applicable rules for design, construction, maintenance, operation, testing, and use of manually propelled mobile ladder stands and scaffolds (towers) shall be in accordance with ANSI A92.1-1977.

(2) General and design requirements: Stands and scaffolds of this section shall meet the requirements specified:

(a) The design working load of ladder stands shall be calculated on the basis of one or more two hundred fifty-pound persons together with fifty pounds of equipment each.

(b) The design working load of all scaffolds shall be calculated on the basis of:

- (i) LIGHT - Designed and constructed to carry a working load of 25 lb/ft<sup>2</sup>
- (ii) MEDIUM - Designed and constructed to carry a working load of 50 lb/ft<sup>2</sup>
- (iii) HEAVY - Designed and constructed to carry a working load of 75 lb/ft<sup>2</sup>

(c) All ladder stands and scaffolds shall be capable of supporting at least four times the design working load.

(d) The materials used in mobile ladder stands and scaffolds shall be of standard manufacture and conform to standard specifications of strength, dimensions, and weights, and shall be selected to safely support the design working load.

(e) Nails, bolts, weldments, or other mechanical fasteners used in the construction of ladders, scaffolds, and towers shall be of adequate size and in sufficient numbers at each connection to develop the designed strength of the unit. Nails shall be driven full length and all exposed surfaces shall be free from sharp edges, burrs, or other safety hazards.

(f) The maximum work level height shall not exceed four times the minimum or least base dimension of any mobile ladder stand or scaffold. Where the basic mobile unit does not meet this requirement, outrigger frames shall be employed to achieve this least base dimension, or provisions shall be made to guy or brace the unit against tipping.

(g) The minimum platform width for any work level shall not be less than eighteen inches for mobile scaffolds (towers).

(h) Ladder stands shall have a minimum step width of sixteen inches.

(i) The supporting structure for the work level shall be rigidly braced, using cross bracing, diagonal bracing, knee

braces, or the equivalent, with rigid platforms or steps at each work level.

(j) The steps and platform of ladder stands and scaffolds shall be fabricated from slip-resistant materials.

(k) The work level platform of scaffolds (towers) shall be made of wood, aluminum, or plywood planking, steel, or expanded metal, for the full width of the scaffold, except for necessary openings.

(i) Work platforms shall be secured in place.

(ii) The clearances between adjacent platform boards or scaffold members, or both, shall not exceed one inch.

(iii) All planking shall be two inch (nominal) scaffold grade minimum 1500 lbf/in<sup>3</sup> (stress grade) construction grade lumber, or the equivalent.

(l) All scaffold and ladder stand platform work levels ten feet or higher above the ground or floor shall have a standard (1 x 4 lumber nominal or the equivalent) toeboard.

(m) All scaffold and ladder stand platform work levels with platform height of four feet or greater shall be provided with guardrails and midrails on exposed sides and end wherever the horizontal dimension of the platform in either direction is less than forty-five inches.

(n) All scaffold and ladder stand platform work levels ten feet or higher above the ground or floor shall be provided with standard guardrails.

(o) A climbing ladder or stairway shall be provided for proper access and egress, and shall be affixed or built into the scaffold and so located that its use will not have a tendency to tip the scaffold.

(p) Where the horizontal members of the scaffold frame are spaced not more than sixteen inches apart, and a standard guardrail has been provided on the scaffold platform to serve as handholds during access to the platform, persons may use the scaffold frames for access and exit, provided that scaffold platform does not project beyond the bearer.

(q) Wheels or casters, when under load, shall be properly designed for strength and dimensions to support four times the design working load.

(i) All scaffold casters shall be provided with a positive wheel or swivel lock, or both, to prevent movement.

(ii) Ladder stands shall have at least two locking casters or other means of locking the unit in position.

(iii) Swivel casters, if used, shall be provided with a positive lock.

(iv) Where leveling of the elevated work platform is required, screw jacks or other suitable means for adjusting the height shall be provided in the base section of each mobile unit.

(3) Mobile tubular fabricated frame scaffolds: Mobile tubular fabricated frame scaffolds shall be designed to comply with the requirements of subsections (1) through (2)(q) of this section.

(a) Scaffolds shall be braced by cross braces or diagonal braces, or both, for securing vertical members together laterally.

(b) The cross braces shall be of a length that will automatically square and align vertical members so that the erected scaffold is always plumb, square, and rigid.

(c) Spacing of panels of frames shall be consistent with the loads imposed.

(d) The frames shall be placed one on top of the other with coupling or stacking pins to provide vertical alignment of the legs.

(e) Where uplift may occur, panels shall be locked together vertically by pins or other equivalent means.

(f) Only the manufacturer of the scaffold or the manufacturer's qualified designated agent shall be permitted to erect or supervise the erection of scaffolds exceeding fifty feet in height above the base, unless:

(i) Such structure is approved in writing by a licensed professional engineer;

(ii) Erected in accordance with instructions furnished by the manufacturer.

(4) Mobile tubular fabricated sectional folding scaffolds: Mobile tubular fabricated sectional folding scaffolds, including sectional stairway and sectional ladder scaffolds, shall be designed to comply with the requirements of subsections (1) through (2)(q) of this section.

(a) An integral stairway and work platform shall be incorporated into the structure of each sectional folding stairway scaffold.

(b) An integral set of pivoting and hinged folding diagonal and horizontal braces and a detachable work platform shall be incorporated into the structure of each sectional folding ladder scaffold.

(c) The end frames of sectional ladder and stairway scaffolds shall be designed so that the horizontal bearers provide supports for multiple planking levels.

(d) Only the manufacturer of the scaffold or ~~((his))~~ the qualified designated agent shall be permitted to erect or supervise the erection of scaffolds exceeding fifty feet in height above the base, unless:

(i) Such structure is approved in writing by a licensed professional engineer;

(ii) Erected in accordance with instructions furnished by the manufacturer.

(5) Mobile tube and coupler scaffolds: Mobile tube and coupler scaffolds shall be designed to comply with the requirements of subsections (1) through (2)(q) of this section.

(a) The material used for the couplers shall be of a structural type, such as a drop-forged steel, malleable iron, or structural grade aluminum.

(b) The use of gray cast iron is prohibited.

(c) Only the manufacturer of the scaffold or ~~((his))~~ the qualified designated agent shall be permitted to erect or supervise the erection of scaffolds exceeding fifty feet in height above the base, unless:

(i) Such structure is approved in writing by a qualified engineer.

(ii) Erected in accordance with instructions furnished by the manufacturer.

(6) Mobile work platforms: Mobile work platforms shall be designed for the use intended and shall comply with the requirements of subsections (1) through (2)(q) of this section.

(a) The minimum width of the base of mobile work platforms shall not be less than eighteen inches.

(b) Adequate rigid bracing to vertical members shall be provided.

(7) Mobile ladder stands: Mobile ladder stands shall comply with applicable requirements of subsections (1) through (2)(q) of this section.

(a) The minimum base width shall conform to subsection (2)(f) of this section.

(b) The minimum length of the base section shall be the total length of combined steps and top assembly, measured horizontally, plus five-eighths inch per step of rise.

(c) Steps shall be uniformly spaced and sloped, with a rise of not less than nine inches or more than ten inches and a depth of not less than seven inches.

(d) The slope of the steps shall be a maximum of sixty degrees measured from the horizontal.

(e) Units having more than four steps shall be equipped with handrails.

(i) Handrails shall be a minimum of thirty inches plus or minus one inch in height.

(ii) Measurements shall be taken vertically from the center of the step.

(f) The load shall be applied uniformly to a three and one-half inch wide area front to back at the center of the width span with a safety factor of four.

(8) Scaffold and ladder stands: Scaffolds and ladder stands shall be furnished, where ladders or other equipment are not deemed appropriate, and erected in accordance with this standard for persons engaged in work that cannot be done safely from the ground or from solid construction, and where it is desired to facilitate relocation of the unoccupied units without disassembly.

(a) Persons shall be prohibited from riding on units while they are being moved, and materials, tools, or equipment shall not be stored on the units while they are being moved except under strict compliance with the provisions following, and only with extreme care and caution exercised by the user.

(b) Guardrails, midrails, and toeboards shall be installed as required by subsection (2)(l), (m) and (n) of this section.

(c) The floor or surface shall be within three degrees of level, smooth (the equivalent of broom-finished concrete), and free from pits, holes, or obstructions.

(d) The minimum dimension of the scaffold base when ready for rolling shall be at least one-half of the height.

(e) Outriggers, if used, shall be installed on all four sides of the scaffold and then can be included as a part of the base dimension.

(f) All tools or materials, or both, shall be secured or removed from the platform before the mobile scaffold is moved.

(g) Employees on the mobile scaffold shall be advised and be aware of each movement in advance.

(h) Employees on the work platform of the mobile scaffold may move the scaffold when the mobile scaffold is equipped with a manual system in which the propelling force is applied to the wheels only and cannot exceed normal walking speed.

(i) The force necessary to move the mobile scaffold shall be applied as close to the base as practicable, and provision shall be made to stabilize the tower during movement from one location to another.

(j) The vertical posts of frames shall be accurately spaced and rest upon suitable footing capable of carrying the maximum design load without settling or displacement.

They shall be plumb, and securely and rigidly braced to prevent swaying and displacement.

(k) Where leveling of the mobile scaffold platform is required, screw jacks or other means for adjusting the height shall be provided in each leg section of each mobile unit.

(i) At least six inches of the screw jack shall be in the scaffold leg.

(ii) The screw jack shall not be extended more than twelve inches.

(l) Units shall be erected, used, and disassembled in accordance with instructions furnished by the manufacturer.

(m) Scaffolds shall be erected and used only by personnel who have been trained in their erection.

(n) Units shall be inspected before and after use.

(o) Units shall not be loaded in excess of the design working load.

(p) Units shall be repaired immediately when damaged or weakened from any cause.

(q) They shall not be used until repairs are completed.

(r) Units shall not be altered while they are in use or occupied.

(s) They shall be securely locked to prevent movement while occupied.

(t) Overhead protection shall be provided for the work platform, consisting of two-inch (nominal) planking, or the equivalent, not more than nine feet above the platform when an overhead hazard exists to the user on the platform.

(u) Ladders or unstable objects shall not be placed on top of rolling scaffolds to gain greater height.

(v) Persons shall not work on scaffolds during high winds, storms, or when the scaffolds are covered with ice or snow until all the ice and snow has been removed and the platform is sanded.

(w) Persons climbing or descending scaffold ladders shall have both hands free for climbing and shall remove foreign substances, such as, but not limited to, mud or grease from their shoes.

(x) Where moving vehicles are present, the scaffold area shall be marked with warnings, such as, but not limited to, flags, roped off areas, and barricades.

(y) Unstable objects such as barrels, boxes, loose brick, tools, and debris shall not be allowed to accumulate on the work level.

(z) In operations involving production of small debris, chips, etc., and the use of small tools and materials, and where persons are required to work or pass under the equipment, screens shall be required and properly secured between toeboards and guardrails. The screen shall extend along the entire opening, and shall consist of No. 19 gauge U.S. standard wire one-half inch mesh, or the equivalent.

(9) Required markings and data plates. Each unit shall be marked with the manufacturer's or vendor's name or identification symbol and rated working load, and shall indicate conformance to ANSI A92.1-1977 or a revision thereof.

(a) These markings shall be either stamped into a metal component of the unit, or provided on a metal name plate, or equivalent durable label, permanently secured to the unit.

(b) Precautionary labels or signs shall be permitted to warn of common hazards anticipated with the use of specific products, such as electrical hazards and contact with corrosive substances.

(c) Additional items for labeling consideration are inspection, proper selection, setup, climbing instructions, storage and care, and other instructions as deemed necessary.

(d) The precautionary labels or signs shall conform to the requirements of ANSI Specifications for Accident Prevention Signs, ANSI Z35.1-1972, and ANSI Specifications for Informational Signs Complementary to Accident Prevention Signs, ANSI Z35.4-1973.

**AMENDATORY SECTION** (Amending Order 92-06, filed 8/10/92, effective 9/10/92)

**WAC 296-155-48531 Vehicle mounted elevating and rotating aerial devices.** (1) All applicable rules for design, construction, maintenance, operation, testing, and use of vehicle mounted elevating and rotating aerial devices shall be in conformance with American National Standards for "Vehicle Mounted Elevating and Rotating Work Platforms," ANSI A92.2-1969 and as amended through ANSI A92.2-1979.

(2) Application:

(a) Aerial lifts, acquired before February 21, 1986, which do not meet the requirements of ANSI A92.2-1979, may not be used unless they have been modified so as to conform with the applicable design and construction requirements of ANSI A92.2-1969.

(b) Aerial devices include the following:

- (i) Extensible boom platforms;
- (ii) Aerial ladders;
- (iii) Articulating boom platforms;
- (iv) Vertical towers; and
- (v) A combination of any of the above.

(3) Specification display. The aerial device shall have manufacturer's statement clearly stating the minimum values for the following characteristics of vehicles required to provide a stable and structurally sound carrier for the aerial device:

- (a) The front gross axle weight rating (GAWR front).
- (b) The rear gross axle weight rating (GAWR rear).
- (c) The gross vehicle weight rating (GVWR).
- (d) The frame section modulus.
- (e) The yield strength of the vehicle frame.
- (f) The frame resisting bending moment (RBM).
- (g) The wheelbase dimension (WB).
- (h) The rear of cab to rear axle centerline dimension (CA).

(4) Data display: The following information shall be clearly stated in the manufacturer's manual and on the aerial device.

- (a) Make and model.
- (b) Rated load capacity.
- (c) Aerial device height and reach.
- (d) Maximum pressure of the hydraulic system and voltage of the electrical system.
- (e) Cautions and restrictions of operations.

(5) Types of rated load: Rated load capacity is of two distinct types:

- (a) The platform load consisting of the weight of personnel and all items carried on or in the platform.
- (b) Supplemental loads which may be fixed directly to the boom(s), or to load-carrying attachments on the aerial device.

(i) The capacity rating in either case shall be designated with boom or booms extended to the position of maximum overturning moment attainable throughout full rotation of the pedestal.

(ii) Capacities of the aerial device in other positions shall be specified separately.

(iii) The manual and placards affixed to the aerial device shall state all applicable capacity ratings.

(6) Multiple configuration rated load. If the aerial device is specified in multiple configurations, these configurations shall be clearly described including the rated load capacity of each, in the manufacturer's manual and on the aerial device. Examples of alternate configurations are:

(a) With outriggers extended to firm footing versus outriggers not extended.

(b) With chassis suspension locking device engaged versus disengaged.

(c) With one platform versus more than one platform.

(d) Used as a personnel-carrying device only versus used as a personnel-carrying and material-handling device.

(e) With extensible aerial device retracted or extended.

(f) With digger attached to boom versus with digger removed from boom. If the rated load capacity of the alternate configuration is related to an angle which a boom(s) makes with the horizontal, the manufacturer shall install a means by which the angle of the boom(s) can be determined.

(7) Maximum elevation determination: Height shall be determined at maximum elevation, from the floor of the platform to the ground, with the aerial device assumed to be mounted on a vehicle having a chassis frame height of thirty-six inches.

(8) Maximum reach determination: Reach, as a maximum, shall be measured in the horizontal plane, from the centerline of rotation to the outer edge (rail) of the platform.

(9) Insulated aerial devices.

(a) The aerial device manufacturer's manual and instruction plate(s) shall clearly state whether the aerial device is insulated or noninsulated.

(b) In the case of insulated aerial devices.

(i) The manual and instruction plate(s) shall clearly state the qualification voltage for which the aerial device has been satisfactorily tested in accordance with this standard.

(ii) The manual and instruction plate(s) shall clearly state the design voltage for which the aerial device can be tested.

(iii) All components bridging the insulated portions of the aerial device shall have electrical insulating values consistent with the design voltage rating of the upper boom, and, when provided, of the lower insulator.

(iv) Test electrodes on articulating-boom aerial devices rated over 69 kV, and optionally at 69 kV, shall be installed permanently on the inside and outside surfaces of the insulated portion of the upper boom for the purposes of monitoring electrical leakage current.

(v) The test electrodes shall be two to six inches from the metal portion of the lower end of the insulated upper boom.

(vi) All hydraulic and pneumatic lines bridging the insulated portion of the upper boom shall have metallic couplings which connect the inside and outside of any hose and shall be adjacent to the insulated boom test electrodes.

(vii) The test electrode on the outside surface of the insulated boom on extensible-boom aerial devices shall be removable.

(viii) The location of the removable test electrode shall be permanently marked or recorded to facilitate repeating future tests of the apparatus.

(10) Quality control. The design and manufacture of the aerial device shall comply with the principles outlined in this subsection. The manufacture of the aerial device shall include a quality control system which will ensure compliance with ANSI A92.2-1979 and this standard. The drawings and manual shall specify those welds that are considered critical and that must conform to the following standards:

(a) Structural Welding Code, AWS D1.1-1979.

(b) Specifications for Welding Industrial and Mill Cranes, AWS D14.1-1970.

(c) Standards for Qualifications of Welding Procedures and Welders for Piping and Tubing, AWS D10.9-1969.

(i) The manufacture and installation of aerial devices shall include applicable welding quality control procedures for all weldments.

(ii) Methods of nondestructive testing shall be described in the quality control procedures.

(iii) The quality control procedures shall designate the welds to be examined, the extent of examination, and the method of testing.

(iv) Appropriate inspection methods of welds are recommended by the American Welding Society.

(v) The structural load-supporting elements of the aerial device which support the platform, and which are made of a ductile material, shall have a design stress of not more than fifty percent of the minimum yield strength of the material, based on the combined rated load and weight of the support structure.

(vi) The structural load-supporting elements of the aerial device which support the platform, and which are made of a nonductile material, shall have a design stress of not more than twenty percent of the minimum ultimate strength of the material, based on the combined rated load and weight of the support structure.

(vii) The same structural safety factors stated above shall also apply to the platform.

(11) Aerial lift specification. Articulating-boom and extensible-boom aerial devices primarily designed as personnel carriers shall have both upper and lower controls.

(a) Upper controls shall be in or beside the platform, readily visible and available within easy reach of the operator, and protected from damage and inadvertent actuation.

(b) Lower controls shall be easily accessible and shall provide for overriding the upper controls. Lower level controls shall not be operated unless permission has been obtained from the employee in the lift, except in case of emergency.

(c) These and all other controls shall be plainly identified as to their function.

(d) The controls shall return to their neutral position when released by the operator.

(e) Vehicle-mounted articulating and telescoping cranes or derricks equipped with accessory platforms need not have controls at the platform station.

(f) Aerial ladders that are designed and manufactured with upper controls shall comply with the requirements of this subsection.

(g) Mechanical ladders that are counterbalanced for ease in raising to, and lowering from, an operating position shall be equipped with a locking device to secure the ladder in the lower traveling position.

(h) Each aerial device, when mounted on a vehicle meeting the manufacturer's minimum vehicle specifications, and used in a specific configuration, shall comprise a mobile unit capable of sustaining a static load one and one-half times its rated load capacity, in every position in which the load can be placed within the definition of the specific configuration, when the vehicle is on a firm and level surface. If having the outriggers extended to a firm footing is part of the definition of the configuration, they shall be extended to provide leveling for the purpose of determining whether the mobile unit meets the stability requirements.

(i) Each aerial device, when mounted on a vehicle meeting the manufacturer's minimum vehicle specifications, and used in a specific configuration, shall comprise a mobile unit capable of sustaining a static load one and one-third times its rated load capacity in every position in which the load can be placed within the definition of the specific configuration when the vehicle is on a slope of five degrees downward in the direction most likely to cause overturning. If having the outriggers extended to a firm footing is part of the definition of the configuration, they shall be extended to provide leveling for the purpose of determining whether the mobile unit meets the stability requirements.

(j) If other facilities, such as a means of turntable leveling, are provided to minimize the effect of the sloping surface, then those facilities shall be utilized for the purpose of determining whether the mobile unit meets the stability requirements.

(k) Vertical towers designed specifically for operation only on a level surface shall be excluded from this requirement.

(l) None of the stability tests described in this subsection shall produce instability of the mobile unit as defined herein or cause permanent deformation of any component.

(m) The lifting of a tire or outrigger on the opposite side of the load does not necessarily indicate a condition of instability.

(12) Hydraulic components.

(a) All hydraulic components whose failure could result in free and unrestricted motion of the boom(s) shall have a minimum bursting strength of at least four times the operating pressure for which the system is designed.

(b) All hydraulic components normally rated according to bursting strength, such as hose, tubing, and fittings, shall have a minimum bursting strength of at least three times the operating pressure for which the system is designed.

(c) All hydraulic components normally rated according to performance criteria, such as rated flow and pressure, life cycles, pressure drop, rpm, torque, and speed, shall have a minimum bursting strength of at least two times the operating pressure for which the system is designed. Such components generally include pumps, motors, directional controls, and similar functional components.

(13) Power failure.



(a) Where the operation of the aerial device is accomplished by hydraulic means, the system shall be equipped with appropriate devices to prevent free and unrestricted motion of the aerial device in the event of hydraulic line failure.

(b) Where the operation of the aerial device is accomplished electrically, the system shall be designed to prevent free and unrestricted motion in the event of generator or power failure.

(c) This protection shall also apply to components used to stabilize a mobile unit where a system failure would result in instability.

(14) Platforms.

(a) Platform walls shall be approximately forty-two inches plus or minus three inches high when buckets or baskets are used as platforms, or the platforms shall be provided with a rail or other device around the periphery that also shall be approximately forty-two inches plus or minus three inches above the floor with a midrail and a kick plate that is at least four inches high, or its equivalent.

(b) A means shall be provided that allows personnel to attach a safety strap or lanyard to the platform or boom.

(c) Steps of all platforms shall be provided with nonskid surfaces.

(d) The platform wall height of any unit made in conformance with ANSI A92.2-1979 shall be acceptable.

(e) After the effective date of this standard, units shall conform to the requirements of this subsection.

(f) Platforms with folding-type floors and steps or rungs may be used without rails and kick plates if a method is provided to allow personnel equipped with a body belt and safety strap or lanyard to attach themselves to the platform or boom.

(g) Platforms for aerial ladders shall have a kick plate at least four inches high or its equivalent, around three sides of the platform.

(h) Provision shall be made to allow personnel equipped in accordance with WAC 296-155-24510 with a full body harness and safety strap or lanyard to attach themselves to the ladder rail.

(15) Specifications display. The aerial device shall have identification, operation, and instruction placards, decals, plates, or the equivalent, which are legible, permanent, and readily visible. There shall be installed on each aerial device applicable markings or provide these markings with appropriate installation instructions. The markings on the aerial device shall not be removed, defaced, or altered. All missing or defective markings shall be replaced.

(a) An aerial device shall have the following markings:

(i) Identification markings.

(ii) Operation markings.

(iii) Instruction markings.

(b) Aerial devices shall have markings to indicate the following:

(i) Make.

(ii) Model.

(iii) Insulated or noninsulated.

(iv) Qualification voltage and date of test.

(v) Serial number.

(vi) Rated load capacity.

(vii) Height.

(viii) Aerial device system pressure or aerial device system voltage, or both.

(c) Aerial devices shall have markings describing the function of each control. Markings shall be determined by the manufacturer or the manufacturer and user jointly to indicate hazards inherent in the operation of an aerial device and those hazards for which the aerial device does not provide protection. The following instruction markings shall be provided for:

(i) Electrical hazards involved in the operation of the machine to warn that an aerial device does not provide protection to the operator from contact with or in proximity to an electrically charged conductor when ~~((he is))~~ they are in contact with or in proximity to another conductor.

(ii) Electrical hazards involved in the operation of the machine to warn that an aerial device, when working on or in proximity to energized conductors, shall be considered energized, and that contact with the aerial device or vehicle under those conditions may cause serious injuries.

(iii) Hazards that result from failure to operate the equipment in a prescribed manner.

(iv) Information related to the use and load rating of the equipment for material handling.

(v) Information related to the use and load rating of the aerial device for alternate configurations.

(vi) Information related to operator cautions.

(d) The color, format, and substance shall conform to:

(i) American National Standard for Accident Prevention Signs, ANSI Z35.1-1972.

(ii) American National Standard for Accident Prevention Tags, ANSI Z35.2-1968.

(iii) American National Standard for Informational Signs Complementary to ANSI Z35.1-1972 Accident Prevention Signs, ANSI Z35.4-1973.

(16) Testing of new aerial devices: In addition to the manufacturer's prototype tests and quality control measures, each new aerial device, including mechanisms, shall be tested to the extent necessary to ensure compliance with the operational requirements of this subsection.

(a) Operational tests shall include the following:

(i) Boom(s) elevating and lowering mechanism.

(ii) Boom extension mechanism.

(iii) Rotating mechanism.

(iv) Stability tests.

(v) Safety devices.

(b) A visual inspection of the finished unit shall be made to determine whether the operational test has produced an adverse effect on any component. Whoever mounts an aerial device upon a vehicle shall, before the mobile unit is placed in operation, perform stability tests in accordance with the requirements of subsection (11) of this section, and the operational and visual tests in accordance with this subsection.

(17) Electrical tests: All electrical tests shall be performed in accordance with ANSI A92.2-1979.

(18) Test reports: A certified report of the tests, specified in this subsection, signed by a registered professional engineer, or an equivalent entity shall be provided with each unit.

(19) Manual requirement: Aerial devices shall comply with the requirements of this standard and shall be provided with manuals. The manuals shall contain:

(a) Descriptions, specifications, and ratings of the aerial device.

(b) The maximum system pressure and the maximum voltage of electrical systems which are part of the aerial device.

(c) Instructions regarding operation, maintenance, and specified welds.

(d) Replacement part information.

(e) Instructions for installing or mounting the aerial device.

(20) Inspections:

(a) Prior to initial use, all new or modified mobile units shall be inspected and tested by the owners and users to ensure compliance with the provisions of this standard and ANSI A92.2-1979.

(b) The inspection procedure for mobile units in regular service is divided into two classifications based upon the intervals at which inspections and tests shall be performed. Safe intervals shall be set by the user, within the limits recommended by the manufacturer, and are dependent upon the nature of the critical components of the mobile unit and the degree of their exposure to wear, deterioration, or malfunction. The two classifications are designated as "frequent" and "periodic" with respective intervals between inspections and tests, as defined below:

(i) Frequent inspection and test: Daily to monthly intervals, or before use, if not used regularly.

(ii) Periodic inspection and test: One to twelve month intervals.

(21) Frequent inspections: Items such as, but not limited to the following shall be inspected for defects at the intervals as defined in subsection (20)(b)(i) of this section or as specifically indicated, including observation during operation, for any defects which might appear between regular inspections. These tests and inspections shall be performed by the operator. Any suspected items shall be carefully examined and a determination made by a qualified person as to whether they constitute a safety hazard. All unsafe items shall be corrected before further use.

(a) Operating controls and associated mechanisms for conditions interfering with proper operation.

(b) Operating controls and associated mechanisms for excessive component wear and contamination by foreign material.

(c) Visual and audible safety devices for malfunction.

(d) Hydraulic or pneumatic systems for observable deterioration or excessive leakage.

(e) Fiberglass and other insulating components for visible damage or contamination.

(f) Electrical apparatus for malfunction, signs of excessive dirt, and moisture accumulation.

(22) Periodic inspection. An inspection of the mobile unit shall be performed at the intervals defined in subsection (20)(b)(ii) of this section, depending upon its activity, severity of service, and environment, or as specifically indicated below. Any suspect items shall be carefully examined and a determination made by a qualified person as to whether they constitute a safety hazard. All unsafe items shall be corrected before further use. Nondestructive inspection and testing methods shall be used where there are questionable structural components.

(a) Deformed, cracked, or corroded members in the aerial device structure.

(b) Worn, cracked or distorted parts, such as pins, bearings, shafts, gears, rollers, locking devices, chains, chain sprockets, wire ropes, and sheaves.

(c) Hydraulic and pneumatic relief valve settings.

(d) Hydraulic system for proper oil level.

(e) Hydraulic and pneumatic fittings, hoses, and tubing for evidence of leakage, abnormal deformation, or excessive abrasion.

(f) Compressors, pumps, motors, and generators for loose fasteners, leaks, unusual noises or vibrations, loss of operating speed, and excessive heating.

(g) Hydraulic and pneumatic valves for cracks in the valve housing, leaks, and sticking spools.

(h) Hydraulic and pneumatic cylinders and holding valves for malfunction and visible damage.

(i) Hydraulic and pneumatic filters for cleanliness and the presence of foreign material in the system indicating other component deterioration.

(j) Performance test of all boom movements.

(k) Condition and tightness of bolts and other fasteners.

(l) Welds, as specified by the manufacturer.

(m) Legible and proper markings of controls, ratings, and instructions.

(23) Electrical insulation rating tests: If the aerial device is considered, rated, and used as an insulated device, the electrical insulating components and system, after a thorough inspection for lack of cleanliness and other hazards, shall be tested for compliance with the rating of the aerial device in accordance with one of the following applicable methods and procedures:

(a) In accordance with section 5.2 of ANSI A92.2-1979 where adequate test facilities are available.

(b) In the field if the aerial device is equipped with electrical test electrodes. The insulated boom may be raised into a high voltage line whose voltage is as high as or higher than the voltage to be worked but not exceeding the design voltage of the aerial device. The electrical leakage current shall not exceed 1 microampere per line to ground per kilovolt applied.

(c) For units rated 69 kV and under, by placing a fused and protected ammeter in the circuit between a test powerline and the conductive metal assembly at the bucket end of the insulated boom.

(i) The lower end of the boom section to be tested shall be grounded.

(ii) The ammeter shall be shielded from any stray electrical currents, and shall give the measurement of any leakage current across the boom and controls, or any capacitive currents involved from the platform to ground, or both.

(iii) The minimum voltage of the test line shall be that of any circuit on which the aerial device is to be used but not exceeding the design voltage of the aerial device.

(iv) During a three minute test period, the total current through the ammeter shall not exceed the following limits at the corresponding rated line voltages:

Line Voltage (kV)	Maximum Current (Microamperes)
69	1000
34.5	500
13.2	200

(d) For units rated 69 kV and under and not used for bare hand application, a dc test voltage and procedure shall be used. The dc potential and leakage current limit shall be specified by the aerial device manufacturer or an equivalent entity.

(e) For platform liners, a retest at seventy percent of the original factory test voltage in accordance with the procedures of section 5.2.2.5 of ANSI A92.2-1979, or the equivalent shall be made.

(f) All electrical tests shall be performed only by qualified persons who are aware of the dangers.

(24) Inspection documentation:

(a) A check sheet or list of items to be inspected shall be provided to the operator or other authorized person for use in making frequent inspections. Records of frequent inspections need not be made. However, where a safety hazard is found, it shall be reported in writing to a person responsible for the corrective action and that report and a record of the correction shall be maintained.

(b) Written, dated, and signed reports and records shall be made of periodic inspections and tests and retained for a period of time consistent with need. Records shall be readily available. Manufacturer's recommendations as to the necessity and frequency of maintenance shall be followed.

(25) Modifications: No modifications or additions which affect the mechanical, hydraulic, or electrical integrity or the safe operation of the aerial device shall be made without the written approval of the manufacturer or an equivalent entity.

(a) If such modification or changes are made, the capacity, operation, and maintenance instruction markings shall be changed accordingly.

(b) In no case shall the safety factors be reduced below those specified in this standard, ANSI A92.2-1979, or below the manufacturer's design factors, whichever are greater.

(c) Changes in loading or additions made to the mobile unit after the final acceptance that affect weight distribution shall meet applicable loading regulations of the National Traffic and Motor Vehicle Safety Act of 1966 sections on Certification.

(26) Qualified operators: The user shall select and authorize only those persons qualified by training or experience, or both, to operate the aerial devices. Each operator shall be instructed in the safe and proper operation of the aerial device in accordance with the manufacturer's operator's manual and the user's work instructions.

(27) The truck shall not be moved until the boom or ladder is cradled and/or fastened down, the outrigger(s) retracted, and the power take-off disengaged, except for equipment which is specifically designed for this type of operation in accordance with provisions of subsections (1) and (2) of this section.

AMENDATORY SECTION (Amending Order 90-18, filed 1/10/91, effective 2/12/91)

**WAC 296-155-48533 Crane or derrick suspended personnel platforms.** (1) Scope, application, and definitions.

(a) Scope and application. This standard applies to the design, construction, testing, use and maintenance of personnel platforms, and the hoisting of personnel platforms on the load lines of cranes or derricks.

(b) Definitions. For the purposes of this section, the following definitions apply:

(i) "Failure" means load refusal, breakage, or separation of components.

(ii) "Hoist" (or hoisting) means all crane or derrick functions such as lowering, lifting, swinging, booming in and out or up and down, or suspending a personnel platform.

(iii) "Load refusal" means the point where the ultimate strength is exceeded.

(iv) "Maximum intended load" means the total load of all employees, tools, materials, and other loads reasonably anticipated to be applied to a personnel platform or personnel platform component at any one time.

(v) "Runway" means a firm, level surface designed, prepared, and designated as a path of travel for the weight and configuration of the crane being used to lift and travel with the crane suspended platform. An existing surface may be used as long as it meets these criteria.

(2) General requirements. The use of a crane or derrick to hoist employees on a personnel platform is prohibited, except when the erection, use, and dismantling of conventional means of reaching the worksite, such as a personnel hoist, ladder, stairway, aerial lift, elevating work platform or scaffold, would be more hazardous, or is not possible because of structural design or worksite conditions.

(3) Cranes and derricks.

(a) Operational criteria.

(b) Hoisting of the personnel platform shall be performed in a slow, controlled, cautious manner with no sudden movements of the crane or derrick, or the platform.

(c) Load lines shall be capable of supporting, without failure, at least seven times the maximum intended load, except that where rotation resistant rope is used, the lines shall be capable of supporting without failure, at least ten times the maximum intended load. The required design factor is achieved by taking the current safety factor of 3.5 (required under WAC 296-155-525 (3)(b)) and applying the fifty percent derating of the crane capacity which is required by (f) of this subsection.

(d) Load and boom hoist drum brakes, swing brakes, and locking devices such as pawls or dogs shall be engaged when the occupied personnel platform is in a stationary working position.

(e) The crane shall be uniformly level within one percent of level grade and located on firm footing. Cranes equipped with outriggers shall have them all fully deployed following manufacturer's specifications, insofar as applicable, when hoisting employees.

(f) The total weight of the loaded personnel platform and related rigging shall not exceed fifty percent of the rated capacity for the radius and configuration of the crane or derrick.

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(g) The use of machines having live booms (booms in which lowering is controlled by a brake without aid from other devices which slow the lowering speeds) is prohibited.

(h) Multiple-part line block: When a multiple-part line block is in use, a substantial strap shall be used between the crane hook and common ring, shackle, or other equivalent device, to eliminate employee exposure to the lines running through the block, and to the block itself.

(4) Instruments and components.

(a) Cranes and derricks with variable angle booms shall be equipped with a boom angle indicator, readily visible to the operator.

(b) Cranes with telescoping booms shall be equipped with a device to indicate clearly to the operator, at all times, the boom's extended length, or an accurate determination of the load radius to be used during the lift shall be made prior to hoisting personnel.

(c) A positive acting device shall be used which prevents contact between the load block or overhaul ball and the boom tip (anti-two-blocking device), or a system shall be used which deactivates the hoisting action before damage occurs in the event of a two-blocking situation (two block damage prevention feature).

(d) The load line hoist drum shall have a system or device on the power train, other than the load hoist brake, which regulates the lowering rate of speed of the hoist mechanism (controlled load lowering). Free fall is prohibited.

(5) Rigging.

(a) Lifting bridles on box-type platforms shall consist of four legs of equal length, with one end securely shackled to each corner of the platform and the other end securely attached to a common ring, shackle, or other equivalent device to accommodate the crane hook, or a strap to the crane hook.

(b) Shackle bolts used for rigging of personnel platforms shall be secured against displacement.

(c) A substantial safety line shall pass through the eye of each leg of the bridle adjacent to the common ring, shackle, or equivalent device.

(d) Securely fastened with a minimum amount of slack to the lift line above the headache ball or to the crane hook itself.

(e) All eyes in wire rope slings shall be fabricated with thimbles.

(f) Wire rope, shackles, rings, master links, and other rigging hardware must be capable of supporting, without failure, at least five times the maximum intended load applied or transmitted to that component. Where rotation resistant wire rope is used for slings, they shall be capable of supporting without failure at least ten times the maximum intended load.

(g) Hooks on headache ball assemblies, lower load blocks, or other attachment assemblies shall be of a type that can be closed and locked, eliminating the hook throat opening. Alternatively, an alloy anchor type shackle with a bolt, nut and retaining pin may be used.

(h) Bridles and associated rigging for attaching the personnel platform to the hoist line shall be used only for the platform and the necessary employees, their tools and the materials necessary to do their work, and shall not be used for any other purpose when not hoisting personnel.

(6) Personnel platforms - design criteria.

(a) The personnel platform and suspension system shall be designed by a qualified engineer or a qualified person competent in structural design.

(b) The suspension system shall be designed to minimize tipping of the platform due to movement of employees occupying the platform.

(c) The personnel platform itself, except the guardrail system and body harness anchorages, shall be capable of supporting, without failure, its own weight and at least five times the maximum intended load based on a minimum allowance of five hundred pounds for the first person with light tools, and an additional two hundred fifty pounds for each additional person.

(d) Criteria for guardrail systems contained in Part K of chapter 296-155 WAC and body harness anchorages are contained in ~~((WAC 296-155-505(6) and 296-155-24510 (3)(a)(i) respectively))~~ Part C-1 of chapter 296-155 WAC.

(e) The personnel platform shall be conspicuously posted with a plate or other permanent marking which indicates the weight of the platform and its rated load capacity or maximum intended load.

(7) Platform specifications.

(a) Each personnel platform shall be equipped with a guardrail system which meets the requirements of ~~((WAC 296-155-505(6)))~~ chapter 296-155 WAC Part K and, shall be enclosed at least from the toeboard to mid-rail with either solid construction or expanded metal having openings no greater than one-half inch (1.27 cm).

(b) A grab rail shall be installed inside the entire perimeter of the personnel platform.

(c) Access gates, if installed, shall not swing outward during hoisting.

(d) Access gates, including sliding or folding gates, shall be equipped with a restraining device to prevent accidental opening.

(e) Headroom shall be provided which allows employees to stand upright in the platform.

(f) In addition to the use of hard hats, employees shall be protected by overhead protection on the personnel platform when employees are exposed to falling objects.

(g) All rough edges exposed to contact by employees shall be surfaced or smoothed in order to prevent injury to employees from punctures or lacerations.

(h) All welding of the personnel platform and its components shall be performed by a qualified welder familiar with the weld grades, types, and material specified in the platform design.

(i) Occupants of all personnel platforms shall wear a safety belt or harness and lanyard which meets the requirements of ~~((WAC 296-155-225 (3) through (8)))~~ chapter 296-155 WAC Part C-1.

(j) Box-type platform: The workers lanyard shall be secured to an anchorage within the platform meeting the requirements of ~~((WAC 296-155-225(4)))~~ chapter 296-155 WAC Part C-1.

(k) Rescue platform:

(i) If the platform is used as a rescue vehicle, the injured worker shall be strapped into the stretcher or basket.

(ii) The basket shall then be secured by lanyard to an anchorage within the platform meeting the requirements of ~~((WAC 296-155-225(4)))~~ chapter 296-155 WAC Part C-1.

(l) Boatswains chair: The workers lanyard shall be secured to the lift line above the headache ball or to the crane hook itself.

(m) Barrel-type platform:

(i) The workers lanyard shall be secured to the lift line above the headache ball or to the crane hook itself.

(ii) A solid bar or rod shall be substantially attached in a rigid position to the bottom or side of the platform.

(iii) The bottom of the barrel-type platform shall be of a convex shape to cause the platform to lay on its side when lowered to the ground or floor.

(iv) The bar or rod shall extend a minimum of eight feet above the floor of the platform.

(v) Workers shall enter and exit from barrel-type platforms only when they are in an upright position, stable, and securely attached to the load line.

(vi) The employer shall use methods or devices which allow employees to safely enter or exit barrel-type platforms.

(8) Personnel platform loading.

(a) The personnel platform shall not be loaded in excess of its rated load capacity.

(b) The number of employees occupying the personnel platform shall not exceed the number required for the work being performed.

(c) Personnel platforms shall be used only for employees, their tools, and the materials necessary to do their work, and shall not be used to hoist only materials or tools when not hoisting personnel.

(d) Materials and tools for use during a personnel lift shall be secured to prevent displacement.

(e) Materials and tools for use during a personnel lift shall be evenly distributed within the confines of the platform while the platform is suspended.

(9) Trial lift, inspection, and proof testing.

(a) A trial lift with the unoccupied personnel platform loaded at least to the anticipated lightweight shall be made from ground level, or any other location where employees will enter the platform, to each location at which the personnel platform is to be hoisted and positioned. This trial lift shall be performed immediately prior to placing personnel on the platform. The operator shall determine that all systems, controls, and safety devices are activated and functioning properly; that no interferences exist; and that all configurations necessary to reach those work locations will allow the operator to remain under the fifty percent limit of the hoist's rated capacity. Materials and tools to be used during the actual lift can be loaded in the platform, as provided in subsection (8)(d) and (e) of this section for the trial lift. A single trial lift may be performed at one time for all locations that are to be reached from a single set-up position.

(b) The trial lift shall be repeated prior to hoisting employees whenever the crane or derrick is moved and set up in a new location or returned to a previously used location. Additionally, the trial lift shall be repeated when the lift route is changed unless the operator determines that the route change is not significant (i.e., the route change would not affect the safety of hoisted employees).

(c) After the trial lift, and just prior to hoisting personnel, the platform shall be hoisted a few inches and inspected to ensure that it is secure and properly balanced. Employees

shall not be hoisted unless the following conditions are determined to exist:

(i) Hoist ropes shall be free of kinks;

(ii) Multiple part lines shall not be twisted around each other;

(iii) The primary attachment shall be centered over the platform; and

(iv) The hoisting system shall be inspected if the load rope is slack to ensure all ropes are properly stated on drums and in sheaves.

(d) A visual inspection of the crane or derrick, rigging, personnel platform, and the crane or derrick base support or ground shall be conducted by a competent person immediately after the trial lift to determine whether the testing has exposed any defect or produced any adverse effect upon any component or structure.

(e) Any defects found during inspections which create a safety hazard shall be corrected before hoisting personnel.

(f) At each job site, prior to hoisting employees on the personnel platform, and after any repair or modification, the platform and rigging shall be proof tested to one hundred twenty-five percent of the platform's rated capacity by holding it in a suspended position for five minutes with the test load evenly distributed on the platform (this may be done concurrently with the trial lift). After proof testing, a competent person shall inspect the platform and rigging. Any deficiencies found shall be corrected and another proof test shall be conducted. Personnel hoisting shall not be conducted until the proof testing requirements are satisfied.

(10) Work practices.

(a) Employees shall keep all parts of the body inside the platform during raising, lowering, and positioning. This provision does not apply to an occupant of the platform performing the duties of a signal person.

(b) Before employees exit or enter a hoisted personnel platform that is not landed, the platform shall be secured to the structure where the work is to be performed, unless securing to the structure creates an unsafe situation.

(c) Tag lines shall be used unless their use creates an unsafe condition.

(d) The crane or derrick operator shall remain at the controls at all times when the crane engine is running and the platform is occupied.

(e) Hoisting of employees shall be promptly discontinued upon indication of any dangerous weather conditions or other impending danger.

(f) Employees being hoisted shall remain in continuous sight of and in direct communication with the operator or signal person. In those situations where direct visual contact with the operator is not possible, and the use of a signal person would create a greater hazard for that person, direct communication alone such as by radio may be used.

(g) Hand signals to the operator shall be in accordance with WAC 296-155-525 (1)(c).

(h) Except over water, employees occupying the personnel platform shall use a full body harness system with lanyard appropriately attached to the lower load block or overhaul ball, or to a structural member within the personnel platform capable of supporting a fall impact for employees using the anchorage as specified in WAC 296-155-24510 (3)(a)(i). When working over water, the requirements of WAC 296-155-235 shall apply.

(i) No lifts shall be made on another of the crane's or derrick's load lines while personnel are suspended on a platform.

(11) Traveling.

(a) Hoisting of employees while the crane is traveling is prohibited, except for portal, tower and locomotive cranes, or where the employer demonstrates that there is no less hazardous way to perform the work.

(b) Under any circumstances where a crane would travel while hoisting personnel, the employer shall implement the following procedures to safeguard employees:

(i) Crane travel shall be restricted to a fixed track or runway;

(ii) Travel shall be limited to the load radius of the boom used during the lift; and

(iii) The boom must be parallel to the direction of travel.

(c) A complete trial run shall be performed to test the route of travel before employees are allowed to occupy the platform. This trial run can be performed at the same time as the trial lift required by subsection (9)(a) of this section which tests the route of the lift.

(d) If travel is done with a rubber tired-carrier, the condition and air pressure of the tires shall be checked. The chart capacity for lifts on rubber shall be used for application of the fifty percent reduction of rated capacity. Notwithstanding subsection (3)(e) of this section, outriggers may be partially retracted as necessary for travel.

(12) Prelift meeting.

(a) A meeting attended by the crane or derrick operator, signal person(s) (if necessary for the lift), employee(s) to be lifted, and the person responsible for the task to be performed shall be held to review the appropriate requirements of this section and the procedures to be followed.

(b) This meeting shall be held prior to the trial lift at each new work location, and shall be repeated for any employees newly assigned to the operation.

**AMENDATORY SECTION** (Amending Order 91-07, filed 11/22/91, effective 12/24/91)

**WAC 296-155-505 Guardrails, handrails, and covers.** (1) General provisions. This part applies to temporary or emergency conditions where there is danger of employees or materials falling through floor, roof, or wall openings, or from stairways, runways, ramps, open sided floors, open sides of structures, bridges, or other open sided walking or working surfaces. When guardrails or covers required by this section must be temporarily removed to perform a specific task, the area shall be constantly attended by a monitor to warn others of the hazard or shall be protected by a movable barrier.

(2) Guarding of floor openings and floor holes.

(a) Floor openings shall be guarded by a standard railing and toe boards or cover, as specified in subsections (2)(g) and (5) of this section. In general, the railing shall be provided on all exposed sides, except at entrances to stairways. All vehicle service pits shall have a cover or removable type standard guardrail. When not in use, pits shall be covered or guarded. Where vehicle service pits are to be used again immediately, and the service (~~man~~) person is within a 50 foot distance of the unguarded pit and also

within line of sight of the unguarded pit, the cover or guardrail need not be replaced between uses. Where vehicle service pits are used frequently, the perimeters of the pits shall be delineated by high visibility, luminescent, skid resistant paint. Such painted delineation shall be kept clean and free of extraneous materials.

(b) Ladderway floor openings or platforms shall be guarded by standard railings with standard toe boards on all exposed sides, except at entrance to opening, with the passage through the railing either provided with a swinging gate or so offset that a person cannot walk directly into the opening.

(c) Hatchways and chute floor openings shall be guarded by one of the following:

(i) Hinged covers of standard strength and construction and a standard railing with only one exposed side. When the opening is not in use, the cover shall be closed or the exposed side shall be guarded at both top and intermediate positions by removable standard railings;

(ii) A removable standard railing with toe board on not more than two sides of the opening and fixed standard railings with toe boards on all other exposed sides. The removable railing shall be kept in place when the opening is not in use and shall be hinged or otherwise mounted so as to be conveniently replaceable.

(d) Wherever there is danger of falling through a skylight opening, and the skylight itself is not capable of sustaining the weight of a two hundred pound person with a safety factor of four, standard guardrails shall be provided on all exposed sides or the skylight shall be covered in accordance with (g) of this subsection.

(e) Pits and trap-door floor openings shall be guarded by floor opening covers of standard strength and construction. While the cover is not in place, the pit or trap openings shall be protected on all exposed sides by removable standard railings.

(f) Manhole floor openings shall be guarded by standard covers which need not be hinged in place. While the cover is not in place, the manhole opening shall be protected by standard railings.

(g) All floor opening covers shall be capable of supporting the maximum potential load but never less than two hundred pounds (with a safety factor of four).

(i) The cover shall be recessed to conform to the level of the surrounding floor or to be flush with the perimeter of the opening.

(ii) The cover shall be secured by fastening devices to prevent unintentional removal.

(iii) If it becomes necessary to remove the cover, a monitor shall remain at the opening until the cover is replaced. The monitor shall advise persons entering the area of the hazard, shall prevent exposure to the fall hazard and shall perform no other duties.

(h) Floor holes, into which persons can accidentally walk, shall be guarded by either a standard railing with standard toe board on all exposed sides, or a floor hole cover of standard strength and construction that is secured against accidental displacement. While the cover is not in place, the floor hole shall be protected by a standard railing.

(3) Guarding of wall openings.

(a) Wall openings, from which there is a drop of more than 4 feet, and the bottom of the opening is less than 3 feet above the working surface, shall be guarded as follows:

(i) When the height and placement of the opening in relation to the working surface is such that either a standard rail or intermediate rail will effectively reduce the danger of falling, one or both shall be provided;

(ii) The bottom of a wall opening, which is less than 4 inches above the working surface, regardless of width, shall be protected by a standard toe board or an enclosing screen either of solid construction or as specified in (5)(e)(ii) of this section.

(b) An extension platform, outside a wall opening, onto which materials can be hoisted for handling shall have standard guardrails on all exposed sides or equivalent. One side of an extension platform may have removable railings in order to facilitate handling materials.

(c) When a chute is attached to an opening, the provisions of (a) of this subsection shall apply, except that a toe board is not required.

(4) Guarding of open-sided surfaces.

(a) Every open-sided floor, platform or surface four feet or more above adjacent floor or ground level shall be guarded by a standard railing, or the equivalent, as specified in subsection (5)(a) of this section, on all open sides, except where there is entrance to a ramp, stairway, or fixed ladder. The railing shall be provided with a standard toe board wherever, beneath the open sides, persons can pass, or there is moving machinery, or there is equipment with which falling materials could create a hazard.

(b) Runways shall be guarded by a standard railing, or the equivalent, as specified in subsection (5) of this section, on all open sides, 4 feet or more above floor or ground level. Wherever tools, machine parts, or materials are likely to be used on the runway, a toe board shall also be provided on each exposed side.

(c) Runways used exclusively for special purposes may have the railing on one side omitted where operating conditions necessitate such omission, providing the falling hazard is minimized by using a runway not less than 18 inches wide.

(d) Where employees entering upon runways become thereby exposed to machinery, electrical equipment, or other danger not a falling hazard, additional guarding shall be provided.

(e) Regardless of height, open-sided floors, walkways, platforms, or runways above or adjacent to dangerous equipment, pickling or galvanizing tanks, degreasing units, and similar hazards, shall be guarded with a standard railing and toe board.

(f) Open sides of gardens, patios, recreation areas and similar areas located on roofs of buildings or structures shall be guarded by permanent standard railings or the equivalent. Where a planting area has been constructed adjacent to the open sides of the roof and the planting area is raised above the normal walking surface of the roof area, the open side of the planting area shall also be protected with standard railings or the equivalent.

(5) Standard specifications.

(a) A standard railing shall consist of top rail, intermediate rail, toe board, and posts, and shall have a vertical height of 36 inches to 42 inches from upper surface of top rail to

floor, platform, runway, or ramp level. Each length of lumber shall be smooth-surfaced throughout the length of the railing. The intermediate rail shall be halfway between the top rail and the floor, platform, runway, or ramp. The ends of the rails shall not overhang the terminal posts except where such overhang does not constitute a projection hazard. Minimum requirements for standard railings under various types of construction are specified in the following items:

(i) For wood railings, the posts shall be of at least 2-inch by 4-inch stock spaced not to exceed 8 feet; the top rail shall be of at least 2-inch by 4-inch stock; the intermediate rail shall be of at least 1-inch by 6-inch stock.

(ii) For pipe railings, posts and top and intermediate railings shall be at least 1 1/2 inches nominal OD diameter with posts spaced not more than 8 feet on centers.

(iii) For structural steel railings, posts and top and intermediate rails shall be of 2-inch by 2-inch by 3/8-inch angles or other metal shapes of equivalent bending strength, with posts spaced not more than 8 feet on centers.

(iv) For wire rope railings, the top and intermediate railings shall be at least 1/2-inch fibre core rope, or the equivalent to meet strength factor and deflection of subsection (5)(a)(v). Posts shall be spaced not more than 8 feet on centers. The rope shall be stretched taut, so as to present a minimum deflection.

(v) The anchoring of posts and framing of members for railings of all types shall be of such construction that the completed structure shall be capable of withstanding a load of at least 200 pounds applied in any direction at any point on the top rail, with a minimum of deflection.

(vi) Railings receiving heavy stresses from employees trucking or handling materials shall be provided additional strength by the use of heavier stock, closer spacing of posts, bracing, or by other means.

(vii) Other types, sizes, and arrangements of railing construction are acceptable, provided they meet the following conditions:

(A) A smooth-surfaced top rail at a height above floor, platform, runway, or ramp level of between 36 inches and 42 inches;

(B) A strength to withstand at least the minimum requirement of 200 pounds top rail pressure with a minimum of deflection;

(C) Protection between top rail and floor, platform, runway, ramp, or stair treads, equivalent at least to that afforded by a standard intermediate rail;

(D) Elimination of overhang of rail ends unless such overhang does not constitute a hazard.

(b)(i) A standard toe board shall be 4 inches minimum in vertical height from its top edge to the level of the floor, platform, runway, or ramp. It shall be securely fastened in place and have not more than 1/4-inch clearance above floor level. It may be made of any substantial material, either solid, or with openings not over 1 inch in greatest dimension.

(ii) Where material is piled to such height that a standard toe board does not provide protection, paneling, or screening from floor to intermediate rail or to top rail shall be provided.

(c) Floor opening covers shall be of any material that meets the following strength requirements:



(i) Conduits, trenches, and manhole covers and their supports, when located in roadways, and vehicular aisles shall be designed to carry a truck rear-axle load of at least 2 times the maximum intended load;

(ii) All floor opening covers shall be capable of supporting the maximum potential load but never less than two hundred pounds (with a safety factor of four).

(A) The cover shall be recessed to conform to the level of the surrounding floor or to be flush with the perimeter of the opening.

(B) The cover shall be secured by fastening devices to prevent unintentional removal.

(C) If it becomes necessary to remove the cover, a monitor shall remain at the opening until the cover is replaced. The monitor shall advise persons entering the area of the hazard, shall prevent exposure to the fall hazard and shall perform no other duties.

(d) Skylight openings that create a falling hazard shall be guarded with a standard railing, or covered in accordance with (c)(ii) of this subsection.

(e) Wall opening protection shall meet the following requirements:

(i) Barriers shall be of such construction and mounting that, when in place at the opening, the barrier is capable of withstanding a load of at least 200 pounds applied in any direction (except upward), with a minimum of deflection at any point on the top rail or corresponding member.

(ii) Screens shall be of such construction and mounting that they are capable of withstanding a load of at least 200 pounds applied horizontally at any point on the near side of the screen. They may be of solid construction, of grill work with openings not more than 8 inches long, or of slat work with openings not more than 4 inches wide with length unrestricted.

**AMENDATORY SECTION** (Amending Order 91-07, filed 11/22/91, effective 12/24/91)

**WAC 296-155-50505** (~~Roofing, insulating and waterproofing~~) **Reserved.** (~~(1) Hoisting jack construction. Roofers hoisting jack shall be constructed to withstand the contemplated load to be hoisted. The beam from counter balance point to heel of jack shall be at least 3/4 the length of the entire beam.~~

~~(2) Counterweight. Hoisting jack shall be counterweighted with a minimum of three times the contemplated maximum load to be lifted. Counterweight shall be securely fastened to heel of jack to prevent displacement, or the jack shall be fastened by means of lashing, bolting, or other means to prevent displacement.~~

~~(3) Pulley attachment. A steel collar or U-bolt and shackle on head of the hoisting jack shall be provided for attachment of the pulley.~~

~~(4) Pulley construction. Hoisting pulleys shall be of steel construction.~~

~~(5) Hoisting line specifications. Where materials are hoisted by hand the hoist line shall be not less than five-eighths manila rope, or the equivalent. Where machine hoist is used the hoist line shall be wire rope.~~

~~(6) Hook construction. Hoisting hooks shall be of cast or forged steel heavy enough to prevent straightening under a load.~~

~~(7) Worker clearance. Workers shall not stand under the load.~~

~~(8) Hot buckets. Hot asphalt shall be kept at a safe level in buckets for carrying and hoisting.~~

~~(9) Ladders. Service buckets of hot asphalt shall not be carried up ladders by workers.~~

~~(10) Service bucket specifications. Service buckets shall be standard safety bucket or flatbottom bucket with bails fastened to an offset ear firmly riveted to side of bucket. There shall be a handle riveted near bottom of bucket for tipping purposes.~~

~~(11) Ladder extensions. Ladders shall extend at least three feet above the platform or roof served and shall be secured at top and bottom to prevent slipping.~~

~~(12) Safeguards for power lines. Safeguards shall be erected to prevent loads and lines contacting power lines where it is not possible to work at least 10 feet from the power lines.~~

~~(13) Asphalt cakes. Whole asphalt cakes shall be broken in chunks before being placed in hot tar pot. To eliminate the potential hazard of moisture being trapped in the cake and also prevent the splashing of hot material.~~

~~(14) Fire smothering. There shall be means to smother fires at fired tar pots.~~

~~(15) Mop handles. Mop or spud bar handles over three feet long shall be of wood or other nonconductive material.~~

~~(16) Protective clothing. Persons working at kettles or handling hot tar shall wear gloves and have arms fully protected by material capable of preventing burns.~~

~~(17) Tar pots. Open tar heating pots shall be kept outside of buildings.~~

~~(18) Tar pot procedures. Electric tar heating equipment may be used inside of the working enclosure provided that:~~

~~(a) Exhaust fans in connection with tubing capable of carrying fumes created by the heating process to the outside are installed and in constant use during heating operations.~~

~~(b) The equipment shall be provided with a hinged lid or baffle plate for the purpose of immediately smothering a pot fire.~~

~~(19) Ventilation. While hot tar is being applied inside an enclosure, exhaust fans to supplement natural ventilation shall be installed to expedite removal of gaseous fumes from the building.~~

~~(20) Prohibited locations. Flame heated tar pots shall be prohibited on roofs of structures.~~

~~(21) Tar pot controls. Tar pots shall be equipped with automatic controls or have an attendant at all times while in operation.~~

~~(22) Guarding roof perimeters. The perimeter of all roofs shall be guarded as specified by chapter 296-155 WAC Part C-1 Fall restraint and fall arrest.)~~

**AMENDATORY SECTION** (Amending Order 90-18, filed 1/10/91, effective 2/12/91)

**WAC 296-155-530** **Material hoists, personnel hoists, and elevators.** (1) General requirements.

(a) The employer shall comply with the manufacturer's specifications and limitations applicable to the operation of all hoists and elevators. Where the manufacturer's specifications are not available, the limitations assigned to the

equipment shall be based on the determinations of a professional engineer competent in the field.

(b) The employer shall ensure that no person shall enter a hoistway, elevator shaft, or similar enclosure in which the hoisting apparatus or vehicle is installed and functioning unless the power source operating those systems is locked out in accordance with WAC 296-155-429 (~~((1), (2), and (3))~~).

(c) Rated load capacities, recommended operating speeds, and special hazard warning or instructions shall be posted on cars and platforms.

(d) Wire rope shall be removed from service when any of the following conditions exists:

(i) In hoisting ropes, six randomly distributed broken wires in one rope lay or three broken wires in one strand in one rope lay;

(ii) Abrasion, scrubbing, flattening, or peening, causing loss of more than one-third of the original diameter of the outside wires;

(iii) Evidence of any heat damage resulting from a torch or any damage caused by contact with electrical wires;

(iv) Reduction from nominal diameter of more than three sixty-fourths inch for diameters up to and including three-fourths inch; one-sixteenth inch for diameters seven-eighths to 1 1/8 inches; and three thirty-seconds inch for diameters 1 1/4 to 1 1/2 inches.

(e) Hoisting ropes shall be installed in accordance with the wire rope manufacturer's recommendations.

(f) The installation of live booms on hoists is prohibited.

(g) The use of endless belt-type man lifts on construction shall be prohibited.

(h) Employees shall not be permitted to ride on top of material hoists, personnel hoists or permanent elevators except for purposes of inspection, maintenance, elevator installation or dismantling work.

(2) Material hoists, (a)(i) Operating rules shall be established and posted at the operator's station of the hoist. Such rules shall include signal system and allowable line speed for various loads. Rules and notices shall be posted on the car frame or crosshead in a conspicuous location, including the statement "No riders allowed."

(ii) No person shall be allowed to ride on material hoists except for the purposes of inspection and maintenance.

(b) All entrances of the hoistways shall be protected by substantial gates or bars which shall guard the full width of the landing entrance. All hoistway entrance bars and gates shall be painted with diagonal contrasting colors, such as black and yellow stripes.

(i) Bars shall be not less than 2- by 4-inch wooden bars or the equivalent, located 2 feet from the hoistway line. Bars shall be located not less than 36 inches nor more than 42 inches above the floor.

(ii) Gates or bars protecting the entrances to hoistway shall be quipped with a latching device.

(c) Overhead protective covering of two-inch planking, 3/4-inch plywood or other solid material of equivalent strength shall be provided on the top of every material hoist cage or platform to prevent objects falling on the workers loading or unloading the hoist.

(i) The protective covering on the top of the cage or platform may be made in hinged sections that may be raised when hoisting long material.

(ii) When using a cage or platform for long material, the several pieces of the material shall be securely fastened together and made fast to the cage or platform, so that no part of the load can fall or project beyond the sides of the cage or platform.

(d) The operator's station of a hoisting machine shall be provided with overhead protection equivalent to tight planking not less than 2 inches thick. The support for the overhead protection shall be of equal strength.

(e) Hoist towers may be used with or without an enclosure on all sides. However, whichever alternative is chosen, the following applicable conditions shall be met:

(i) When a hoist tower is enclosed, it shall be enclosed on all sides for its entire height with a screen enclosure of 1/2-inch mesh, No. 18 U.S. gauge wire or equivalent, except for landing access.

(ii) When a hoist tower is not enclosed, the hoist platform or car shall be totally enclosed (caged) on all sides for the full height between the floor and the overhead protective covering with 1/2-inch mesh of No. 14 U.S. gauge wire or equivalent. The hoist platform enclosure shall include the required gates for loading and unloading. A 6-foot high enclosure shall be provided on the unused sides of the hoist tower at ground level.

(f) Car arresting devices shall be installed to function in case of rope failure.

(g) All material hoist towers shall be designed by a licensed professional engineer.

(h) All material hoists shall conform to the requirements of ANSI A10.5-1969, Safety Requirements for Material Hoists.

(3) Personnel hoists.

(a) Personnel hoists shall be provided for access and egress on all multi story buildings where vertical travel exceeds sixty feet from a ground level access point.

(b) Hoist towers outside the structure shall be enclosed for the full height on the side or sides used for entrance and exit to the structure. At the lowest landing, the enclosure on the sides not used for exit or entrance to the structure shall be enclosed to a height of at least 10 feet. Other sides of the tower adjacent to floors or scaffold platforms shall be enclosed to a height of 10 feet above the level of such floors or scaffolds.

(c) Towers inside of structures shall be enclosed on all four sides throughout the full height.

(d) Towers shall be anchored to the structure at intervals not exceeding 25 feet. In addition to tie-ins, a series of guys shall be installed. Where tie-ins are not practical the tower shall be anchored by means of guys made of wire rope at least one-half inch in diameter, securely fastened to anchorages to ensure stability.

(e) Hoistway doors or gates shall be not less than 6 feet 6 inches high and shall be provided with mechanical locks which cannot be operated from the landing side, and shall be accessible only to persons on the car.

(f) Cars shall be permanently enclosed on all sides and the top, except sides used for entrance and exit, which have car gates or doors.

(g) A door or gate shall be provided at each entrance to the car which shall protect the full width and height of the car entrance opening.

(h) Overhead protective covering of 2-inch planking, 3/4-inch plywood or other solid material of equivalent strength shall be provided on the top of every personnel hoist.

(i) Doors or gates shall be provided with electric contacts which do not allow movement of the hoist when door or gate is open.

(j) A signal device shall be installed in the elevator car and only operated by an attendant who shall give the signals for operation, when transporting workers.

(k) An electrical push button signalling device or other approved signalling system shall be provided at each floor landing connected to an annunciator in the car. The signal code shall be posted adjacent to the signal device at each and every work level and at operator's work level. All wording shall be black on a white card, in large clear letters.

(l) The elevator machine and controls shall be housed in as a protection against accidents and the weather, and the door kept locked against unauthorized entrance when operator is not in attendance.

(m) Safeties shall be capable of stopping and holding the car and rated load when traveling at governor tripping speed.

(n) Cars shall be provided with a capacity and data plate secured in a conspicuous place on the car or crosshead.

(o) Internal combustion engines shall not be permitted for direct drive.

(p) Normal and final terminal stopping devices shall be provided.

(q) An emergency stop switch shall be provided in the car and marked "stop."

(r) Ropes:

(i) The minimum number of hoisting ropes used shall be three for traction hoists and two for drum-type hoists.

(ii) The minimum diameter of hoisting and counter-weight wire ropes shall be 1/2-inch.

(iii) Safety factors:

MINIMUM FACTORS OF SAFETY FOR SUSPENSION WIRE ROPES

Rope speed in feet per minute:	Minimum factor of safety
50	7.60
75	7.75
100	7.95
125	8.10
150	8.25
175	8.40
200	8.60
225	8.75
250	8.90
300	9.20
350	9.50
400	9.75
450	10.00
500	10.25
550	10.45
600	10.70

(s) Following assembly and erection of hoists, and before being put in service, an inspection and test of all functions and safety devices shall be made under the supervision of a competent person. A similar inspection and test is required following major alteration of an existing

installation. All hoists shall be inspected and tested at not more than 3-month intervals. Records shall be maintained and kept on file for the duration of the job.

(t) All personnel hoists used by employees shall be constructed of materials and components which meet the specifications for materials, construction, safety devices, assembly, and structural integrity as stated in the American National Standard A10.4-1963, Safety Requirements for Workmen's Hoists. The requirements of this subdivision do not apply to cantilever type personnel hoists.

(u) Wire rope shall be taken out of service when any of the following conditions exist:

(i) In running ropes, six randomly distributed broken wires in one lay or three broken wires in one strand in one lay;

(ii) Wear of one-third the original diameter of outside individual wires. Kinking, crushing, bird caging, or any other damage resulting in distortion of the rope structure;

(iii) Evidence of any heat damage from any cause;

(iv) Reductions from nominal diameter of more than three-sixty-fourths inch for diameters to and including three-fourths inch, one sixteenth inch for diameter seven-eighths inch to 1 1/8 inches inclusive, three-thirty-seconds inch for diameters 1 1/4 to 1 1/2 inches inclusive;

(v) In standing ropes, more than two broken wires in one lay in sections beyond end connections or more than one broken wire at an end connection.

(v)(i) Personnel hoists used in bridge tower construction shall be approved by a registered professional engineer and erected under the supervision of a qualified engineer competent in this field.

(ii) When a hoist tower is not enclosed, the hoist platform or car shall be totally enclosed (caged) on all sides for the full height between the floor and the overhead protective covering with 3/4-inch mesh of No. 14 U.S. gauge wire or equivalent. The hoist platform enclosure shall include the required gates for loading and unloading.

(iii) These hoists shall be inspected and maintained on a weekly basis. Whenever the hoisting equipment is exposed to winds exceeding 35 miles per hour it shall be inspected and put in operable condition before reuse.

(4) Permanent elevators under the care and custody of the employer and used by employees for work covered by this act shall comply with the requirements of American National Standards Institute, A17.1-1971, and inspected in accordance with A17.2-1960 with addenda A17.2a-1965, A17.2b-1967.

Note: For additional information refer to ((chapter 296-90 WAC, safety requirements for cantilever hoists and)) chapter 296-100 WAC, safety requirements for material hoists.

AMENDATORY SECTION (Amending Order 86-14, filed 1/21/86)

WAC 296-155-545 Conveyors. (1) All conveyors in use shall meet the applicable requirements for design, construction, inspection, testing, maintenance, and operation, as prescribed in ANSI B20.1-1976, Safety Code for Conveyors, Cableways, and Related Equipment.

(2) Starting precautions.

(a) When the entire length of a conveyor is visible from the starting switch, the operator shall visually check to make

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certain that all persons are in the clear before starting the conveyor.

(b) When the entire length of the conveyor is not visible from the starting switch, a positive audible or visible warning system shall be installed and operated to warn persons that the conveyor will be started.

(c) All reasonable precautions shall be taken by the operator prior to starting a conveyor, to assure that no person is in a hazardous location where ~~(he)~~ they may be injured when the conveyor is started.

(3) Riding and walking on conveyors.

(a) Riding on conveyor chains, belt, or bucket elevators shall be prohibited.

(b) Persons shall not be allowed to walk on conveyors except for emergency purposes and then only after the conveyor has been de-energized and the person can do so safely.

(c) Riding of conveyors shall only be permitted on the manlift steps and platforms with handholds attached and other safety factors as specified in chapter 296-82 WAC, Safety standards for existing belt manlifts.

(4) Stop controls.

(a) Means for stopping the motor or engine of a conveyor shall be provided at the operator's station.

(b) If the operator's station is at a remote point, similar provisions for stopping the motor or engine shall be provided at the motor or engine location.

(5) Emergency controls. Emergency stop switches shall be arranged so that the conveyor cannot be started again until the actuating stop switch has been reset to running or "on" position.

(6) Screw type conveyors. Screw or auger type conveyors shall be guarded to prevent employee contact with turning flights.

(7) Overhead conveyors.

(a) Where a conveyor passes over work areas, aisles, or thoroughfares, guards shall be provided to protect persons required to work below the conveyors.

(b) Where a conveyor crosses over an aisle or passageway, it shall be conspicuously marked by suitable signs, as required by Part E of this chapter.

(c) When the return strand of a conveyor operates within seven feet of the floor there shall be a trough provided of sufficient strength to carry the weight resulting from a broken chain. If the strands are over a passageway, a means shall be provided to catch and support the ends of the chain in the event of a break.

(8) Emergency stop.

(a) Conveyors shall be provided with an emergency stopping device (panic-type) which can be reached from the conveyor.

(b) The emergency stopping device shall be located near the material entrance and shall stop the conveyor a sufficient distance away from the hazard to prevent injury.

(c) Where the conveyor leading into such equipment is under constant control of an operator who has full view of the material entrance who is located or restrained where ~~(he)~~ they cannot possibly fall onto the conveyor an emergency stopping device is not mandatory.

(9) Conveyor lockout.

(a) Conveyors shall be locked out with a padlock at any time repair, maintenance, or clean-up work is being performed on the conveyor.

(b) Tags or push-button stops are not acceptable.

(10) Where conveyors are in excess of seven feet in height, means shall be provided to safely permit essential inspection and maintenance operations.

(11) Conveyor repair.

(a) Any part showing signs of significant wear shall be inspected carefully and replaced prior to reaching a condition where it may create a hazard.

(b) Replacement parts shall be equal to or exceed the manufacturer's specifications.

AMENDATORY SECTION (Amending Order 74-26, filed 5/7/74, effective 6/6/74)

**WAC 296-155-565 Hoisting engines.** (1) All gearing on hoisting engines shall be enclosed. Steam piping subject to contact shall be insulated and if electrical equipment is used, it shall be grounded.

(2) Hoisting engines shall be of ample capacity and equipped with brakes capable of sustaining one hundred and fifty percent of rated load for stopping and sustaining the maximum load in any position.

(3) Hoisting engines shall be protected against the weather and falling objects by a substantial cover.

(4) All hoisting equipment shall be frequently inspected, and brakes, gears and operating levers kept in working condition.

(5) Guards shall be provided to prevent persons coming in contact with hoisting cables.

(6) Brake drums shall be kept free of oil or grease.

(7) A positive operated pawl shall be used in addition to the brake to hold the load when it is suspended. Counter weight operated dogs are prohibited.

(8) Hoisting engines shall not be set up in the street when it can be avoided; but, if so located, they shall be completely housed.

(9) Only competent personnel shall operate material hoists.

(10) The operator shall not lift a load when a person is on the hoist, and all towers shall be posted to that effect, except as provided in other sections of this part.

(11) The operator shall be notified when any person goes up the tower ladder, or before any work is done on any part of the tower, overhead work, hoist or in the pit.

(12) The operator shall make daily inspections of all equipment before ~~(he starts)~~ starting operations.

(13) When the hoisting engine is located close to the building operation, it shall be covered with a strong plank roof covering to protect the operator from falling objects.

(14) Exhaust steam pipes shall discharge overhead so as not to obstruct the view of the operator or scald persons.

(15) In the operation of hoists, the operator shall always give a warning sign or signal before starting.

(16) When hoisting machinery is set on an elevated platform such platform shall be of substantial construction and standard guard rails and toeboards shall be provided along all open sides of the platform.

(17) Material hoists of more than one drum capacity shall be equipped with brake controls.

(18) A safety strap shall be provided on the foot block of all hoists.

(19) When electric motors are used for hoisting equipment, they shall be operated only by qualified personnel.

(a) Installations shall be made in accordance with provisions of local and national electrical safety codes, and shall be made by experienced workers only.

(b) Inclosed switches and fuses shall always be used.

(c) Switchboards shall be screened, and a sign placed warning unauthorized persons to keep clear.

**AMENDATORY SECTION** (Amending Order 86-14, filed 1/21/86)

**WAC 296-155-575 Helicopters and helicopter cranes.** (1) Helicopter regulations. Helicopter cranes shall be expected to comply with any applicable regulations of the Federal Aviation Administration.

(2) Briefing. Prior to each day's operation a briefing shall be conducted. This briefing shall set forth the plan of operation for the pilot and ground personnel.

(3) Slings and tag lines. Load shall be properly slung. Tag lines shall be of a length that will not permit their being drawn up into rotors. Pressed sleeve, swedged eyes, or equivalent means shall be used for all freely suspended loads to prevent hand splices from spinning open or cable clamps from loosening.

(4) Cargo hooks. All electrically operated cargo hooks shall have the electrical activating device so designed and installed as to prevent inadvertent operation. In addition, these cargo hooks shall be equipped with an emergency mechanical control for releasing the load. The hooks shall be tested prior to each day's operation to determine that the release functions properly, both electrically and mechanically.

(5) Personal protective equipment.

(a) Personal protective equipment for employees receiving the load shall consist of complete eye protection and hard hats secured by chinstraps.

(b) Loose-fitting clothing likely to flap in the downwash, and thus be snagged on hoist line, shall not be worn.

(6) Loose gear and objects. Every practical precaution shall be taken to provide for the protection of the employees from flying objects in the rotor downwash. All loose gear within 100 feet of the place of lifting the load, depositing the load, and all other areas susceptible to rotor downwash shall be secured or removed.

(7) Housekeeping. Good housekeeping shall be maintained in all helicopter loading and unloading areas.

(8) Operator responsibility. The helicopter operator shall be responsible for size, weight, and manner in which loads are connected to the helicopter. If, for any reason, the helicopter operator believes the lift cannot be made safely, the lift shall not be made.

(9) Hooking and unhooking loads. Employees shall not perform work under hovering craft except for that limited period of time necessary to guide, secure and unhook loads, or to hook loads. Regardless of whether the hooking or unhooking of a load takes place on the ground or a flat roof, or other location in an elevated work position in structural members, a safe means of access and egress, to include an

unprogrammed emergency escape route or routes, shall be provided for the employees who are hooking or unhooking loads.

(10) Static charge. Static charge on the suspended load shall be dissipated with a grounding device before ground personnel touch the suspended load, or protective rubber gloves shall be worn by all ground personnel touching the suspended load.

(11) Weight limitation. The weight of an external load shall not exceed the manufacturer's rating.

(12) Ground lines. Hoist wires or other gear, except for pulling lines or conductors that are allowed to "pay out" from a container or roll off a reel, shall not be attached to any fixed ground structure, or allowed to foul on any fixed structure.

(13) Visibility. When visibility is reduced by dust or other conditions, ground personnel shall exercise special caution to keep clear of main and stabilizing rotors. Precautions shall also be taken by the employer to eliminate as far as practical reduced visibility.

(14) Signal systems. Signal systems between aircrew and ground personnel shall be understood and checked in advance of hoisting the load. This applies to either radio or hand signal systems. Hand signals shall be as shown in Figure L-1.

(15) Approach distance. No unauthorized person shall be allowed to approach within 50 feet of the helicopter when the rotor blades are turning.

(16) Approaching helicopter. Whenever approaching or leaving a helicopter with blades rotating, all employees shall remain in full view of the pilot and keep in a crouched position. Employees shall avoid the area from the cockpit or cabin rearward unless authorized by the helicopter operator to work there.

(17) Personnel. Sufficient ground personnel shall be provided when required for safe helicopter loading and unloading operations.

(18) Communications. There shall be constant reliable communication between the pilot, and a designated employee of the ground crew who acts as a ~~((signalman))~~ signalperson during the period of loading and unloading. This ~~((signalman))~~ signalperson shall be distinctly recognizable from other ground personnel.

(19) Fires. Open fires shall not be permitted in an area that could result in such fires being spread by the rotor downwash.

(20) Refueling operations.

(a) Under no circumstances shall the refueling of any type helicopter with either aviation gasoline or Jet B (turbine-kerosene) type fuel be permitted while the engines are running.

(b) No unauthorized persons shall be allowed within fifty feet of the refueling operation or fueling equipment.

(c) A minimum of one thirty-pound fire extinguisher, or a combination of same, good for Class A, B and C fires, shall be provided within one hundred feet on the upwind side of the refueling operation.

(d) All fueling personnel shall be thoroughly trained in the refueling operation and in the use of available fire extinguishing equipment.

(e) There shall be no smoking, open flames, exposed flame heaters, flare pots or open flame lights for spark

producing agents within fifty feet of the refueling area or fueling equipment. All entrances to the refueling area shall be posted with "NO SMOKING" signs.

(f) Due to the numerous causes of static electricity, it should be considered present at all times. Prior to starting refueling operations, the fueling equipment and the helicopter shall be grounded and the fueling nozzle shall be electrically bonded to the helicopter.

(i) Conductive hose shall not be used to accomplish the bonding.

(ii) All grounding and bonding connections shall be electrically and mechanically firm, to clean unpainted metal parts.

(g) To control spills:

(i) Fuel shall be pumped either by hand or power.

(ii) Pouring or gravity flow shall not be permitted.

(iii) Selfclosing nozzles shall not be dragged on the ground.

(h) In case of a spill, the fueling operation shall be immediately stopped until such time as the person in charge determines that it is safe to resume the refueling operation.

(i) When ambient temperatures have been in the one hundred degree F range for an extended period of time, all refueling of helicopters with the engines running shall be suspended until such time as conditions become suitable to resume refueling with the engines running.

(21) Hook on persons shall wear contrasting colored hard hats, with chinstraps, and high visibility vests or outer garments to enable the helicopter operator to readily identify their locations.

(22) Riding the load or hook of a helicopter is prohibited except in the case of emergency and then only with the proper safety gear.

**AMENDATORY SECTION** (Amending Order 86-14, filed 1/21/86)

**WAC 296-155-615 Material handling equipment.**

(1) Earthmoving equipment; general.

(a) These rules apply to the following types of earthmoving equipment: Scrapers, loaders, crawler or wheel tractors, bulldozers, off-highway trucks, graders, agricultural and industrial tractors, and similar equipment. The promulgation of specific rules for compactors and rubber-tired "skid-steer" equipment is reserved pending consideration of standards currently being developed.

(b) Seat belts.

(i) Seat belts shall be provided on all equipment covered by this section and shall meet the requirements of the Society of Automotive Engineers, J386-1969, Seat Belts for Construction Equipment. Seat belts for agricultural and light industrial tractors shall meet the seat belt requirements of Society of Automotive Engineers J333a-1970, Operator Protection for Agricultural and Light Industrial Tractors.

(ii) Seat belts need not be provided for equipment which is designed only for standup operation.

(iii) Seat belts shall not be provided for equipment which does not have rollover protective structure (ROPS) or adequate canopy protection.

(c) Access roadways and grades.

(i) No employer shall move or cause to be moved construction equipment or vehicles upon any access roadway

or grade unless the access roadway or grade is constructed and maintained to accommodate safely the movement of the equipment and vehicles involved.

(ii) Every emergency access ramp and berm used by an employer shall be constructed to restrain and control runaway vehicles.

(d) Brakes. All earthmoving equipment mentioned in WAC 296-155-615 (1)(a) shall have a service braking system capable of stopping and holding the equipment fully loaded, as specified in Society of Automotive Engineers SAE-J237, Loader Dozer-1971, J236, Graders-1971, and J319b, Scrapers-1971. Brake systems for self-propelled rubber-tired off-highway equipment manufactured after January 1, 1972 shall meet the applicable minimum performance criteria set forth in the following Society of Automotive Engineers Recommended Practices:

Self-propelled scrapers	_____	SAE J319b-1971
Self-propelled graders	_____	SAE J236-1971
Trucks and wagons	_____	SAE J166-1971
Front end loaders and dozer	_____	SAE J237-1971

(e) Fenders. Pneumatic-tired earthmoving haulage equipment (trucks, scrapers, tractors, and trailing units) whose maximum speed exceeds 15 miles per hour, shall be equipped with fenders on all wheels to meet the requirements of Society of Automotive Engineers SAE J321a-1970, Fenders for Pneumatic-Tired Earthmoving Haulage Equipment. An employer may, of course, at any time seek to show under WAC 296-155-010, that the uncovered wheels present no hazard to personnel from flying materials.

(f) Rollover protective structures (ROPS). See Part V of this chapter for requirements for rollover protective structures and overhead protection.

(g) Rollover protective structures for off-highway trucks. The promulgation of standards for rollover protective structures for off-highway trucks is reserved pending further study and development.

(h) Specific effective dates—Brakes and fenders. ((+)) Equipment mentioned in WAC 296-155-615 (d) and (e) and manufactured after January 1, 1972, which is used by any employer after that date, shall comply with the applicable rules prescribed therein concerning brakes. Equipment mentioned in WAC 296-155-615 (d) and (e) and manufactured before January 1, 1972, which is used by any employer after that date, shall meet the applicable rules prescribed herein not later than October 1, 1974. It should be noted that employers may request variations from the applicable brakes standards required by this part. Employers wishing to seek variations from the applicable brakes rules may submit any requests for variations in accordance with WAC 296-155-010. Any statements should specify how the variation would protect the safety of the employees by providing for any compensating restrictions on the operation of equipment.

(i) Audible alarms.

(i) All bidirectional machines, such as rollers, (~~compactors~~) compactors, front-end loaders, bulldozers, and similar equipment, shall be equipped with a horn, distinguishable from the surrounding noise level, which shall be

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operated as needed when the machine is moving in either direction. The horn shall be maintained in an operative condition.

(ii) No employer shall permit earthmoving or compacting equipment which has an obstructed view to the rear to be used in reverse gear unless the equipment has in operation a reverse signal alarm distinguishable from the surrounding noise level or an employee signals that it is safe to do so.

(iii) In circumstances where the surrounding noise level is of such amplitude that reverse signal alarms are not effective, amber strobe lights shall be used.

(iv) Operators of equipment which does not have an obstructed view to the rear shall look to the rear while operating the equipment in reverse.

(j) Scissor points. Scissor points on all front-end loaders, which constitute a hazard to the operator during normal operation, shall be guarded.

(k) Tractor motors shall be cranked only by operators or other experienced persons.

(l) Waterproof and comfortable seat cushions shall be provided on tractors at all times when working.

(m) Riders, except mechanics and persons in training to operate equipment, shall not be allowed on equipment unless a seat with a seatbelt is provided and used.

(n) Winch lines shall be maintained in good condition and provided with spliced eye, knob or hook in working end, except under conditions where unspliced end is required.

(o) No repairs on blade or dozer equipment shall be initiated unless motor has been stopped and dozer blade is resting on the ground or securely blocked. The same shall apply to carry-all gates.

(p) Bulldozer blades and carryall gates shall rest on the ground or on blocking when machines are not in operation.

(q) Operator shall not leave controls of tractor with master clutch engaged.

(r) Personnel shall not get on or off machine while machine is in motion.

(s) Where excessive dust conditions are created, such areas shall be sprinkled with water to maintain dust at a minimum.

(t) Respirators shall be worn by operators when subject to harmful dust exposure.

(2) Excavating and other equipment.

(a) Tractors covered in subsection (1) of this section shall have seat belts as required for the operators when seated in the normal seating arrangement for tractor operation, even though backhoes, breakers, or other similar attachments are used on these machines for excavating or other work.

(b) For the purposes of this part and of part L of this chapter, the nomenclatures and descriptions for measurement of dimensions of machinery and attachments shall be as described in Society of Automotive Engineers 1970 Handbook, pages 1088 through 1103.

(c) The safety requirements, ratios, or limitations applicable to machines or attachment usage covered in Power Crane and Shovel Association's Standards No. 1 and No. 2 of 1968, and No. 3 of 1969, shall be complied with, and shall apply to cranes, machines, and attachments under this part.

(3) Lifting and hauling equipment (other than equipment covered under Part L of this chapter). ~~((a))~~ Industrial

trucks shall meet the requirements of WAC 296-155-605 and the following:

~~((i))~~ (a) Lift trucks, stackers, etc., shall have the rated capacity clearly posted on the vehicle so as to be clearly visible to the operator. When auxiliary removable counterweights are provided by the manufacturer, corresponding alternate rated capacities also shall be clearly shown on the vehicle. These ratings shall not be exceeded.

~~((ii))~~ (b) No modifications or additions which affect the capacity or safe operation of the equipment shall be made without the manufacturer's or professional engineer's written approval. If such modifications or changes are made, the capacity, operation, and maintenance instruction plates, tags, or decals, shall be changed accordingly. In no case shall the original safety factor of the equipment be reduced.

~~((iii))~~ (c) If a load is lifted by two or more trucks working in unison, the proportion of the total load carried by any one truck shall not exceed its capacity.

~~((iv))~~ (d) Steering or spinner knobs shall not be attached to the steering wheel unless the steering mechanism is of a type that prevents road reactions from causing the steering handwheel to spin. The steering knob shall be mounted within the periphery of the wheel.

~~((v))~~ (e) All high lift rider industrial trucks shall be equipped with overhead guards which meet the configuration and structural requirements as defined in paragraph 502 of American National Standards Institute B56.1-1975, Safety Standards for Powered Industrial Trucks.

~~((vi))~~ (f) All industrial trucks in use shall meet the applicable requirements of design, construction, stability, inspection, testing, maintenance, and operation, as defined in American National Standards Institute B56.1-1975, Safety Standards for Powered Industrial Trucks.

(g) Unauthorized personnel shall not be permitted to ride on powered industrial trucks. A safe place to ride shall be provided where riding of trucks is authorized.

AMENDATORY SECTION (Amending Order 86-14, filed 1/21/86)

**WAC 296-155-61705 Employee training.** (1) Employer responsibility. The employer shall provide a program to train all employees who service rim wheels in the hazards involved in servicing those multipiece rim wheels and the safety procedures to be followed.

(a) The employer shall assure that no employee services any rim wheel unless the employee has been trained and instructed in correct procedures of servicing the type of wheel being serviced, and in the safe operating procedures described in WAC 296-24-21711.

(b) Information to be used in the training program shall include, at a minimum, the applicable data contained in the charts (rim manuals) and the contents of this standard.

(c) Where an employer knows or has reason to believe that any of ~~((his))~~ the employees ~~((is))~~ are unable to read and understand the charts or rim manual, the employer shall assure that the employee is instructed concerning the contents of the charts and rim manual in a manner which the employee is able to understand.

(2) Employee qualification. The employer shall assure that each employee demonstrates and maintains the ability to



service rim wheels safely, including performance of the following tasks:

- (a) Demounting of tires (including deflation);
- (b) Inspection and identification of the rim wheel components;
- (c) Mounting of tires (including inflation with a restraining device or other safeguard required by this section);
- (d) Use of the restraining device or barrier, and other equipment required by this section;
- (e) Handling of rim wheels;
- (f) Inflation of the tire when a single-piece rim wheel is mounted on a vehicle;
- (g) An understanding of the necessity of standing outside the trajectory both during inflation of the tire and during inspection of the rim wheel following inflation; and
- (h) Installation and removal of wheels.

(3) Ongoing training. The employer shall evaluate each employee's ability to perform these tasks and to service rim wheels safely and shall provide additional training as necessary to assure that each employee maintains his or her proficiency.

**AMENDATORY SECTION** (Amending Order 86-14, filed 1/21/86)

**WAC 296-155-61711 Safe operating procedure—Multipiece rim wheels.** The employer shall establish a safe operating procedure for servicing multipiece rim wheels and shall assure that employees are instructed in and follow that procedure. The procedure shall include at least the following elements:

- (1) Deflation before demounting. Tires shall be completely deflated before demounting by removal of the valve core.
- (2) Deflation on axle. Tires shall be completely deflated by removing the valve core, before a rim wheel is removed from the axle in either of the following situations:
  - (a) When the tire has been driven underinflated at eighty percent or less of its recommended pressure; or
  - (b) When there is obvious or suspected damage to the tire or wheel components.
- (3) Rubber lubricant. Rubber lubricant shall be applied to bead and rim mating surfaces during assembly of the wheel and inflation of the tire, unless the tire or wheel manufacturer recommends against it.
- (4) Inflation of tire while on vehicle. If a tire on a vehicle is underinflated but has more than eighty percent of the recommended pressure, the tire may be inflated while the rim wheel is on the vehicle provided remote control inflation equipment is used, and no employees remain in the trajectory during inflation.
- (5) Tire bead. Tires shall be inflated outside a restraining device only to a pressure sufficient to force the tire bead onto the rim ledge and create an airtight seal with the tire and bead.
- (6) Restraining device clearance. Whenever a rim wheel is in a restraining device the employee shall not rest or lean any part of ~~(his)~~ the body or equipment on or against the restraining device.
- (7) Inspection of components. After tire inflation, the tire and wheel components shall be inspected while still within the restraining device to make sure that they are

properly seated and locked. If further adjustment to the tire or wheel components is necessary, the tire shall be deflated by removal of the valve core before the adjustment is made.

(8) Use of force. No attempt shall be made to correct the seating of side and lock rings by hammering, striking or forcing the components while the tire is pressurized.

(9) Damaged components. Cracked, broken, bent, or otherwise damaged rim components shall not be reworked, welded, brazed, or otherwise heated.

(10) Trajectory clearance. Whenever multipiece rim wheels are being handled, employees shall stay out of the trajectory unless the employer can demonstrate that performance of the servicing makes the employee's presence in the trajectory necessary.

(11) Wheel heating prohibition. No heat shall be applied to a multi-piece wheel or wheel component.

**AMENDATORY SECTION** (Amending Order 86-14, filed 1/21/86)

**WAC 296-155-61713 Safe operating procedure—Single-piece rim wheels.** The employer shall establish a safe operating procedure for servicing single-piece rim wheels and shall assure that employees are instructed in and follow that procedure. The procedure shall include at least the following elements:

- (1) Deflation. Tires shall be completely deflated by removal of the valve core before demounting.
- (2) Mounting and demounting. Mounting and demounting of the tire shall be done only from the narrow ledge side of the wheel. Care shall be taken to avoid damaging the tire beads while mounting tires on wheels. Tires shall be mounted only on compatible wheels of matching bead diameter and width.
- (3) Lubricant. Nonflammable rubber lubricant shall be applied to bead and wheel mating surfaces before assembly of the rim wheel, unless the tire or wheel manufacturer recommends against the use of any rubber lubricant.
- (4) Changing machine. If a tire changing machine is used, the tire shall be inflated only to the minimum pressure necessary to force the tire bead onto the rim ledge while on the tire changing machine.
- (5) Bead expander. If a bead expander is used, it shall be removed before the valve core is installed and as soon as the rim wheel becomes airtight (the tire bead slips onto the bead seat).
- (6) Inflation restrictions. Tires may be inflated only when contained within a restraining device, positioned behind a barrier or bolted on the vehicle with the lug nuts fully tightened.
- (7) Inflation trajectory. Tires shall not be inflated when any flat, solid surface is in the trajectory and within one foot of the sidewall.
- (8) Employee safety. Employees shall stay out of the trajectory when inflating a tire.
- (9) Inflation pressure. Tires shall not be inflated to more than the inflation pressure stamped in the sidewall unless a higher pressure is recommended by the manufacturer.
- (10) Seating tire bead. Tires shall not be inflated above the maximum pressure recommended by the manufacturer to seat the tire bead firmly against the rim flange.

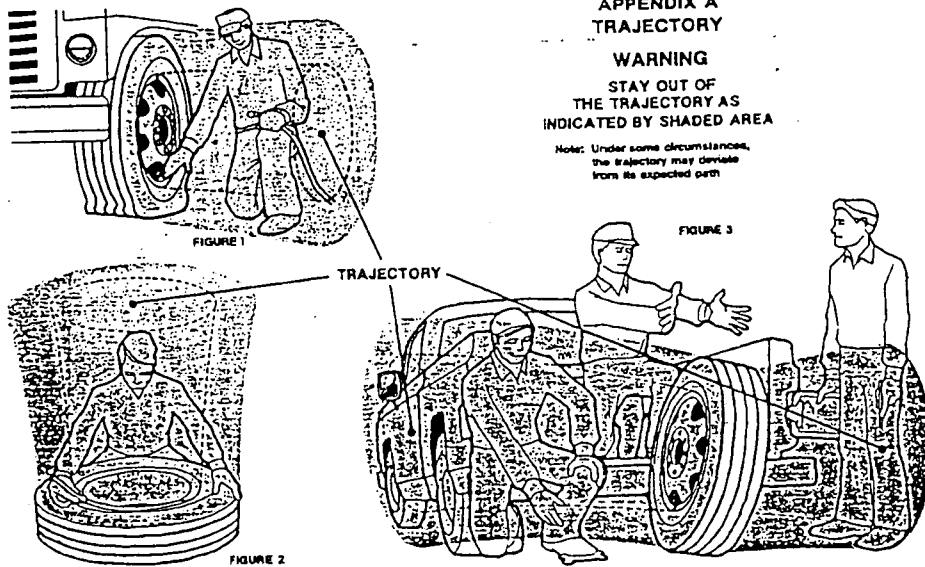
(11) Prohibition on use of heat. No heat shall be applied to a single-piece wheel.

(12) Mixing tire and rim sizes. Employee shall be informed of the hazard created by mixing 16" and 16.5" tires and rims.

(13) Defective components. Cracked, broken, bent, or otherwise damaged wheels shall not be reworked, welded, brazed, or otherwise heated.

APPENDIX A  
TRAJECTORY  
WARNING  
STAY OUT OF  
THE TRAJECTORY AS  
INDICATED BY SHADED AREA

Note: Under some circumstances, the trajectory may deviate from its expected path.



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Appendix B—Ordering Information for NHTSA charts

The NHTSA charts as part of a continuing campaign to alert rim wheel serving personnel of the industry accepted procedures for servicing multipiece rim wheels.

Prints of the charts are available through the ~~((Division of Industrial Safety and Health Administration (WISHA)))~~ Occupational Safety and Health Administration (OSHA) area offices. The address and telephone number of the nearest ~~((WISHA))~~ OSHA area office can be obtained by ~~((contacting the State of Washington, Department of Labor and Industries, Division of Industrial Safety and Health, P.O. Box 207, Olympia, Washington, 98504, (206) 754-1258, or in your telephone directory for a local number))~~ looking in the local telephone directory under U.S. Government, U.S. Department of Labor, Occupational Safety and Health Administration.

AMENDATORY SECTION (Amending Order 90-18, filed 1/10/91, effective 2/12/91)

**WAC 296-155-620 Pile driving equipment.** (1) General requirements.

(a) Boilers and piping systems which are a part of, or used with, pile driving equipment shall meet the applicable

requirements of the American Society of Mechanical Engineers, Powers Boilers (section I).

(b) All pressure vessels which are a part of or used with, pile driving equipment shall meet the applicable requirements of the American Society of Mechanical Engineers, Pressure Vessels (section VIII).

(c) Overhead protection, which will not obscure the vision of the operator, and which meets the requirements of Part L of this chapter, shall be provided. Protection shall be of 2-inch planking or other solid material of equivalent strength.

(d) Stop blocks shall be provided for the leads to prevent the hammer from being raised against the head block.

(e) A blocking device, capable of safely supporting the weight of the hammer shall be provided for placement in the leads under the hammer at all times while employees are working under the hammer.

(f) Guards shall be provided across the top of the head block to prevent the cable from jumping out of the sheaves.

(g) When the leads must be inclined in the driving of batter piles, provisions shall be made to stabilize the leads.

(h) All working equipment shall be visually inspected at the beginning of each shift.

(i) Fixed leads shall be provided with ladder, and adequate rings, or similar attachment points, so that the loft workers may engage their full body harness lanyard to the leads. If the leads are provided with loft platform(s) such platform(s) shall be protected by standard guardrails.

(j) Pile drivers with swinging leads shall have a wire rope safety strap on top end.

(k) Spud bars shall be of hard wood with smooth round handle end for safe handling. Iron shod spud bars are prohibited.

(l) A follower block or driving cap shall be used with a drop hammer on all piling except sheet piling.

(m) Steam hose leading to a steam hammer or jet pipe shall be securely attached to the hammer with an adequate length of at least 1/4-inch diameter chain or cable to prevent whipping in the event the joint at the hammer is broken. Air hammer hoses shall be provided with the same protection as required for steam lines.

(n) Safety chains, or equivalent means, shall be provided for each hose connection to prevent the line from thrashing around in case the coupling becomes disconnected.

(o) Steam line controls shall consist of two shutoff valves, one of which shall be a quick-acting lever type within easy reach of the hammer operator.

(p) Guys, outriggers, thrustouts, or counterbalances shall be provided as necessary to maintain stability of pile driver rigs.

(q) Ladders constructed in compliance with this chapter shall be installed on all pile drivers from the hoist platform to the head block, and in such position that workers using ladders will not come in contact with lines, sheaves, etc.

(r) Drop hammers which have been chipped on the face shall not be used for pile driving.

(s) Groove worn drums or spools shall be replaced or properly repaired to present a smooth working surface.

(t) At least two full wraps of cable shall be maintained on hoisting drums.

(u) Proper racks shall be provided for storage of cross-cut saws.

(v) Every hoisting drum used as a pile driver shall be equipped with manually operated dogs or pawls to hold suspended loads. Foot brakes shall only be used to hold suspended loads until drum dogs are engaged. The dogs shall be visible from the operator's station or be equipped with a positive direct connected telltale which shall be visible to the operator.

(w) No counterweight or spring arrangement on dogs shall be permitted which would allow dog to be automatically disengaged either by relieving the load or rolling the drum.

(x) In every crew there shall be designated ~~((signalmen))~~ signalperson. The driver operator or drum person shall receive signals from no others, except when ~~((loftsmen))~~ loftworker is above. The hammer shall not be lowered except on the ~~((loftsmen's))~~ loftworker's signal.

(y) Spliced hammer lines shall not be used.

(2) Pile driving from barges and floats. Barges or floats supporting pile driving operations shall meet the applicable requirements of WAC 296-155-630.

(3) Pile driving equipment.

(a) Engineers and ~~((winchmen))~~ winchperson shall accept signals only from the designated ~~((signalmen))~~ signalperson.

(b) All employees shall be kept clear when piling is being hoisted into the leads.

(c) When piles are being driven in an excavated pit, the walls of the pit shall be sloped to the angle of repose or sheet-piled and braced.

(d) When steel tube piles are being "blown out," employees shall be kept well beyond the range of falling materials.

(e) When it is necessary to cut off the tops of driven piles, pile driving operations shall be suspended except where the cutting operations are located at least twice the length of the longest pile from the driver.

(f) When driving jacked piles, all access pits shall be provided with ladders and bulkheaded curbs to prevent material from falling into the pit.

(g) Floating equipment such as dredges and pile drivers shall maintain a signal system to shore in the event of an emergency.

(h) The distribution of machinery on floating equipment shall be such that the completed unit floats on an even keel.

(i) Fuel tanks below decks shall be vented to outside of hull and vents shall be equipped with flame arrestors.

(j) All hull compartments shall be ventilated. No person shall work in hull compartments until it is shown the compartments contain no flammable or toxic concentrations.

(k) Light fixtures installed or used within the hull shall be explosion proof.

(l) All floating rigs shall be equipped with ladderways extending from the deck to the waterline where the deck is more than 36 inches above the water. A wire rope shall be hung along both sides of the hull or float and so hung that it shall be at all times near or at the waterline.

(m) Doors of deck houses where deck house sets within 36" of edge of deck and doorways in hull shall be equipped with guard rails or cross chains.

(n) Deck houses shall have a substantial grab rail installed on all sides where such installation will not interfere with operations.

(o) Pile driver and dredge fairlead sheaves, and spudline sheaves shall be guarded to prevent workers or tools being drawn into them.

(p) All work deck shall be kept clear of debris, unnecessary tools and equipment in order to minimize the stumbling hazard. Lines shall be coiled, tools stored and material stacked clear of working spaces.

(q) Night operations shall be adequately lighted for all activity while work is in progress and shall be maintained until workers leave the work area.

(r) Electrical installation and equipment shall be installed and maintained in compliance with the National Electric Code.

(s) All walkways over water and on dredge pontoon discharge pipe lines shall be a minimum of 20" in width with standard handrail along one side on structures and gang planks. Walkways on pontoon lines may be equipped with hand lines in lieu of standard handrail.

(t) Adequate fire extinguishing equipment shall be provided and maintained in a serviceable condition.

(u) Protective equipment shall be used when working with creosote timbers. Protective creams shall be used on exposed skin surfaces and gloves and eye protection worn especially when driving piles.

(v) Pulling piles with hammer or pile line rigged through the head block is prohibited unless driver and rigging are designed to safely withstand the imposed strain.

(w) Truck runways and platforms shall be equipped with a wheel guard on all outside edges. Top of wheel guards shall be a minimum of 10 inches above deck.

(x) Use of foot blocks at base of leads for hammer line or pile line is prohibited.

**AMENDATORY SECTION** (Amending Order 90-18, filed 1/10/91, effective 2/12/91)

**WAC 296-155-625 Site clearing.** (1) General.

(a) The word "clearing" means the removal of trees, stumps, logs, brush, debris and rubbish from the surface of the ground in preparation of a site for construction work of any kind. The removal of trees and logs shall be in accordance with the requirements of chapter 296-54 WAC.

(b) All equipment and tools such as axes, sledges, wedges, saws, springboards, etc., shall be maintained in a safe condition and guarded with standard safeguards.

(c) Fallers shall give warning to brushing crews, buckers and other persons in the vicinity where a tree is being felled; taking notice that such persons are not only out of the reach of tree, but also out of danger of possible sidewinders, snags or other trees which may be knocked over by the tree being felled.

(d) No tree shall be felled toward and within range of traveled road or railroad in use, unless a ~~((flagman))~~ flagger is placed on such road or railroad to warn all approaching persons or to stop vehicles.

(e) Clearing crews shall not be placed immediately below other crews working on hillsides where there is a possible danger of skidding or rolling trees, moving earth or rock.

(f) Pioneer roads on clearing operations shall be constructed to safely accommodate all equipment moved over road.

(g) Hazardous standing and down timber, rocks, etc., shall be moved from upper sides of cuts on side hill operations.

(h) Care shall be exercised in the use of oil for burning brush or timber.

(i) Employees engaged in site clearing shall be protected from hazards of irritant and toxic plants and suitably instructed in the first-aid treatment available.

(j) All equipment used in site clearing operations shall be equipped with rollover guards meeting the requirements of this chapter. In addition, rider-operated equipment shall be equipped with an overhead and rear canopy guard meeting the following requirements:

(i) The overhead covering on this canopy structure shall be of not less than 1/8-inch steel plate or 1/4-inch woven wire mesh with openings no greater than 1 inch, or equivalent.

(ii) The opening in the rear of the canopy structure shall be covered with not less than 1/4-inch woven wire mesh with openings no greater than 1 inch.

(iii) Use of 1/2 inch thick plastic sheets or other thicknesses of plastic panels derived from polycarbonate, acrylic, cellulose acetate butyrate which provides equivalent or better protection against particular hazards involved is acceptable in lieu of 1 or 1 3/4 inch open mesh material.

(A) All panels shall be installed in a manner which can withstand the initial impact, and maintain the protective barrier integrity; and

(B) All panels must be labeled or marked to distinguish between acceptable and inferior materials.

(k) In addition to observance of the general safety and health standards;

(i) The employer shall assume the responsibility of work assignment so that no worker shall be required to work in a position or location so isolated as to not be within ordinary calling distance of another person who can render assistance in case of emergency. In any operation where cutting, felling trees, loading, or a combination of these duties is carried on, there shall be a minimum crew of two persons who shall work as a team and shall be in visual or voice contact with one another. If one worker at these operations is required to be left alone for a period of time, ~~((he))~~ the worker shall be contacted by another person at reasonable intervals not to exceed fifteen minutes unless such practice can be established to be impractical.

(ii) This does not apply to operators of motor vehicles, ~~((watchmen))~~ watchpersons or certain other jobs which, by their nature, are singular worker assignments. However, a definite procedure for checking the welfare of all workers during working hours shall be instituted and all workers so advised.

**AMENDATORY SECTION** (Amending Order 76-29, filed 9/30/76)

**WAC 296-155-630 Marine operations and equipment.** (1) Material handling operations.

~~((a))~~ Operations fitting the definition of "material handling" shall be performed in conformance with applicable requirements of "Safety and health regulations for longshoring." The term "longshoring operations" means the loading, unloading, moving, or handling of construction materials, equipment and supplies, etc. into, in, on, or out of any vessel, from a fixed structure or shore-to-vessel, vessel-to-shore or fixed structure or vessel-to-vessel.

(2) Access to barges.

(a) Ramps for access of vehicles to or between barges shall be of adequate strength, provided with side boards, well maintained, and properly secured.

(b) Unless employees can step safely to or from the wharf, float, barge, or river towboat, either a ramp, meeting the requirements of (a) of this subsection, or a safe walkway, shall be provided.

(c) Jacob's ladders shall be of the double rung or flat tread type. They shall be well maintained and properly secured.

(d) A Jacob's ladder shall either hang without slack from its lashings or be pulled up entirely.

(e) When the upper end of the means of access rests on or is flush with the top of the bulwark, substantial steps, properly secured and equipped with at least one substantial

hand rail approximately 33 inches in height, shall be provided between the top of the bulwark and the deck.

(f) Obstructions shall not be laid on or across the gangway.

(g) The means of access shall be adequately illuminated for its full length.

(h) Unless the structure makes it impossible, the means of access shall be so located that the load will not pass over employees.

(3) Working surfaces of barges.

(a) Employees shall not be permitted to walk along the sides of covered lighters or barges with coamings more than 5 feet high, unless there is a 3-foot clear walkway, or a grab rail, or a taut handline is provided.

(b) Decks and other working surfaces shall be maintained in a safe condition.

(c) Employees shall not be permitted to pass fore and aft, over, or around deckloads, unless there is a safe passage.

(d) Employees shall not be permitted to walk over deckloads from rail to coaming unless there is a safe passage. If it is necessary to stand at the outboard or inboard edge of the deckload where less than 24 inches of bulwark, rail, coaming, or other protection exists, all employees shall be provided with a suitable means of protection against falling from the deckload.

(4) First-aid and lifesaving equipment.

(a) Provisions for rendering first aid and medical assistance shall be in accordance with Part B of this Chapter.

(b) The employer shall ensure that there is in the vicinity of each barge in use at least one U.S. Coast Guard-approved 30-inch life ring with not less than 90 feet of line attached, and at least one portable or permanent ladder which will reach the top of the apron to the surface of the water. If the above equipment is not available at the pier, the employer shall furnish it during the time that ~~(he)~~ the employer is working the barge.

(c) Employees walking or working on the unguarded decks of barges shall be protected with U.S. Coast Guard-approved personal flotation devices such as Type I PFD, Type II PFD, Type III PFD, or Type V PFD, or their equivalent, pursuant to 46 CFR 160 (Coast Guard Lifesaving Equipment Specifications) and 33 CFR 175.23 (Coast Guard table of devices equivalent to personal flotation devices). Ski belt or inflatable type personal flotation devices are specifically prohibited.

(5) Diving operations. (Reserved.)

**AMENDATORY SECTION** (Amending Order 92-06, filed 10/30/92, effective 12/8/92)

**WAC 296-155-650 Scope, application, and definitions applicable to this part.** (1) Scope and application. This part applies to all open excavations made in the earth's surface. Excavations are defined to include trenches.

(2) Definitions applicable to this part.

(a) "Accepted engineering requirements or practices." Those requirements which are compatible with standards of practice required by a registered professional engineer.

(b) "Aluminum hydraulic shoring." A preengineered shoring system comprised of aluminum hydraulic cylinders (crossbraces) used in conjunction with vertical rails (uprights) or horizontal rails (walers). Such system is designed,

specifically to support the sidewalls of an excavation and prevent cave-ins.

(c) "Bell-bottom pier hole." A type of shaft or footing excavation, the bottom of which is made larger than the cross section above to form a belled shape.

(d) "Benching (benching system)." A method of protecting employees from cave-ins by excavating the sides of an excavation to form one or a series of horizontal levels or steps, usually with vertical or near-vertical surfaces between levels.

(e) "Cave-in." The separation of a mass of soil or rock material from the side of an excavation, or loss of soil from under a trench shield or support system, and its sudden movement into the excavation in quantity that it could entrap, bury, injure, or immobilize a person.

(f) "Competent person." One who can identify existing or predictable hazards in the surroundings that are unsanitary, hazardous, or dangerous to employees. Also has authorization or authority by the nature of their position to take prompt corrective measures to eliminate them. The person shall be knowledgeable in the requirements of this part.

(g) "Cross braces." The horizontal members of a shoring system installed perpendicular to the sides of the excavation, the ends of which bear against either uprights or wales.

(h) "Excavation." Any ~~(man)~~ person-made cut, cavity, trench, or depression in the earth's surface, formed by earth removal.

(i) "Faces or sides." The vertical or inclined earth surfaces formed as a result of excavation work.

(j) "Failure." The breakage, displacement, or permanent deformation of a structural member or connection so as to reduce its structural integrity and its supportive capabilities.

(k) "Hazardous atmosphere." A atmosphere which by reason of being explosive, flammable, poisonous, corrosive, oxidizing, irritating, oxygen deficient, toxic, or otherwise harmful, may cause death, illness, or injury.

(l) "Kickouts." Accidental release or failure of a cross brace.

(m) "Protective system." A method of protecting employees from cave-ins, from material that could fall or roll from an excavation face or into an excavation, or from the collapse of adjacent structures. Protective systems include support systems, sloping and benching systems, shield systems, and other systems that provide the necessary protection.

(n) "Ramp." An inclined walking or working surface that is used to gain access to one point to another, and is constructed from earth or from structural materials such as steel or wood.

(o) "Registered professional engineer." A person who is registered as a professional engineer in the state of Washington. The registered professional engineer shall comply with the Washington state department of licensing requirements, chapter 18.43 RCW.

(p) "Sheeting." The members of a shoring system that retain the earth in position and in turn are supported by other members of the shoring system.

(q) "Shield (shield system)." A structure that is able to withstand the forces imposed on it by a cave-in and thereby protect employees within the structure. Shields can be

permanent structures or can be designed to be portable and moved along as work progresses. Additionally, shields can be either premanufactured or job-built in accordance with WAC 296-155-657 (3)(c) or (d). Shields used in trenches are usually referred to as "trench boxes" or "trench shields."

(r) "Shoring (shoring system)." A structure such as a metal hydraulic, mechanical, or timber shoring system that supports the sides of an excavation and which is designed to prevent cave-ins.

(s) "Sides." See "faces."

(t) "Sloping (sloping system)." A method of protecting employees from cave-ins by excavating to form sides of an excavation that are inclined away from the excavation so as to prevent cave-ins. The angle of incline required to prevent a cave-in varies with differences in such factors as the soil type, environmental conditions of exposure, and application of surcharge loads.

(u) "Stable rock." A natural solid mineral material that can be excavated with vertical sides and will remain intact while exposed. Unstable rock is considered to be stable when the rock material on the side or sides of the excavation is secured against caving-in or movement by rock bolts or by another protective system that has been designed by a registered professional engineer.

(v) "Structural ramp." A ramp built of steel or wood, usually used for vehicle access. Ramps made of soil or rock are not considered structural ramps.

(w) "Support system." A structure such as underpinning, bracing or shoring, which provides support to an adjacent structure, underground installation, or the sides of an excavation.

(x) "Tabulated data." Tables and charts approved by a registered professional engineer and used to design and construct a protective system.

(y) "Trench (trench excavation)." A narrow excavation in relation to its length made below the surface of the ground. In general, the depth is greater than the width, but the width of a trench (measured at the bottom) is not greater than 15 feet (4.6m). If forms or other structures are installed or constructed in an excavation so as to reduce the dimension measured from the forms or structure to the side of the excavation to 15 feet (4.6 m) or less (measured at the bottom of the excavation), the excavation is also considered to be a trench.

(z) Trench box. See "shield."

(aa) "Trench shield." See "shield."

(bb) "Uprights." The vertical members of a trench shoring system placed in contact with the earth and usually positioned so that individual members do not contact each other. Uprights placed so that individual members are closely spaced, in contact with or interconnected to each other, are often called "sheeting."

(cc) "Wales." Horizontal members of a shoring system placed parallel to the excavation face whose sides bear against the vertical members of the shoring system or earth.

**AMENDATORY SECTION** (Amending Order 91-01, filed 5/20/91, effective 6/20/91)

**WAC 296-155-675 Scope, application, and definitions applicable to this part.** (1) Scope and application. This ((subpart)) part sets forth requirements to protect all

construction employees from the hazards associated with concrete and masonry construction operations performed in workplaces covered under chapter 296-155 WAC.

(2) Definitions applicable to this part.

(a) "Bull float" means a tool used to spread out and smooth the concrete.

(b) "Formwork" means the total system of support for freshly placed or partially cured concrete, including the mold or sheeting (form) that is in contact with the concrete as well as all supporting members including shores, reshores, hardware, braces, and related hardware.

(c) "Jacking operation" means the task of lifting a slab (or group of slabs) vertically from one location to another (e.g., from the casting location to a temporary (parked) location, or from a temporary location to another temporary location, or to its final location in the structure), during the construction of a building/structure where the lift-slab process is being used.

(d) "Lift slab" means a method of concrete construction in which floor and roof slabs are cast on or at ground level and, using jacks, lifted into position.

(e) "Limited access zone" means an area alongside a masonry wall, which is under construction, and which is clearly demarcated to limit access by employees.

(f) "Precast concrete" means concrete members (such as walls, panels, slabs, columns, and beams) which have been formed, cast, and cured prior to final placement in a structure.

(g) "Reshoring" means the construction operation in which shoring equipment (also called reshores or reshoring equipment) is placed, as the original forms and shores are removed, in order to support partially cured concrete and construction loads.

(h) "Shore" means a supporting member that resists a compressive force imposed by a load.

(i) "Vertical slip forms" means forms which are jacked vertically during the placement of concrete.

(j) "Guy" means a line that steadies a high piece or structure by pulling against an off-center load.

**AMENDATORY SECTION** (Amending Order 90-10, filed 8/13/90, effective 9/24/90)

**WAC 296-155-680 General provisions.** (1) General. All equipment, material and construction techniques used in concrete construction and masonry work shall meet the applicable requirements for design, construction, inspection, testing, maintenance and operations as prescribed in ANSI A10.9-1970, Safety Requirements for Concrete Construction and Masonry Work.

(2) Construction loads. No construction loads shall be placed on a concrete structure or portion of a concrete structure unless the employer determines, based on information received from a person who is qualified in structural design, that the structure or portion of the structure is capable of supporting the loads.

(3) Vertical loads. Vertical loads consist of a dead load plus an allowance for live load. The weight of formwork together with the weight of freshly placed concrete is dead load. The live load consists of the weight of ((workmen)) workers, equipment, runways and impact, and shall be

computed in pounds per square foot (psf) of horizontal projection.

(4) Lateral loads. Braces and shores shall be designed to resist all foreseeable lateral loads such as wind, cable tensions, inclined supports, impact of placement, and starting and stopping of equipment. The assumed value of load due to wind, impact of concrete, and equipment acting in any direction at each floor line shall not be less than one hundred pounds per lineal foot of floor edge or two percent of total dead load of the floor, whichever is greater. Wall forms shall be designed for a minimum wind load of ten psf, and bracing for wall forms should be designed for a lateral load of at least one hundred pounds per lineal foot of wall, applied at the top. Walls of unusual height require special consideration.

(5) Special loads. Formwork shall be designed for all special conditions of construction likely to occur, such as unsymmetrical placement of concrete, impact of machine-delivered concrete, uplift, and concentrated loads.

(6) Form supports and wedges shall be checked during concrete placement to prevent distortion or failure.

(7) Reinforcing steel.

(a) All protruding reinforcing steel, onto and into which employees could fall, shall be guarded to eliminate the hazard of impalement.

~~((Note: Acceptable methods to meet this requirement to prevent impalement will be to secure a plank or platform over the vertical ends of the reinforcing steel bars or to bend bars over to the extent they would be horizontal instead of vertical.))~~

(b) Wire mesh rolls: Wire mesh rolls shall be secured at each end to prevent dangerous recoiling action.

(c) Guying: Reinforcing steel for walls, piers, columns, and similar vertical structures shall be guyed and supported to prevent overturning and to prevent collapse.

(8) Post-tensioning operations.

(a) No employee (except those essential to the post-tensioning operations) shall be permitted to be behind the jack during tensioning operations.

(b) Signs and barriers shall be erected to limit employee access to the post-tensioning area during tensioning operations.

(9) Working under loads.

(a) No employee shall be permitted to work under concrete buckets while buckets are being elevated or lowered into position.

(b) To the extent practical, elevated concrete buckets shall be routed so that no employee, or the fewest number of employees, are exposed to the hazards associated with falling concrete buckets.

(10) Personal protective equipment.

(a) No employee shall be permitted to apply a cement, sand, and water mixture through a pneumatic hose unless the employee is wearing protective head and face equipment.

(b) No employee shall be permitted to place or tie reinforcing steel more than six feet (1.8 m) above any adjacent working surface unless the employee is protected by the use of a safety belt or equivalent fall protection meeting the criteria of ~~((WAC 296-155-225))~~ chapter 296-155 WAC, Part C-1.

AMENDATORY SECTION (Amending Order 90-18, filed 1/10/91, effective 2/12/91)

**WAC 296-155-682 Requirements for equipment and tools.** (1) Bulk cement storage. Bulk storage bins, containers, and silos shall be equipped with the following:

(a) Conical or tapered bottoms; and

(b) Mechanical or pneumatic means of starting the flow of material.

(2) No employee shall be permitted to enter storage facilities unless the ejection system has been shut down and locked out in accordance with WAC 296-155-429.

(3) Safety belts, harnesses, lanyards, lifelines or droplines, independently attached or attended, shall be used as prescribed in WAC 296-155-24510 (5)(a).

(4) Concrete mixers. Concrete mixers with one cubic yard (.8 m<sup>3</sup>) or larger loading skips shall be equipped with the following:

(a) A mechanical device to clear the skip of materials; and

(b) Guardrails installed on each side of the skip.

(5) Power concrete trowels. Powered and rotating type concrete troweling machines that are manually guided shall be equipped with a control switch that will automatically shut off the power whenever the hands of the operator are removed from the equipment handles.

(6) Concrete buggies. Concrete buggy handles shall not extend beyond the wheels on either side of the buggy.

Note: Installation of knuckle guards on buggy handles is recommended.

(7) Runways.

(a) Runways shall be constructed to carry the maximum contemplated load with a safety factor of four, have a smooth running surface, and be of sufficient width for two buggies to pass. Single runs to have a minimum width of forty-two inches with turnouts. Runways to have standard railings. Where motor driven concrete buggies are used, a minimum four-inches by four-inches wheel guard shall be securely fastened to outside edge of runways.

(b) All concrete buggy runways which are 12 inches or more above a work surface or floor, or ramps with more than 4 percent incline shall be considered "elevated" runways.

Exception: Small jobs utilizing only one concrete buggy, or larger jobs utilizing a "one-way traffic pattern" may be exempt from the requirements for "turnouts" or for "sufficient width for two buggies to pass."

Exemption: Runways less than 12 inches above the floor or ground which are utilized by hard-powered buggies only, may be exempt from the requirements for guardrails and wheelguards.

(8) Concrete pumping systems.

(a) The employer shall comply with the manufacturer's specifications and limitations applicable to the operation of pumpcrete or similar systems. Where manufacturer's specifications are not available, the limitations assigned to the equipment shall be based on the determinations of a qualified engineer, competent in this field, and such determinations will be appropriately documented and recorded.

(b) Rated load capacities, and recommended operating speeds and pressures, special hazard warnings, or instructions, shall be conspicuously posted on all equipment.



Instructions and warnings shall be visible to the operator while ~~((he is))~~ at ~~((his))~~ the control station.

(c) Concrete pumping systems using discharge pipes shall be provided with pipe supports designed for one hundred percent overload.

(d) Compressed air hoses used on concrete pumping systems shall be provided with positive fail-safe joint connectors to prevent separation of sections when pressurized.

(e) No part of the concrete pumping system shall operate closer to high voltage electrical conductors than the distances specified in ~~((WAC 296-155-428 (1)(d)(i) and (ii)))~~ chapter 296-155 WAC, Part I.

(f) Hoses and/or pipes used to carry concrete under pressure shall be secured one to the other with an adequate length of at least 1/4 inch diameter chain or cable to prevent whipping in the event of an accidental separation of joints. All system safety pins shall be in place during pumping operations.

(g) The employer shall designate a competent person who shall inspect all machinery, equipment, and accessories prior to each use, and periodically during use, to make sure it is in safe operating conditions. Any deficiencies shall be repaired, or defective parts replaced before continued use.

(h) A thorough annual inspection of the equipment including nondestructive testing of all sections of the booms, by a method capable of ensuring the structural integrity of the material being tested shall be made. The inspection and testing shall be conducted by a competent person, or a government or private agency recognized by the department. A record of the test results shall be maintained by the employer, and a copy shall be available in each unit for inspection by the department.

(i) All welding shall conform to AWS B3.0-41 Standard Qualification Procedure: AWS D8.4-61 Recommended Practices of Automotive Welding Design: or AWS D10.9-69 Standard Qualification of Welding Procedures and Welders for Piping and Tubing.

(j) Booms shall not be used for operations other than that for which they are designed.

(9) Concrete buckets.

(a) Concrete buckets equipped with hydraulic or pneumatic gates shall have positive safety latches or similar safety devices installed to prevent premature or accidental dumping.

(b) Concrete buckets shall be designed to prevent concrete from hanging up on top and the sides.

(c) Riding of concrete buckets for any purpose shall be prohibited, and vibrator crews shall be kept out from under concrete buckets suspended from cranes or cableways.

(d) When discharging on a slope, the wheels of ready-mix trucks shall be blocked and the brakes set to prevent movement.

(10) Tremies. Sections of tremies and similar concrete conveyances shall be secured with wire rope (or equivalent materials in addition to the regular couplings or connections).

(11) Bull floats. Bull float handles, used where they might contact energized electrical conductors, shall be constructed of nonconductive material or insulated with a nonconductive sheath whose electrical and mechanical characteristics provide the equivalent protection of a handle constructed of nonconductive material.

(12) Masonry saws shall be constructed, guarded, and operated in accordance with WAC 296-155-367 (1) through (4).

(13) Lockout/tagout procedures. No employee shall be permitted to perform maintenance or repair activity on equipment (such as compressors, mixers, screens, or pumps used for concrete and masonry construction activities) where the inadvertent operation of the equipment could occur and cause injury, unless all potentially hazardous energy sources have been locked out and tagged in accordance with ~~((WAC 296-155-429))~~ chapter 296-155 WAC, Part I.

AMENDATORY SECTION (Amending Order 89-03, filed 5/15/89, effective 6/30/89)

**WAC 296-155-684 Requirements for cast in place concrete.** (1) General requirements for formwork.

(a) Formwork shall be designed, fabricated, erected, supported, braced, and maintained so that it will be capable of supporting without failure all vertical and lateral loads that may reasonably be anticipated to be applied to the formwork. Formwork which is designed, fabricated, erected, supported, braced, and maintained in conformance with the Appendix to this section will be deemed to meet the requirements of this subdivision.

(b) Any form, regardless of size, shall be planned in every particular and designed and constructed with an adequate factor of safety. In addition to computable loading, additional form pressures may result from impact during concrete placement, sudden lowering of temperatures retarding the set and increasing the liquid head or static pressure, vibrations of the form or concrete, uneven stressing resulting from failure or weakening of form members, or impact from concrete buckets or placing equipment. As a result, an adequate factor of safety is required to offset these unpredictable conditions.

(c) The thoroughness of planning and design shall be governed by the size, complexity, and intended use of the form. Formwork which is complex in nature or which will be subjected to unusually high concrete pressures shall be designed or approved for use by an engineer or experienced form designer.

(2) Drawings or plans, including all revisions, for the jack layout, formwork (including shoring equipment), working decks, and scaffolds, shall be available at the jobsite.

(3) Shoring and reshoring.

(a) General: Shoring installations constructed in accordance with this standard shall be designed in accordance with American National Standard Recommended Practice for Concrete Formwork, ANSI-(ACI 347-78), Formwork for Concrete ACI 318-83, or with the following publications of the Scaffolding & Shoring Institute: Recommended Standard Safety Code for Vertical Shoring, 1970; Single Post Shore Safety Rules, 1969; and Steel Frame Shoring Safety, Safety Rules, 1969.

(b) All shoring equipment shall be inspected prior to erection to determine that it is as specified in the shoring layout.

(c) A shoring layout shall be prepared or approved by a person qualified to analyze the loadings and stresses which are induced during the construction process.

(d) A copy of the shoring layout shall be available at the jobsite.

(e) The shoring layout shall include all details of the specification, including unusual conditions such as heavy beams, sloping areas, ramps, and cantilevered slabs, as well as plan and elevation views.

(f) Shoring equipment found to be damaged such that its strength is reduced to less than that required by WAC ((296-155-683)) 296-155-684 (1)(a) shall not be used for shoring.

(g) Erected shoring equipment shall be inspected immediately prior to, during, and immediately after concrete placement.

(h) Upon inspection, shoring equipment that is found to be damaged or weakened shall be immediately removed and replaced.

(i) The sills for shoring shall be sound, rigid, and capable of carrying the maximum intended load without settlement or displacement.

(j) All base plates, shore heads, extension devices, and adjustment screws shall be in firm contact, and secured when necessary, with the foundation and the form.

(k) Eccentric loads on shore heads and similar members shall be prohibited unless these members have been designed for such loading.

(l) The minimum total design load for any shoring used in slab and beam structures shall be not less than one hundred pounds per square foot for the combined live and dead load regardless of slab thickness; however, the minimum allowance for live load and formwork shall be not less than twenty pounds per square foot in addition to the weight of the concrete. Additional allowance for live load shall be added for special conditions other than when placing concrete for standard-type slabs and beams. Shoring shall also be designed to resist all foreseeable lateral loads such as wind, cable tensions, inclined supports, impact of placement, and starting and stopping of equipment. The assumed value of load due to wind, impact of concrete, and equipment acting in any direction at each floor line shall not be less than one hundred pounds per lineal foot of floor edge or two percent of total dead load of the floor, whichever is greater. (See subsection (3)(b) of this section.)

(m) When motorized carts are used, the design load shall be increased twenty-five pounds per square foot.

(4) The design stresses for form lumber and timbers shall be within the tolerance of the grade, condition, and species of lumber used.

(5) The design stresses used for form lumber and timber shall be shown on all drawings, specifications, and shoring layouts.

(6) All load-carrying timber members of scaffold framing shall be a minimum of 1500 f (stress grade) construction grade lumber. All dimensions are nominal sizes except that where rough sizes are noted, only rough or undressed lumber of the size specified shall satisfy minimum requirements.

(7) When shoring from soil, an engineer or other qualified person shall determine that the soil is adequate to support the loads which are to be placed on it.

(8) Precautions shall be taken so that weather conditions do not change the load-carrying conditions of the soil below the design minimum.

(9) When shoring from fill or when excessive earth disturbance has occurred, an engineer or other qualified person shall supervise the compaction and reworking of the disturbed area and determine that it is capable of carrying the loads which are to be imposed upon it.

(10) Suitable sills shall be used on a pan or grid dome floor or any other floor system involving voids where vertical shoring equipment could concentrate an excessive load on a thin concrete section.

(11) When temporary storage of reinforcing rods, material, or equipment on top of formwork becomes necessary, these areas shall be sufficient to meet the loads.

(12) If any deviation in the shoring plan is necessary because of field conditions, the person who prepared the shoring layout shall be consulted for ((his)) approval of the actual field setup before concrete is placed.

(13) The shoring setup shall be checked to insure that all details of the layout have been met.

(14) The completed shoring setup shall be a homogeneous unit or units and shall have the specified bracing to give it lateral stability.

(15) The shoring setup shall be checked to make certain that bracing specified in the shoring layout for lateral stability is in place.

(16) All vertical shoring equipment shall be plumb. Maximum allowable deviation from the vertical is one-eighth inch in three feet. If this tolerance is exceeded, the shoring equipment shall not be used until readjusted within this limit.

(17) Upon inspection, shoring equipment that is found to be damaged or weakened shall be immediately removed and replaced.

(18) Shoring equipment shall not be released or removed until the approval of a qualified engineer has been received.

(19) Removal of shoring equipment shall be planned so that the equipment which is still in place is not overloaded.

(20) Slabs or beams which are to be reshored should be allowed to take their actual permanent deflection before final adjustment of reshoring equipment is made.

(21) While the reshoring is underway, no construction loads shall be permitted on the partially-cured concrete.

(22) The allowable load on the supporting slab shall not be exceeded when reshoring.

(23) The reshoring shall be thoroughly checked to determine that it is properly placed and that it has the load capacity to support the areas that are being reshored.

AMENDATORY SECTION (Amending Order 90-10, filed 8/13/90, effective 9/24/90)

**WAC 296-155-691 Precast concrete and tilt-up operations.** (1) It shall be the responsibility of the contractor to use accessories which are designed to be compatible.

(2) The design capacity of all lifting devices and accessories shall be known. The devices and accessories with the appropriate capacity shall be used.

(3) Prior to pouring the panels of a tilt-up type construction job, a set of plans or job specifications, including lifting procedures, shall be drawn up.

(a) These plans shall be at the job site and made available upon request.

(b) Any changes made in the rigging procedure of a tilt-up panel or slab shall provide the same degree of safety as required by the original plans.

(c) The plans or specifications shall contain the following information:

(i) The type, size, and location of all lifting inserts.

(ii) The type, size, and location of all brace inserts or fittings for guy wires in each panel and floor or support.

(iii) The size of braces or guys to be used.

(iv) The compression strength which concrete panels must attain prior to being lifted.

(4) The following conditions shall be included in the erection process and shall be incorporated in the design plan:

(a) Braces and all associated components of the bracing system shall be designed to incorporate a safety factor of one and one-half to resist any normal stresses to which they may be subjected, including normal high wind velocity pressures for the area.

(b) Precast concrete wall units, structural framing, and tilt-up wall panels shall be adequately supported to prevent overturning and to prevent collapse until permanent connections are completed.

(c) Floor braces used to secure panel sections shall be placed at an angle of not less than forty-five degrees or more than sixty degrees from horizontal when physically possible to install in this manner.

(d) The bracing on all panel sections shall be installed in such a manner as to prevent the panel from accidentally rotating.

(e) Each panel section not secured by other means shall have a minimum of two braces. The braces shall be installed in such a manner as to evenly distribute the load or guy wires, when properly installed, may be used in lieu of stiff leg braces.

(f) If braces are attached to a panel or slab by bolts tightened into inserts installed in holes drilled in concrete, the type of inserts used and method of installation shall be such as to develop the required strength to be maintained for the bracing system.

(g) Inserts to be installed for lifting sections of tilt-up precast panels shall be designed mechanically to maintain a safety factor of three.

(h) Lifting inserts which are embedded or otherwise attached to precast concrete members, other than the tilt-up members, shall be capable of supporting at least four times the maximum intended load applied or transmitted to them.

(i) The compression strength of the concrete shall be such that when the proper type, size, and amount of inserts are installed a minimum safety factor of two will be maintained.

(j) Lifting hardware shall be capable of supporting at least five times the maximum intended load applied or transmitted to the lifting hardware.

(k) Lifting bolts or other lifting devices which have been bent, worn, or are defective shall be discarded.

(l) The upper and lower sections of telescoping type braces shall be secured by high tensile steel pins or bolts which provide adequate shear strength and which will positively secure against accidental removal.

(m) Manufactured products shall not be altered in a manner which would reduce the safe working load to less than its original value.

(n) Inserts shall be positioned so that bolts, or lifting devices, when inserted, will be perpendicular to the face on which they are placed.

(5) Design of the panels and layout of the pour shall be made in such a manner so that when picking, the top of the panel will be away from the crane. If this is not possible, the contractor shall consult with a representative of the department and the crane company involved to determine the procedure to be followed in lifting and placing in its permanent position safely. Panels shall be lifted and handled in such a manner that they will not strike the hoisting equipment, in case of failure.

(a) Physical stops shall be provided which will prevent the bottom edge of a panel being set from slipping off the edge of its supporting structure.

(b) Tilt-up panels shall not be set when there is a possibility that wind velocity would create a hazardous condition.

(c) A qualified ~~((signalman))~~ signalperson shall be designated and shall consult with the crane operator on lifting procedures prior to making the pick. The ~~((signalman))~~ signalperson shall be located in such a position during the pick of the panel that ~~((he))~~ they can observe both the crane operator and the employees working in the immediate area.

(d) During the lifting process, workers shall keep clear of the under side of the panel.

(e) Persons not involved in the lifting process shall be kept clear of the hazardous area near where panels are being raised, moved or placed.

(f) If braces must be removed temporarily during construction, other effective means shall be provided to safely support the panel during the interim period.

(g) Each panel shall be properly braced or otherwise secured prior to removal of the hoisting equipment.

(h) Short panels or sections not otherwise supported by floor, footings, columns or other structure, shall be properly shored.

AMENDATORY SECTION (Amending Order 89-03, filed 5/15/89, effective 6/30/89)

**WAC 296-155-699 Appendix A to ((Subpart Q)) Part O—References to ((Subpart Q)) Part O of ((Part 1926)) chapter 296-155 WAC.** (This Appendix is nonmandatory.)

The following nonmandatory references provide information which can be helpful in understanding and complying with the requirements contained in ((Subpart Q)) Part O.

● Accident Prevention Manual for Industrial Operations; Eighth Edition; National Safety Council.

● Building Code Requirements for Reinforced Concrete (ACI 318-83).

● Formwork for Concrete (ACI SP-4).

● Recommended Practice for Concrete Formwork (ACI 347-78).

● Safety Requirements for Concrete and Masonry Work (ANSI A10.9-1983).

● Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens (ASTM C39-86).

● Standard Test Method for Making and Curing Concrete Test Specimens in the Field (ASTM C31-85).

- Standard Test Method for Penetration Resistance of Hardened Concrete (ASTM C803-82).

- Standard Test Method for Compressive Strength of Concrete Cylinders Cast In-Place in Cylindrical Molds (ASTM C873-85).

- Standard Method for Developing Early Age Compressive Test Values and Projecting Later Age Strengths (ASTM C918-80).

- Recommended Practice for Inspection and Testing Agencies for Concrete, Steel and Bituminous Materials as Used in Construction (ASTM E329-77).

- Method of Making and Curing Concrete Test Specimens in the Laboratory (ASTM C192-88).

- Methods of Obtaining and Testing Drilled Cores and Sawed Beams of Concrete (ASTM C42-87).

- Methods of Securing, Preparing and Testing Specimens from Hardened Lightweight Insulating Concrete for Compressive Strength (ASTM C513-86).

- Test Method for Comprehensive Strength of Lightweight Insulating Concrete (ASTM C495-86).

- Method of Making, Accelerating Curing, and Testing of Concrete Compression Test Specimens (ASTM C684-81).

- Test Method for Compressive Strength of Concrete Using Portions of Beams Broken in Flexure (ASTM C116-68 (1980)).

**AMENDATORY SECTION** (Amending Order 90-18, filed 1/10/91, effective 2/12/91)

**WAC 296-155-700 General requirements.** (1) Erection gangs on structural steel erection shall work under the direction of experienced ((foreman)) crew leader.

(2) Workers shall not ride on steel being hoisted, nor slide down ropes, columns or ladders.

(3) Wire rope slings shall be used when lifting loads. Care shall be taken to avoid sharp bends by using wood or similar type padding between wire rope and load. Reinforcing steel shall not be lifted by bundling ties.

(4) If float scaffolds are used during steel erection, they shall be used in accordance with WAC 296-155-485(24).

**AMENDATORY SECTION** (Amending Order 76-29, filed 9/30/76)

**WAC 296-155-715 Bolting, riveting, fitting-up, and plumbing-up.** (1) General requirements.

(a) Containers shall be provided for storing or carrying rivets, bolts, and drift pins, and secured against accidental displacement when aloft.

(b) Pneumatic hand tools shall be disconnected from the power source, and pressure in hose lines shall be released, before any adjustments or repairs are made.

(c) Air line hose sections shall be tied together except when quick disconnect couplers are used to join sections.

(d) Eye protection shall be provided in accordance with Part C of this chapter.

(2) Bolting.

(a) When bolts or drift pins are being knocked out, means shall be provided to keep them from falling.

(b) Impact wrenches shall be provided with a locking device for retaining the socket.

(3) Riveting.

(a) Riveting shall not be done in the vicinity of combustible material unless precautions are taken to prevent fire.

(b) When workers are below and rivet heads are knocked off or backed out, means shall be provided to keep the rivet heads from falling on such workers.

(c) A safety wire shall be properly installed on the snap and on the handle of the pneumatic riveting hammer and shall be used at all times. The wire size shall be not less than No. 9 (B & S gauge), leaving the handle and annealed No. 14 on the snap or equivalent.

(d) The rivet heating equipment shall be kept as near as possible to the riveting gang with whom the rivet heater is working.

(e) Hot rivets shall never be thrown across shaftways or towards the outside of a building.

(f) When riveting is done on an outside wall, the rivets shall be passed by hand or thrown parallel to the wall.

(g) Metal cone shaped buckets shall be used for catching hot rivets.

(h) Riveters shall avoid allowing the air hose to become wrapped or tangled around their legs.

(i) Empty bolt and rivet kegs shall be removed from the floor as soon as possible.

(j) Pails and hand lines shall be used when raising or lowering bolts, rivets or small tools.

(k) The nozzle of the riveting gun shall be periodically inspected and the wire attachment not allowed to become worn so as to permit the nozzle to fly out with the air pressure.

(l) Electric welding equipment shall not be used where wire rope is used to suspend scaffolds.

(4) Plumbing-up.

(a) Connections of the equipment used in plumbing-up shall be properly secured.

(b) The turnbuckles shall be secured to prevent unwinding while under stress.

(c) Plumbing-up guys related equipment shall be placed so that employees can get at the connection points.

(d) Plumbing-up guys shall be removed only under the supervision of a competent person.

(5) Wood planking shall be of proper thickness to carry the working load, but shall be not less than 2 inches thick full size undressed, exterior grade plywood, at least 3/4-inch thick, or equivalent material.

(6) Metal decking of sufficient strength shall be laid tight and secured to prevent movement.

(7) Planks shall overlap the bearing on each end by a minimum of 12 inches.

(8) Wire mesh, exterior plywood, or equivalent, shall be used around columns where planks do not fit tightly.

(9) Provisions shall be made to secure temporary flooring against displacement.

(10) All unused openings in floors, temporary or permanent, shall be completely planked over or guarded in accordance with Part K of this chapter.

(11) Temporary bracing and/or guying shall be utilized to stabilize a structure until construction has been completed.

(12) Employees shall use safety belts in accordance with ((WAC 296-155-225)) Part C-1 of this chapter when they are working on float scaffolds.

**AMENDATORY SECTION** (Amending Order 91-01, filed 5/20/91, effective 6/20/91)

**WAC 296-155-730 Tunnels and shafts.** (1) Scope and application.

(a) This section applies to the construction of underground tunnels, shafts, chambers, and passageways. This section also applies to cut-and-cover excavations which are both physically connected to ongoing underground construction operations within the scope of this section, and covered in such a manner as to create conditions characteristic of underground construction.

(b) This section does not apply to excavation and trenching operations covered by Part N of this chapter, such as foundation operations for above-ground structures that are not physically connected to underground construction operations, and surface excavation.

(c) The employer shall comply with the requirements of this part and chapter in addition to applicable requirements of chapter 296-36 WAC, Safety standards—Compressed air work.

(2) Access and egress.

(a) Each operation shall have a check-in/check-out system that will provide positive identification of every employee underground. An accurate record of identification and location of the employees shall be kept on the surface. This procedure is not required when the construction of underground facilities designed for human occupancy has been sufficiently completed so that the permanent environmental controls are effective, and when the remaining construction activity will not cause any environmental hazard, or structural failure within the facilities.

(b) The employer shall provide and maintain safe means of access and egress to all work stations.

(c) The employer shall provide access and egress in such a manner that employees are protected from being struck by excavators, haulage machines, trains, and other mobile equipment.

(d) The employer shall control access to all openings to prevent unauthorized entry underground. Unused chutes, manways, or other openings shall be tightly covered, bulkheaded, or fenced off, and shall be posted with warning signs indicating "keep out" or similar language. Completed or unused sections of the underground facility shall be barricaded.

(3) Safety instruction. All employees shall be instructed in the recognition and avoidance of hazards associated with underground construction activities including, where appropriate, the following subjects:

- (a) Air monitoring;
- (b) Ventilation;
- (c) Confined space entry procedures;
- (d) Illumination;
- (e) Communications;
- (f) Flood control;
- (g) Mechanical equipment;
- (h) Personal protective equipment;
- (i) Explosives;
- (j) Fire prevention and protection; and
- (k) Emergency procedures, including evacuation plans and check-in/check-out systems.

(4) Notification.

(a) Oncoming shifts shall be informed of any hazardous occurrences or conditions that have affected, or might affect employee safety, including liberation of gas, equipment failures, earth or rock slides, cave-ins, floodings, fire(s), or explosions.

(b) Information specified in (a) of this subsection shall be recorded in a shift journal which shall be current prior to the end of each shift, and shall be located aboveground.

(c) Oncoming supervisory personnel shall read the notification prior to going underground, and shall signify their understanding of the contents by affixing their respective initials to the log.

(d) The hazard notification log shall be retained on the site until the completion of the project.

(e) The employer shall establish and maintain direct communications for coordination of activities with other employers whose operations at the jobsite affect or may affect the safety of employees underground.

(5) Communications.

(a) When natural unassisted voice communication is ineffective, a power-assisted means of voice communication shall be used to provide communication between the work face, the bottom of the shaft, and the surface.

(b) Two effective means of communication, at least one of which shall be voice communication, shall be provided in all shafts which are being developed or used either for personnel access or for hoisting. Additional requirements for hoist operator communication are contained in subsection (22)(c)(xv) of this section.

(c) Powered communication systems shall operate on an independent power supply, and shall be installed so that the use of or disruption of any one phone or signal location will not disrupt the operation of the system from any other location.

(d) Communication systems shall be tested upon initial entry of each shift to the underground, and as often as necessary at later times, to ensure that they are in working order.

(e) Any employee working alone underground in a hazardous location, who is both out of the range of natural unassisted voice communication and not under observation by other persons, shall be provided with an effective means of obtaining assistance in an emergency.

(6) Emergency provisions. Hoisting capability. When a shaft is used as a means of egress, the employer shall make advance arrangements for power-assisted hoisting capability to be readily available in an emergency, unless the regular hoisting means can continue to function in the event of an electrical power failure at the jobsite. Such hoisting means shall be designed so that the load hoist drum is powered in both directions of rotation and so that the brake is automatically applied upon power release or failure.

(7) Self-rescuers. The employer shall provide self-rescuers having current approval from the National Institute for Occupational Safety and Health and the Mine Safety and Health Administration to be immediately available to all employees at work stations in underground areas where employees might be trapped by smoke or gas. The selection, issuance, use, and care of respirators shall be in accordance with the requirements of WAC 296-62-071 through 296-62-07121.

(8) Designated person. At least one designated person shall be on duty aboveground whenever any employee is working underground. This designated person shall be responsible for securing immediate aid and keeping an accurate record of the number, identification, and location of employees who are underground in case of emergency. The designated person must not be so busy with other responsibilities that the personnel counting and identification function is encumbered.

(9) Emergency lighting. Each employee underground shall have an acceptable portable hand lamp or cap lamp in his or her work area for emergency use, unless natural light or an emergency lighting system provides adequate illumination for escape.

(10) Rescue teams.

(a) On jobsites where 25 or more employees work underground at one time, the employer shall provide (or make arrangements in advance with locally available rescue services to provide) at least two 5-person rescue teams, one on the jobsite or within one-half hour travel time from the entry point, and the other within 2 hours travel time.

(b) On jobsites where less than 25 employees work underground at one time, the employer shall provide (or make arrangements in advance with locally available rescue services to provide) at least one 5-person rescue team to be either on the jobsite or within one-half hour travel time from the entry point.

(c) Rescue team members shall be qualified in rescue procedures, the use and limitations of breathing apparatus, and the use of fire fighting equipment. Qualifications shall be reviewed not less than annually.

(d) On jobsites where flammable or noxious gases are encountered or anticipated in hazardous quantities, rescue team members shall practice donning and using pressure demand mode, self-contained breathing apparatuses monthly.

(e) The employer shall ensure that rescue teams are familiar with conditions at the jobsite.

(11) Hazardous classifications.

(a) Potentially gassy operations. Underground construction operations shall be classified as potentially gassy if either:

(i) Air monitoring discloses 10 percent or more of the lower explosive limit for methane or other flammable gases measured at 12 inches (304.8 mm)  $\pm$  0.25 inch (6.35 mm) from the roof, face, floor, or walls in any underground work area for more than a 24-hour period; or

(ii) The history of the geographical area or geological formation indicates that 10 percent or more of the lower explosive limit for methane or other flammable gases is likely to be encountered in such underground operations.

(b) Gassy operations. Underground construction operations shall be classified as gassy if:

(i) Air monitoring discloses 10 percent or more of the lower explosive limit for methane or other flammable gases measured at 12 inches (304.8 mm)  $\pm$  0.25 inch (6.35 mm) from the roof, face, floor, or walls in any underground work area for three consecutive days; or

(ii) There has been an ignition of methane or of other flammable gases emanating from the strata that indicates the presence of such gases; or

(iii) The underground construction operation is both connected to an underground work area which is currently

classified as gassy and is also subject to a continuous course of air containing the flammable gas concentration.

(c) Declassification to potentially gassy operations. Underground construction gassy operations may be declassified to potentially gassy when air monitoring results remain under 10 percent of the lower explosive limit for methane or other flammable gases for three consecutive days.

(12) Gassy operations—Additional requirements. Only acceptable equipment, maintained in suitable condition, shall be used in gassy operations.

(a) Mobile diesel-powered equipment used in gassy operations shall be either approved in accordance with the requirements of 30 CFR Part 36 (formerly Schedule 31) by MSHA, or shall be demonstrated by the employer to be fully equivalent to such MSHA-approved equipment, and shall be operated in accordance with that part.

(b) Each entrance to a gassy operation shall be prominently posted with signs notifying all entrants of the gassy classification.

(c) Smoking shall be prohibited in all gassy operations and the employer shall be responsible for collecting all personal sources of ignition, such as matches and lighters, from all persons entering a gassy operation.

(d) A fire watch as described in WAC 296-155-410(5) shall be maintained when hot work is performed.

(e) Once an operation has met the criteria in subsection (11)(a)(i) of this section, warranting classification as gassy, all operations in the affected area, except the following, shall be discontinued until the operation either is in compliance with all of the gassy operation requirements or has been declassified in accordance with (c) of this subsection:

(i) Operations related to the control of the gas concentration;

(ii) Installation of new equipment, or conversion of existing equipment, to comply with this subsection; and

(iii) Installation of above-ground controls for reversing the air flow.

(13) Air quality and monitoring.

(a) General. Air quality limits and control requirements specified in chapter 296-62 WAC shall apply except as modified by this subsection.

(b) The employer shall assign a competent person who shall perform all air monitoring required by this section.

(c) Where this ~~(paragraph)~~ section requires monitoring of airborne contaminants "as often as necessary," the competent person shall make a reasonable determination as to which substances to monitor and how frequently to monitor, considering at least the following factors:

(i) Location of jobsite: Proximity to fuel tanks, sewers, gas lines, old landfills, coal deposits, and swamps;

(ii) Geology: Geological studies of the jobsite, particularly involving the soil type and its permeability;

(iii) History: Presence of air contaminants in nearby jobsites, changes in levels of substances monitored on the prior shift; and

(iv) Work practices and jobsite conditions: The use of diesel engines, use of explosives, use of fuel gas, volume and flow of ventilation, visible atmospheric conditions, decompression of the atmosphere, welding, cutting and hot work, and employees' physical reactions to working underground.

(d) The employer shall provide testing and monitoring instruments which are capable of achieving compliance with the provisions of this subsection, and:

(i) Shall maintain the testing and monitoring instruments in good condition;

(ii) Shall calibrate the instruments on a frequency not to exceed 6 months.

(e) Exposure to airborne contaminants shall not exceed the levels established by chapter 296-62 WAC.

(f) Respirators shall not be substituted for environmental control measures. However, where environmental controls have not yet been developed, or when necessary by the nature of the work involved (for example, welding, sand blasting, lead burning), an employee may work for short periods of time in concentrations of airborne contaminants which exceed the limit of permissible exposure referred to in (d) of this subsection, if the employee wears a respiratory protective device approved by MSHA-NIOSH as protection against the particular hazards involved, and the selection and use of respirators complies with the provisions of WAC 296-62-071 through 296-62-07121.

(g) Employees shall be withdrawn from areas in which there is a concentration of an airborne contaminant which exceeds the permissible exposure limit listed for that contaminant, except as modified in (t)(i) and (ii) of this subsection.

(h) The atmosphere in all underground work areas shall be tested as often as necessary to assure that the atmosphere at normal atmospheric pressure contains at least 19.5 percent oxygen and no more than 22 percent oxygen.

(i) Tests for oxygen content shall be made before tests for air contaminants.

(j) Field-type oxygen analyzers, or other suitable devices, shall be used to test for oxygen deficiency.

(k) The atmosphere in all underground work areas shall be tested quantitatively for carbon monoxide, nitrogen dioxide, hydrogen sulfide, and other toxic gases, dust, vapors, mists, and fumes as often as necessary to ensure that the permissible exposure limits prescribed in chapter 296-62 WAC, are not exceeded.

(l) The atmosphere in all underground work areas shall be tested quantitatively for methane and other flammable gases as often as necessary to determine:

(i) Whether action is to be taken under (q), (r), and (s) of this subsection; and

(ii) Whether an operation is to be classified potentially gassy or gassy under subsection (11) of this section.

(m) If diesel-engine or gasoline-engine driven ventilating fans or compressors are used, an initial test shall be made of the inlet air of the fan or compressor, with the engines operating, to ensure that the air supply is not contaminated by engine exhaust.

(n) Testing shall be performed as often as necessary to ensure that the ventilation requirements of subsection (15) of this section are met.

(o) When rapid excavation machines are used, a continuous flammable gas monitor shall be operated at the face with the sensor(s) placed as high and close to the front of the machine's cutter head as practicable.

(p) Whenever air monitoring indicates the presence of 5 ppm or more of hydrogen sulfide, a test shall be conducted in the affected underground work area(s), at least at the

beginning and midpoint of each shift, until the concentration of hydrogen sulfide has been less than 5 ppm for 3 consecutive days.

(i) Whenever hydrogen sulfide is detected in an amount exceeding 10 ppm, a continuous sampling and indicating hydrogen sulfide monitor shall be used to monitor the affected work area.

(ii) Employees shall be informed when a concentration of 10 ppm hydrogen sulfide is exceeded.

(iii) The continuous sampling and indicating hydrogen sulfide monitor shall be designed, installed, and maintained to provide a visual and aural alarm when the hydrogen sulfide concentration reaches ~~((20))~~ 15 ppm to signal that additional measures, such as respirator use, increased ventilation, or evacuation, might be necessary to maintain hydrogen sulfide exposure below the permissible exposure limit.

(q) When the competent person determines, on the basis of air monitoring results or other information, that air contaminants may be present in sufficient quantity to be dangerous to life, the employer shall:

(i) Prominently post a notice at all entrances to the underground jobsite to inform all entrants of the hazardous condition; and

(ii) Immediately increase sampling frequency levels to insure workers are not exposed to identified contaminants in excess of the permissible exposure limit(s); and

(iii) Ensure that all necessary precautions are taken to comply with pertinent requirements of this section, and chapter 296-62 WAC.

(r) Whenever five percent or more of the lower explosive limit for methane or other flammable gases is detected in any underground work area(s) or in the air return, steps shall be taken to increase ventilation air volume or otherwise control the gas concentration, unless the employer is operating in accordance with the potentially gassy or gassy operation requirements. Such additional ventilation controls may be discontinued when gas concentrations are reduced below five percent of the lower explosive limit, but shall be reinstated whenever the five percent level is exceeded.

(s) Whenever 10 percent or more of the lower explosive limit for methane or other flammable gases is detected in the vicinity of welding, cutting, or other hot work, such work shall be suspended until the concentration of such flammable gas is reduced to less than 10 percent of the lower explosive limit.

(t) Whenever 20 percent or more of the lower explosive limit for methane or other flammable gases is detected in any underground work area(s) or in the air return:

(i) All employees, except those necessary to eliminate the hazard, shall be immediately withdrawn to a safe location above ground; and

(ii) Employees who remain underground to correct or eliminate the hazard described in (t) above shall be equipped with approved, pressure demand mode, self-contained breathing apparatus, and shall have received adequate training in the proper use of that equipment.

(iii) Electrical power, except for acceptable pumping and ventilation equipment, shall be cut off to the area endangered by the flammable gas until the concentration of such gas is reduced to less than 20 percent of the lower explosive limit.



(14) Additional monitoring for potentially gassy and gassy operations. Operations which meet the criteria for potentially gassy and gassy operations set forth in subsection (13) of this section shall be subject to the additional monitoring requirements of this subsection.

(a) A test for oxygen content shall be conducted in the affected underground work areas and work areas immediately adjacent to such areas at least at the beginning and midpoint of each shift.

(b) When using rapid excavation machines, continuous automatic flammable gas monitoring equipment shall be used to monitor the air at the heading, on the rib, and in the return air duct. The continuous monitor shall signal the heading, and shut down electric power in the affected underground work area, except for acceptable pumping and ventilation equipment, when 20 percent or more of the lower explosive limit for methane or other flammable gases is encountered.

(i) A manual flammable gas monitor shall be used as needed, but at least at the beginning and midpoint of each shift, to ensure that the limits prescribed in subsections (11) and (13) of this section are not exceeded. In addition, a manual electrical shut down control shall be provided near the heading.

(ii) Local gas tests shall be made prior to and continuously during any welding, cutting, or other hot work.

(iii) In underground operations driven by drill-and-blast methods, the air in the affected area shall be tested for flammable gas prior to re-entry after blasting, and continuously when employees are working underground.

(c) Recordkeeping. A record of all air quality tests shall be maintained above ground at the worksite and be made available to the director or his/her representatives upon request. The record shall include the location, date, time, substance and amount monitored. Records of exposures to toxic substances shall be retained in accordance with Part B, chapter 296-62 WAC. All other air quality test records shall be retained until completion of the project.

(15) Ventilation.

(a)(i) Fresh air shall be supplied to all underground work areas in sufficient quantities to prevent dangerous or harmful accumulation of dust, fumes, mists, vapors, or gases.

(ii) Mechanical ventilation shall be provided in all underground work areas except when the employer can demonstrate that natural ventilation provides the necessary air quality through sufficient air volume and air flow.

(b) A minimum of 200 cubic feet (5.7 m<sup>3</sup>) of fresh air per minute shall be supplied for each employee underground.

(c) The linear velocity of air flow in the tunnel bore, in shafts, and in all other underground work areas shall be at least 30 feet (9.15 m) per minute where blasting or rock drilling is conducted, or where other conditions likely to produce dust, fumes, mists, vapors, or gases in harmful or explosive quantities are present.

(d) The direction of mechanical air flow shall be reversible.

(e) Air that has passed through underground oil or fuel-storage areas shall not be used to ventilate working areas.

(f) Following blasting, ventilation systems shall exhaust smoke and fumes to the outside atmosphere before work is resumed in affected areas.

(g) Ventilation doors shall be designed and installed so that they remain closed when in use, regardless of the direction of the air flow.

(h) When ventilation has been reduced to the extent that hazardous levels of methane or flammable gas may have accumulated, a competent person shall test all affected areas after ventilation has been restored and shall determine whether the atmosphere is within flammable limits before any power, other than for acceptable equipment, is restored or work is resumed.

(i) Whenever the ventilation system has been shut down with all employees out of the underground area, only competent persons authorized to test for air contaminants shall be allowed underground until the ventilation has been restored and all affected areas have been tested for air contaminants and declared safe.

(j) When drilling rock or concrete, appropriate dust control measures shall be taken to maintain dust levels within limits set in (~~WAC 296-155-160~~) chapter 296-62 WAC. Such measures may include, but are not limited to, wet drilling, the use of vacuum collectors, and water mix spray systems.

(k)(i) Internal combustion engines, except diesel-powered engines on mobile equipment, are prohibited underground.

(ii) Mobile diesel-powered equipment used underground in atmospheres other than gassy operations shall be either approved by MSHA in accordance with the provisions of 30 CFR Part 32 (formerly Schedule 24), or shall be demonstrated by the employer to be fully equivalent to such MSHA-approved equipment, and shall be operated in accordance with that Part. (Each brake horsepower of a diesel engine requires at least 100 cubic feet (28.32 m<sup>3</sup>) of air per minute for suitable operation in addition to the air requirements for personnel. Some engines may require a greater amount of air to ensure that the allowable levels of carbon monoxide, nitric oxide, and nitrogen dioxide are not exceeded.)

(iii) Application shall be made to the mining/explosives section, (~~division of industrial safety and health~~) department of labor and industries, for permission to use specified diesel equipment in a specified underground area and shall include the following:

(A) The type of construction and complete identification data and specifications including analysis of the undiluted exhaust gases of the diesel equipment.

(B) The location where the diesel equipment is to be used.

(C) Before the diesel equipment is taken underground, written permission shall be obtained from the (~~division of industrial safety and health~~) department of labor and industries or its duly authorized representative. A satisfactory test on surface, to show that the exhaust gases do not exceed the maximum percentage of carbon monoxide permitted, shall be required.

(D) Diesel equipment shall only be used underground where the ventilation is controlled by mechanical means and shall not be operated if the ventilating current is less than 100 CFM per horsepower based on the maximum brake horsepower of the engines.

(E) Air measurements shall be made at least once daily in the diesel engine working area and the measurements entered in the Underground Diesel Engine Record Book.

Permissible maximum amounts of noxious gases are as follows:

At engine exhaust ports	Carbon Monoxide	.10%	1,000 ppm <sup>3</sup>
Next to equipment	Carbon Monoxide	<del>((.005%))</del>	<del>50 ppm)</del>
		.0035%	35 ppm
General atmosphere	Carbon Monoxide	<del>((.005%))</del>	<del>50 ppm)</del>
		.0035%	35 ppm
General atmosphere	Nitrogen Dioxide	<del>((.0003%))</del>	<del>3 ppm)</del>
		.0001%	1 ppm
General atmosphere	Aldehydes	.0002%	2 ppm

<sup>3</sup> Parts of vapor or gas per million parts of contaminated air by volume at 25°C and 760 mm Hg. pressure.

(l) Potentially gassy or gassy operations shall have ventilation systems installed which shall:

- (i) Be constructed of fire-resistant materials; and
- (ii) Have acceptable electrical systems, including fan motors.

(m) Gassy operations shall be provided with controls located aboveground for reversing the air flow of ventilation systems.

(n) In potentially gassy or gassy operations, wherever mine-type ventilation systems using an offset main fan installed on the surface are used, they shall be equipped with explosion-doors or a weak-wall having an area at least equivalent to the cross-sectional area of the airway.

(16) Illumination.

(a) Sufficient lighting shall be provided, in accordance with the requirements of WAC 296-155-165 (~~(1) through (4)~~), to permit safe operations at the face as well as in the general tunnel or shaft area and at the employees' workplace.

(b) Only acceptable portable lighting shall be used within 50 feet (15.24 m) of any underground heading during explosive handling.

(17) Fire prevention and control. Fire prevention and protection requirements applicable to underground construction operations are found in Part D of this chapter except as modified by the following additional standards.

(a) Open flames and fires are prohibited in all underground construction operations except as permitted for welding, cutting, and other hot work operations.

(i) Smoking may be allowed only in areas free of fire and explosion hazards.

(ii) Readily visible signs prohibiting smoking and open flames shall be posted in areas having fire or explosion hazards.

(iii) The carrying of matches, lighters, or other flame-producing smoking materials shall be prohibited in all underground operations where fire or explosion hazards exist.

(b) The employer may store underground no more than a 24-hour supply of diesel fuel for the underground equipment used at the worksite.

(c) The piping of diesel fuel from the surface to an underground location is permitted only if:

- (i) Diesel fuel is contained at the surface in a tank whose maximum capacity is no more than the amount of fuel required to supply for a 24-hour period the equipment serviced by the underground fueling station; and
- (ii) The surface tank is connected to the underground fueling station by an acceptable pipe or hose system that is

controlled at the surface by a valve, and at the shaft bottom by a hose nozzle; and

(iii) The pipe is empty at all times except when transferring diesel fuel from the surface tank to a piece of equipment in use underground; and

(iv) Hoisting operations in the shaft are suspended during refueling operations if the supply piping in the shaft is not protected from damage.

(d)(i) Gasoline shall not be carried, stored, or used underground.

(ii) Acetylene, liquefied petroleum gas, and methylacetylene propadiene stabilized gas may be used underground only for welding, cutting and other hot work, and only in accordance with Part H of this chapter and subsections (13), (15), (17), and (18) of this section.

(e) Oil, grease, and diesel fuel stored underground shall be kept in tightly sealed containers in fire-resistant areas at least 300 feet (91.44 m) from underground explosive magazines, and at least 100 feet (30.48 m) from shaft stations and steeply inclined passageways. Storage areas shall be positioned or diked so that the contents of ruptured or overturned containers will not flow from the storage area.

(f) Flammable or combustible materials shall not be stored above ground within 100 feet (30.48 m) of any access opening to any underground operation. Where this is not feasible because of space limitations at the jobsite, such materials may be located within the 100-foot limit, provided that:

(i) They are located as far as practicable from the opening; and

(ii) Either a fire-resistant barrier of not less than one-hour rating is placed between the stored material and the opening, or additional precautions are taken which will protect the materials from ignition sources.

(g) Fire-resistant hydraulic fluids shall be used in hydraulically-actuated underground machinery and equipment unless such equipment is protected by a fire suppression system or by multipurpose fire extinguisher(s) rated at a sufficient capacity for the type and size of hydraulic equipment involved, but rated at least 4A:4OB:C.

(h)(i) Electrical installations in underground areas where oil, grease, or diesel fuel are stored shall be used only for lighting fixtures.

(ii) Lighting fixtures in storage areas, or within 25 feet (7.62 m) of underground areas where oil, grease, or diesel fuel are stored, shall be approved for Class I, Division 2 locations, in accordance with Part I of this chapter.

(i) Leaks and spills of flammable or combustible fluids shall be cleaned up immediately.

(j) A fire extinguisher of at least 4A:4OB:C rating or other equivalent extinguishing means shall be provided at the head pulley and at the tail pulley of underground belt conveyors, and at 300-foot intervals along the belt.

(k) Any structure located underground or within 100 feet (30.48 m) of an opening to the underground shall be constructed of material having a fire-resistance rating of at least one hour.

(18) Welding, cutting, and other hot work. In addition to the requirements of Part H of this chapter, the following requirements shall apply to underground welding, cutting, and other hot work.

PERMANENT

(a) No more than the amount of fuel gas and oxygen cylinders necessary to perform welding, cutting, or other hot work during the next 24-hour period shall be permitted underground.

(b) Noncombustible barriers shall be installed below welding, cutting, or other hot work being done in or over a shaft or raise.

(19) Ground support.

(a) In tunnels (other than hard rock) timber sets, steel rings, steel frames, concrete liners, or other engineered tunnel support systems shall be used. Every tunnel support system shall be designed by a licensed professional engineer. Design specifications shall be available at the worksite.

(b) Portal areas. Portal openings and access areas shall be guarded by shoring, fencing, head walls, shotcreting, or other equivalent protection to ensure safe access of employees and equipment. Adjacent areas shall be scaled or otherwise secured to prevent loose soil, rock, or fractured materials from endangering the portal and access area.

(c) Subsidence areas. The employer shall ensure ground stability in hazardous subsidence areas by shoring, by filling in, or by erecting barricades and posting warning signs to prevent entry.

(d) Underground areas.

(i)(A) A competent person shall inspect the roof, face, and walls of the work area at the start of each shift and as often as necessary to determine ground stability.

(B) Competent persons conducting such inspections shall be protected from loose ground by location, ground support, or equivalent means.

(ii) Ground conditions along haulageways and travelways shall be inspected as frequently as necessary to ensure safe passage.

(iii) Loose ground that might be hazardous to employees shall be taken down, scaled, or supported.

(iv) Torque wrenches shall be used wherever bolts that depend on torsionally applied force are used for ground support.

(v) A competent person shall determine whether rock bolts meet the necessary torque, and shall determine the testing frequency in light of the bolt system, ground conditions, and the distance from vibration sources.

(vi) Suitable protection shall be provided for employees exposed to the hazard of loose ground while installing ground support systems.

(vii) Support sets shall be installed so that the bottoms have sufficient anchorage to prevent ground pressures from dislodging the support base of the sets. Lateral bracing (collar bracing, tie rods, or spreaders) shall be provided between immediately adjacent sets to ensure added stability.

(viii) Damaged or dislodged ground supports that create a hazardous condition shall be promptly repaired or replaced. When replacing supports, the new supports shall be installed before the damaged supports are removed.

(ix) A shield or other type of support shall be used to maintain a safe travelway for employees working in dead-end areas ahead of any support replacement operation.

(e) Shafts.

(i) Shafts and wells over 4 feet (1.219 m) in depth that employees must enter shall be supported by a steel casing, concrete pipe, timber, solid rock, or other suitable material.

(ii)(A) The full depth of the shaft shall be supported by casing or bracing except where the shaft penetrates into solid rock having characteristics that will not change as a result of exposure. Where the shaft passes through earth into solid rock, or through solid rock into earth, and where there is potential for shear, the casing or bracing shall extend at least 5 feet (1.53 m) into the solid rock. When the shaft terminates in solid rock, the casing or bracing shall extend to the end of the shaft or 5 feet (1.53 m) into the solid rock, whichever is less.

(B) The casing or bracing shall extend 42 inches (1.07 m) plus or minus 3 inches (8 cm) above ground level, except that the minimum casing height may be reduced to 12 inches (0.3 m), provided that a standard railing is installed; that the ground adjacent to the top of the shaft is sloped away from the shaft collar to prevent entry of liquids; and that effective barriers are used to prevent mobile equipment operating near the shaft from jumping over the 12-inch (0.3 m) barrier.

(iii) After blasting operations in shafts, a competent person shall determine if the walls, ladders, timbers, blocking, or wedges have loosened. If so, necessary repairs shall be made before employees other than those assigned to make the repairs are allowed in or below the affected areas.

(f) Blasting. This subsection applies in addition to the requirements for blasting and explosives operations, including handling of misfires, which are found in chapter 296-52 WAC.

(i) Blasting wires shall be kept clear of electrical lines, pipes, rails, and other conductive material, excluding earth, to prevent explosives initiation or employee exposure to electric current.

(ii) Following blasting, an employee shall not enter a work area until the air quality meets the requirements of subsection (13) of this section.

(g) Drilling.

(i) A competent person shall inspect all drilling and associated equipment prior to each use. Equipment defects affecting safety shall be corrected before the equipment is used.

(ii) The drilling area shall be inspected for hazards before the drilling operation is started.

(iii) Employees shall not be allowed on a drill mast while the drill bit is in operation or the drill machine is being moved.

(iv) When a drill machine is being moved from one drilling area to another, drill steel, tools, and other equipment shall be secured and the mast shall be placed in a safe position.

(v) Receptacles or racks shall be provided for storing drill steel located on jumbos.

(vi) Employees working below jumbo decks shall be warned whenever drilling is about to begin.

(vii) Drills on columns shall be anchored firmly before starting drilling, and shall be retightened as necessary thereafter.

(viii) The employer shall provide mechanical means on the top deck of a jumbo for lifting unwieldy or heavy material.

(ix) When jumbo decks are over 10 feet (3.05 m) in height, the employer shall install stairs wide enough for two persons.

(x) Jumbo decks more than 10 feet (3.05 m) in height shall be equipped with guardrails on all open sides, excluding access openings of platforms, unless an adjacent surface provides equivalent fall protection.

(xi) Only employees assisting the operator shall be allowed to ride on jumbos, unless the jumbo meets the requirements of subsection (20)(e) of this section.

(xii) Jumbos shall be chocked to prevent movement while employees are working on them.

(xiii) Walking and working surfaces of jumbos shall be maintained to prevent the hazards of slipping, tripping, and falling.

(xiv) Jumbo decks and stair treads shall be designed to be slip-resistant and secured to prevent accidental displacement.

(xv) Scaling bars shall be available at scaling operations and shall be maintained in good condition at all times. Blunted or severely worn bars shall not be used.

(xvi) Before commencing the drill cycle, the face and lifters shall be examined for misfires (residual explosives) and, if found, they shall be removed before drilling commences at the face. Blasting holes shall not be drilled through blasted rock (muck) or water.

(xvii) Employees in a shaft shall be protected either by location or by suitable barrier(s) if powered mechanical loading equipment is used to remove muck containing unfired explosives.

(xviii) A caution sign reading "buried line," or similar wording shall be posted where air lines are buried or otherwise hidden by water or debris.

(20) Haulage.

(a) A competent person shall inspect haulage equipment before each shift.

(i) Equipment defects affecting safety and health shall be corrected before the equipment is used.

(ii) Powered mobile haulage equipment shall be provided with adequate brakes.

(iii) Power mobile haulage equipment, including trains, shall have audible warning devices to warn employees to stay clear. The operator shall sound the warning device before moving the equipment and whenever necessary during travel.

(iv) The operator shall assure that lights which are visible to employees at both ends of any mobile equipment, including a train, are turned on whenever the equipment is operating.

(v) In those cabs where glazing is used, the glass shall be safety glass, or its equivalent, and shall be maintained and cleaned so that vision is not obstructed.

(b) Antirollback devices or brakes shall be installed on inclined conveyor drive units to prevent conveyors from inadvertently running in reverse. Employees shall not be permitted to ride a power-driven chain, belt, or bucket conveyor unless the conveyor is specifically designed for the transportation of persons.

(c) Endless belt-type manlifts are prohibited in underground construction.

(d) General requirements also applicable to underground construction for use of conveyors in construction are found in WAC 296-155-545 ~~((1) through (17))~~.

(e) No employee shall ride haulage equipment unless it is equipped with seating for each passenger and protects

passengers from being struck, crushed, or caught between other equipment or surfaces. Members of train crews may ride on a locomotive if it is equipped with handholds and nonslip steps or footboards. Requirements applicable to underground construction for motor vehicle transportation of employees are found in WAC 296-155-610.

(f) Conveyor lockout.

(i) Conveyors shall be de-energized and locked out with a padlock, and tagged out with a "Do Not Operate" tag at any time repair, maintenance, or clean-up work is being performed on the conveyor.

(ii) Tags or push button stops are not acceptable.

(iii) Persons shall not be allowed to walk on conveyors, except for emergency purposes and then only after the conveyor has been deenergized and locked out in accordance with (f) above, and persons can do so safely.

(g) Powered mobile haulage equipment, including trains, shall not be left unattended unless the master switch or motor is turned off; operating controls are in neutral or park position; and the brakes are set, or equivalent precautions are taken to prevent rolling.

(h) Whenever rails serve as a return for a trolley circuit, both rails shall be bonded at every joint and crossbonded every 200 feet (60.96 m).

(i) When dumping cars by hand, the car dumps shall have tiedown chains, bumper blocks, or other locking or holding devices to prevent the cars from overturning.

(j) Rocker-bottom or bottom-dump cars shall be equipped with positive locking devices to prevent unintended dumping.

(k) Equipment to be hauled shall be loaded and secured to prevent sliding or dislodgement.

(l)(i) Mobile equipment, including rail-mounted equipment, shall be stopped for manual connecting or service work, and;

(ii) Employees shall not reach between moving cars during coupling operations.

(iii) Couplings shall not be aligned, shifted, or cleaned on moving cars or locomotives.

(iv) Safety chains or other connections shall be used in addition to couplers to connect ~~((man))~~ person cars or powder cars whenever the locomotive is uphill of the cars.

(v) When the grade exceeds one percent and there is a potential for runaway cars, safety chains or other connections shall be used in addition to couplers to connect haulage cars or, as an alternative, the locomotive must be downhill of the train.

(vi) Such safety chains or other connections shall be capable of maintaining connection between cars in the event of either coupler disconnect, failure or breakage.

(m) Parked rail equipment shall be chocked, blocked, or have brakes set to prevent inadvertent movement.

(n) Berms, bumper blocks, safety hooks, or equivalent means shall be provided to prevent overtravel and overturning of haulage equipment at dumping locations.

(o) Bumper blocks or equivalent stopping devices shall be provided at all track dead ends.

(p)(i) Only small handtools, lunch pails, or similar small items may be transported with employees in ~~((man))~~ person cars, or on top of a locomotive.

(ii) When small hand tools or other small items are carried on top of a locomotive, the top shall be designed or modified to retain them while traveling.

(q)(i) Where switching facilities are available, occupied personnel cars shall be pulled, not pushed. If personnel cars must be pushed and visibility of the track ahead is hampered, then a qualified person shall be stationed in the lead car to give signals to the locomotive operator.

(ii) Crew trips shall consist of personnel loads only.

(21) Electrical safety. This ~~((paragraph))~~ subsection applies in addition to the general requirements for electrical safety which are found in Part I of this chapter.

(a) Electric power lines shall be insulated or located away from water lines, telephone lines, air lines, or other conductive materials so that a damaged circuit will not energize the other systems.

(b) Lighting circuits shall be located so that movement of personnel or equipment will not damage the circuits or disrupt service.

(c) Oil-filled transformers shall not be used underground unless they are located in a fire-resistant enclosure suitably vented to the outside and surrounded by a dike to retain the contents of the transformers in the event of rupture.

(22) Hoisting unique to underground construction except as modified by this section, the following provisions of chapter 296-155 WAC, Part L apply: Requirements for cranes are found in WAC 296-155-525. WAC 296-155-48533 contains rules applicable to crane hoisting of personnel, except, that the limitations imposed by WAC 296-155-48533(2) do not apply to the routine access of employees to the underground via a shaft. Requirements for personnel hoists, material hoists, and elevators are found in WAC 296-155-530 and in this subsection.

(a) General requirements for cranes and hoists.

(i) Materials, tools, and supplies being raised or lowered, whether within a cage or otherwise, shall be secured or stacked in a manner to prevent the load from shifting, snagging, or falling into the shaft.

(ii) A warning light suitably located to warn employees at the shaft bottom and subsurface shaft entrances shall flash whenever a load is above the shaft bottom or subsurface entrances, or the load is being moved in the shaft. This ~~((paragraph))~~ subsection does not apply to fully enclosed hoistways.

(iii) Whenever a hoistway is not fully enclosed and employees are at the shaft bottom, conveyances or equipment shall be stopped at least 15 feet (4.57 m) above the bottom of the shaft and held there until the ~~((signalman))~~ signalperson at the bottom of the shaft directs the operator to continue lowering the load, except that the load may be lowered without stopping if the load or conveyance is within full view of a bottom ~~((signalman))~~ signalperson who is in constant voice communication with the operator.

(iv)(A) Before maintenance, repairs, or other work is commenced in the shaft served by a cage, skip, or bucket, the operator and other employees in the area shall be informed and given suitable instructions.

(B) A sign warning that work is being done in the shaft shall be installed at the shaft collar, at the operator's station, and at each underground landing.

(v) Any connection between the hoisting rope and the cage or skip shall be compatible with the type of wire rope used for hoisting.

(vi) Spin-type connections, where used, shall be maintained in a clean condition and protected from foreign matter that could affect their operation.

(vii) Cage, skip, and load connections to the hoist rope shall be made so that the force of the hoist pull, vibration, misalignment, release of lift force, or impact will not disengage the connection. Only closed shackles shall be used for cage and skip rigging.

(viii) When using wire rope wedge sockets, means shall be provided to prevent wedge escapement and to ensure that the wedge is properly seated.

(b) Additional requirements for cranes. Cranes shall be equipped with a limit switch to prevent overtravel at the boom tip. Limit switches are to be used only to limit travel of loads when operational controls malfunction and shall not be used as a substitute for other operational controls.

(c) Additional requirements for hoists.

(i) Hoists shall be designed so that the load hoist drum is powered in both directions of rotation, and so that brakes are automatically applied upon power release or failure.

(ii) Control levers shall be of the "deadman type" which return automatically to their center (neutral) position upon release.

(iii) When a hoist is used for both personnel hoisting and material hoisting, load and speed ratings for personnel and for materials shall be assigned to the equipment.

(iv) Hoist machines with cast metal parts shall not be used.

(v) Material hoisting may be performed at speeds higher than the rated speed for personnel hoisting if the hoist and components have been designed for such higher speeds and if shaft conditions permit.

(vi) Employees shall not ride on top of any cage, skip, or bucket except when necessary to perform inspection or maintenance of the hoisting system, in which case they shall be protected by a body belt/harness system to prevent falling.

(vii) Personnel and materials (other than small tools and supplies secured in a manner that will not create a hazard to employees) shall not be hoisted together in the same conveyance. However, if the operator is protected from the shifting of materials, then the operator may ride with materials in cages or skips which are designed to be controlled by an operator within the cage or skip.

(viii) Line speed shall not exceed the design limitations of the systems.

(ix) Hoists shall be equipped with landing level indicators at the operator's station. Marking of the hoist rope does not satisfy this requirement.

(x) Whenever glazing is used in the hoist house, it shall be safety glass, or its equivalent, and be free of distortions and obstructions.

(xi) A fire extinguisher that is rated at least 2A:10B:C (multipurpose, dry chemical) shall be mounted in each hoist house.

(xii) Hoist controls shall be arranged so that the operator can perform all operating cycle functions and reach the emergency power cutoff without having to reach beyond the operator's normal operating position.

(xiii) Hoists shall be equipped with limit switches to prevent overtravel at the top and bottom of the hoistway.

(xiv) Limit switches are to be used only to limit travel of loads when operational controls malfunction and shall not be used as a substitute for other operational controls.

(xv) Hoist operators shall be provided with a closed-circuit voice communication system to each landing station, with speaker-microphones so located that the operator can communicate with individual landing stations during hoist use.

(xvi) When sinking shafts 75 feet (22.86 m) or less in depth, cages, skips, and buckets that may swing, bump, or snag against shaft sides or other structural protrusions shall be guided by fenders, rails, ropes, or a combination of those means.

(xvii) When sinking shafts more than 75 feet (22.86 m) in depth, all cages, skips, and buckets shall be rope or rail-guided to within a rail length from the sinking operation.

(xviii) Cages, skips, and buckets in all completed shafts, or in all shafts being used as completed shafts, shall be rope or rail-guided for the full length of their travel.

(xix) Wire rope used in load lines of material hoists shall be capable of supporting, without failure, at least five times the maximum intended load or the factor recommended by the rope manufacturer, whichever is greater. Refer to WAC 296-155-530 (3)(r)(i), (ii), and (iii) for design factors for wire rope used in personnel hoists. The design factors shall be calculated by dividing the breaking strength of wire rope, as reported in the manufacturer's rating tables, by the total static load, including the weight of the wire rope in the shaft when fully extended.

(xx) A competent person shall visually check all hoisting machinery, equipment, anchorages, and hoisting rope at the beginning of each shift and during hoist use, as necessary.

(xxi) Each safety device shall be checked by a competent person at least weekly during hoist use to ensure suitable operation and safe condition.

(xxii) In order to ensure suitable operation and safe condition of all functions and safety devices, each hoist assembly shall be inspected and load-tested to 100 percent of its rated capacity: At the time of installation; after any repairs or alterations affecting its structural integrity; after the operation of any safety device; and annually when in use. The employer shall prepare a certification record which includes the date each inspection and load-test was performed; the signature of the person who performed the inspection and test; and a serial number or other identifier for the hoist that was inspected and tested. The most recent certification record shall be maintained on file until completion of the project.

(xxiii) Before hoisting personnel or material, the operator shall perform a test run of any cage or skip whenever it has been out of service for one complete shift, and whenever the assembly or components have been repaired or adjusted.

(xiv) Unsafe conditions shall be corrected before using the equipment.

(d) Additional requirements for personnel hoists.

(i) Hoist drum systems shall be equipped with at least two means of stopping the load, each of which shall be capable of stopping and holding 150 percent of the hoist's

rated line pull. A broken-rope safety, safety catch, or arrestment device is not a permissible means of stopping under this subsection.

(ii) The operator shall remain within sight and sound of the signals at the operator's station.

(iii) All sides of personnel cages shall be enclosed by one-half inch (12.70 mm) wire mesh (not less than No. 14 gauge or equivalent) to a height of not less than 6 feet (1.83 m). However, when the cage or skip is being used as a work platform, its sides may be reduced in height to 42 inches (1.07 m) when the conveyance is not in motion.

(iv) All personnel cages shall be provided with a positive locking door that does not open outward.

(v) All personnel cages shall be provided with a protective canopy. The canopy shall be made of steel plate, at least 3/16 -inch (4.763 mm) in thickness, or material of equivalent strength and impact resistance. The canopy shall be sloped to the outside, and so designed that a section may be readily pushed upward to afford emergency egress. The canopy shall cover the top in such a manner as to protect those inside from objects falling in the shaft.

(vi) Personnel platforms operating on guide rails or guide ropes shall be equipped with broken-rope safety devices, safety catches, or arrestment devices that will stop and hold 150 percent of the weight of the personnel platform and its maximum rated load.

(vii) During sinking operations in shafts where guides and safeties are not yet used, the travel speed of the personnel platform shall not exceed 200 feet (60.96 m) per minute. Governor controls set for 200 feet (60.96 m) per minute shall be installed in the control system and shall be used during personnel hoisting.

(viii) The personnel platform may travel over the controlled length of the hoistway at rated speeds up to 600 feet (182.88 m) per minute during sinking operations in shafts where guides and safeties are used.

(ix) The personnel platform may travel at rated speeds greater than 600 feet (182.88 m) per minute in complete shafts.

#### AMENDATORY SECTION (Amending Order 88-25, filed 11/14/88)

**WAC 296-155-745 Compressed air.** (1) General provisions.

(a) There shall be present, at all times, at least one competent person designated by and representing the employer, who shall be familiar with this part in all respects and responsible for full compliance with these and other applicable parts.

(b) Every employee shall be instructed in the rules and regulations which concern ~~(his)~~ their safety or the safety of others.

(2) Medical attendance, examination, and regulations.

(a) There shall be retained one or more licensed physicians familiar with and experienced in the physical requirements and the medical aspects of compressed air work and the treatment of decompression illness. ~~((He))~~ They shall be available at all times while work is in progress in order to provide medical supervision of employees employed in compressed air work. ~~((He))~~ They shall ~~((himself))~~ be

physically qualified and be willing to enter a pressurized environment.

(b) No employee shall be permitted to enter a compressed air environment until ~~((he has))~~ they have been examined by the physician and reported ~~((by him))~~ to be physically qualified to engage in such work.

(c) In the event an employee is absent from work for 10 days, or is absent due to sickness or injury, ~~((he))~~ they shall not resume work until ~~((he is))~~ they are reexamined by the physician, and ~~((his))~~ their physical condition reported, as provided in this subsection, to be such as to permit ~~((him))~~ them to work in compressed air.

(d) After an employee has been employed continuously in compressed air for a period designated by the physician, but not to exceed 1 year, ~~((he))~~ the employee shall be reexamined by the physician to determine if ~~((he is))~~ they are still physically qualified to engage in compressed air work.

(e) Such physician shall at all times keep a complete and full record of examinations made by ~~((him))~~ themselves. The physician shall also keep an accurate record of any decompression illness or other illness or injury incapacitating any employee for work, and of all loss of life that occurs in the operation of a tunnel, caisson, or other compartment in which compressed air is used.

(f) Records shall be available for the inspection by the director or his/her representatives, and a copy thereof shall be forwarded to the ~~((division))~~ department within 48 hours following the occurrence of the accident, death, injury, or decompression illness. It shall state as fully as possible the cause of said death or decompression illness, and the place where the injured or sick employee was taken, and such other relative information as may be required by the director.

(g) A fully equipped first-aid station shall be provided at each tunnel project regardless of the number of persons employed. An ambulance or transportation suitable for a litter case shall be at each project.

(h) Where tunnels are being excavated from portals more than 5 road miles apart, a first-aid station and transportation facilities shall be provided at each portal.

(i) A medical lock shall be established and maintained in immediate working order whenever air pressure in the working chamber is increased above the normal atmosphere.

(j) The medical lock shall:

(i) Have at least 6 feet of clear headroom at the center, and be subdivided into not less than two compartments;

(ii) Be readily accessible to employees working under compressed air;

(iii) Be kept ready for immediate use for at least 5 hours subsequent to the emergence of any employee from the working chamber;

(iv) Be properly heated, lighted and ventilated;

(v) Be maintained in a sanitary condition;

(vi) Have a nonshatterable port through which the occupant(s) may be kept under constant observation;

(vii) Be designed for a working pressure of 75 p.s.i.g.;

(viii) Be equipped with internal controls which may be overridden by external controls;

(ix) Be provided with air pressure gauges to show the air pressure within each compartment to observers inside and outside the medical lock;

(x) Be equipped with a manual type sprinkler system that can be activated inside the lock or by the outside lock tender;

(xi) Be provided with oxygen lines and fittings leading into external tanks. The lines shall be fitted with check valves to prevent reverse flow. The oxygen system inside the chamber shall be of a closed circuit design and be so designed as to automatically shut off the oxygen supply whenever the fire system is activated.

(xii) Be in constant charge of an attendant under the direct control of the retained physician. The attendant shall be trained in the use of the lock and suitably instructed regarding steps to be taken in the treatment of employee exhibiting symptoms compatible with a diagnosis of decompression illness;

(xiii) Be adjacent to an adequate emergency medical facility;

(xiv) The medical facility shall be equipped with demand-type oxygen inhalation equipment approved by the U.S. Bureau of Mines or Mine Safety and Health Administration (MSHA) and the National Institute for Occupational Safety and Health (NIOSH);

(xv) Be capable of being maintained at a temperature, in use, not to exceed 90°F. nor be less than 70°F.; and

(xvi) Be provided with sources of air, free of oil and carbon monoxide, for normal and emergency use, which are capable of raising the air pressure in the lock from 0 to 75 p.s.i.g. in 5 minutes.

(k) Identification badges shall be furnished to all employees, indicating that the wearer is a compressed air worker. A permanent record shall be kept of all identification badges issued. The badge shall give the employee's name, address of the medical lock, the telephone number of the licensed physician for the compressed air project, and contain instructions that in case of emergency of unknown or doubtful cause or illness, the wearer shall be rushed to the medical lock. The badge shall be worn at all times—off the job, as well as on the job.

(3) Telephone and signal communication. Effective and reliable means of communication, such as bells, whistles, or telephones, shall be maintained at all times between all the following locations;

(a) The working chamber face;

(b) The working chamber side of the man lock near the door;

(c) The interior of the man lock;

(d) Lock attendant's station;

(e) The compressor plant;

(f) The first-aid station;

(g) The emergency lock (if one is required); and

(h) The special decompression chamber (if one is required).

(4) Signs and records.

(a) The time of decompression shall be posted in each man lock as follows:



TIME OF DECOMPRESSION FOR THIS LOCK

..... pounds to ..... pounds in ..... minutes.

..... pounds to ..... pounds in ..... minutes.

(Signed by) ..... (Superintendent)

This form shall be posted in the man lock at all times.

(b) Any code of signals used shall be conspicuously posted near workplace entrances and such other locations as may be necessary to bring them to the attention of all employees concerned.

(c) For each 8-hour shift, a record of employees employed under air pressure shall be kept by an employee who shall remain outside the lock near the entrance. This record shall show the period each employee spends in the air chamber and the time taken from decompression. A copy shall be submitted to the appointed physician after each shift.

(5) Compression.

(a) Every employee going under air pressure for the first time shall be instructed on how to avoid excessive discomfort.

(b) During the compression of employees, the pressure shall not be increased to more than 3 p.s.i.g. within the first minute. The pressure shall be held at 3 p.s.i.g. and again at 7 p.s.i.g. sufficiently long to determine if any employees are experiencing discomfort.

(c) After the first minute the pressure shall be raised uniformly and at a rate not to exceed 10 p.s.i. per minute.

(d) If any employee complains of discomfort, the pressure shall be held to determine if the symptoms are relieved. If, after 5 minutes the discomfort does not disappear, the lock attendant shall gradually reduce the pressure until the employee signals that the discomfort has ceased. If ~~((he))~~ the employee does not indicate that the discomfort has disappeared, the lock attendant shall reduce the pressure to atmospheric and the employee shall be released from the lock.

(e) No employee shall be subjected to pressure exceeding 50 pounds per square inch except in an emergency.

(6) Decompression.

(a) Decompression to normal condition shall be in accordance with the decompression tables in Appendix A of this part.

(b) In the event it is necessary for an employee to be in compressed air more than once in a 24-hour period, the appointed physician shall be responsible for the establishment of methods and procedures of decompression applicable to repetitive exposures.

(c) If decanting is necessary, the appointed physician shall establish procedures before any employee is permitted to be decompressed by decanting methods. The period of time that the employees spend at atmospheric pressure between the decompression following the shift and recompression shall not exceed 5 minutes.

(7) Man locks and special decompression chambers.

(a) Man locks.

(i) Except in emergency, no employees employed in compressed air shall be permitted to pass from the working

chamber to atmospheric pressure until after decompression, in accordance with the procedures in this part.

(ii) The lock attendant in charge of a man lock shall be under the direct supervision of the appointed physician. ~~((He))~~ The lock attendant shall be stationed at the lock controls on the free air side during the period of compression and decompression and shall remain at the lock control station whenever there are persons in the working chamber or in the man lock.

(iii) Except where air pressure in the working chamber is below 12 p.s.i.g., each man lock shall be equipped with automatic controls which, through taped programs, cams, or similar apparatus, shall automatically regulate decompressions. It shall also be equipped with manual controls to permit the lock attendant to override the automatic mechanism in the event of an emergency, as provided in item (viii) of this subdivision.

(iv) A manual control, which can be used in the event of an emergency, shall be placed inside the man lock.

(v) A clock, thermometer, and continuous recording pressure gauge with a 4-hour graph shall be installed outside of each man lock and shall be changed prior to each shift's decompression. The chart shall be of sufficient size to register a legible record of variations in pressure within the man lock and shall be visible to the lock attendant. A copy of each graph shall be submitted to the appointed physician after each shift. In addition, a pressure gauge, clock, and thermometer shall also be installed in each man lock. Additional fittings shall be provided so that the test gauges may be attached whenever necessary

(vi) Except where air pressure is below 12 p.s.i.g. and there is no danger of rapid flooding, all caissons having a working area greater than 150 square feet, and each bulkhead in tunnels of 14 feet or more in diameter, or equivalent area, shall have at least two locks in perfect working condition, one of which shall be used exclusively as a man lock, the other, as a materials lock.

(vii) Where only a combination man-and-materials lock is required, this single lock shall be of sufficient capacity to hold the employees constituting two successive shifts.

(viii) Emergency locks shall be large enough to hold an entire heading shift and a limit maintained of 12 p.s.i.g. There shall be a chamber available for oxygen decompression therapy to 28 p.s.i.g.

(ix) The man lock shall be large enough so that those using it are not compelled to be in a cramped position and shall not have less than 5 feet clear head room at the center and a minimum of 30 cubic feet of air space per occupant.

(x) Locks on caissons shall be so located that the bottom door shall be not less than 3 feet above the water level surrounding the caisson on the outside. (The water level, where it is affected by tides, is construed to mean high tide.)

(xi) In addition to the pressure gauge in the locks, an accurate pressure gauge shall be maintained on the outer and inner side of each bulkhead. These gauges shall be accessible at all times and shall be kept in accurate working order.

(xii) Man locks shall have an observation port at least 4 inches in diameter located in such a position that all occupants of the man lock may be observed from the working chamber and from the free air side of the lock.

(xiii) Adequate ventilation in the lock shall be provided.

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(xiv) Man locks shall be maintained at a minimum temperature of 70°F.

(xv) When locks are not in use and employees are in the working chamber, lock doors shall be kept open to the working chamber, where practicable.

(xvi) Provision shall be made to allow for rescue parties to enter the tunnel if the working force is disabled.

(xvii) A special decompression chamber of sufficient size to accommodate the entire force of employees being decompressed at the end of a shift shall be provided whenever the regularly established working period requires total time of decompression exceeding 75 minutes.

(b) Special decompression chamber.

(i) The headroom in the special decompression chamber shall be not less than a minimum 7 feet and the cubical content shall provide at least 50 cubic feet of airspace for each employee. For each occupant, there shall be provided 4 square feet of free walking area and 3 square feet of seating space, exclusive of area required for lavatory and toilet facilities. The rated capacity shall be based on the stated minimum space per employee and shall be posted at the chamber entrance. The posted capacity shall not be exceeded, except in case of emergency.

(ii) Each special decompression chamber shall be equipped with the following:

(A) A clock or clocks suitably placed so that the attendant and the chamber occupants can readily ascertain the time;

(B) Pressure gauges which will indicate to the attendants and to the chamber occupants the pressure in the chamber;

(C) Valves to enable the attendant to control the supply and discharge of compressed air into and from the chamber.

(D) Valves and pipes, in connection with the air supply and exhaust, arranged so that the chamber pressure can be controlled from within and without;

(E) Effective means of oral intercommunication between the attendant, occupants of the chamber, and the air compressor plant; and

(F) An observation port at the entrance to permit observation of the chamber occupants.

(iii) Seating facilities in special decompression chambers shall be so arranged as to permit a normal sitting posture without cramping. Seating space, not less than 18 inches by 24 inches wide, shall be provided per occupant.

(iv) Adequate toilet and washing facilities, in a screened or enclosed recess, shall be provided. Toilet bowls shall have a built-in protector on the rim so that an air space is created when the seat lid is closed.

(v) Fresh and pure drinking water shall be available. This may be accomplished by either piping water into the special decompression chamber and providing drinking fountains, or by providing individual canteens, or by some other sanitary means. Community drinking vessels are prohibited.

(vi) No refuse or discarded material of any kind shall be permitted to accumulate, and the chamber shall be kept clean.

(vii) Unless the special decompression chamber is serving as the man lock to atmospheric pressure, the special decompression chamber shall be situated, where practicable, adjacent to the man lock on the atmospheric pressure side of the bulkhead. A passageway shall be provided, connecting

the special chamber with the man lock, to permit employees in the process of decompression to move from the man lock to the special chamber without a reduction in the ambient pressure from that designated for the next stage of decompression. The passageway shall be so arranged as to not interfere with the normal operation of the man lock, nor with the release of the occupants of the special chamber to atmospheric pressure upon the completion of the decompression procedure.

(8) Compressor plant and air supply.

(a) At all times there shall be a thoroughly experienced, competent, and reliable person on duty at the air control valves as a gauge tender who shall regulate the pressure in the working areas. During tunneling operations, one gauge tender may regulate the pressure in not more than two headings: Provided; That the gauges and controls are all in one location. In caisson work, there shall be a gauge tender for each caisson.

(b) The low air compressor plant shall be of sufficient capacity to not only permit the work to be done safely, but shall also provide a margin to meet emergencies and repairs.

(c) Low air compressor units shall have at least two independent and separate sources of power supply and each shall be capable of operating the entire low air plant and its accessory systems.

(d) The capacity, arrangement, and number of compressors shall be sufficient to maintain the necessary pressure without overloading the equipment and to assure maintenance of such pressure in the working chamber during periods of breakdown, repair, or emergency.

(e) Switching from one independent source of power supply to the other shall be done periodically to ensure that workability of the apparatus in an emergency.

(f) Duplicate low-pressure air feedlines and regulating valves shall be provided between the source of air supply and a point beyond the locks with one of the lines extending to within 100 feet of the working face.

(g) All high-pressure and low-pressure air supply lines shall be equipped with check valves.

(h) Low-pressure air shall be regulated automatically. In addition, manually operated valves shall be provided for emergency conditions.

(i) The air intakes for all air compressors shall be located at a place where fumes, exhaust gases, and other air contaminants will be at a minimum.

(j) Gauges indicating the pressure in the working chamber shall be installed in the compressor building, the lock attendant's station, and at the employer's field office.

(9) Ventilation and air quality.

(a) Exhaust valves and exhaust pipes shall be provided and operated so that the working chamber shall be well ventilated, and there shall be no pockets of dead air. Outlets may be required at intermediate points along the main low-pressure air supply line to the heading to eliminate such pockets of dead air. The quantity of ventilation air shall be not less than 30 cubic feet per minute.

(b) The air in the workplace shall be analyzed by the employer not less than once each shift, and records of such tests shall be kept on file at the place where the work is in progress. The test results shall be within the threshold limit values specified in part B of this chapter, for hazardous gases, and within 10 percent of the lower explosive limit of

flammable gases. If these limits are not met, immediate action to correct the situation shall be taken by the employer.

(c) The temperature of all working chambers which are subjected to air pressure shall, by means of after-coolers or other suitable devices, be maintained at a temperature not to exceed 85°F.

(d) Forced ventilation shall be provided during decompression. During the entire decompression period, forced ventilation through chemical or mechanical air purifying devices that will ensure a source of fresh air shall be provided.

(e) Whenever heat-producing machines (moles, shields) are used in compressed air tunnel operations, a positive means of removing the heat build-up at the heading shall be provided.

(10) Electricity.

(a) All lighting in compressed-air chambers shall be by electricity exclusively, and two independent electric-lighting systems with independent sources of supply shall be used. The emergency source shall be arranged to become automatically operative in the event of failure of the regularly used source.

(b) The minimum intensity of light on any walkway, ladder, stairway, or working level shall be not less than 10 foot-candles, and in all workplaces the lighting shall at all times be such as to enable employees to see clearly.

(c) All electrical equipment, and wiring for light and power circuits, shall comply with requirements of Part I, of this standard, for use in damp, hazardous, high temperature, and compressed air environments.

(d) External parts of lighting fixtures and all other electrical equipment, when within 8 feet of the floor, shall be constructed of noncombustible, nonabsorptive, insulating materials, except that metal may be used if it is effectively grounded.

(e) Portable lamps shall be equipped with noncombustible, nonabsorptive, insulating sockets, approved handles, basket guards, and approved cords.

(f) The use of worn or defective portable and pendant conductors is prohibited.

(11) Sanitation.

(a) Sanitary, heated, lighted, and ventilated dressing rooms and drying rooms shall be provided for all employees engaged in compressed air work. Such rooms shall contain suitable benches and lockers. Bathing accommodations (showers at the ratio of one to 10 employees per shift), equipped with running hot and cold water, and suitable and adequate toilet accommodations, shall be provided. One toilet for each 15 employees, or fractional part thereof, shall be provided.

(b) When the toilet bowl is shut by a cover, there should be an air space so that the bowl or bucket does not implode when pressure is increased.

(c) All parts of caissons and other working compartments shall be kept in a sanitary condition.

(12) Fire prevention and protection.

(a) Fire fighting equipment shall be available at all times and shall be maintained in working condition.

(b) While welding or flame-cutting is being done in compressed air, a firewatch with a fire hose or approved extinguisher shall stand by until such operation is completed.

(c) Shafts and caissons containing flammable material of any kind, either above or below ground, shall be provided with a waterline and a fire hose connected thereto, so arranged that all points of the shaft or caisson are within reach of the hose stream.

(d) Fire hose shall be at least 1 1/2 inches in nominal diameter; the water pressure shall at all times be adequate for efficient operation of the type of nozzle used; and the water supply shall be such as to ensure an uninterrupted flow. Fire hose, when not in use, shall be located or guarded to prevent injury thereto.

(e) The power house, compressor house, and all buildings housing ventilating equipment, shall be provided with at least one hose connection in the waterline, with a fire hose connected thereto. A fire hose shall be maintained within reach of structures of wood over or near shafts.

(f) Tunnels shall be provided with a 2-inch minimum diameter waterline extending into the working chamber and to within 100 feet of the working face. Such line shall have hose outlets with 100 feet of fire hose attached and maintained as follows: One at the working face; one immediately inside of the bulkhead of the working chamber; and one immediately outside such bulkhead. In addition, hose outlets shall be provided at 200-foot intervals throughout the length of the tunnel, and 100 feet of fire hose shall be attached to the outlet nearest to any location where flammable material is being kept or stored or where any flame is being used.

(g) In addition to fire hose protection required by this part, on every floor of every building not under compressed air, but used in connection with the compressed air work, there shall be provided at least one approved fire extinguisher of the proper type for the hazards involved. At least two approved fire extinguishers shall be provided in the working chamber as follows: One at the working face and one immediately inside the bulkhead (pressure side). Extinguishers in the working chamber shall use water as the primary extinguishing agent and shall not use any extinguishing agent which could be harmful to the employees in the working chamber. The fire extinguisher shall be protected from damage.

(h) Highly combustible materials shall not be used or stored in the working chamber. Wood, paper, and similar combustible material shall not be used in the working chamber in quantities which could cause a fire hazard. The compressor building shall be constructed of noncombustible material.

(i) Man locks shall be equipped with a manual type fire extinguisher system that can be activated inside the man lock and also by the outside lock attendant. In addition, a fire hose and portable fire extinguisher shall be provided inside and outside the man lock. The portable fire extinguisher shall be the dry chemical type.

(j) Equipment, fixtures, and furniture in man locks and special decompression chambers shall be constructed of noncombustible materials. Bedding, etc., shall be chemically treated so as to be fire resistant.

(k) Head frames shall be constructed of structural steel or open frame-work fireproofed timber. Head houses and other temporary surface buildings or structures within 100 feet of the shaft, caisson, or tunnel opening shall be built of fire-resistant materials.

(l) No oil, gasoline, or other combustible materials shall be stored within 100 feet of any shaft, caisson, or tunnel opening, except that oils may be stored in suitable tanks in isolated fireproof buildings, provided such buildings are not less than 50 feet from any shaft, caisson, or tunnel opening, or any building directly connected thereto.

(m) Positive means shall be taken to prevent leaking flammable liquids from flowing into the areas specifically mentioned in the preceding subdivision.

(n) All explosives used in connection with compressed air work shall be selected, stored, transported, and used as specified in part T of this chapter.

(13) Bulkheads and safety screens.

(a) Intermediate bulkheads with locks, or intermediate safety screens or both, are required where there is danger of rapid flooding.

(b) In tunnels 16 feet or more in diameter, hanging walkways shall be provided from the face to the man lock as high in the tunnel as practicable, with at least 6 feet of head room. Walkways shall be constructed of noncombustible material. Standard railings shall be securely installed throughout the length of all walkways on open sides in accordance with part K of this chapter. Where walkways are ramped under safety screens, the walkway surface shall be skidproofed by cleats or by equivalent means.

(c) Bulkheads used to contain compressed air shall be tested, where practicable, to prove their ability to resist the highest air pressure which may be expected to be used.

**AMENDATORY SECTION** (Amending Order 74-26, filed 5/7/74, effective 6/6/74)

**WAC 296-155-74501 Appendix A—Decompression tables.**

**APPENDIX A—DECOMPRESSION TABLES**

(1) **Explanation.** The decompression tables are computed for working chamber pressures from 0 to 14 pounds, and from 14 to 50 pounds per square inch gauge inclusive by 2-pound increments and for exposure times for each pressure extending from one-half to over 8 hours inclusive. Decompressions will be conducted by two or more stages with a maximum of four stages, the latter for a working chamber pressure of 40 pounds per square inch gauge or over.

Stage 1 consists of a reduction in ambient pressure ranging from 10 to a maximum of 16 pounds per square inch, but in no instance will the pressure be reduced below 4 pounds at the end of stage 1. This reduction in pressure in stage 1 will always take place at a rate not greater than 5 pounds per minute.

Further reduction in pressure will take place during stage 2 and subsequent stages as required at a slower rate, but in no event at a rate greater than 1 pound per minute.

Decompression Table No. 1 indicates in the body of the table the total decompression time in minutes for various combinations of working chamber pressure and exposure time.

Decompression Table No. 2 indicates for the same various combinations of working chamber pressure and exposure time the following:

(a) The number of stages required;

(b) The reduction in pressure and the terminal pressure for each required stage;

(c) The time in minutes through which the reduction in pressure is accomplished for each required stage;

(d) The pressure reduction rate in minutes per pound for each required stage;

**Important note** The pressure reduction in each stage is accomplished at a uniform rate. Do not interpolate between values shown on the tables. Use the next higher value of working chamber pressure or exposure time should the actual working chamber pressure or the actual exposure time, respectively, fall between those for which calculated values are shown in the body of the tables.

**Examples:**

Example No. 1:

4 hours working period at 20 pounds gauge.

Decompression Table No. 1:

20 pounds for 4 hours, total decompression time. 43 minutes.

Decompression Table No. 2:

Stage 1: Reduce pressure from 20 pounds to 4 pounds at the uniform rate of 5 pounds per minute.

Elapsed time stage 1: 16/5— 3 minutes.

Stage 2 (final stage): Reduce pressure at a uniform rate from 4 pounds to 0-pound gage over a period of 40 minutes.

Rate—0.10 per pound per minute or 10 minutes per pound.

Stage 2 (final) elapsed time. 40 minutes.

Total time . . . . . 43 minutes.

Example No. 2:

5-hour working period at 24 pounds gage.

Decompression Table No. 1:

24 pounds for 5 hours, total decompression time. 117 minutes.

Decompression Table No. 2:

Stage 1: Reduce pressure from 24 pounds to 8 pounds at the uniform rate of 5 pounds per minute.

Elapsed time stage 1: 16/5 3 minutes.

Stage 2: Reduce pressure at a uniform rate from 8 pounds to 4 pounds over a period of 4 minutes. Rate, 1 pound per minute elapsed time, stage 2 . . . . . 4 minutes.

Transfer ((~~men~~) person) to special decompression chamber maintaining the 4-pound pressure

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during the transfer operation.  
 Stage 3 (final stage): In the special decompression chamber, reduce the pressure at a uniform rate from 4 pounds to 0-pound gage over a period of 110 minutes. Rate, 0.037 pound per minute or 27.5 minutes per pound. Stage 3 (final) elapsed time. . . . . 110 minutes.  
 Total time . . . . . 117 minutes.

DECOMPRESSION TABLE NO. 1  
 TABLE DECOMPRESSION TIME

Work pressure p.s.i.g.	Working period hours									
	1/2	1	1 1/2	2	3	4	5	6	7	Over 8
0-12	3	3	3	3	3	3	3	3	3	3
14	6	6	6	6	6	6	6	6	16	33
16	7	7	7	7	7	7	17	33	48	62
18	7	7	7	8	11	17	48	63	73	87
20	7	7	8	15	15	43	63	73	83	103
22	9	9	16	24	38	68	93	103	113	128
24	11	12	23	27	52	92	117	122	127	137
26	13	14	29	34	69	104	126	141	142	142
28	15	23	31	41	98	127	143	153	153	165
30	17	28	38	62	105	143	165	168	178	188
32	19	35	43	85	126	163	178	193	203	213
34	21	39	58	98	151	178	195	218	223	233
36	24	44	63	113	170	198	223	233	243	253
38	28	49	73	128	178	203	223	238	253	263
40	31	49	84	143	183	213	233	248	258	278
42	37	56	102	144	189	215	245	260	263	268
44	43	64	118	154	199	234	254	264	269	293
46	44	74	139	171	214	244	269	274	289	299
48	51	89	144	189	229	269	299	309	319	319
50	58	94	164	209	249	279	309	329	...	...

DECOMPRESSION TABLE NO. 2

(Do not interpolate, use next higher value for conditions not computed.)

Working chamber pressure P.s.i.g.	Working period Hours	Stage No.	Decompression data				
			Pressure reduction P.s.i.g.		Time in stage Minutes	Pressure reduction rate	Total time decompress Minutes
			From	To			
14	1/2	1	14	4	2	0.20	6
		2	4	0	4	1.00	6
	1	1	14	4	2	0.20	6
		2	4	0	4	1.00	6
	1 1/2	1	14	4	2	0.20	6
		2	4	0	4	1.00	6
	2	1	14	4	2	0.20	6
		2	4	0	4	1.00	6
	3	1	14	4	2	0.20	6
		2	4	0	4	1.00	6
	4	1	14	0	2	0.20	6
		2	4	0	4	1.00	6
	5	1	14	4	2	0.20	6
		2	4	0	4	1.00	6
	6	1	14	4	2	0.20	6

		2	4	0	4	1.00	6
7		1	14	4	2	0.20	
		2	4	0	14	3.50	16
8		1	14	4	2	0.20	
		2	4	0	14	3.50	16
Over 8		1	14	4	2	0.20	
		2	4	0	30	7.50	32
16	1/2	1	16	4	3	0.20	
		2	4	0	4	1.00	7
	1	1	16	4	3	0.20	7
		2	4	0	4	1.00	7
	1 1/2	1	16	4	3	0.20	
		2	4	0	4	1.00	7
	2	1	16	4	3	0.20	
		2	4	0	4	1.00	7
	3	1	16	4	3	0.20	
		2	4	0	4	1.00	7
	4	1	14	4	3	0.20	
		2	4	0	4	1.00	7
	5	1	14	4		0.20	7
		2	4	0	4	3.50	17
	6	1	14	4	3	0.20	
		2	4	0	30	7.50	33
	7	1	14	4	3	0.20	
		2	4	0	45	11.25	48
	8	1	14	4	3	0.20	
		2	4	0	45	11.25	48
Over 8		1	14	4	3	0.20	
		2	4	0	60	15.00	63
18	1/2	1	18	4	3	0.20	
		2	4	0	4	1.00	7
	1	1	18	4	3	0.20	
		2	4	0	4	1.00	7
	1 1/2	1	18	4	3	0.20	
		2	4	0	4	1.00	7
	2	1	18	4	3	0.20	
		2	4	0	5	1.25	8
	3	1	18	4	3	0.20	
		2	4	0	8	2.00	11
	4	1	18	4	3	0.20	
		2	4	0	14	3.50	17
	5	1	18	4	3	0.20	
		2	4	0	45	11.25	48
	6	1	18	4	3	0.20	
		2	4	0	60	15.00	63
	7	1	18	4	3	0.20	
		2	4	0	60	15.00	63
	8	1	18	4	3	0.20	
		2	4	0	70	17.50	73
Over 8		1	18	4	3	0.20	
		2	4	0	84	21.00	87
20	1/2	1	20	4	3	0.20	
		2	4	0	4	1.00	7
	1	1	20	4	3	0.20	
		2	4	0	4	1.00	7
	1 1/2	1	20	4	3	0.20	
		2	4	0	5	1.25	8
	2	1	20	4	3	0.20	
		2	4	0	12	3.00	15
	3	1	20	4	3	0.20	
		2	4	0	12	3.00	15
	4	1	20	4	3	0.20	
		2	4	0	40	10.00	43
	5	1	20	4	3	0.20	
		2	4	0	60	15.00	63
	6	1	20	4	3	0.20	
		2	4	0	70	17.50	73
	7	1	20	4	3	0.20	
		2	4	0	80	20.00	83
	8	1	20	4	3	0.20	
		2	4	0	100	25.00	103
Over 8		1	20	4	3	0.20	
		2	4	0	110	27.50	113
22	1/2	1	22	6	3	0.20	
		2	6	0	6	1.00	9
	1	1	22	6	3	0.20	
		2	6	0	6	1.00	9
	1 1/2	1	22	6	3	0.20	
		2	6	0	13	2.20	16
	2	1	22	6	3	0.20	
		2	6	0	21	3.50	24
	3	1	22	6	3	0.20	
		2	6	0	35	5.85	38
	4	1	22	6	3	0.20	
		2	6	0	65	10.83	68

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5	1	22	6	3	0.20		2	1	28	12	3	0.20	
	2	6	0	90	15.00	93		2	12	4	8	1.00	
6	1	22	6	3	0.20			3	4	0	30	7.50	41
	2	6	0	100	16.67	103	3	1	28	12	3	0.20	
7	1	22	6	3	0.20			2	12	4	10	1.25	
	2	6	0	110	18.35	113		3	4	0	85	21.20	98
8	1	22	6	3	0.20		4	1	28	12	3	0.20	
	2	6	0	125	20.80	128		2	12	4	14	1.75	
Over 8	1	22	6	3	0.20			3	4	0	110	27.50	127
	2	6	0	130	21.70	133	5	1	28	12	3	0.20	
24 ... 1/2	1	24	8	3	0.20			2	12	4	20	2.50	
	2	8	4	4	1.00			3	4	0	120	30.00	143
	3	4	0	4	1.00	11	6	1	28	12	3	0.20	
1	1	24	8	3	0.20			2	12	4	20	2.50	
	2	8	4	4	1.00			3	4	0	130	32.50	153
	3	4	0	5	1.25	12	7	1	28	12	3	0.20	
1 1/2	1	24	8	3	0.20			2	12	4	20	2.50	
	2	8	4	4	1.00			3	4	0	130	32.50	153
	3	4	0	16	4.00	23	8	1	28	12	3	0.20	
2	1	24	8	3	0.20			2	12	4	32	4.00	
	2	8	4	4	1.00			3	4	0	130	32.50	165
	3	4	0	20	5.00	27	Over 8	1	28	12	3	0.20	
3	1	24	8	3	0.20			2	12	4	50	6.25	
	2	8	4	4	1.00			3	4	0	130	32.50	183
	3	4	0	45	11.25	52	30 ... 1/2	1	30	14	3	0.20	
4	1	24	8	3	0.20			2	14	4	10	1.00	
	2	8	4	4	1.00			3	4	0	4	1.00	17
	3	4	0	85	21.25	92	1	1	30	14	3	0.20	
5	1	24	8	3	0.20			2	14	4	10	1.00	
	2	8	4	4	1.00			3	4	0	15	3.75	28
	3	4	0	110	27.50	117	1 1/2	1	30	14	3	0.20	
6	1	24	8	3	0.20			2	14	4	10	1.00	
	2	8	4	4	1.00			3	4	0	25	6.25	38
	3	4	0	115	28.80	122	2	1	30	14	3	0.20	
7	1	24	8	3	0.20			2	14	4	14	1.40	
	2	8	4	4	1.00			3	4	0	45	11.25	62
	3	4	0	120	30.00	127	3	1	30	14	3	0.20	
8	1	24	8	3	0.20			2	14	4	17	1.70	
	2	8	4	4	1.00			3	4	0	85	21.20	105
	3	4	0	130	32.50	137	4	1	30	14	3	0.20	
Over 8	1	24	8	3	0.20			2	14	4	30	3.00	
	2	8	4	8	2.00			3	4	0	110	27.50	143
	3	4	0	140	35.00	151	5	1	30	14	3	0.20	
26 ... 1/2	1	26	10	3	0.20			2	14	4	35	3.50	
	2	10	4	6	1.00			3	4	0	130	32.50	165
	3	4	0	4	1.00	13	6	1	30	14	3	0.20	
1	1	26	10	3	0.20			2	14	4	35	3.50	
	2	10	4	6	1.00			3	4	0	130	32.50	168
	3	4	0	5	1.25	14	7	1	30	14	3	0.20	
1 1/2	1	26	10	3	0.20			2	14	4	45	4.50	
	2	10	4	6	1.00			3	4	0	130	32.50	178
	3	4	0	20	5.00	29	8	1	30	14	3	0.20	
2	1	26	10	3	0.20			2	14	4	55	5.50	
	2	10	4	6	1.00			3	4	0	130	32.50	188
	3	4	0	25	6.25	34	Over 8	1	30	14	3	0.20	
3	1	26	10	3	0.20			2	14	4	71	7.10	
	2	10	4	6	1.00			3	4	0	130	32.50	204
	3	4	0	60	15.00	69	32 ... 1/2	1	32	16	3	0.20	
4	1	26	10	3	0.20			2	16	4	12	1.00	
	2	10	4	6	1.0			3	4	0	4	1.00	19
	3	4	0	95	23.75	104	1	1	32	16	3	0.20	
5	1	26	10	3	0.20			2	16	4	12	1.00	
	2	10	4	8	1.33			3	4	0	20	5.00	35
	3	4	0	115	28.80	126	1 1/2	1	32	16	3	0.20	
6	1	26	10	3	0.20			2	16	4	15	1.25	
	2	10	4	8	1.33			3	4	0	25	6.25	43
	3	4	0	130	32.50	141	2	1	32	16	3	0.20	
7	1	26	10	3	0.20			2	16	4	22	1.83	
	2	10	4	9	1.50			3	4	0	60	15.00	85
	3	4	0	130	32.50	142	3	1	32	16	3	0.20	
8	1	26	10	3	0.20			2	16	4	28	2.33	
	2	10	4	9	1.50			3	4	0	95	23.75	126
	3	4	0	130	32.50	142	4	1	32	16	3	0.20	
Over 8	1	26	10	3	0.20			2	16	4	40	3.33	
	2	10	4	30	5.00			3	4	0	120	30.00	163
	3	4	0	130	32.50	163	5	1	32	16	3	0.20	
28 ... 1/2	1	28	12	3	0.20			2	16	4	45	3.75	
	2	12	4	8	1.00			3	4	0	130	32.50	178
	3	4	0	4	1.00	15	6	1	32	16	3	0.20	
1	1	28	12	3	0.20			2	16	4	60	5.00	
	2	12	4	8	1.00			3	4	0	130	32.50	193
	3	4	0	12	3.00	23	7	1	32	16	3	0.20	
1 1/2	1	28	12	3	0.20			2	16	4	70	5.83	
	2	12	4	8	1.00			3	4	0	130	32.50	203
	3	4	0	20	5.00	31	8	1	32	16	3	0.20	

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	2	16	4	80	6.67			3	6	0	140	23.35	178	
	3	4	0	130	32.50	213		4	38	22	3	0.20		
Over 8	1	32	16	3	0.20			2	22	6	50	3.12		
	2	16	4	93	7.75			3	6	0	150	25.00	203	
	3	4	0	130	32.50	226		5	38	22	3	0.20		
34 .. 1/2	1	34	18	3	0.20			2	22	6	55	3.44		
	2	18	4	14	1.00			3	6	0	165	27.50	223	
	3	4	0	4	1.00	21		6	28	22	3	0.20		
1	1	34	18	3	0.20			2	22	6	70	4.38		
	2	18	4	14	1.00			3	6	0	165	27.50	238	
	3	4	0	22	5.50	39		7	38	22	3	0.20		
1 1/2	1	34	18	3	0.20			2	22	6	85	5.32		
	2	18	4	25	1.80			3	6	0	165	27.50	253	
	3	4	0	30	7.50	58		8	38	22	3	0.20		
2	1	34	18	3	0.20			2	22	6	95	5.93		
	2	18	4	35	2.50			3	6	0	165	27.50	263	
	3	4	0	60	15.00	98		Over 8	1	38	22	3	0.20	
3	1	34	18	3	0.20			2	22	6	110	6.88		
	2	18	4	43	3.10			3	6	0	165	27.50	278	
	3	4	0	105	26.25	151		40 .. 1/2	1	40	24	3	0.20	
4	1	34	18	3	0.20			2	24	8	16	1.00		
	2	18	4	55	3.93			3	8	4	4	1.00		
	3	4	0	120	30.00	178		4	4	0	8	2.00	31	
5	1	34	18	3	0.20			1	40	24	3	0.20		
	2	18	4	62	4.43			2	24	8	16	1.00		
	3	4	0	130	32.50	195		3	8	4	5	1.25		
6	1	34	18	3	0.20			4	4	0	25	6.25	49	
	2	18	4	85	6.07			1 1/2	1	40	24	3	0.20	
	3	4	0	130	32.50	218		2	24	8	16	1.00		
7	1	34	18	3	0.20			3	8	4	20	5.00		
	2	18	4	90	6.43			4	4	0	45	11.25	84	
	3	4	0	130	32.50	223		2	40	24	3	0.20		
8	1	34	18	3	0.20			2	24	8	25	1.56		
	2	18	4	100	7.15			3	8	4	20	5.00		
	3	4	0	130	32.50	233		4	4	0	95	23.75	143	
Over 8	1	34	18	3	0.20			3	40	24	3	0.20		
	2	18	4	115	8.23			2	24	8	30	1.88		
	3	4	0	130	32.50	248		3	8	4	30	7.50		
36 .. 1/2	1	36	20	3	0.20			4	4	0	120	30.00	183	
	2	20	4	16	1.00			4	40	24	3	0.20		
	3	4	0	5	1.25	24		2	24	8	45	2.81		
1	1	36	20	3	0.20			3	8	4	35	8.75		
	2	20	4	16	1.00			4	4	0	130	32.50	213	
	3	4	0	25	6.25	44		5	40	24	3	0.20		
1 1/2	1	36	20	3	0.20			2	24	8	47	2.94		
	2	20	4	30	1.88			3	8	4	53	13.25		
	3	4	0	30	7.50	63		4	4	0	130	32.50	233	
2	1	36	20	3	0.20			6	40	24	3	0.20		
	2	20	4	40	2.50			2	24	8	55	3.44		
	3	4	0	70	17.50	113		3	8	4	60	15.00		
3	1	36	20	3	0.20			4	4	0	130	32.50	248	
	2	20	4	52	3.25			7	40	24	3	0.20		
	3	4	0	115	28.75	170		2	24	8	65	4.06		
4	1	36	20	3	0.20			3	8	4	60	15.00		
	2	20	4	65	4.06			4	4	0	130	32.50	258	
	3	4	0	130	32.50	198		8	40	24	3	0.20		
5	1	36	20	3	0.20			2	24	8	75	4.70		
	2	20	4	90	5.63			3	8	4	60	15.00		
	3	4	0	130	32.50	223		4	4	0	130	32.50	268	
6	1	36	20	3	0.20			Over 8	1	40	24	3	0.20	
	2	20	4	100	6.25			2	24	8	95	5.93		
	3	4	0	130	32.50	233		3	8	4	60	15.00		
7	1	36	20	3	0.20			4	4	0	130	32.50	288	
	2	20	4	110	6.88			42 .. 1/2	1	42	26	3	0.20	
	3	4	0	130	32.50	243		2	26	10	16	1.00		
8	1	36	20	3	0.20			3	10	4	6	1.00		
	2	20	4	120	7.50			4	4	0	12	3.00	37	
	3	4	0	130	32.50	253		1	42	26	3	0.20		
Over 8	1	36	20	3	0.20			2	26	10	16	1.00		
	2	20	4	140	8.75			3	10	4	12	2.00		
	3	4	0	130	32.50	273		4	4	0	25	6.25	56	
38 .. 1/2	1	38	22	3	0.20			1 1/2	1	42	26	3	0.20	
	2	22	6	16	1.00			2	26	10	16	1.00		
	3	6	0	9	1.50	28		3	10	4	23	3.83		
1	1	38	22	3	0.20			4	4	0	60	15.00	102	
	2	22	6	16	1.00			2	42	26	3	0.20		
	3	6	0	30	5.00	49		2	26	10	16	1.00		
1 1/2	1	38	22	3	0.20			3	10	4	30	5.00		
	2	22	6	20	1.25			4	4	0	95	23.75	144	
	3	6	0	50	8.34	73		3	42	26	3	0.20		
2	1	38	22	3	0.20			2	26	10	16	1.00		
	2	22	6	30	1.88			3	10	4	50	8.34		
	3	6	0	95	15.83	128		4	4	0	120	30.00	189	
3	1	38	22	3	0.20			4	42	26	3	0.20		
	2	22	6	35	2.19			2	26	10	17	1.06		



	3	10	4	65	10.83			4	4	0	130	32.50	214
	4	4	0	130	32.50	215		4	46	30	3	0.20	
5	1	42	26	3	0.20			2	30	14	16	1.00	
	2	26	10	27	1.69			3	14	4	95	9.50	
	3	10	4	85	14.18			4	4	0	130	32.50	244
	4	4	0	130	32.50	245		5	46	30	3	0.20	
6	1	42	26	3	0.20			2	30	14	16	1.00	
	2	26	10	27	1.69			3	14	4	120	12.00	
	3	10	4	100	16.67			4	4	0	130	32.50	269
	4	4	0	130	32.50	260		6	46	30	3	0.20	
7	1	42	26	3	0.20			2	30	14	16	1.00	
	2	26	10	30	1.88			3	14	4	125	12.50	
	3	10	4	100	16.67			4	4	0	130	32.50	274
	4	4	0	130	32.50	263		7	46	30	3	0.20	
8	1	42	26	3	0.20			2	30	14	16	1.00	
	2	26	10	35	2.19			3	14	4	140	14.00	
	3	10	4	100	16.67			4	4	0	130	32.50	289
	4	4	0	130	32.50	268		8	46	30	3	0.20	
Over 8	1	42	26	3	0.20			2	30	14	16	1.00	
	2	26	10	60	3.75			3	14	4	150	15.00	
	3	10	4	100	16.67			4	4	0	130	32.50	299
	4	4	0	130	32.50	293		Over 8	46	30	3	0.20	
44	1/2	44	28	3	0.20			2	30	14	25	1.56	
	2	28	12	16	1.00			3	14	4	160	16.00	
	3	12	4	8	1.00			4	4	0	130	32.50	318
	4	4	0	16	4.00	43		48	48	32	3	0.20	
1	1	44	28	3	0.20			2	32	16	16	1.00	
	2	28	12	16	1.00			3	16	4	12	1.00	
	3	12	4	20	2.50			4	4	0	20	5.00	51
	4	4	0	25	6.25	64		1	48	32	3	0.20	
1 1/2	1	44	28	3	0.20			2	32	16	16	1.00	
	2	28	12	16	1.00			3	16	4	35	2.92	
	3	12	4	27	3.38			4	4	0	35	8.75	89
	4	4	0	72	18.00	118		1 1/2	48	32	3	0.20	
2	1	44	28	3	0.20			2	32	16	16	1.00	
	2	28	12	16	1.00			3	16	4	45	3.75	
	3	12	4	40	5.00			4	4	0	80	20.00	144
	4	4	0	95	23.75	154		2	48	32	3	0.20	
3	1	44	28	3	0.20			2	32	16	16	1.00	
	2	28	12	16	1.00			3	16	4	60	5.00	
	3	12	4	60	7.50			4	4	0	110	27.50	189
	4	4	0	120	30.00	199		3	48	32	3	0.20	
4	1	44	28	3	0.20			2	32	16	16	1.00	
	2	28	12	16	1.00			3	16	4	90	7.50	
	3	12	4	85	10.62			4	4	0	120	30.00	229
	4	4	0	130	32.50	234		4	48	32	3	0.20	
5	1	44	28	3	0.20			2	32	16	16	1.00	
	2	28	12	16	1.00			3	16	4	120	10.00	
	3	12	4	105	13.13			4	4	0	130	32.50	269
	4	4	0	130	32.50	254		5	48	32	3	0.20	
6	1	44	28	3	0.20			2	32	16	16	1.00	
	2	28	12	16	1.00			3	16	4	140	11.67	
	3	12	4	115	14.38			4	4	0	130	32.50	299
	4	4	0	130	32.50	264		6	48	32	3	0.20	
7	1	44	28	3	0.20			2	32	16	16	1.00	
	2	28	12	16	1.00			3	16	4	160	13.33	
	3	12	4	120	15.00			4	4	0	130	32.50	309
	4	4	0	130	32.50	269		7	48	32	3	0.20	
8	1	44	28	3	0.20			2	32	16	16	1.00	
	2	28	12	16	1.00			3	16	4	170	14.17	
	3	12	4	120	15.00			4	4	0	130	32.50	319
	4	4	0	130	32.50	269		8	48	32	3	0.20	
Over 8	1	44	28	3	0.20			2	32	16	16	1.00	
	2	28	12	40	2.50			3	16	4	170	14.17	
	3	12	4	120	15.00			4	4	0	130	32.50	319
	4	4	0	130	32.50	293		50	50	34	3	0.20	
46	1/2	46	30	3	0.20			2	34	18	16	1.00	
	2	30	14	16	1.00			3	18	4	14	1.00	
	3	14	4	10	1.00			4	4	0	25	6.25	58
	4	4	0	15	3.75	44		1	50	34	3	0.20	
1	1	46	30	3	0.20			2	34	18	16	1.00	
	2	30	14	16	1.00			3	18	4	40	2.86	
	3	14	4	25	2.50			4	4	0	35	8.75	94
	4	4	0	30	7.50	74		1 1/2	50	34	3	0.20	
1 1/2	1	46	30	3	0.20			2	34	18	16	1.00	
	2	30	14	16	1.00			3	18	4	55	3.93	
	3	14	4	35	3.50			4	4	0	90	22.50	164
	4	4	0	85	21.20	139		2	50	34	3	0.20	
2	1	46	30	3	0.20			2	34	18	16	1.00	
	2	30	14	16	1.00			3	18	4	70	5.00	
	3	14	4	47	4.70			4	4	0	120	30.00	209
	4	4	0	105	26.25	171		3	50	34	3	0.20	
3	1	46	30	3	0.20			2	34	18	16	1.00	
	2	30	14	16	1.00			3	18	4	100	7.15	
	3	14	4	65	6.50			4	4	0	130	32.50	249

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4	1	50	34	3	0.20	279
	2	34	18	16	1.00	
	3	18	4	130	8.58	
	4	4	0	130	32.50	
5	1	50	34	3	0.20	309
	2	34	18	16	1.00	
	3	18	4	160	11.42	
	4	4	0	130	32.50	
6	1	50	34	3	0.20	329
	2	34	18	16	1.00	
	3	18	4	180	12.85	
	4	4	0	130	32.50	

**AMENDATORY SECTION** (Amending Order 87-24, filed 11/30/87)

**WAC 296-155-775 Preparatory operations.** (1) Prior to permitting employees to start demolition operations, an engineering survey shall be made, by a competent person, of the structure to determine structural integrity and the possibility of unplanned collapse of any portion of the structure. Any adjacent structure where employees may be exposed shall also be similarly checked. The employer shall have in writing, evidence that such a survey has been performed.

(2) A copy of the survey report and of the plans and/or methods of operations shall be maintained at the job site for the duration of the demolition operation.

(3) Any device or equipment such as scaffolds, ladders, derricks, hoists, etc., used in connection with demolition work shall be constructed, installed, inspected, maintained and operated in accordance with the regulations governing the construction, installation, inspection, maintenance and operation of such device or equipment as specified in other parts of this chapter.

(4) Federal and state codes, safety standards, rules, regulations, and ordinances governing any and all phases of demolition work shall be observed at all times.

(5) Demolition of all buildings and structures shall be conducted under competent supervision, and safe working conditions shall be afforded the employees.

(6) When employees are required to work within a structure to be demolished which has been damaged by fire, flood, explosion, or other cause, the walls or floor shall be shored or braced.

(7) All electric, gas, water, steam, sewer, and other service lines shall be shut off, capped, or otherwise controlled, outside the building line before demolition work is started. In each case, any utility company which is involved shall be notified in advance.

(8) If it is necessary to maintain any power, water or other utilities during demolition, such lines shall be temporarily relocated, as necessary, and protected.

(9) It shall be determined whether asbestos, hazardous materials, hazardous chemicals, gases, explosives, flammable materials, or similarly dangerous substances are present at the work site. When the presence of any such substance is apparent or suspected, testing and removal or purging shall be performed and the hazard eliminated before demolition is started. Removal of such substances shall be in accordance with the requirements of chapters 296-62 and 296-65 WAC.

(10) Where a hazard exists from fragmentation of glass, such hazards shall be removed.

(11) Where a hazard exists to employees falling through wall openings, the opening shall be protected to a height of between thirty-six and forty-two inches.

(12) When debris is dropped without the use of chutes, the area onto which the material is dropped shall be completely enclosed with barricades not less than forty-two inches high and not less than twenty feet back from the projected edge of the opening above. Signs, warning of the hazard of falling materials, shall be posted at each level. Removal shall not be permitted in this lower area until debris handling ceases above.

(13) All floor openings, not used as material drops, shall be covered over with material substantial enough to support the weight of any load which may be imposed. Such material shall be properly secured to prevent its accidental movement.

(14) Except for the cutting of holes in floors for chutes, holes through which to drop materials, preparation of storage space, and similar necessary preparatory work, the demolition of exterior walls and floor construction shall begin at the top of the structure and proceed downward. Each story of exterior wall and floor construction shall be removed and dropped into the storage space before commencing the removal of exterior walls and floors in the story next below.

(15) (~~Workmen~~) Workers shall not be permitted to carry on a demolition operation which will expose (~~men~~) persons working on a lower level to danger.

(16) Employee entrances to multistory structures being demolished shall be completely protected by sidewalk sheds or canopies, or both, providing protection from the face of the building for a minimum of eight feet. All such canopies shall be at least two feet wider than the building entrances or openings (one foot wider on each side thereof), and shall be capable of sustaining a load of one hundred fifty pounds per square foot.

(17) Protruding nails in boards, planks and timber shall be withdrawn, driven in or bent over as soon as the same is removed from the structure being demolished.

(18) Any material to be removed which will cause dust to be formed, shall be sprinkled with water to lay the dust incidental to its removal.

**AMENDATORY SECTION** (Amending Order 74-26, filed 5/7/74, effective 6/6/74)

**WAC 296-155-785 Chutes.** (1) No material shall be dropped to any point lying outside the exterior walls of the structure unless the area is effectively protected.

(2) All materials chutes, or sections thereof, at an angle of more than 45° from the horizontal, shall be entirely enclosed, except for openings equipped with closures at or about floor level, for the insertion of materials. The openings shall not exceed 48 inches in height measured along the wall of the chute. At all stories below the top floor, such openings shall be kept closed when not in use.

(3) A substantial gate shall be installed in each chute at or near the discharge end. A competent employee shall be assigned to control the operation of the gate, and the backing and loading of trucks.

(4) When operations are not in progress, the area surrounding the discharge end of a chute shall be securely closed off.

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(5) Any chute opening, into which workers dump debris, shall be protected by a substantial guardrail between 36 and 42 inches above the floor or other surface on which the ~~((men))~~ employees stand to dump the material. Any space between the chute and the edge of openings in the floors through which it passes shall be solidly covered over.

(6) Where the material is dumped from mechanical equipment or wheelbarrows, a securely attached toeboard or bumper, not less than 4 inches thick and 6 inches high, shall be provided at each chute opening.

(7) Chutes shall be designed and constructed of such strength as to eliminate failure due to impact of materials or debris loaded therein.

**AMENDATORY SECTION** (Amending Order 74-26, filed 5/7/74, effective 6/6/74)

**WAC 296-155-800 Manual removal of floors.** (1) Openings cut in a floor shall extend the full span of the arch between supports.

(2) Before demolishing any floor arch, debris and other material shall be removed from such arch and other adjacent floor area. Planks not less than 2 inches by 10 inches in cross section, full size undressed, shall be provided for, and shall be used by employees to stand on while breaking down floor arches between beams. Such planks shall be so located as to provide a safe support for the ~~((workmen))~~ workers should the arch between the beams collapse. The open space between planks shall not exceed 16 inches.

(3) Safe walkways, not less than 18 inches wide, formed of planks not less than 2 inches thick if wood, or of equivalent strength if metal, shall be provided and used by ~~((workmen))~~ workers when necessary to enable them to reach any point without walking upon exposed beams.

(4) Stringers of ample strength shall be installed to support the flooring planks, and the ends of such stringers shall be supported by floor beams or girders, and not by floor arches alone.

(5) Planks shall be laid together over solid bearings with the ends overlapping at least 1 foot.

(6) When floor arches are being removed, employees shall not be allowed in the area directly underneath, and such an area shall be barricaded to prevent access to it.

(7) Demolition of floor arches shall not be started until they, and the surrounding floor area for a distance of 20 feet, have been cleared of debris and any other unnecessary materials.

**AMENDATORY SECTION** (Amending Order 74-26, filed 5/7/74, effective 6/6/74)

**WAC 296-155-955 Minimum performance criteria for rollover protective structures for designated scrapers, loaders, dozers, graders, and crawler tractors.** (1) Definitions. For purposes of this section, "vehicle weight" means the manufacturer's maximum weight of the prime mover for rubber-tired self-propelled scrapers. For other types of equipment to which this section applies, "vehicle weight" means the manufacturer's maximum recommended weight of the vehicle plus the heaviest attachment.

(2) General.

(a) This section prescribes minimum performance criteria for rollover protective structures (ROPS) for rubber-

tired self-propelled scrapers; rubber-tired front-end loaders and rubber-tired dozers; crawler tractors, and crawler-type loaders, and motor graders. The vehicle and ROPS as a system shall have the structural characteristics prescribed in subsection (7) of this section for each type of machine described in this subsection.

(b) Equipment listed in subsection (2)(a) of this section may be exempted from the requirements for fitment of ROPS where it can be shown, to the satisfaction of the department, that the equipment will only be used where no rollover hazard will exist.

(3) The static laboratory test prescribed herein will determine the adequacy of the structures used to protect the operator under the following conditions:

(a) For rubber-tired self-propelled scrapers, rubber-tired front-end loaders, and rubber-tired dozers: Operating between 0 and 10 miles per hour over hard clay where rollover would be limited to a maximum roll angle of 360° down a slope of 30° maximum.

(b) For motor graders: Operating between 0 and 10 miles per hour over hard clay where rollover would be limited to 360° down a slope of 30° maximum.

(c) For crawler tractors and crawler-type loaders: Operating between 0 and 10 miles per hour over hard clay where rollover would be limited to a maximum roll angle of 360° down a slope of 45°.

(4) Facilities and apparatus.

(a) The following material is necessary:

(i) Material, equipment, and tiedown means adequate to ensure that the ROPS and its vehicle frame absorb the applied energy.

(ii) Equipment necessary to measure and apply loads to the ROPS. Adequate means to measure deflection and lengths should also be provided.

(iii) Recommended, but not mandatory, types of test setups are illustrated in Figure V-1 for all types of equipment to which this section applies; and in Figure V-2 for rubber-tired self-propelled scrapers; Figure V-3 for rubber-tired front-end loaders, rubber-tired dozers, and motor graders; and Figure V-4 for crawler tractors and crawler-type loaders.

(b) Table V-1 contains a listing of the required apparatus for all types of equipment described in subsection (2)(a) of this section.

**TABLE V-1**

Means to measure	Accuracy
Deflection of ROPS, inches	± 5% of deflection measured.
Vehicle weight, pounds	± 5% of the weight measured.
Force applied to frame, pounds	± 5% of force measured.
Dimensions of critical zone, inches.	± 0.5 in.

(5) Vehicle condition. The ROPS to be tested must be attached to the vehicle structure in the same manner as it will be attached during vehicle use. A totally assembled vehicle is not required. However, the vehicle structure and frame which support the ROPS must represent the actual

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vehicle installation. All normally detachable windows, panels, or nonstructural fittings shall be removed so that they do not contribute to the strength of the ROPS.

(6) Test procedure. The test procedure shall include the following, in the sequence indicated:

(a) Energy absorbing capabilities of ROPS shall be verified when loaded laterally by incrementally applying a distributed load to the longitudinal outside top member of the ROPS, as shown in Figure V-1, V-2 or V-3 as applicable. The distributed load must be applied so as to result in approximately uniform deflection of the ROPS. The load increments should correspond with approximately 0.5 in. ROPS deflection increment in the direction of the load application, measured at the ROPS top edge. Should the operator's seat be off center, the load shall be applied on the off center side. For each applied load increment, the total load (lb.) versus corresponding deflection (in.) shall be plotted, and the area under the load-deflection curve shall be calculated. This area is equal to the energy (in.-lb.) absorbed by the ROPS. For a typical load-deflection curve and calculation method, see Figure V-5.

Incremental loading shall be continued until the ROPS has absorbed the amount of energy and the minimum applied load specified under subsection (7) of this section has been reached or surpassed.

(b) To cover the possibility of the vehicle coming to rest on its top, the support capability shall be verified by applying a distributed vertical load to the top of the ROPS so as to result in approximately uniform deflection (see Figure V-1). The load magnitude is specified in subsection ((6)) (7)(b)(iii) of this section.

(c) The low temperature impact strength of the material used in the ROPS shall be verified by suitable material tests or material certification (see subsection (7)(b)(iv) of this section).

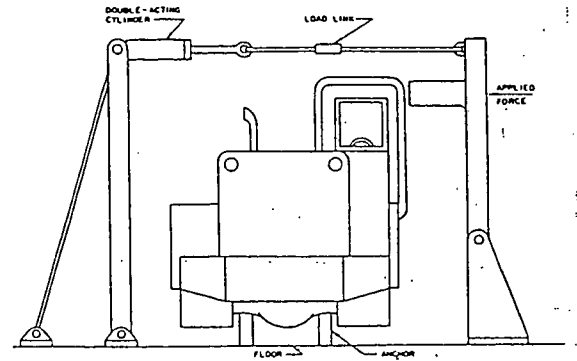


FIGURE V-2

Test setup for rubber-tired self-propelled scrapers.

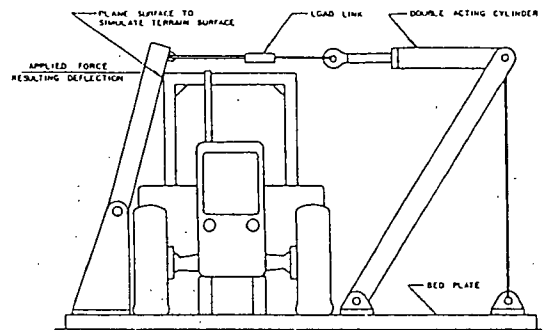


FIGURE V-3

Test setup for rubber-tired front-end loaders, rubber-tired dozers, and motor graders.

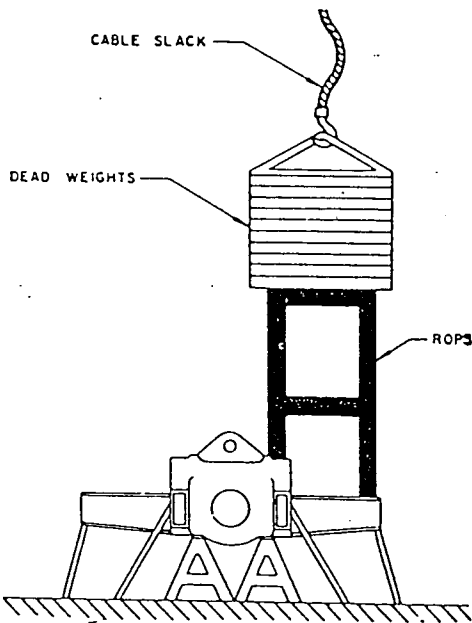


FIGURE V-1

Vertical loading setup for all types of equipment described in WAC 296-155-955(1).

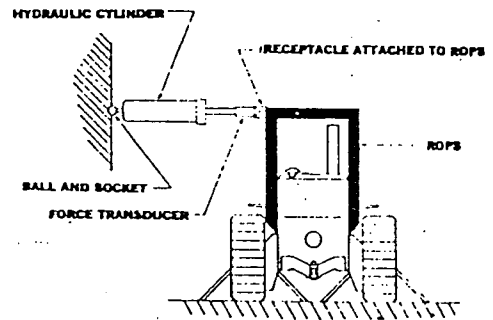


FIGURE V-4

Side-loading setup for crawler tractors and crawler loaders.

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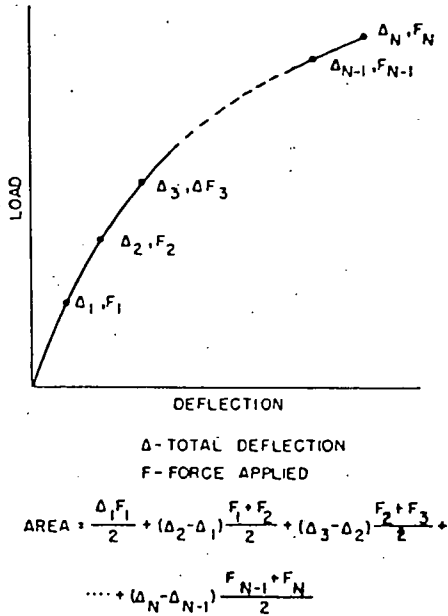


FIGURE V-5

Determination of energy area under force deflection curve for all types of ROPS equipment defined in WAC 296-155-955.

(7) Performance requirements.

(a) General performance requirements.

(i) No repairs or straightening of any member shall be carried out between each prescribed test.

(ii) During each test, no part of the ROPS shall enter the critical zone as detailed in SAE J397 (1969). Deformation of the ROPS shall not allow the plane of the ground to enter this zone.

(b) Specific performance requirements.

(i) The energy requirement for purposes of meeting the requirements of subsection (6)(a) of this section is to be determined by referring to the plot of the energy ((~~versus~~)) versus weight of vehicle (see Figure V-6 for rubber-tired self-propelled scrapers; Figure V-7 for rubber-tired front-end loaders and rubber-tired dozers; Figure V-8 for crawler tractors and crawler-type loaders; and Figure V-9 for motor graders. For purposes of this section, force and weight are measured as pounds; energy (U) is measured as inch-pounds).

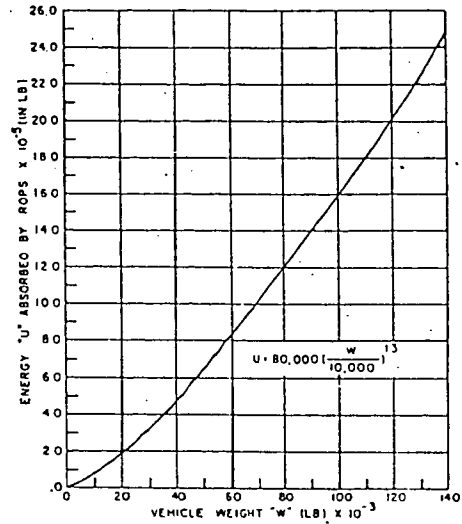


FIGURE V-6

Energy absorbed versus vehicle weight.

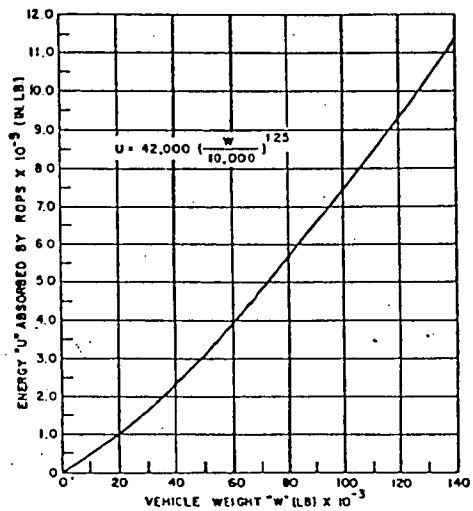


FIGURE V-7

Energy absorbed versus vehicle weight.

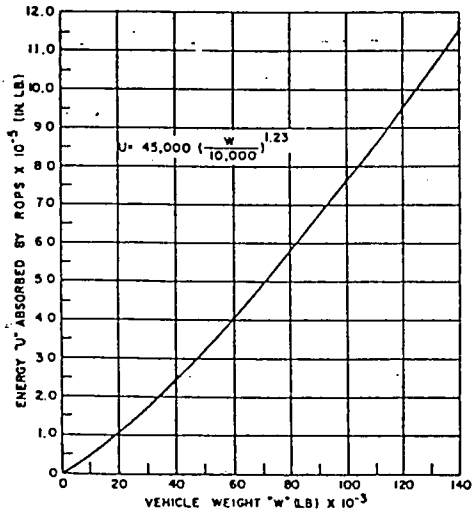


FIGURE V-8

Energy absorbed versus vehicle weight.

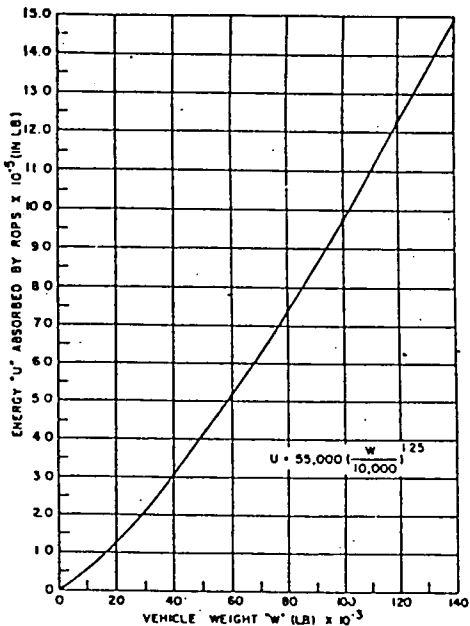


FIGURE V-9

Energy absorbed versus vehicle weight.

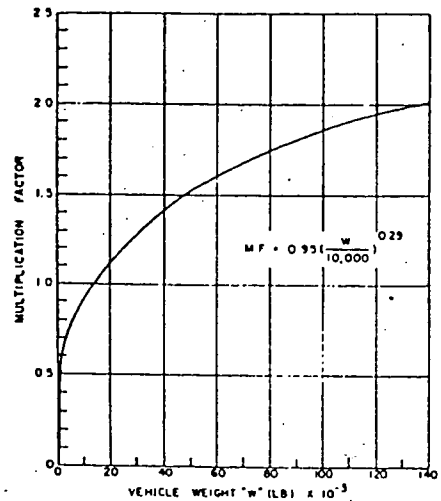


FIGURE V-10

Minimum horizontal load factor for self-propelled scrapers.

(ii) The applied load must attain at least a value which is determined by multiplying the vehicle weight by the corresponding factor shown in Figure V-10 for rubber-tired self-propelled scrapers; in Figure V-11 for rubber-tired front-end loaders and rubber-tired dozers; in Figure V-12 for crawler tractors and crawler-type loaders; and in Figure V-13 for motor graders.

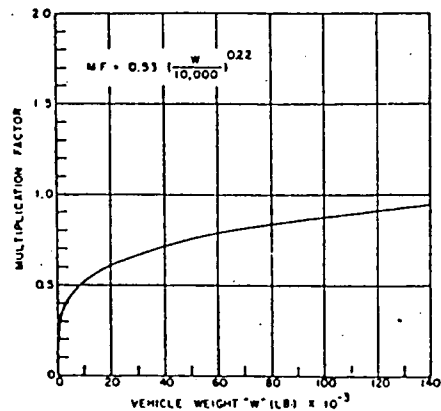


FIGURE V-11

Minimum horizontal load factor for rubber-tired loaders and dozers.

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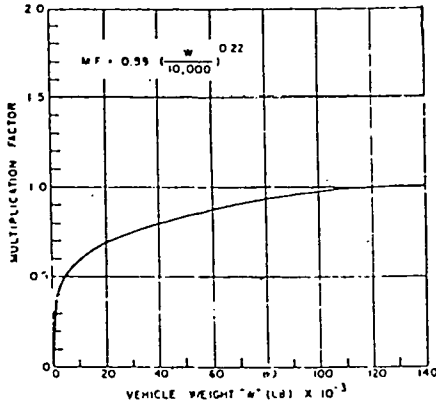


FIGURE V-12

Minimum horizontal load factor for crawler tractors and crawler-type loaders.

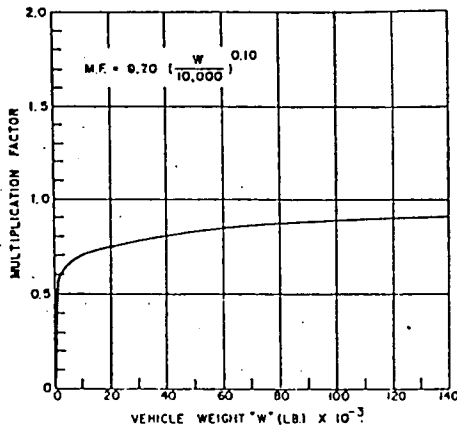


FIGURE V-13

Minimum horizontal load factor for motor graders.

(iii) The load magnitude for purposes of compliance with subsection (6)(b) of this section is equal to the vehicle weight. The test of load magnitude shall only be made after the requirements of subdivision (b)(i) of this subsection are met.

(iv) Material used in the ROPS must have the capability of performing at zero degrees Fahrenheit, or exhibit Charpy V notch impact strength of 8 foot-pounds at minus 20° Fahrenheit. This is a standard Charpy specimen as described in American Society of Testing and Materials A 370, Methods and Definitions for Mechanical Testing of Steel Products. The purpose of this requirement is to reduce the tendency of brittle fracture associated with dynamic loading, low temperature operation, and stress raisers which cannot be entirely avoided on welded structures.

(8) Source of standard. This standard is derived from, and restates, the following Society of Automotive Engineers Recommended Practices: SAE J320a, Minimum Performance Criteria for Roll-Over Protective Structure for Rubber-Tired, Self-Propelled Scrapers; SAE J394, Minimum Performance Criteria for Roll-Over Protective Structure for Rubber-Tired Front- End Loaders and Rubber-Tired Dozers; SAE J395, Minimum Performance Criteria for Roll-Over Protective Structure for Crawler Tractors and Crawler-Type Loaders; and SAE J396, Minimum Performance Criteria for

Roll-Over Protective Structure for Motor Graders. These recommended practices shall be resorted to in the event that questions of interpretation arise. The recommended practices appear in the 1971 SAE Handbook, which may be examined in each of the district offices of the (~~division of industrial safety and health of the~~) department of labor and industries.

AMENDATORY SECTION (Amending Order 80-20, filed 11/13/80)

**WAC 296-350-010 Definitions.** (1) The definitions and interpretations of RCW 49.17.020 shall apply to the provisions of this chapter unless the context of the provision clearly requires otherwise.

(2) "Presiding officer" means that person designated by the director as being responsible for the conducting of the informal conference provided for in RCW 49.17.140(3) and WAC 296-350-070.

(3) "Act" means the Washington Industrial Safety and Health Act (chapter 80, Laws of 1973; chapter 49.17 RCW) as now or hereafter amended.

(4) "Assistant director" shall mean the assistant director of (~~industrial safety and health~~) consultation and compliance of the department, or his/her designated representative.

(5) "Citation" shall mean that CITATION issued to an employer in accordance with the provisions of RCW 49.17.120, otherwise known as a CITATION AND NOTICE. (Form No. WISHERS-110.)

(6) "Abatement date" shall mean the date identified as such on the CITATION. The "abatement date" is the date by which the condition identified in the CITATION must be brought into compliance with the cited safety and health standard.

(7) "Division" shall mean the division of (~~industrial safety and health~~) consultation and compliance of the department.

AMENDATORY SECTION (Amending Order 90-01, filed 4/10/90, effective 5/25/90)

**WAC 296-350-030 Notice of appeal—Filing and service.** Any party authorized to appeal from an action of the department as set forth in RCW 49.17.140(3), may do so by filing a notice of appeal in writing in the recommended manner and containing the recommended subject matter as hereinafter set forth with fifteen working days of the communication of the notice, by serving a copy of such notice of appeal either in person or by mail upon the assistant director of the Division of (~~Industrial Safety and Health, 805 Plum Street South East~~) Consultation and Compliance, P.O. Box 44600, Olympia, Washington 98504-4600.

AMENDATORY SECTION (Amending Order 75-14, filed 4/14/75)

**WAC 296-350-040 Notice of appeal—Contents.** In order to expedite the decision of the department as to whether to reassume jurisdiction over the subject matter of the appeal and in order to facilitate the certification of the notice of appeal and department file to the board of industrial insurance appeals, if appropriate, the notice of appeal should contain:

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(1) The name and address of the appealing party and his/her representative, if any;

(2) The place where the alleged safety violation occurred;

(3) A statement identifying the order, decision or citation appealed from by report number and date of issuance.

(4) The grounds upon which the appealing party considers such order, decision or citation to be unjust or unlawful;

(5) A statement of facts in support of each ground stated;

(6) The relief sought, including the specific nature and extent;

(7) A statement that the person signing the notice of appeal has read it and to the best of his/her knowledge, information and belief there is good ground to support it. A notice of appeal may be signed by the party or by his/her authorized representative.

**AMENDATORY SECTION** (Amending Order 86-27, filed 7/25/86)

**WAC 296-350-050 Reassumption of jurisdiction—Time—Notice of reassumption of jurisdiction and informal conference.** After receipt of a notice of appeal filed pursuant to RCW 49.17.140(3), and these rules, the department after investigation of the allegations contained in the notice of appeal, and not later than five working days from the date of receipt of such notice of appeal, shall make a determination to reassume jurisdiction over the subject matter of the appeal or, in the alternative, certify the record of the department which is the subject of appeal to the board of industrial insurance appeals along with such notice of appeal. If the department determines to reassume jurisdiction over the subject matter of the appeal, a **notice of reassumption of jurisdiction** and a **notice of informal conference** shall be issued giving notice that jurisdiction has been reassumed and that an opportunity will be afforded to all appealing parties as well as other interested parties as prescribed in RCW 49.17.140(3), to participate in an informal conference and that any redetermination and corrective notices will be completed not later than thirty working days (that may be extended an additional fifteen working days upon agreement of all parties to the appeal) following the date that the determination to reassume jurisdiction was made. The notice of informal conference shall give notice of the time, date and place at which such informal conference is to be conducted. The **notice of reassumption of jurisdiction and informal conference** may be combined on one document and issued as a single notice.

**AMENDATORY SECTION** (Amending Order 75-14, filed 4/14/75)

**WAC 296-350-070 Reassumption of jurisdiction—Informal conferences—Procedure—Evidence.** (1) The director shall designate personnel of the staff of the division of ~~((industrial safety and health))~~ consultation and compliance to act as presiding officers at informal conferences.

(2) A presiding officer shall be present and preside over the proceedings at all informal conferences conducted. He/she may be accompanied by an assistant attorney general

who shall be able to render legal advice to the presiding officer. The assistant attorney general may, at the presiding officer's request, preside over the proceedings.

(3) Prior to the commencement of the informal conference, the presiding officer may confer with the parties to the informal conference concerning the material to be presented for the record in order to determine an orderly method of procedure. The designated presiding officer may admit and give probative effect to evidence which possesses probative value commonly accepted by reasonably prudent ~~((men))~~ persons in the conduct of their affairs. Effect shall be given to the rules of privilege recognized by law. The presiding officer may exclude incompetent, irrelevant, immaterial and unduly repetitious evidence. Documentary evidence may be received in the form of copies of excerpts or by incorporation in the record by reference. Every party shall have the right to ask questions of other parties present. The designated presiding officer may take notice of judicially cognizable facts and in addition may take notice of general, technical, or scientific facts within the specialized knowledge of the department's officers relating to industrial safety and health.

**AMENDATORY SECTION** (Amending Order 75-14, filed 4/14/75)

**WAC 296-350-200 Variances—Foreword.** WAC 296-350-200 through 296-350-280 contain rules pursuant to which employers may apply for departmental orders granting variances from industrial safety and health standards in accordance with the provisions of RCW 49.17.080 and 49.17.090. Also included are rules on procedures to be followed by the director or his/her authorized representatives following the receipt of such an application for an order granting a variance.

**AMENDATORY SECTION** (Amending Order 75-14, filed 4/14/75)

**WAC 296-350-210 Types of orders granting a variance.** (1) Section 8 (RCW 49.17.080) and section 9 (RCW 49.17.090) of the Washington Industrial Safety and Health Act (chapter 80, Laws of 1973) provide for the granting of two types of orders granting a variance from industrial safety and health standards administered according to that chapter.

(2) RCW 49.17.080 authorizes the issuance of an order granting a variance (temporary) from any safety and health standard promulgated under the authority of the act upon proper application by the employer and sufficient showing by the applicant employer that the applicant employer is unable to comply with a safety and health standard because of unavailability of professional or technical personnel or materials and equipment needed to come into compliance with the safety and health standard or because necessary construction or alteration of facilities cannot be accomplished by the effective date of the standard, and that the employer is taking all available steps to safeguard his/her employees against the hazards covered by the safety and health standard and that the employer has an effective program for coming into compliance with the safety and health standard as quickly as practicable.

(3) RCW 49.17.090 authorizes the issuance of an order granting a variance (permanent) from any safety and health

standard promulgated under the authority of the act upon proper application by the employer and sufficient showing by the applicant employer that the conditions, practices, means, methods, operations or processes used or proposed to be used by such applicant employer will provide employment and places of employment to his/her employees which are as safe and healthful as those which would prevail if the employer complied with the safety and health standard or standards from which the variance is sought.

AMENDATORY SECTION (Amending Order 75-14, filed 4/14/75)

**WAC 296-350-230 Effect of variances.** All variances granted pursuant to the provisions of this chapter shall have only future effect. In his/her discretion, the director or his/her authorized representative may decline to entertain an application for a variance on a subject or issue concerning which a citation has been issued to the employer involved and a proceeding on the citation or a related issue concerning a proposed penalty or period of abatement is pending before the board of industrial insurance appeals, or an appropriate court, until the completion of such proceeding.

AMENDATORY SECTION (Amending Order 75-14, filed 4/14/75)

**WAC 296-350-240 Variance applications—Form of documents—Subscription.** (1) No particular form is prescribed for applications and other papers which may be filed in proceedings relating to the application for an order granting a variance. However, any applications and other papers shall be clearly legible. Department forms for application for a variance may be used and may be obtained from the Division of (~~Industrial Safety and Health~~) Consultation and Compliance, Department of Labor and Industries, P.O. Box 44600 Olympia, Washington 98504-4600; or other offices of that division.

(2) Each application or other paper which is filed in proceedings relating to the application for an order granting a variance under this chapter shall be subscribed by the person filing the same or by his/her attorney or other authorized representative.

AMENDATORY SECTION (Amending Order 75-14, filed 4/14/75)

**WAC 296-350-250 Order granting a temporary variance—Application.** (1) Application for a temporary variance. Any employer(~~(-or class of employers;)~~) desiring a variance from a standard, or portion thereof, authorized by section 8 of the act (RCW 49.17.080) may file a written application containing the information specified in this section with the (~~Supervisor of Industrial Safety and Health~~) Assistant director of the division of Consultation and Compliance, P.O. Box (~~(207)~~) 44600, Olympia, Washington 98504-4600.

(2) Contents. An application filed pursuant to subsection (1) of this section shall include:

(a) The name(~~((s))~~) and address(~~((es))~~) of the applicant (~~(or applicants)~~);

(b) The address(~~((es))~~) of the place (~~(or places)~~) of employment involved;

(c) A specification of the standard or portion thereof from which the applicant(~~((s))~~) seek(~~((t))s((h))~~) a variance; to include a reference to the appropriate code section or sections;

(d) A representation by the applicant(~~((s))~~) supported by representations from a qualified person or persons having firsthand knowledge of the facts represented, that he (~~((they))~~)/she is (~~((are))~~) unable to comply with the standard(~~((s))~~) or portion(~~((s))~~) thereof by its effective date and a detailed statement of the reasons therefor;

(e) A statement of the steps the applicant(~~((s))~~) has (~~((have))~~) taken and will take, with specific dates where appropriate, to protect employees against the hazard covered by the standard;

(f) A statement of when the applicant(~~((s))~~) expect(~~((t))s((h))~~) to be able to comply with the standard and of what steps he (~~((they))~~)/she has (~~((have))~~) taken and will take, with specific dates where appropriate, to come into compliance with the standard;

(g) A statement of the facts the applicant(~~((s))~~) would show to establish that:

(i) The applicant(~~((s))~~) is (~~((are))~~) unable to comply with a standard by its effective date because of unavailability of professional or technical personnel or materials and equipment needed to come into compliance with the standard or because necessary construction or alteration of facilities cannot be completed by the effective date of the standard from which the variance is sought;

(ii) He (~~((they))~~)/she is (~~((are))~~) taking all available steps to safeguard (~~(his)~~) their employees against the hazards covered by the standard; and

(iii) He (~~((they))~~)/she has (~~((have))~~) an effective program for coming into compliance with the standard as quickly as practicable;

(h) Any request for a hearing, as provided in WAC 296-350-280;

(i) A statement that the applicant(~~((s))~~) has (~~((have))~~) informed (~~(his-)~~)their(~~(h))~~) affected employees of the application by giving a copy thereof to their authorized representative, posting a statement, giving a summary of the application and specifying where a copy may be examined, at the place or places where notices to employees are normally posted, and by other appropriate means; and

(j) A description of how affected employees have been informed of the application and of their right to petition the director for a hearing.

AMENDATORY SECTION (Amending Order 80-20, filed 11/13/80)

**WAC 296-350-255 Order granting a permanent variance—Application.** (1) Application for a permanent variance. Any employer(~~(-or class of employers;)~~) desiring a variance authorized by section 9 of the act (RCW 49.17.090) may file a written application containing the information specified in this section with the assistant director of (~~Industrial Safety and Health~~) Consultation and Compliance, P.O. Box (~~(207)~~) 44600, Olympia, Washington 98504-4600.

(2) Contents. An application filed pursuant to subsection (1) of this section shall include:

(a) The name(~~((s))~~) and address(~~((es))~~) of the applicant (~~(or applicants)~~);

(b) The address(~~((es))~~) of the place (~~(or places)~~) of employment involved;

(c) A specification of the standard or portion thereof from which the applicant(~~((s))~~) seek(~~((t))s~~(~~((t))~~) a variance; to include a reference to the appropriate code section or sections;

(d) A description of the conditions, practices, means, methods, operations, or processes used or proposed to be used by the applicant (~~(or applicants)~~);

(e) A statement showing how the conditions, practices, means, methods, operations, or processes used or proposed to be used would provide employment and places of employment to employees which are as safe and healthful as those required by the standard from which a variance is sought;

(f) A certification that the applicant(~~((s))~~) has (~~((have))~~) informed his/her (~~((their))~~) employees of the application by:

(i) Giving a copy thereof to their authorized representative;

(ii) Posting a statement giving a summary of the application and specifying where a copy may be examined, at the place or places where notices to employees are normally posted (or in lieu of such summary, the posting of the application itself); and

(iii) By other appropriate means.

(g) Any request for a hearing, as provided in WAC 296-350-280; and

(h) A description of how employees have been informed of the application and of their right to petition the director for a hearing.

AMENDATORY SECTION (Amending Order 75-14, filed 4/14/75)

**WAC 296-350-260 Interim order—Application—Notice of grant.** (1) An application may also be made for an interim order to be effective until a decision is rendered on the application for the variance filed previously or concurrently. An application for an interim order may include statements of fact and arguments as to why the order should be granted. The director or his/her authorized representatives may rule ex parte upon the application.

(2) If an interim order is granted, a copy of the order shall be served upon the applicant(~~((s))~~) for the order and other parties. It shall be a condition of the order that the employer(~~((s))~~) shall give notice thereof to affected employees by the same means to be used to inform them of an application for a variance.

AMENDATORY SECTION (Amending Order 80-20, filed 11/13/80)

**WAC 296-350-280 Hearings on applications for variances—Temporary and permanent.** (1) Any affected employee or employees, or an authorized representative of affected employees may request of the assistant director of (~~(industrial safety and health)~~) consultation and compliance that a hearing be held on the application for a temporary or permanent variance.

(2) The employer applicant(~~((s))~~) or his/her (~~((their))~~) representative may request of the assistant director of (~~(industrial safety and health)~~) consultation and compliance

that a hearing be held on the application for a temporary or permanent variance.

(3) Requests for hearings authorized by section 8 and 9 of the act (RCW 49.17.080 and 49.17.090) and subsections (1) and (2) of this section shall be in writing, signed by the applicant(~~((s))~~), and must be received by the assistant director of (~~(industrial safety and health)~~) consultation and compliance within twenty-one calendar days of the date of the application for a variance.

(4) After receipt of a request for a hearing filed pursuant to these rules, the department, not later than ten working days from the date of the receipt of such request, shall issue a notice of hearing advising that the opportunity will be afforded to all interested parties as prescribed in this section to participate in a hearing on the application for a variance. The notice of hearing shall fix the time for such hearing, such that the affected parties can reasonably be expected to receive the NOTICE OF HEARING not less than twenty days in advance of the date set for the hearing, and shall indicate the time, date and place at which such hearing is to be conducted. Such notice of hearing shall be immediately communicated to affected employees by giving a copy thereof to their authorized representative and posting a copy thereof with the application for a variance or a summary of said application as prescribed in WAC 296-350-250 (2)(i) or (2)(f). In addition to the forwarding of the notice of hearing, the department may give telephonic or telegraphic notice of the time, date and place for any such hearing.

(5) The director shall designate department personnel (~~(of the staff of the division of industrial safety and health)~~) to act as presiding officers at hearings on applications for variances.

(6) The duties of the presiding officer include but are not limited to the following:

(a) A presiding officer shall be present and preside over the proceedings at all hearings conducted. He/she may be accompanied by an assistant attorney general who shall be able to render legal advice to the presiding officer. The assistant attorney general may, at the presiding officer's request, preside over the proceedings.

(b) Prior to the commencement of the hearing, the presiding officer may confer with the parties attending the hearing concerning the material to be presented for the record in order to determine an orderly method of procedure. The designated presiding officer may admit and give effect to evidence which possesses probative value commonly accepted by reasonably prudent people in the conduct of their affairs. Effect shall be given to the rules of privilege recognized by law. The presiding officer may exclude incompetent, irrelevant, immaterial and unduly repetitious evidence. Documentary evidence may be received in the form of copies of exhibits or by incorporation in the record by reference. Every party shall have the right to ask questions of other parties present. The designated presiding officer may take notice of judicially cognizable facts, and in addition may take notice of general, technical or scientific facts within the specialized knowledge of the department's officers relating to industrial safety and health.

(c) All proceedings relating to a hearing under this section shall be recorded mechanically or otherwise. Copies of transcripts of such recordings will be made available to any party at cost upon request of the party.

AMENDATORY SECTION (Amending Order 75-14, filed 4/14/75)**WAC 296-350-350 Extension of abatement date(s)—**

**Application—Authority.** All sections of this chapter which include WAC 296-350-350 in the section number apply to the request of extension of abatement dates in accordance with the provisions of RCW 49.17.140(3), which reads in pertinent part:

"Upon application by an employer showing that a good faith effort to comply with the abatement requirements of a citation has been made and that the abatement has not been completed because of factors beyond his/her control, the director after affording an opportunity for a hearing shall issue an order affirming or modifying the abatement requirements in such citation."

AMENDATORY SECTION (Amending Order 80-20, filed 11/13/80)

**WAC 296-350-35010 Application for extension of abatement date(s).** Applications for extensions of abatement dates shall be submitted in writing by the employer, or his/her representative, whose workplace is the subject of the citation containing the abatement date for which the extension(s) is (are) sought. Subject to the provisions of WAC 296-350-35015, applications received by telephone or personal nonwritten communication may be acted upon by the assistant director.

AMENDATORY SECTION (Amending Order 82-22, filed 6/11/82)

**WAC 296-350-35055 Extension of abatement date(s)—Hearings.** (1) The assistant director shall designate department personnel (~~(of the staff of the division of industrial safety and health)~~) to act as hearing officers at hearings on applications for extension of abatement date(s).

(2) A hearing officer shall be present and preside over the proceedings at all hearings conducted. The hearing officer may be accompanied by an assistant attorney general who shall be able to render legal advice to the hearing officer. The assistant attorney general may, at the hearing officer's request, preside over the proceedings.

(3) Prior to the commencement of the hearing, the hearing officer may confer with the parties attending the hearing concerning the material to be presented for the record in order to determine an orderly method of procedure.

(4) The provisions of chapter 34.04 RCW are applicable to hearings conducted pursuant to the provisions of this section.

(5) All proceedings relating to a hearing under this section shall be recorded mechanically or otherwise. Copies of transcripts of such recordings will be made available to any parties involved, upon request therefore and payment of the reasonable costs thereof.

AMENDATORY SECTION (Amending Order 91-07, filed 11/22/91, effective 12/24/91)

**WAC 296-350-400 Posting of notices—Posting of citation and notice—Availability of act and applicable standards.** (1) Definitions. The definitions of WAC 296-350-010 and 296-27-020 shall apply to this section.

(2) Each employer shall post and keep posted a notice or notices (the WISHA poster, Job safety and health protection, F416-081-000) to be furnished by the division of (~~industrial safety and health~~) consultation and compliance, department of labor and industries, informing employees of the protections and obligations provided for in the act and that for assistance and information, including copies of the act, and of specific safety and health standards employees should contact the employer or the nearest office of the department of labor and industries. Such notice or notices shall be posted by the employer at each establishment in a conspicuous place or places where notices to employees are customarily posted. Each employer shall take steps to assure that such notices are not altered, defaced or covered by other material.

(3) The notice identified in subsection (2) of this section shall be posted in each establishment of the employer as defined in WAC 296-27-020(8).

(4) All notices required to be posted by provisions of the act, provisions of this chapter or the provisions of any other safety and health standard, rule or regulation adopted pursuant to the authority of the act, shall be posted as required by this section, or as required by the act, or as required by the provision of the applicable safety and health standard, rule or regulation.

(5) Unless otherwise specified in this section, the act, or the applicable safety and health standard, rule or regulation, notices or other materials required to be posted, shall be posted in each establishment of the employer, as defined in WAC 296-27-020(8).

(6) Copies of the act, all regulations published in this chapter and all applicable standards shall be available at all regional offices of the (~~division of industrial safety and health~~) department of labor and industries. If an employer has obtained copies of these materials, he/she shall make them available upon request to any employee or his/her authorized representative on the same day the request is made, or at the earliest time mutually convenient to the employee or his/her authorized representative and the employer, for review by the requesting employee or authorized representative.

(7) Any employer failing to comply with the provisions of this section shall be subject to citation and penalty in accordance with the provisions of section 12 and 18 of the act. (RCW 49.17.120 and 49.17.180.)

(8) Documents required to be posted include, but shall not be limited to the following:

(a) A copy or copies of an application or applications for a variance or variances from any safety and health standards applied for in accordance with RCW 49.17.080 or 49.17.090 shall be posted at each establishment to which the variance, if granted, will apply. The manner of posting such applications shall be in accordance with subsections (4) and (5) of this section.

(b) Upon receipt of any **citation and notice** issued by the department pursuant to RCW 49.17.120 or 49.17.130, the employer shall immediately post the **citation and notice** or a copy thereof in a prominent place at or near each place a violation referred to in the **citation and notice** occurred. Where, because of the nature of the employer's operations, it is not practicable to post the **citation and notice** or a copy thereof at or near each place of violation, the **citation and**

notice or a copy thereof shall be posted in the establishment of the employer, as defined in WAC 296-27-020(8).

The posted **citation and notice** or copy thereof shall be complete and shall not be abstracted, edited or otherwise changed from the original. The posted **citation and notice** or copy thereof shall be readily visible, and shall not be defaced or covered by other material.

The **citation and notice** or copy thereof shall remain posted as required by this subsection until all violations have been abated, or for three working days, whichever is longer. Whenever an employer verifies abatement of a violation in writing, see WAC 296-27-16009, a copy of the written verification shall be posted with the **citation and notice** for at least three working days.

(c) A copy of the notice of filing of appeal pursuant to RCW 49.17.140, the notice of conference pursuant to WAC 263-12-090, and the notice of hearing pursuant to WAC 263-12-100 shall be posted by the employer at each establishment to which the notices apply in a conspicuous place or places where notices to employees are customarily posted. The manner of posting such notices shall be in accordance with subsections (4) and (5) of this section.

(d) In the event that a proposed agreement settling an appeal of a citation and notice to the board of industrial insurance appeals is reached between the employer and the department without the concurrence of the affected employees or employee groups, a copy of the proposed agreement shall be posted by the employer at each establishment to which the agreement applies in a conspicuous place or places where notices to employees are customarily posted. The agreement shall be posted for 10 days before it is filed with the board of industrial insurance appeals. The manner of posting shall be in accordance with subsections (4) and (5) of this section.

(e) Notices required to be posted by specific provisions of any safety and health standard or other rule or regulation duly adopted by the director shall be posted according to the standard, rule or regulation requiring such posting. If the provision containing the requirement for posting does not specify the manner of posting, such posting shall conform to the requirements of subsections (4) and (5) of this section.

**AMENDATORY SECTION** (Amending Order 75-14, filed 4/14/75)

**WAC 296-350-450 Complaints by employees or their representatives.** (1) Any employee or representative of employees who in good faith believes that a violation of any safety or health standard or an imminent danger exists in any workplace where such employee is employed may request an inspection of such workplace by giving notice of the alleged violation or danger to any office or officer of the division of ~~((industrial safety and health))~~ **consultation and compliance** of the department. Any such notice shall be reduced to writing, shall set forth with reasonable particularity the grounds for the notice, and shall be signed by the employee or representative of employees. A copy shall be provided the employer or his/her agent by an officer of the division no later than at the time of inspection, if any, except that upon the request of the person giving such notice, his/her name and the names of individual employees referred to therein shall not appear in such copy or on any record published,

released, or made available by the department of labor and industries.

(2) If upon receipt of such notification it is determined that the complaint meets the requirements set forth in subsection (1) of this section, and that there are reasonable grounds to believe that the alleged violation or danger exists, an inspection shall be made as soon as practicable, to determine if such alleged violation or danger exists. Inspections under this section may extend beyond the matters referred to in the complaint.

(3) Prior to or during any inspection of a workplace, any employee or representative of employees employed in such workplace may notify the inspector, in writing, of any violation of the act or safety or health standard he/she has reason to believe exists in such workplace. Any such notice shall comply with the requirements of subsection (1) of this section.

(4) RCW 49.17.160(1) provides: "No person shall discharge or in any manner discriminate against any employee because such employee has filed any complaint or instituted or caused to be instituted any proceeding under or related to this chapter or has testified or is about to testify in such proceeding or because of the exercise of such employee on behalf of himself or others of any right afforded by this chapter."

**AMENDATORY SECTION** (Amending Order 80-20, filed 11/13/80)

**WAC 296-350-460 Complaints—Inspection not warranted—Informal review.** (1) If it is determined that an inspection is not warranted because there are no reasonable grounds to believe that a violation or danger exists with respect to a complaint received pursuant to WAC 296-350-450, the complaining party shall be notified in writing of such determination. The complaining party may obtain informal review of such determination by submitting a written statement of position with the assistant director ~~((of industrial safety and health))~~ requesting such review. Upon the request of the complaining party, the assistant director ~~((of industrial safety and health))~~ or his/her designee, at his/her discretion, may hold an informal conference in which the complaining party may present his/her views orally or in writing. After considering all written and oral views presented, the assistant director ~~((of industrial safety and health))~~ or his/her designee shall affirm, modify, or reverse the original determination and furnish the complaining party with written notification of his/her decision and the reasons therefor.

(2) If the assistant director ~~((of industrial safety and health))~~ or his/her designee, determines that an inspection is not warranted because the requirements of WAC 296-350-460(1) have not been met, he/she shall notify the complaining party in writing of such determination. Such determination shall be without prejudice to the filing of a new complaint meeting the requirements of WAC 296-350-460(1).

**AMENDATORY SECTION** (Amending Order 80-20, filed 11/13/80)

**WAC 296-350-470 Citation not issued following complaint.** (1) If a citation or notice of de minimis violations is issued for a violation alleged in a request for

inspection under WAC 296-350-450(3), a copy of the citation or notice of de minimis violations shall also be sent to the employee or representative of employees who gave such notification.

(2) After an inspection, if it is determined that a citation is not warranted with respect to a danger or violation alleged to exist in a request for inspection under WAC 296-350-360(1), or a notification of violation under WAC 296-350-450(3), the informal review procedures prescribed in WAC 296-350-460(1) shall be applicable. After considering all views presented, the assistant director (~~(of industrial safety and health)~~) or his/her designee, shall affirm the determination, order a reinspection, or issue a citation if he/she believes that the inspection disclosed a violation.

(3) The assistant director (~~(of industrial safety and health)~~) or his/her designee shall furnish the complaining party and the employer with written notification of his/her determination and the reasons therefor.

AMENDATORY SECTION (Amending Order 87-24, filed 11/30/87)

**WAC 296-350-500 Citation and notice—Copy to employee representative.** (1) RCW 49.17.120 provides in pertinent part

"The director shall provide by rule for procedures to be followed by an employee representative upon written application to receive copies of **citations and notices** issued to any employer having employees who are represented by such employee representative. Such rule may prescribe the forms of such application, the time for renewal of applications, and the eligibility of the applicant to receive copies of **citations and notices**."

(2) "Employee representative" means:

(a) Any officer of the recognized bargaining agent of employees, acting on behalf of the employees of the employer.

(b) Any employee representative of an employer-employee safety committee within an establishment or the firm of the employer.

(c) Any employee of an employer who has been selected by the employees of that employer to act as their representative for the purposes indicated in subsection (1) of this section. Such selection shall be evidenced by a letter or other written communication to the division of (~~(industrial safety and health)~~) consultation and compliance stating the name of the employee so selected and signed by not less than one-half of the employees of the employer so represented.

(3) An employee representative may receive copies of **citations and notices** issued to any employer having employees who are represented by such employee representative upon the filing of a complete application Form F418-023-000, a facsimile of which constitutes Appendix A of this section, with the Division of (~~(Industrial Safety and Health)~~) Consultation and Compliance, Department of Labor and Industries, P.O. Box 44600 Olympia, Washington 98504-4600.

(4) In the event that the director or his/her authorized representative finds that application for copies of the **citation**

**and notice** have been received by more than one employee representative of the same employees of the employer, the director or his/her authorized representative may elect which of the applicants to which the copies of the **citation and notice** shall be sent.

(5) The director or his/her authorized representative may deny an application for copies of **citations and notices** upon finding that the applicant is not an employee representative as defined in subsection (2) of this section or upon finding that more than one employee representative of the same employees has applied for copies of **citations and notices**.

(6) An application for copies of **citations and notices** may be granted for a period not exceeding one year and may be renewed upon re-application for another one year period. The director or his/her authorized representative may, at the request of the applicant, waive the one year limitation.

(7) Upon the granting of the application for copies of **citations and notices**, the applicant shall be informed of the granting and of the date on which that grant shall expire.

AMENDATORY SECTION (Amending Order 80-21, filed 11/13/80)

**WAC 296-360-005 Definitions.** For the purposes of this chapter.

(1) "Assistant director" - the assistant director for the division of (~~(industrial safety and health)~~) consultation and compliance.

(2) "Division" - the division of (~~(industrial safety and health)~~) consultation and compliance of the department of labor and industries.

AMENDATORY SECTION (Amending Order 85-09, filed 4/19/85)

**WAC 296-360-040 Notification of assistant director's determination.** (1) RCW 49.17.160(3) provides that the assistant director is to notify a complainant within ninety days of the complaint of his determination whether prohibited discrimination has occurred. This ninety-day provision is directory, not mandatory. Although every effort will be made to notify complainants of the assistant director's determination within ninety days, there may be instances when it is not possible to do so.

(2) If a complainant receives a determination from the assistant director that prohibited discrimination has not occurred, the complainant may file a written request for review by the director within fifteen working days of receipt of the determination. The request for review must set forth the basis for the request. The request shall be filed by mailing or delivering the request to the Director of Labor and Industries, (~~(General Administration Building)~~) P.O. Box 44000, Olympia, Washington 98504-4000. Upon review the director may set aside the assistant director's determination, remand the matter for further investigation, or affirm the determination of the assistant director. The director shall notify the complainant of the decision after review.

AMENDATORY SECTION (Amending Order 80-21, filed 11/13/80)

**WAC 296-360-050 Withdrawal of complaint.** Enforcing the provisions of RCW 49.17.160 is not only a matter of protecting rights of individual employees, but also of protecting the public interest. Attempts by an employee to withdraw a filed complaint will not necessarily result in termination of the division's investigation. The division's jurisdiction cannot be foreclosed as a matter of law by unilateral action of the employee. However, a voluntary and uncoerced request from a complainant to withdraw his/her complaint shall generally be accepted.

AMENDATORY SECTION (Amending Order 80-21, filed 11/13/80)

**WAC 296-360-080 Persons protected by RCW 49.17.160.** (1) All employees are afforded the full protection of RCW 49.17.160. WISHA defines an employee as "an employee of an employer who is employed in a business of his/her employer which affects commerce." RCW 49.17.020(4). WISHA does not define "employ"; however, the broad remedial nature of WISHA demonstrates a clear intent that the existence of an employment relationship, for purposes of RCW 49.17.160, is to be based upon economic realities rather than upon common law doctrines and concepts. See *U.S. v. Silk*, 331 U.S. 704 (1947); *Rutherford Food Corporation v. McComb*, 331 U.S. 722 (1947).

(2) For purposes of RCW 49.17.160, an applicant for employment could be considered an employee. See *NLRB v. Lamar Creamery*, 246 F.2d 8 (5th Cir., 1957).

AMENDATORY SECTION (Amending Order 80-21, filed 11/13/80)

**WAC 296-360-090 Unprotected activities distinguished.** (1) An employer or others may base actions that adversely affect an employee upon nondiscriminatory grounds. An employee's engagement in activities protected by WISHA does not automatically render him/her immune from discharge or discipline for legitimate reasons, or from adverse action dictated by nonprohibited considerations. See *NLRB v. Dixie Motor Coach Corp.* 128 F.2d 201 (5th Cir., 1942).

(2) To establish a violation of RCW 49.17.160, the employee's engagement in protected activity need not be the sole consideration behind discharge or other adverse action. If protected activity was a substantial reason for the action, or if the discharge or other adverse action would not have taken place "but for" the employee's engagement in protected activity, RCW 49.17.160 has been violated.

AMENDATORY SECTION (Amending Order 80-21, filed 11/13/80)

**WAC 296-360-140 Discrimination because of exercise of right afforded by WISHA—Walkaround pay.** Employee participation in walkaround inspections under RCW 49.17.100 is essential. Employees are a vital source of information to the ((safety)) division about work place hazards. Employees must be able freely to exercise their statutory right to participate in walkarounds without fear of economic loss, such as the denial of pay for the time spent

helping WISHA inspectors during the walkaround. To ensure the unimpeded flow of information to the inspectors, and the unfettered statutory right of employees to participate in walkaround inspections, an employer's failure to pay employees for time they spend in walkaround inspections is discrimination under RCW 49.17.160. In addition, an employer's failure to pay employees for time spent in other inspection-related activities, such as answering questions of inspectors or participating in the opening and closing conferences, is discrimination under RCW 49.17.160.



**WSR 94-15-004**  
**NOTICE OF PUBLIC MEETINGS**  
**BUILDING CODE COUNCIL**

[Memorandum—June 17, 1994]

The National Energy Policy Act of 1992 (EPA 92) directs that every state review their energy codes (residential and nonresidential) and determine equivalence with national model codes. The final determination for both the residential and nonresidential energy codes must be completed by October 1994. To comply with this federal law, Washington state is required to make this determination:

- (A) after public notice and hearing;
- (B) in writing;
- (C) based upon findings included in such determination and upon the evidence presented at the hearing; and
- (D) available to the public.

The public hearing is scheduled for Friday, August 12, 1994, at 9:00 a.m., at the SeaTac Marriott, 3201 South 176th Street, SeaTac, WA 98188.

**Residential Energy Code**

The EPA 92 directs each state to certify to the U.S. Secretary of Energy that it has reviewed the provisions of its residential building code regarding energy efficiency and to determine whether it is appropriate to revise the residential building code provisions to meet or exceed the Council of American Building Officials (CABO) 1992 Model Energy Code (MEC).

**Nonresidential Energy Code**

The EPA 92 also requires each state to certify to the secretary that it has reviewed and updated the provisions of its commercial building code regarding energy efficiency. The certification must include a demonstration that the code provisions meet or exceed the requirements of the American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE) Standard 90.1-1989.

**WSR 94-15-016**  
**NOTICE OF PUBLIC MEETINGS**  
**CONVENTION AND TRADE**  
**CENTER**

[Memorandum—July 8, 1994]

Pursuant to board action on June 15, 1994, the following changes were made to the board's 1994 regular meeting schedule.

The regular meeting scheduled for Wednesday, July 20 will begin at 11:00 a.m. (and not at 1:30 p.m. as originally planned).

An additional regular meeting will be held on Thursday, August 4 at 2:00 p.m. The original schedule adopted by the board last year did not include an August meeting.

**1994 Regular Meetings of the Board of Directors**

Wednesday,  
 January 12  
 February 23  
 March 23

April 20  
 May 18  
 June 15  
 July 20, 11:00 a.m.  
 Thursday, August 4, 2:00 p.m.  
 September 14  
 October 19  
 November 16  
 December 21

Unless otherwise noted, all meetings will begin at 1:30 p.m. and will be held at the Washington State Convention and Trade Center, 800 Convention Place, in downtown Seattle.

**WSR 94-15-017**  
**NOTICE OF PUBLIC MEETINGS**  
**WASHINGTON STATE LIBRARY**

[Memorandum—July 8, 1994]

On Thursday, July 28, 1994, at 10:00 a.m., the Public Information Access Policy Taskforce will meet on Thursday, July 28, 1994, at the Legislative Meeting Room at SeaTac, Washington.

**WSR 94-15-018**  
**NOTICE OF PUBLIC MEETINGS**  
**WASHINGTON STATE LIBRARY**

(Library Commission)  
 [Memorandum—July 8, 1994]

On Thursday, August 4, 1994, at 9:00 a.m., the Washington State Library Commission will meet for a staff workshop at the WestCoast SeaTac Hotel, Parlor Room #512, SeaTac, Washington.

**WSR 94-15-025**  
**NOTICE OF PUBLIC MEETINGS**  
**SOUTH PUGET SOUND**  
**COMMUNITY COLLEGE**

[Memorandum—July 7, 1994]

At their July 7, 1994, meeting, the board of trustees of Community College District 24, scheduled a board study session on Wednesday, August 24, 1994, 8:00 a.m. to 10:00 a.m. in the boardroom of Building 25 on our campus.

If you have any questions, please contact 754-7711, ext. 202.

**WSR 94-15-027**  
**NOTICE OF PUBLIC MEETINGS**  
**DEPARTMENT OF**  
**GENERAL ADMINISTRATION**

[Memorandum—July 11, 1994]

Please record, in the Washington State Register, a change in one of the scheduled meeting dates of the Capitol Campus Design Advisory Committee. The previously posted date is

Thursday, August 18. The date has been changed to Thursday, September 8.

The meeting will begin at 9:00 a.m. in Room 214, General Administration Building.

**WSR 94-15-042**  
**RULES COORDINATOR**  
**CENTRALIA COLLEGE**  
 [Filed July 15, 1994, 9:45 a.m.]

Stephen L. Ward, Dean of Administration, is the rules coordinator for Centralia College, District 12.

Henry P. Kirk  
 President

**WSR 94-15-040**  
**NOTICE OF PUBLIC MEETINGS**  
**CONVENTION AND TRADE**  
**CENTER**

[Memorandum—July 13, 1994]

The Art Advisory Committee of the Washington State Convention and Trade Center will meet on Monday, July 18, 1994, at 11:30 a.m. in Room 310 of the Convention Center, 800 Convention Place, Seattle.

A regular meeting of the Washington State Convention and Trade Center board of directors will be held on Wednesday, July 20, 1994, at 11:00 a.m. in Room 310 of the Convention Center.

If you have any questions regarding these meetings, please call 447-5000.

**WSR 94-15-051**  
**NOTICE OF PUBLIC MEETINGS**  
**INTERAGENCY COMMITTEE**  
**FOR OUTDOOR RECREATION**  
 [Memorandum—July 15, 1994]

Regular Meeting  
 July 27-29, 1994  
 The Best Western Summit Inn  
 Snoqualmie Pass, Washington

Note: Sessions will commence as shown, all other times are approximate. If you need special accommodations to participate in this meeting, please call us by July 20 at (206) 902-3000 or TDD (206) 902-1996.

Wednesday, July 27		Location: Summit Meeting Room 2	
2:00-6:00		Work Session Regarding WWRP 1995-97 Issues (a) Second Year Funding (Notebook Item #10) (b) Distribution of Unallocated Funds (Notebook Item #10) (c) Target Numbers for 1995-97 and 10-year Outlook	Panel and IAC Staff
Thursday, July 28			
7:30 a.m.-5:15 p.m.		Field Trip, Snoqualmie Pass and East King County area	
6:00 p.m.-9:00 p.m.		(Optional) Cle Elum No-host dinner and U.S. Forest Service presentation	
Friday, July 29		Location: Summit Meeting Room 1	
8:00 a.m.-8:30	Item #1	Call to Order Determination of Quorum Introduction of Officials, Guests, and Designees Approval of IAC Minutes - March 24-25, 1994 Review and approval of agenda - July 29, 1994	Eliot Scull  Laura Eckert
8:30-9:00	Item #2	Management and Status Reports (a) Director's Report (b) Financial and Management Services (c) Planning Services (d) Project Services	Laura Eckert Debra Wilhelmi Greg Lovelady Eric Johnson
9:00-9:10	Item #3	Reallocation of Returned WWRP Funds <i>Action: Adopt Resolution #94-11</i>	Eric Johnson
9:10-10:15	Item #4	WAC Rule Hearing <i>Action: Staff Briefing and Receive Testimony</i>	Greg Lovelady

MISCELLANEOUS

10:15- 10:30	Break	
10:30- 10:45	Item #5 Init. 215 Direct Appropriation <i>Action: Adopt Resolution #94-12</i>	Debra Wilhelmi
10:45- 11:45	Item #6 Legislative Package #1 (a) Agency Name Change (b) Committee Composition (c) Initiative 215 Allocation (d) Establishing Marine Recreation & NOVA Projects Accounts (e) Re-codifications and Related Issues <i>Action: Adopt Resolution #94-13</i>  Legislative Package #2 (a) NOVA Fund Distribution <i>Action: Approve Resolution #94-14</i>	Jim Fox
11:45 1:00 p.m.	Lunch	
1:00- 1:30	Item #7 Operating Budget Overview and Briefing <i>Action: Adopt Resolution #94-15</i>	Debra Wilhelmi
1:30- 2:00	Item #8 Capital Budget Overview and Briefing 215 NOVA FRP LWCF <i>Action: Adopt Resolution #94-16</i>	Debra Wilhelmi
2:00- 2:15	Item #9 (a) Approve 95-97 WWRP Request Level <i>Action: Adopt Resolution #94-17</i>  (b) Funding Stewardship of State Lands <i>Action: Adopt Resolution #94-18</i>	Debra Wilhelmi
2:15 2:45	Item #10 Discuss WWRP Allocation Method and "Second Year" <i>Action: Adopt Resolution #94-19</i>	Laura Eckert/ Jim Fox
2:45 3:00	Break	
3:00- 3:15	Item #11 WWRP Planning Deadlines/Growth Management <i>Action: Staff Presentation</i>	Laura Eckert
3:15- 3:45	Item #12 Init. 215 Program Review Update <i>Action: Staff Presentation</i>	Jim Eychaner/ Jim Fox
3:45- 4:00	Item #13 30th Anniversary Celebration <i>Action: Discussion</i>	Laura Eckert
4:00- 4:15	Item #14 WAC Rule Adoption <i>Action: Adopt Resolution #94-20</i>	Greg Lovelady
4:15- 5:00	Item #15 Public Comment/Open Session <i>Action: Adopt Appreciation Resolutions #94-21 through 28</i>  Adjourn	Laura Eckert

MISCELLANEOUS

Next Meeting: September 26-27, 1994, Nendel's Inn, Tukwila, Washington.

**WSR 94-15-059**  
**NOTICE OF PUBLIC MEETINGS**  
**EASTERN WASHINGTON UNIVERSITY**  
 [Memorandum—July 18, 1994]

BOARD OF TRUSTEES  
 July 22, 1994, 9:00 a.m.  
 Spokane Center, Second Floor Mall

Breakfast, which is open to the public, will be served to board members prior to the meeting at 8:00 a.m. in Room 222 on the Second Floor of the Spokane Center.

Eastern Washington University strives to satisfy all requests for special access needs for persons with disabilities. Requests for such accommodation are welcome and may be made by calling President's Office, 359-2371.

**WSR 94-15-060**  
**ATTORNEY GENERAL OPINION**  
**Cite as: AGO 1994 No. 9**  
 [July 7, 1994]

**INSURANCE—HEALTH INSURANCE—INSURANCE COMMISSIONER—**Coordination of benefits in cases of dual insurance coverage

1. RCW 48.21.200, as amended, does not require a secondary insurer to pay the full policy amount to an insured who has dual or multiple coverage, whether the policies in question are individual or group policies.
2. In enacting amendments to RCW 48.21.200, the Legislature intended to allow insurers to reduce overall health insurance cost by coordinating benefits in cases of dual or multiple coverage, subject to implementing regulations to be adopted by the insurance commissioner.

Requested by:

Honorable Deborah Senn  
 Insurance Commissioner  
 Insurance Building, MS 40255  
 Olympia, WA 98504-0255

**WSR 94-15-074**  
**DEPARTMENT OF ECOLOGY**  
 [Filed July 19, 1994, 12:24 p.m.]

STATEWIDE DAIRY WASTE GENERAL DISCHARGE  
 PERMIT  
 PUBLIC NOTICE OF FINAL PERMIT ISSUANCE  
 August 3, 1994

The Washington Department of Ecology (ecology) has made a determination to issue a final dairy waste general discharge permit to satisfy requirements of the federal Clean Water Act, state Water Pollution Control Act and state Dairy Waste Management Act.

A list of all Washington state commercial dairy farms is available. The permit will apply statewide to commercial dairy farms classified as a concentrated dairy animal feeding operation under RCW 90.64.010(3), determined to be a

significant contributor of pollution under RCW 90.64.020 or 90.64.030, or meeting the definition of a concentrated animal feeding operation under 40 CFR 122.23, Appendix B. Generally, such farms discharge manure or wastewater directly to surface or ground waters of the state or are significant contributors of pollutants. Commercial dairy farms are facilities engaged in the commercial production of milk from dairy cows.

A tentative determination to issue the permit and announcement of the public comment period and hearings was provided in the state register on May 18, 1994. No significant changes have been made to the terms or conditions of the permit.

The permit is to be issued on August 10, 1994, and become effective on September 3, 1994. Farms the permit applies to that require coverage must submit an application within 90 days of permit issuance. An application may be obtained by contacting the appropriate ecology regional office below:

Department of Ecology  
 Northwest Regional Office  
 Water Quality Program  
 3190 160th Avenue S.E.  
 Bellevue, WA. 98008-5452  
 Attn: Carla Skog  
 (206) 649-7201

Department of Ecology  
 Water Quality Program  
 Central Regional Office  
 106 South 6th Avenue  
 Yakima, WA 98902-3387  
 Attn: Charlie McKinney  
 (509) 575-2397

Department of Ecology  
 Southwest Regional Office  
 Water Quality Program  
 Abbot Raphael Hall  
 St. Martins Campus  
 P.O. Box 47775  
 Olympia, WA 98504-7775  
 Attn: Holly Francis  
 (206) 407-6280

Department of Ecology  
 Eastern Regional Office  
 Water Quality Program  
 North 4601 Monroe  
 Suite 202  
 Spokane, WA 99205-1295  
 Attn: Jim Jacobson  
 (509) 456-3287

The terms and conditions of the permit may be appealed only by filing an appeal with the Pollution Control Hearings Board and by serving it upon the Department of Ecology within thirty days. The process for doing so is contained in RCW 43.21B.310.

Additional information may be obtained by contacting the Washington Department of Ecology, Water Quality Program,

P.O. Box 47600, Olympia, WA 98504-7600, Attn: Philip A. KauzLoric, (206) 407-6413, or (206) 407-6006 (TDD).

**WSR 94-15-085**  
**NOTICE OF PUBLIC MEETINGS**  
**HUMAN RIGHTS COMMISSION**

[Memorandum—July 20, 1994]

The Washington State Human Rights Commission will hold its August regular commission meeting in Seattle, Washington, on August 25, 1994. The meeting will be held at the Bank of California Building, Conference Room 2400, 900 Fourth Avenue, Seattle, WA, beginning at 9:00 a.m.

**WSR 94-15-087**  
**NOTICE OF PUBLIC MEETINGS**  
**EDMONDS COMMUNITY COLLEGE**

[Memorandum—July 20, 1994]

**BOARD OF TRUSTEES MEETING**  
July 21, 1994  
Sno-King Room 103  
(4:30 - 6:30)

The facilities for this meeting are free of mobility barriers and interpreters for deaf individuals and braille or taped information for blind individuals will be provided upon request when adequate notice is given.

**WSR 94-15-088**  
**NOTICE OF PUBLIC MEETINGS**  
**UNIVERSITY OF WASHINGTON**

[Memorandum—July 15, 1994]

At the direction of Mari J. Clack, president of the board of regents, at the meeting of the board on July 15, 1994, and with the concurrence of the members of the board and of Dr. William P. Gerberding, president of the university, the meeting of the board of regents scheduled for August 19, 1994, is cancelled.

The next regular meeting of the board will be held as scheduled on September 16, 1994.

MISCELLANEOUS



**WSR 94-15-010**  
**EMERGENCY RULES**  
**WASHINGTON STATE PATROL**

[Filed July 8, 1994, 10:32 a.m.]

Date of Adoption: July 8, 1994.

Purpose: Amend rule to clarify standards for motorcycle helmets.

Citation of Existing Rules Affected by this Order: Amending WAC 204-10-040 Motorcycle helmets.

Statutory Authority for Adoption: RCW 46.37.005, 46.37.530.

Pursuant to RCW 34.05.350 the agency for good cause finds that immediate adoption, amendment, or repeal of a rule is necessary for the preservation of the public health, safety, or general welfare, and that observing the time requirements of notice and opportunity to comment upon adoption of a permanent rule would be contrary to the public interest.

Reasons for this Finding: Recent state court decision found possibility for confusion regarding the federal standards outlined in RCW for motorcycle helmets. Amendment will clarify those standards for the public.

Effective Date of Rule: Immediately.

July 8, 1994  
 Roger W. Bruett  
 Chief

[AMENDATORY SECTION (Amending Order 91-008, filed 11/1/91)]

**WAC 204-10-040 Motorcycle helmets.** (1) The Washington State Patrol has hereby adopted by reference, Federal Motor Vehicle Safety Standard 218 (49 C.F.R. Sec. 571.218) is hereby adopted by reference as the standard for motorcycle helmets.

(2) Motorcycle helmets are to meet the following Federal Motor Vehicle Safety Standard 218, labeling requirements. Each helmet shall be labeled permanently and legibly, in a manner such that the label(s) can be read easily without removing padding or any other permanent part, with the following:

(a) Manufacturer's name or identification.

(b) Precise model designation.

(c) Size.

(d) Month and year of manufacture. This may be spelled out (e.g. June 1988), or expressed in numeral (e.g. 6/99).

(e) The symbol DOT, constituting the manufacturer's certification that the helmet conforms to the applicable Federal Motor Vehicle Safety Standard. This symbol shall appear on the outer surface, in a color that contrasts with the background, in letters at least three-eighths inch (one centimeter) high.

(f) Instructions to the purchaser as follows:

(i) "Shell and liner constructed on (identify type(s) of materials)."

(ii) "Helmet can be seriously damaged by some common substances without damage being visible to the user. Apply only the following: (Recommended cleaning agents, paints, adhesives, etc., as appropriate)."

(iii) "Make no modifications. Fasten helmet securely. If helmet experiences a severe blow, return it to the manufacturer for inspection, or destroy it and replace it."

(iv) Any additional relevant safety information should be applied at the time of purchase by means of an attached tag, brochure, or other suitable means.

(3) If a motorcycle helmet meeting the above federal requirements is to be equipped with an electronic device for transmitting sound, the speaker portion, affixed to the helmet, must not enter or completely block the ear canals.

**Reviser's note:** The bracketed material preceding the section above was supplied by the code reviser's office.

**Reviser's note:** RCW 34.05.395 requires the use of underlining and deletion marks to indicate amendments to existing rules. The rule published above varies from its predecessor in certain respects not indicated by the use of these markings.

**Reviser's note:** The typographical errors in the above section occurred in the copy filed by the agency and appear in the Register pursuant to the requirements of RCW 34.08.040.

**WSR 94-15-013**  
**EMERGENCY RULES**  
**DEPARTMENT OF ECOLOGY**  
 (Water Resources Program)

[Order 94-15—Filed July 8, 1994, 4:40 p.m.]

Date of Adoption: July 8, 1994.

Purpose: This emergency rule amends chapter 173-548 WAC elevating group domestic water systems to receive the same consideration as single domestics provided specified conservation requirements are met.

Citation of Existing Rules Affected by this Order: Amending chapter 173-548 WAC, Water resources program in the Methow Valley River Basin, WRIA 48.

Statutory Authority for Adoption: Chapters 34.05, 43.21A, 43.27A, and 90.54 RCW.

Pursuant to RCW 34.05.350 the agency for good cause finds that immediate adoption, amendment, or repeal of a rule is necessary for the preservation of the public health, safety, or general welfare, and that observing the time requirements of notice and opportunity to comment upon adoption of a permanent rule would be contrary to the public interest.

Reasons for this Finding: The existing regulation encourages the development of single domestic water systems to the detriment of water and associated resources because these wells are not subject to established instream flows. A citizens advisory group established under the Chelan agreement and comprised of water users has recommended group domestic water systems receive the same consideration as single domestic systems in the water right permitting process. They recommended ecology act as soon as possible to prevent further proliferation of single domestic wells and the associated deterioration in water quantity. The local committee's recommendation to ecology has been taken as the expression of the public interest.

Effective Date of Rule: Immediately.



July 8, 1994  
 Mary Riveland  
 Director

**AMENDATORY SECTION** (Amending Order DE 76-37, filed 12/28/76)

**WAC 173-548-010 General provision.** These rules, including any subsequent additions and amendments, apply to waters within and contributing to the Methow River basin, WRIA 48 (see WAC 173-500-040). Chapter 173-500 WAC, the general rules of the department of ecology for the implementation of the comprehensive water resources program, applies to this chapter 173-548 WAC.

These requirements for new small group domestic water systems were developed and approved by the Methow Valley Water Resources Pilot Planning Project and recommended to the department of ecology as the basis for a rule change. This group is comprised of caucuses which represent the various water interests and users in the Methow Valley. Their recommendation on the elevation in priority of new small group domestic water systems in Chapter 173-548 WAC is taken as an expression of the public interest.

**NEW SECTION**

**WAC 173-548-015 Definitions.** For the purposes of this chapter the following definitions shall apply:

"**Exempt well(s)**" includes those well(s) providing water to one or several houses, up to a maximum of 5,000 gallons per day

"**Open space**" means land within or related to a development, not individually owned (undivided interest), which remains undeveloped (except for approved trails and accessory structures) and that is dedicated to one or more of the following purposes: Historical/architectural preservation, wildlife habitat, agriculture or recreation.

"**Planned development(s)**" are served by a small group domestic water system as defined in this section and means any development consistent with local plan review, and uses no more than 5,000 gallons per day.

"**Small Group Domestic**" shall include those water systems which provide water to planned developments, are exempt from the permit requirement of RCW 90.44.050, and are owned or controlled by an incorporated homeowners association and managed in accordance with state-defined water management practices.

This definition includes "group domestics", "domestic public water supply systems", "planned development water systems", and other such similar systems described in similar terms.

**AMENDATORY SECTION** (Amending Order DE 76-37, filed 12/28/76)

**WAC 173-548-030 Future allocations—Reservation of surface water for beneficial uses.** (1) The department determines that there are surface waters available for appropriation from the stream management units specified in the amount specified in cubic feet per second (cfs) during the time specified as follows:

(a) Maximum surface water available for future allocation from the indicated reach is as follows:

Month	Lower Methow	Middle Methow	Upper Methow	Methow Headwaters	Early Winters Creek	Chewack River	Twisp River
Oct.	95	50	44	15	29	09	14
Nov.	116	101	46	06	21	10	15
Dec.	112	99	44	17	26	10	15
Jan.	50	36	26	08	19	03	09
Feb.	51	37	29	09	19	04	10
Mar.	147	139	80	38	19	24	18
Apr.	565	590	273	336	35	118	148
May	2,922	2,927	784	412	403	809	703
Jun.	3,116	2,853	1,017	1,249	294	1,292	890
Jul.	965	877	583	608	189	308	298
Aug.	214	192	203	109	94	70	70
Sep.	62	55	76	33	47	23	26

All figures in cubic feet per second.

(b) The control station for each reach is defined in WAC 173-548-020.

(c) The appropriation limit is set forth to be an amount equal to the one in two year natural reach discharge on a monthly basis for all management reaches except Early Winters Creek. The appropriation limit for Early Winters Creek is set forth to be an amount equal to the estimated natural mean monthly streamflow for that stream.

(2) The amounts of water referred to in WAC 173-548-030(1) above are allocated for beneficial uses in the future as follows:

(a) Allocation of surface waters by use category (April through September):

Use Description	Apr.	May	Jun.	Jul.	Aug.	Sep.
<b>Lower Methow</b>						
Single Domestic, Small Group Domestic, and Stock Use	2.0	2.0	2.0	2.0	2.0	2.0
Base Flow	860	1,940	2,220	800	300	300
Public Water Supply, Irrigation, and Other Uses	Remaining waters up to the appropriation limit set forth in WAC 173-548-030 (1)(c)					
<b>Middle Methow</b>						
Single Domestic, Small Group Domestic and Stock Use	2.0	2.0	2.0	2.0	2.0	2.0
Base Flow	650	1,500	1,500	500	220	220
Public Water Supply, Irrigation, and Other Uses	Remaining waters up to the appropriation limit set forth in WAC 173-548-030 (1)(c)					
<b>Upper Methow</b>						
Single Domestic, Small Group Domestic, and Stock Use	2.0	2.0	2.0	2.0	2.0	2.0
Base Flow	300	690	790	240	100	100
Public Water Supply, Irrigation, and Other Uses	Remaining waters up to the appropriation limit set forth in WAC 173-548-030 (1)(c)					
<b>Methow Headwaters</b>						
Single Domestic, Small Group Domestic, and Stock Use	2.0	2.0	2.0	2.0	2.0	2.0

EMERGENCY

Base Flow	90	430	1,160	180	32	32
Public Water Supply, Irrigation, and Other Uses	Remaining waters up to the appropriation limit set forth in WAC 173-548-030 (1)(c)					
<u>Early Winters Creek</u>						
Single Domestic, Small Group Domestic, and Stock Use	2.0	2.0	2.0	2.0	2.0	2.0
Base Flow	23	108	290	45	8.0	11.0
Public Water Supply, Irrigation, and Other Uses	Remaining waters up to the appropriation limit set forth in WAC 173-548-030 (1)(c)					
<u>Chewack River</u>						
Single Domestic, Small Group Domestic, and Stock Use	2.0	2.0	2.0	2.0	2.0	2.0
Base Flow	140	290	320	110	47	47
Public Water Supply, Irrigation, and Other Uses	Remaining waters up to the appropriation limit set forth in WAC 173-548-030 (1)(c)					
<u>Twisp River</u>						
Single Domestic, Small Group Domestic, and Stock Use	2.0	2.0	2.0	2.0	2.0	2.0
Base Flow	100	300	440	130	27	27
Public Water Supply, Irrigation, and Other Uses	Remaining waters up to the appropriation limit set forth in WAC 173-548-030 (1)(c)					

(b) Allocation of surface waters by use category (October through March):

Use Description	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.
<u>Lower Methow</u>						
Single Domestic and Small Group Domestic, Stock Use	2.0	2.0	2.0	2.0	2.0	2.0
Base Flow	425	425	350	350	350	350
Public Water Supply, Irrigation, and Other Uses	Remaining waters up to the appropriation limit set forth in WAC 173-548-030 (1)(c)					
<u>Middle Methow</u>						
Single Domestic and Small Group Domestic, Stock Use	2.0	2.0	2.0	2.0	2.0	2.0
Base Flow	320	320	260	260	260	260
Public Water Supply, Irrigation, and Other Uses	Remaining waters up to the appropriation limit set forth in WAC 173-548-030 (1)(c)					
<u>Upper Methow</u>						
Single Domestic and Small Group Domestic, Stock Use	2.0	2.0	2.0	2.0	2.0	2.0
Base Flow	150	150	120	120	120	120
Public Water Supply, Irrigation, and Other Uses	Remaining waters up to the appropriation limit set forth in WAC 173-548-030 (1)(c)					

<u>Methow Headwaters</u>						
Single Domestic and Small Group Domestic, Stock Use	2.0	2.0	2.0	2.0	2.0	2.0
Base Flow	60	60	42	42	42	42
Public Water Supply, Irrigation, and Other Uses	Remaining waters up to the appropriation limit set forth in WAC 173-548-030 (1)(c)					
<u>Early Winters Creek</u>						
Single Domestic and Small Group Domestic, Stock Use	2.0	2.0	2.0	2.0	2.0	2.0
Base Flow	15	15	10	10	10	10
Public Water Supply, Irrigation, and Other Uses	Remaining waters up to the appropriation limit set forth in WAC 173-548-030 (1)(c)					
<u>Chewack River</u>						
Single Domestic and Small Group Domestic, Stock Use	2.0	2.0	2.0	2.0	2.0	2.0
Base Flow	68	68	56	56	56	56
Public Water Supply, Irrigation, and Other Uses	Remaining waters up to the appropriation limit set forth in WAC 173-548-030 (1)(c)					
<u>Twisp River</u>						
Single Domestic, Small Group Domestic, and Stock Use	2.0	2.0	2.0	2.0	2.0	2.0
Base Flow	45	45	34	34	34	34
Public Water Supply, Irrigation, and Other Uses	Remaining waters up to the appropriation limit set forth in WAC 173-548-030 (1)(c)					

All figures in cubic feet per second.

(c) Allocations presented in this section do not limit the utilization of waters stored for later release, provided such storage does not infringe upon existing rights or base flow and is duly permitted under RCW 90.03.290 and 90.03.350.

(d) As the amount of water allocated for each category of use approaches the amount available for future allocation set forth in WAC 173-548-030(1), the department shall review the program to determine whether there is a need for program revision.

(e) The following applies only to planned developments. Water acquired through conservation or conversion of seasonal agricultural water rights shall be the preferred source of water for planned developments with year round use. A determination will be made at the time of application whether the appurtenant lands are "cropland" or "orchard land". The determination will be based on the use of the lands at the time of application. If no agricultural water rights are available for conversion, a small group domestic water system which meets the requirements of this section and is exempt from the permit requirement of RCW 90.44.050 shall have the same priority as single domestic and stock uses.

Small group domestic water supply systems shall be required to:

[1] Meter any new systems, or systems requesting change(s) in their water right.

EMERGENCY

[2] Curtail irrigation of open space lands within the boundaries of the planned development on the first of August or the acreage irrigated on those lands must have been reduced by at least 25% for the entire year.

[3] By April 1 of each year, a homeowners association owning or controlling a small group domestic water supply system must decide whether to reduce acreage irrigated by 25% or curtail irrigation by August 1 and notify members and potentially affected parties. A letter to the Okanogan County Planning Department and the department's Central Regional Office Water Resources Section, shall suffice for notice.

[4] The maximum diversion rates for open space lands in planned developments (areas so designated by Okanogan County) subject to these provisions are as follows:

a.) The maximum diversion for irrigation of open space lands planted with field crops (areas so designated by Okanogan County) on which irrigation is not curtailed on August 1 shall be 0.02 cubic feet per second (cfs) per acre instantaneously not to exceed 2.7 acre feet per acre plus ditch transportation loss of 15% per mile up to a maximum total of 4.0 acre feet per acre annually.

b.) The maximum diversion for irrigation of open space lands planted with orchards on which irrigation is not curtailed on August 1 shall be 0.02 cfs instantaneous diversion, not to exceed 4.2 acre feet; plus ditch transportation loss of 15% per mile, up to a maximum total of 5.0 acre feet per acre annually.

c.) The maximum diversion for irrigation of open space lands planted with field crops on which irrigation is curtailed on August 1 shall be 0.02 cfs per acre not to exceed 2.0 acre feet per acre plus ditch transportation loss of 15% per mile for a maximum total of 3.0 acre feet per acre annually.

d.) The maximum diversion for irrigation of open space lands planted with orchards on which irrigation is curtailed on August 1 shall be 0.02 cfs instantaneous diversion, not to exceed 3.15 acre feet per acre plus ditch transportation loss of 15% per mile, for a maximum total of 3.75 acre feet per acre annually.

[5] Water available for allocation under this section shall meet the following standards and come from:

[a] First, water saved from the conversion of agricultural lands as described in subsection [2], above. Waters contained in the two cubic foot per second per reach reservation as denoted in WAC 173-548-030 (availability determined by the department) would be available for allocation only after water saved from agricultural diversions has been used.

[b] The maximum amount of water use per unit or connection shall be 700 gallons per day (gpd) for in-house and outside use. If a more restrictive use is jointly agreed to by Okanogan County and the department, the maximum use per unit or connection shall be 400 gallons per day for in-house and outside use.

[c] New exempt ground water uses with no irrigation are subject to a maximum use per unit or connection of 400 gallons per day for in-house use and outside use. For the purposes of these provisions, an existing exempt well is a well in use before January 1, 1994 and exempt from the permit requirement of RCW 90.44.050.

(6) If any conversion or curtailment of consumptive or transportation irrigation water to instream flows is applicable, an agreement to transfer the water savings to the department

as a trust water right must be made prior to the approval of the small group domestic system for the planned development. When total water use after conversion from seasonal to year around use is less than is currently used under a valid water right, establishment of a trust water right for instream flow will be pursued prior to the approval of water allocations for the planned development; such trust water shall have a priority date immediately junior to the original water right.

Reviser's note: The brackets and enclosed material in the text of the above section occurred in the copy filed by the agency and appear in the Register pursuant to the requirements of RCW 34.08.040.

**WSR 94-15-036  
EMERGENCY RULES  
DEPARTMENT OF  
FISH AND WILDLIFE**

[Order 94-63—Filed July 13, 1994, 3:47 p.m., effective July 14, 1994, 11:59 p.m.]

Date of Adoption: July 12, 1994.

Purpose: Personal use rules.

Citation of Existing Rules Affected by this Order: Amending WAC 220-57-160 and 220-57A-183.

Statutory Authority for Adoption: RCW 75.08.080.

Pursuant to RCW 34.05.350 the agency for good cause finds that immediate adoption, amendment, or repeal of a rule is necessary for the preservation of the public health, safety, or general welfare, and that observing the time requirements of notice and opportunity to comment upon adoption of a permanent rule would be contrary to the public interest.

Reasons for this Finding: An emergency regulation is necessary due to a near record low run size of about 15,000 sockeye, the escapement goal of 65,000 sockeye in the mainstem of the Columbia River and 23,000 in Lake Wenatchee will not be met.

Effective Date of Rule: July 14, 1994, 11:59 p.m.

July 12, 1994  
Judith Freeman  
Deputy  
for Robert Turner  
Director

**NEW SECTION**

**WAC 220-57-16000V Columbia River.** Notwithstanding the provisions of WAC 220-57-160:

(1) Effective 11:59 p.m. July 14, 1994 until further notice, it is unlawful to fish for or possess sockeye salmon taken for personal use from those waters of the Columbia River upstream of the Highway 395 Bridge at Pasco.

(2) Effective 11:59 p.m. July 14, 1994 through August 15, 1994, in those waters of the Columbia River from the marker located approximately 1/2 mile upstream of Spring Creek (Ringold Hatchery rearing pond outlet) downstream to a boundary marker approximately 1/4 mile downstream of Ringold waterway outlet - Bag Limit D, except all sockeye must be released immediately.

EMERGENCY

**NEW SECTION**

**WAC 220-57A-18300D Lake Wenatchee.** Notwithstanding the provisions of WAC 220-57A-183, effective 12:01 a.m. August 1, 1994, until further notice, it is unlawful to fish for or possess sockeye salmon taken for personal use from Lake Wenatchee.

**REPEALER**

The following section of the Washington Administrative Code is repealed effective 11:59 p.m. July 14, 1994:

WAC 220-56-16000U Columbia River. (94-24)

**WSR 94-15-050****EMERGENCY RULES****DEPARTMENT OF AGRICULTURE**

[Order 5053—Filed July 15, 1994, 2:28 p.m.]

Date of Adoption: July 15, 1994.

Purpose: To restrict the use of mevinphos (Phosdrin), chapter 16-219 WAC.

Citation of Existing Rules Affected by this Order: Amending WAC 16-219-017 and 16-219-027.

Statutory Authority for Adoption: Chapters 15.58 and 17.21 RCW.

Pursuant to RCW 34.05.350 the agency for good cause finds that immediate adoption, amendment, or repeal of a rule is necessary for the preservation of the public health, safety, or general welfare, and that observing the time requirements of notice and opportunity to comment upon adoption of a permanent rule would be contrary to the public interest.

Reasons for this Finding: The registrant of Phosdrin has voluntarily cancelled all use and distribution of Phosdrin in the near future. The department is placing the effective dates of the cancellation into rule.

Effective Date of Rule: Immediately.

July 15, 1994

Jim Jesernig

Director

**AMENDATORY SECTION** (Amending Order 5036, filed 4/15/94)

**WAC 16-219-017 Use requirements—Mevinphos (Phosdrin).** (1) The use of all formulations containing the active ingredient mevinphos (Phosdrin) shall be prohibited throughout the state of Washington: *PROVIDED*, That the use of mevinphos (Phosdrin) shall be allowed on the following crops:

- (a) Green peas grown west of the Cascades;
- (b) Fresh vegetable crops consisting of broccoli, brussels sprouts, cauliflower, and lettuce; and
- (c) Seed crops consisting of beets, (~~(bok choy)~~) cabbage, carrots, collards, kale, (~~(kohlrabi, leeks)~~) mustard, onion, (~~(parsley, parsnip, radish)~~) spinach and turnip.

PROVIDED, That seed crops appear on the specific label of the product applied.

(2) A permit may be issued by the director, upon written request, for use of mevinphos (Phosdrin) on seed crops and fresh vegetables not listed in subsection (1) of this section

when a pest problem with no viable alternatives for control is identified.

**Reviser's note:** RCW 34.05.395 requires the use of underlining and deletion marks to indicate amendments to existing rules. The rule published above varies from its predecessor in certain respects not indicated by the use of these markings.

**AMENDATORY SECTION** (Amending Order 5036, filed 4/15/94)

**WAC 16-219-027 Prior notification—Mevinphos (Phosdrin).** (1) All applications of mevinphos (Phosdrin) is prohibited unless the department is notified of the intent to make application at least twenty four hours prior to commencing the actual application.

(2) Notice of intent to apply mevinphos (Phosdrin) shall be made by the certified applicator licensed to apply the product by one of the following:

(a) By telephone or facsimile to the department office:  
(i) For applications east of the Cascades, phone number (509) 575-2746 or facsimile (509) 575-2210;

(ii) For applications west of the Cascades, phone number (206) 902-2040 or facsimile (206) 902-2093.

(b) Other conditions to be designated by the department.

(3) The notice of intent shall include the following information:

(a) Name and telephone number of person making the application;

(b) Location of the land where the mevinphos (Phosdrin) is to be applied, specifying township, range and section;

(c) Year, month, day and time the mevinphos (Phosdrin) is to be applied; and

(d) Crop or site to be treated.

(4) Application of mevinphos (Phosdrin) shall not begin prior to the day and time provided in the notice of intent. If the application cannot be started or completed within forty-eight hours from the day and time stated in the notice of intent, a new notice of intent shall be made to the department.

**Reviser's note:** RCW 34.05.395 requires the use of underlining and deletion marks to indicate amendments to existing rules. The rule published above varies from its predecessor in certain respects not indicated by the use of these markings.

**NEW SECTION**

**WAC 16-219-033 Use and distribution—Mevinphos (Phosdrin).** (1) The use of mevinphos (Phosdrin) products shall not be allowed in Washington State after February 28, 1995.

(2) The distribution of mevinphos (Phosdrin) shall not be allowed in Washington State after December 31, 1994.

**WSR 94-15-055**  
**EMERGENCY RULES**  
**DEPARTMENT OF**  
**FISH AND WILDLIFE**

[Order 94-64—Filed July 15, 1994, 4:55 p.m.]

Date of Adoption: July 15, 1994.

Purpose: Commercial fishing regulations.

Citation of Existing Rules Affected by this Order:  
Repealing WAC 220-52-07100S; and amending WAC 220-52-071.

Statutory Authority for Adoption: RCW 75.08.080.

Pursuant to RCW 34.05.350 the agency for good cause finds that immediate adoption, amendment, or repeal of a rule is necessary for the preservation of the public health, safety, or general welfare, and that observing the time requirements of notice and opportunity to comment upon adoption of a permanent rule would be contrary to the public interest.

Reasons for this Finding: The harvestable surplus of sea cucumbers in Marine Fish-Shellfish Management and Catch Reporting Area 26C has been taken. Eagle Harbor is closed due to contamination and for the economic well being of the industry.

Effective Date of Rule: Immediately.

July 15, 1994  
Judith Freeman  
Deputy  
for Robert Turner  
Director

#### NEW SECTION

**WAC 220-52-07100T Sea cucumbers.** Notwithstanding the provisions of WAC 220-52-071, effective immediately until further notice, it is unlawful to fish for or possess sea cucumbers taken for commercial use from all state waters except during the times and in the areas as provided for in this section:

(1) Sea cucumber harvest using the shellfish diver gear is allowed in Sea Cucumber District 3, Monday, Tuesday, and Wednesday of each week from 6:00 a.m. to one-half hour before official sunset of each day, except Marine Fish-Shellfish Management and Catch Reporting Area 26C is closed.

(2) The following waters are closed to the harvest of sea cucumbers at all times:

(a) Eagle Harbor - All waters westerly of a line projected northerly from Wing Point to Eagle Harbor Cresote Light number one and then due west to the shoreline of Bainbridge Island.

(b) Hale Passage - Those waters within a line projected northerly from Point Migley to Sandy Point and a line projected from Point Francis through the marker north of Inati Bay to landfall on Lummi Island.

#### REPEALER

The following section of the Washington Administrative Code is repealed:

WAC 220-52-07100S Sea cucumbers. (94-58)

EMERGENCY

**Table of WAC Sections Affected**

**KEY TO TABLE**

This table covers the current calendar year through this issue of the Register and should be used to locate rules amended, adopted, or repealed subsequent to the publication date of the latest WAC or Supplement.

**Symbols:**

- AMD = Amendment of existing section
- A/R = Amending and recodifying a section
- DECOD = Decodification of an existing section
- NEW = New section not previously codified
- OBJEC = Notice of objection by Joint Administrative Rules Review Committee
- PREP = Preproposal comments
- RE-AD = Readoption of existing section
- RECOD = Recodification of previously codified section
- REP = Repeal of existing section
- RESCIND = Rescind previous emergency rule
- REVIEW = Review of previously adopted rule

**Suffixes:**

- P = Proposed action
- C = Continuance of previous proposal
- E = Emergency action
- S = Supplemental notice
- W = Withdrawal of proposed action
- No suffix means permanent action

WAC # shows the section number under which an agency rule is or will be codified in the Washington Administrative Code.

WSR # shows the issue of the Washington State Register where the document may be found; the last three digits identify the document within the issue.

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1-21-170	AMD-P	94-09-045	16-212-020	AMD	94-10-002	16-223-040	REP	94-03-023
1-21-170	AMD	94-12-075	16-212-030	AMD-P	94-06-058	16-223-050	REP	94-03-023
4-25-020	REP-P	94-13-060	16-212-030	AMD	94-10-002	16-223-060	REP	94-03-023
4-25-030	REP-P	94-13-060	16-212-060	AMD-P	94-06-058	16-223-070	REP	94-03-023
4-25-080	REP-P	94-13-060	16-212-060	AMD	94-10-002	16-228-235	REP-P	94-09-017
4-25-185	REP	94-02-070	16-212-070	AMD-P	94-06-058	16-228-235	REP	94-13-195
4-25-186	REP	94-02-070	16-212-070	AMD	94-10-002	16-228-245	REP-P	94-09-017
4-25-187	REP	94-02-070	16-212-080	AMD-P	94-06-058	16-228-245	REP	94-13-195
4-25-188	REP	94-02-070	16-212-080	AMD	94-10-002	16-228-250	REP-P	94-09-017
4-25-270	REP-P	94-13-060	16-212-082	AMD-P	94-06-058	16-228-250	REP	94-13-195
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106-116-205	AMD	94-10-049	106-116-853	AMD-P	94-07-090	132F-08-480	REP-P	94-05-097A
106-116-207	AMD-P	94-07-090	106-116-853	AMD-E	94-07-091	132F-104-030	AMD-P	94-05-097A
106-116-207	AMD-E	94-07-091	106-116-853	AMD	94-10-049	132F-104-811	AMD-P	94-05-097A
106-116-207	AMD	94-10-049	106-116-901	AMD-P	94-07-090	132F-104-813	AMD-P	94-05-097A
106-116-208	AMD-P	94-07-090	106-116-901	AMD-E	94-07-091	132F-104-815	AMD-P	94-05-097A
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106-116-301	AMD	94-10-049	131-46-020	AMD	94-04-120	132F-108-100	NEW-P	94-05-097A
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106-116-303	AMD-E	94-07-091	131-46-027	NEW	94-04-120	132F-108-120	NEW-P	94-05-097A
106-116-303	AMD	94-10-049	131-46-029	NEW	94-04-120	132F-108-130	NEW-P	94-05-097A
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106-116-305	AMD-E	94-07-091	131-46-050	AMD	94-04-120	132H-160-059	REP	94-04-098
106-116-305	AMD	94-10-049	131-46-055	AMD	94-04-120	132H-160-070	REP	94-04-098
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132R-190-100	AMD	94-07-019	148-120-100	NEW-P	94-08-066
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136-130-060	AMD-P	94-06-029	148-120-200	NEW	94-13-058
136-130-060	AMD	94-10-020	148-120-205	NEW-P	94-08-066
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173-58-020	AMD	94-12-001	173-180B-080	NEW	94-10-083	173-401-532	NEW	94-11-105
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173-70-070	REP	94-12-001	173-224-100	AMD-P	94-02-080	173-440-040	REP	94-14-067
173-70-080	REP-P	94-05-037	173-224-100	AMD	94-10-027	173-440-100	REP-P	94-10-078
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173-70-090	REP-P	94-05-037	173-224-120	REP-W	94-15-070	173-440-900	REP-P	94-10-078
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173-70-110	REP	94-12-001	173-320-010	REP	94-07-078	173-460-050	AMD	94-03-072
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173-70-120	REP	94-12-001	173-320-020	REP	94-07-078	173-460-080	AMD	94-03-072
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220-48-015	AMD-C	94-12-007	220-49-025	REP	94-12-009	220-52-069	AMD-P	94-03-106
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232-28-226	REP	94-11-046	240-20-025	NEW	94-10-030	240-20-090	NEW	94-11-081
232-28-227	REP-P	94-04-116	240-20-025	NEW	94-11-081	240-20-110	NEW-P	94-05-100
232-28-227	REP	94-11-048	240-20-030	NEW-P	94-05-100	240-20-110	NEW-E	94-05-101
232-28-228	REP-P	94-04-115	240-20-030	NEW-E	94-05-101	240-20-110	NEW	94-10-030
232-28-228	REP	94-11-047	240-20-030	NEW	94-10-030	240-20-110	NEW	94-11-081
232-28-236	REP-P	94-05-079	240-20-030	NEW	94-11-081	240-20-120	NEW-P	94-05-100
232-28-236	REP	94-11-050	240-20-035	NEW-P	94-05-100	240-20-120	NEW-E	94-05-101
232-28-237	REP-P	94-05-078	240-20-035	NEW-E	94-05-101	240-20-120	NEW	94-10-030
232-28-237	REP	94-11-051	240-20-035	NEW	94-10-030	240-20-120	NEW	94-11-081
232-28-238	REP-P	94-04-117	240-20-035	NEW	94-11-081	240-20-130	NEW-P	94-05-100
232-28-238	REP	94-11-049	240-20-040	NEW-P	94-05-100	240-20-130	NEW-E	94-05-101
232-28-239	NEW	94-04-123	240-20-040	NEW-E	94-05-101	240-20-130	NEW	94-10-030
232-28-240	NEW-P	94-04-114	240-20-040	NEW	94-10-030	240-20-130	NEW	94-11-081
232-28-240	NEW	94-11-046	240-20-040	NEW	94-11-081	240-20-210	NEW-P	94-05-100
232-28-241	NEW-P	94-04-115	240-20-042	NEW-P	94-05-100	240-20-210	NEW-E	94-05-101
232-28-241	NEW	94-11-047	240-20-042	NEW-E	94-05-101	240-20-210	NEW	94-10-030
232-28-242	NEW-P	94-04-116	240-20-042	NEW	94-10-030	240-20-210	NEW	94-11-081
232-28-242	NEW	94-11-048	240-20-042	NEW	94-11-081	240-20-220	NEW-P	94-05-100
232-28-242	AMD-P	94-14-087	240-20-044	NEW-P	94-05-100	240-20-220	NEW-E	94-05-101
232-28-24201	NEW-E	94-11-078	240-20-044	NEW-E	94-05-101	240-20-220	NEW	94-10-030
232-28-243	NEW-P	94-04-117	240-20-044	NEW	94-10-030	240-20-220	NEW	94-11-081
232-28-243	NEW	94-11-049	240-20-044	NEW	94-11-081	240-20-230	NEW-P	94-05-100
232-28-244	NEW-P	94-05-079	240-20-046	NEW-P	94-05-100	240-20-230	NEW-E	94-05-101
232-28-244	NEW	94-11-050	240-20-046	NEW-E	94-05-101	240-20-230	NEW	94-10-030
232-28-245	NEW-P	94-05-078	240-20-046	NEW	94-10-030	240-20-230	NEW	94-11-081
232-28-245	NEW	94-11-051	240-20-046	NEW	94-11-081	240-20-310	NEW-P	94-05-100
232-28-245	AMD-P	94-14-088	240-20-048	NEW-P	94-05-100	240-20-310	NEW-E	94-05-101
232-28-24501	NEW-E	94-12-069	240-20-048	NEW-E	94-05-101	240-20-310	NEW	94-10-030
232-28-417	AMD-E	94-04-007	240-20-048	NEW	94-10-030	240-20-310	NEW	94-11-081
232-28-417	REP-P	94-14-092	240-20-048	NEW	94-11-081	240-20-320	NEW-P	94-05-100
232-28-418	NEW-P	94-14-092	240-20-050	NEW-P	94-05-100	240-20-320	NEW-E	94-05-101
232-28-513	REP-P	94-14-091	240-20-050	NEW-E	94-05-101	240-20-320	NEW	94-10-030
232-28-514	NEW-P	94-14-091	240-20-050	NEW	94-10-030	240-20-320	NEW	94-11-081
232-28-61940	NEW	94-04-018	240-20-050	NEW	94-11-081	240-20-330	NEW-P	94-05-100
232-28-61941	NEW	94-06-012	240-20-052	NEW-P	94-05-100	240-20-330	NEW-E	94-05-101
232-28-61942	NEW	94-06-013	240-20-052	NEW-E	94-05-101	240-20-330	NEW	94-10-030
232-28-61944	NEW-E	94-03-038	240-20-052	NEW	94-10-030	240-20-330	NEW	94-11-081
232-28-61945	NEW-E	94-04-012	240-20-052	NEW	94-11-081	240-20-410	NEW-P	94-05-100
232-28-61945	NEW-P	94-06-038	240-20-054	NEW-P	94-05-100	240-20-410	NEW-E	94-05-101
232-28-61945	NEW	94-09-068	240-20-054	NEW-E	94-05-101	240-20-410	NEW	94-10-030
232-28-61946	NEW-P	94-06-039	240-20-054	NEW	94-10-030	240-20-410	NEW	94-11-081
232-28-61946	NEW	94-09-067	240-20-054	NEW	94-11-081	240-20-420	NEW-P	94-05-100
232-28-61947	NEW-P	94-06-040	240-20-056	NEW-P	94-05-100	240-20-420	NEW-E	94-05-101
232-28-61947	NEW	94-09-066	240-20-056	NEW-E	94-05-101	240-20-420	NEW	94-10-030
232-28-61948	NEW-E	94-09-005	240-20-056	NEW	94-10-030	240-20-420	NEW	94-11-081
232-28-61949	NEW-E	94-08-048	240-20-056	NEW	94-11-081	240-20-430	NEW-P	94-05-100
232-28-61950	NEW-P	94-09-069	240-20-058	NEW-P	94-05-100	240-20-430	NEW-E	94-05-101
232-28-61950	NEW	94-12-067	240-20-058	NEW-E	94-05-101	240-20-430	NEW	94-10-030
232-28-61951	NEW-P	94-11-125	240-20-058	NEW	94-10-030	240-20-430	NEW	94-11-081
232-28-61951	NEW	94-14-035	240-20-058	NEW	94-11-081	240-20-425	NEW-E	94-04-015
232-28-61952	NEW-P	94-14-108	240-20-060	NEW-P	94-05-100	240-20-427	NEW-E	94-04-015
232-28-61953	NEW-P	94-14-107	240-20-060	NEW-E	94-05-101	242-02-040	AMD	94-07-033
232-28-61954	NEW-P	94-14-106	240-20-060	NEW	94-10-030	242-02-052	AMD	94-07-033
236-14	PREP	94-09-047	240-20-060	NEW	94-11-081	242-02-072	AMD	94-07-033
236-48-190	PREP	94-11-007	240-20-065	NEW-P	94-05-100	242-02-110	AMD	94-07-033
240-20-001	NEW-P	94-05-100	240-20-065	NEW-E	94-05-101	242-02-140	AMD	94-07-033
240-20-001	NEW-E	94-05-101	240-20-065	NEW	94-10-030	242-02-210	AMD	94-07-033
240-20-001	NEW	94-10-030	240-20-065	NEW	94-11-081	242-02-220	AMD	94-07-033
240-20-001	NEW	94-11-081	240-20-070	NEW-P	94-05-100	242-02-240	AMD	94-07-033
240-20-010	NEW-P	94-05-100	240-20-070	NEW-E	94-05-101	242-02-250	AMD	94-07-033
240-20-010	NEW-E	94-05-101	240-20-070	NEW	94-10-030	242-02-270	AMD	94-07-033
240-20-010	NEW	94-10-030	240-20-070	NEW	94-11-081	242-02-280	AMD	94-07-033
240-20-010	NEW	94-11-081	240-20-075	NEW-P	94-05-100	242-02-310	AMD	94-07-033
240-20-015	NEW-P	94-05-100	240-20-075	NEW-E	94-05-101	242-02-320	AMD	94-07-033
240-20-015	NEW-E	94-05-101	240-20-075	NEW-P	94-10-029	242-02-330	AMD	94-07-033
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240-20-015	NEW	94-11-081	240-20-080	NEW-P	94-05-100	242-02-410	AMD	94-07-033
240-20-020	NEW-P	94-05-100	240-20-080	NEW-E	94-05-101	242-02-440	AMD	94-07-033
240-20-020	NEW-E	94-05-101	240-20-080	NEW	94-10-030	242-02-510	AMD	94-07-033
240-20-020	NEW	94-10-030	240-20-080	NEW	94-11-081	242-02-520	NEW-W	94-07-007
240-20-020	NEW	94-11-081	240-20-090	NEW-P	94-05-100	242-02-522	AMD	94-07-033



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242-02-540	AMD	94-07-033	245-04-115	NEW-S	94-12-079	246-11-510	AMD	94-04-078
242-02-550	AMD	94-07-033	246-01-040	PREP	94-15-066	246-11-530	AMD	94-04-078
242-02-554	AMD	94-07-033	246-01-080	PREP	94-15-066	246-11-540	AMD	94-04-078
242-02-558	AMD	94-07-033	246-08-450	AMD	94-04-079	246-11-560	AMD	94-04-078
242-02-570	AMD	94-07-033	246-10-102	AMD	94-04-079	246-11-580	AMD	94-04-078
242-02-580	AMD	94-07-033	246-10-103	AMD	94-04-079	246-11-590	AMD	94-04-078
242-02-620	AMD	94-07-033	246-10-107	AMD	94-04-079	246-11-600	AMD	94-04-078
242-02-680	AMD	94-07-033	246-10-109	AMD	94-04-079	246-11-610	AMD	94-04-078
242-02-830	AMD	94-07-033	246-10-110	AMD	94-04-079	246-50-001	PREP	94-09-042
242-02-850	AMD	94-07-033	246-10-114	AMD	94-04-079	246-50-010	PREP	94-09-042
242-02-880	AMD	94-07-033	246-10-115	AMD	94-04-079	246-50-020	PREP	94-09-042
242-02-892	NEW-W	94-07-007	246-10-123	AMD	94-04-079	246-50-030	PREP	94-09-042
242-02-910	AMD	94-07-033	246-10-124	AMD	94-04-079	246-50-040	PREP	94-09-042
242-02-920	AMD	94-07-033	246-10-201	AMD	94-04-079	246-50-990	PREP	94-09-042
242-04-050	AMD	94-07-033	246-10-202	AMD	94-04-079	246-100	PREP	94-12-048
245-01-010	NEW	94-04-046	246-10-203	AMD	94-04-079	246-100-011	AMD-P	94-14-081
245-01-020	NEW	94-04-046	246-10-204	AMD	94-04-079	246-100-076	AMD-P	94-14-081
245-01-020	AMD-P	94-06-060	246-10-205	AMD	94-04-079	246-100-236	AMD-P	94-14-081
245-01-020	AMD-W	94-13-208	246-10-303	AMD-W	94-13-088	246-132-020	REP	94-06-048
245-01-030	NEW	94-04-046	246-10-304	AMD	94-04-079	246-132-030	REP	94-06-048
245-01-040	NEW	94-04-046	246-10-305	AMD	94-04-079	246-170	PREP	94-12-048
245-01-050	NEW	94-04-046	246-10-401	AMD	94-04-079	246-170-010	AMD-P	94-14-081
245-01-060	NEW	94-04-046	246-10-402	AMD	94-04-079	246-170-030	AMD-P	94-14-081
245-01-070	NEW	94-04-046	246-10-403	AMD	94-04-079	246-170-035	NEW-P	94-14-081
245-01-080	NEW	94-04-046	246-10-404	AMD	94-04-079	246-170-050	AMD-P	94-14-081
245-01-090	NEW	94-04-046	246-10-501	AMD	94-04-079	246-225-020	AMD	94-06-017
245-01-100	NEW	94-04-046	246-10-502	AMD	94-04-079	246-227-030	NEW-W	94-06-016
245-01-110	NEW	94-04-046	246-10-503	AMD	94-04-079	246-227-100	NEW-W	94-06-016
245-01-120	NEW	94-04-046	246-10-504	AMD	94-04-079	246-235-077	PREP	94-15-028
245-01-130	NEW	94-04-046	246-10-604	AMD	94-04-079	246-235-150	PREP	94-15-028
245-01-140	NEW	94-04-046	246-10-607	AMD	94-04-079	246-239-020	AMD	94-06-017
245-01-150	NEW	94-04-046	246-10-701	AMD	94-04-079	246-239-022	NEW	94-06-017
245-02-010	NEW-P	94-06-060	246-10-702	AMD	94-04-079	246-239-030	AMD	94-06-017
245-02-010	NEW-P	94-12-081	246-10-704	AMD	94-04-079	246-239-035	NEW	94-06-017
245-02-010	NEW-W	94-13-208	246-10-705	AMD	94-04-079	246-239-050	AMD	94-06-017
245-02-020	NEW-P	94-06-060	246-10-706	AMD	94-04-079	246-239-070	AMD	94-06-017
245-02-020	NEW-P	94-12-081	246-10-707	AMD	94-04-079	246-239-080	AMD	94-06-017
245-02-020	NEW-W	94-13-208	246-11-010	AMD	94-04-078	246-239-090	AMD	94-06-017
245-02-025	NEW-P	94-12-081	246-11-020	AMD	94-04-078	246-239-100	AMD	94-06-017
245-02-030	NEW-P	94-06-060	246-11-030	AMD	94-04-078	246-240-020	AMD	94-06-017
245-02-030	NEW-P	94-12-081	246-11-050	AMD	94-04-078	246-247-001	AMD	94-07-010
245-02-030	NEW-W	94-13-208	246-11-060	AMD	94-04-078	246-247-002	NEW	94-07-010
245-02-040	NEW-P	94-06-060	246-11-080	AMD	94-04-078	246-247-010	AMD	94-07-010
245-02-040	NEW-P	94-12-081	246-11-090	AMD	94-04-078	246-247-020	AMD	94-07-010
245-02-040	NEW-W	94-13-208	246-11-100	AMD	94-04-078	246-247-030	AMD	94-07-010
245-02-050	NEW-P	94-06-060	246-11-110	AMD	94-04-078	246-247-040	AMD	94-07-010
245-02-050	NEW-P	94-12-081	246-11-130	AMD	94-04-078	246-247-050	REP	94-07-010
245-02-050	NEW-W	94-13-208	246-11-140	AMD	94-04-078	246-247-060	AMD	94-07-010
245-02-060	NEW-P	94-12-081	246-11-160	AMD	94-04-078	246-247-065	NEW	94-07-010
245-02-070	NEW-P	94-12-081	246-11-180	AMD	94-04-078	246-247-070	REP	94-07-010
245-02-080	NEW-P	94-12-081	246-11-220	AMD	94-04-078	246-247-075	NEW	94-07-010
245-02-090	NEW-P	94-12-081	246-11-230	AMD	94-04-078	246-247-080	AMD	94-07-010
245-02-100	NEW-P	94-12-078	246-11-250	AMD	94-04-078	246-247-085	NEW	94-07-010
245-02-110	NEW-P	94-12-078	246-11-260	AMD	94-04-078	246-247-090	REP	94-07-010
245-02-115	NEW-P	94-12-078	246-11-270	AMD	94-04-078	246-247-100	AMD	94-07-010
245-02-120	NEW-P	94-12-078	246-11-280	AMD	94-04-078	246-247-110	NEW	94-07-010
245-02-125	NEW-P	94-12-078	246-11-290	AMD	94-04-078	246-247-120	NEW	94-07-010
245-02-130	NEW-P	94-12-078	246-11-300	AMD	94-04-078	246-247-130	NEW	94-07-010
245-02-135	NEW-P	94-12-078	246-11-320	AMD-W	94-13-087	246-254-053	AMD-P	94-07-108
245-02-140	NEW-P	94-12-078	246-11-330	AMD	94-04-078	246-254-053	AMD	94-11-010
245-02-145	NEW-P	94-12-078	246-11-340	AMD	94-04-078	246-254-070	AMD-P	94-07-107
245-02-150	NEW-P	94-12-078	246-11-360	AMD	94-04-078	246-254-070	AMD	94-11-011
245-02-155	NEW-P	94-12-078	246-11-370	AMD	94-04-078	246-254-080	AMD-P	94-07-107
245-02-160	NEW-P	94-12-078	246-11-380	AMD	94-04-078	246-254-080	AMD	94-11-011
245-02-165	NEW-P	94-12-078	246-11-390	AMD	94-04-078	246-254-090	AMD-P	94-07-107
245-02-170	NEW-P	94-12-078	246-11-400	AMD	94-04-078	246-254-090	AMD	94-11-011
245-02-175	NEW-P	94-12-078	246-11-420	AMD	94-04-078	246-254-100	AMD-P	94-07-107
245-02-180	NEW-P	94-12-078	246-11-425	NEW	94-04-078	246-254-100	AMD	94-11-011
245-04-100	NEW-P	94-10-085	246-11-430	AMD	94-04-078	246-254-120	AMD-P	94-07-107
245-04-100	NEW-S	94-12-079	246-11-440	AMD	94-04-078	246-254-120	AMD	94-11-011
245-04-110	NEW-P	94-10-085	246-11-450	AMD	94-04-078	246-254-160	AMD	94-07-010
245-04-110	NEW-S	94-12-079	246-11-480	AMD	94-04-078	246-260-990	REP-P	94-07-121



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246-260-9901	NEW-P	94-07-121	246-290-100	AMD-P	94-08-075	246-291-130	NEW	94-14-002
246-260-9901	NEW	94-11-056	246-290-100	AMD	94-14-001	246-291-140	NEW-P	94-06-008
246-272-001	REP	94-09-025	246-290-110	AMD-P	94-08-075	246-291-140	NEW	94-14-002
246-272-00101	NEW	94-09-025	246-290-110	AMD	94-14-001	246-291-200	NEW-P	94-06-008
246-272-002	REP	94-09-025	246-290-115	NEW-P	94-08-075	246-291-200	NEW	94-14-002
246-272-005	REP	94-09-025	246-290-115	NEW	94-14-001	246-291-210	NEW-P	94-06-008
246-272-00501	NEW	94-09-025	246-290-130	AMD-P	94-08-075	246-291-210	NEW	94-14-002
246-272-010	REP	94-09-025	246-290-130	AMD	94-14-001	246-291-220	NEW-P	94-06-008
246-272-01001	NEW	94-09-025	246-290-135	AMD-P	94-08-075	246-291-220	NEW	94-14-002
246-272-020	REP	94-09-025	246-290-135	AMD	94-14-001	246-291-230	NEW-P	94-06-008
246-272-02001	NEW	94-09-025	246-290-140	AMD-P	94-08-075	246-291-230	NEW	94-14-002
246-272-030	REP	94-09-025	246-290-140	AMD	94-14-001	246-291-240	NEW-P	94-06-008
246-272-03001	NEW	94-09-025	246-290-230	AMD-P	94-08-075	246-291-240	NEW	94-14-002
246-272-040	REP	94-09-025	246-290-230	AMD	94-14-001	246-291-250	NEW-P	94-06-008
246-272-04001	NEW	94-09-025	246-290-230	AMD	94-14-001	246-291-250	NEW	94-14-002
246-272-050	REP	94-09-025	246-290-300	AMD-P	94-08-075	246-291-260	NEW-P	94-06-008
246-272-05001	NEW	94-09-025	246-290-300	AMD	94-14-001	246-291-260	NEW	94-14-002
246-272-060	REP	94-09-025	246-290-310	AMD-P	94-08-075	246-291-260	NEW	94-14-002
246-272-070	REP	94-09-025	246-290-310	AMD	94-14-001	246-291-270	NEW-P	94-06-008
246-272-07001	NEW	94-09-025	246-290-320	AMD-P	94-08-075	246-291-270	NEW	94-14-002
246-272-080	REP	94-09-025	246-290-320	AMD	94-14-001	246-291-300	NEW-P	94-06-008
246-272-08001	NEW	94-09-025	246-290-330	AMD-P	94-08-075	246-291-300	NEW	94-14-002
246-272-090	REP	94-09-025	246-290-330	AMD	94-14-001	246-291-310	NEW-P	94-06-008
246-272-09001	NEW	94-09-025	246-290-410	AMD-P	94-08-075	246-291-310	NEW	94-14-002
246-272-09501	NEW	94-09-025	246-290-410	AMD	94-14-001	246-291-320	NEW-P	94-06-008
246-272-100	REP	94-09-025	246-290-440	AMD-P	94-08-075	246-291-320	NEW	94-14-002
246-272-110	REP	94-09-025	246-290-440	AMD	94-14-001	246-291-330	NEW-P	94-06-008
246-272-11001	NEW	94-09-025	246-290-480	AMD-P	94-08-075	246-291-330	NEW	94-14-002
246-272-11501	NEW	94-09-025	246-290-480	AMD	94-14-001	246-291-340	NEW-P	94-06-008
246-272-120	REP	94-09-025	246-290-632	AMD-P	94-08-075	246-291-340	NEW	94-14-002
246-272-12501	NEW	94-09-025	246-290-632	AMD	94-14-001	246-291-350	NEW-P	94-06-008
246-272-130	REP	94-09-025	246-290-654	AMD-P	94-08-075	246-291-350	NEW	94-14-002
246-272-13501	NEW	94-09-025	246-290-654	AMD	94-14-001	246-291-360	NEW-P	94-06-008
246-272-140	REP	94-09-025	246-290-660	AMD-P	94-08-075	246-291-360	NEW	94-14-002
246-272-14501	NEW	94-09-025	246-290-660	AMD	94-14-001	246-291-370	NEW-P	94-06-008
246-272-150	REP	94-09-025	246-290-662	AMD-P	94-08-075	246-291-370	NEW	94-14-002
246-272-15501	NEW	94-09-025	246-290-662	AMD	94-14-001	246-292-001	AMD	94-04-004
246-272-160	REP	94-09-025	246-290-664	AMD-P	94-08-075	246-292-010	AMD	94-04-004
246-272-16501	NEW	94-09-025	246-290-664	AMD	94-14-001	246-292-020	AMD	94-04-004
246-272-170	REP	94-09-025	246-290-666	AMD-P	94-08-075	246-292-030	AMD	94-04-004
246-272-17501	NEW	94-09-025	246-290-666	AMD	94-14-001	246-292-040	AMD	94-04-004
246-272-180	REP	94-09-025	246-290-670	AMD-P	94-08-075	246-292-050	AMD	94-04-004
246-272-18501	NEW	94-09-025	246-290-670	AMD	94-14-001	246-292-055	NEW	94-04-004
246-272-190	REP	94-09-025	246-290-686	AMD-P	94-08-075	246-292-060	AMD	94-04-004
246-272-19501	NEW	94-09-025	246-290-686	AMD	94-14-001	246-292-070	AMD	94-04-004
246-272-200	REP	94-09-025	246-290-692	AMD-P	94-08-075	246-292-075	NEW	94-04-004
246-272-20501	NEW	94-09-025	246-290-692	AMD	94-14-001	246-292-080	AMD	94-04-004
246-272-210	REP	94-09-025	246-290-694	AMD-P	94-08-075	246-292-090	AMD	94-04-004
246-272-21501	NEW	94-09-025	246-290-694	AMD	94-14-001	246-292-100	AMD	94-04-004
246-272-220	REP	94-09-025	246-290-696	AMD-P	94-08-075	246-292-110	AMD	94-04-004
246-272-22501	NEW	94-09-025	246-290-696	AMD	94-14-001	246-292-120	REP	94-04-004
246-272-230	REP	94-09-025	246-291-001	NEW-P	94-06-008	246-292-130	REP	94-04-004
246-272-23501	NEW	94-09-025	246-291-001	NEW	94-14-002	246-292-140	REP	94-04-004
246-272-240	REP	94-09-025	246-291-010	NEW-P	94-06-008	246-292-150	REP	94-04-004
246-272-24001	NEW	94-09-025	246-291-010	NEW	94-14-002	246-292-160	NEW	94-04-004
246-272-25001	NEW	94-09-025	246-291-020	NEW-P	94-06-008	246-292-170	NEW	94-04-004
246-272-26001	NEW	94-09-025	246-291-020	NEW	94-14-002	246-292-990	REP	94-04-004
246-272-27001	NEW	94-09-025	246-291-025	NEW-P	94-06-008	246-295-001	NEW-P	94-13-085
246-272-28001	NEW	94-09-025	246-291-025	NEW	94-14-002	246-295-010	NEW-P	94-13-085
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246-282	PREP	94-12-088	246-291-030	NEW	94-14-002	246-295-030	NEW-P	94-13-085
246-290-010	AMD-P	94-08-075	246-291-040	NEW-P	94-06-008	246-295-040	NEW-P	94-13-085
246-290-010	AMD	94-14-001	246-291-040	NEW	94-14-002	246-295-050	NEW-P	94-13-085
246-290-020	AMD-P	94-08-075	246-291-050	NEW-P	94-06-008	246-295-060	NEW-P	94-13-085
246-290-020	AMD	94-14-001	246-291-050	NEW	94-14-002	246-295-070	NEW-P	94-13-085
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246-290-030	AMD	94-14-001	246-291-100	NEW	94-14-002	246-295-110	NEW-P	94-13-085
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246-316-060	AMD	94-13-180	246-327-055	REP-P	94-10-047	246-450-050	REP-P	94-09-026
246-316-070	AMD-P	94-08-040	246-327-065	AMD-P	94-10-047	246-450-050	REP	94-12-089
246-316-070	AMD	94-13-180	246-327-077	AMD-P	94-10-047	246-450-060	REP-P	94-09-026
246-316-080	AMD-P	94-08-040	246-327-085	AMD-P	94-10-047	246-450-060	REP	94-12-089
246-316-080	AMD	94-13-180	246-327-090	AMD-P	94-10-047	246-450-070	REP-P	94-09-026
246-316-090	AMD-P	94-08-040	246-327-095	AMD-P	94-10-047	246-450-070	REP	94-12-089
246-316-090	AMD	94-13-180	246-327-105	AMD-P	94-10-047	246-450-080	REP-P	94-09-026
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246-316-100	AMD	94-13-180	246-327-125	AMD-P	94-10-047	246-450-090	REP-P	94-09-026
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246-316-120	AMD	94-13-180	246-327-165	AMD-P	94-10-047	246-451-001	AMD-P	94-09-026
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246-316-150	AMD-P	94-08-040	246-331-010	AMD-P	94-10-045	246-451-020	AMD	94-12-089
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246-316-160	AMD	94-13-180	246-331-035	AMD-P	94-10-045	246-451-040	AMD-P	94-09-026
246-316-170	AMD-P	94-08-040	246-331-045	REP-P	94-10-045	246-451-040	AMD	94-12-089
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246-316-180	AMD	94-13-180	246-331-077	AMD-P	94-10-045	246-451-060	AMD-P	94-09-026
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246-316-190	AMD	94-13-180	246-331-095	AMD-P	94-10-045	246-452-001	REP-P	94-09-026
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246-316-230	AMD	94-13-180	246-331-175	REP-P	94-10-045	246-452-040	REP-P	94-09-026
246-316-240	AMD-P	94-08-040	246-331-185	AMD-P	94-10-045	246-452-040	REP	94-12-089
246-316-240	AMD	94-13-180	246-331-990	AMD-P	94-10-045	246-452-050	REP-P	94-09-026
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246-316-250	AMD	94-13-180	246-336-010	AMD-P	94-10-046	246-452-060	REP-P	94-09-026
246-316-260	AMD-P	94-08-040	246-336-025	AMD-P	94-10-046	246-452-060	REP	94-12-089
246-316-260	AMD	94-13-180	246-336-030	NEW-P	94-10-046	246-452-070	REP-P	94-09-026
246-316-265	NEW-P	94-08-040	246-336-035	AMD-P	94-10-046	246-452-070	REP	94-12-089
246-316-265	NEW	94-13-180	246-336-045	REP-P	94-10-046	246-452-080	REP-P	94-09-026
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246-454-040	REP	94-12-089	246-824-230	NEW-P	94-02-057	246-839-330	PREP	94-11-079
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246-454-060	REP-P	94-09-026	246-824-990	AMD	94-08-078	246-839-350	PREP	94-10-056
246-454-060	REP	94-12-089	246-828-055	NEW-P	94-08-037	246-839-350	PREP	94-11-079
246-454-070	AMD-P	94-09-026	246-828-055	NEW	94-11-108	246-839-360	PREP	94-10-056
246-454-070	AMD	94-12-089	246-828-060	AMD-P	94-08-037	246-839-360	PREP	94-11-079
246-454-080	AMD-P	94-09-026	246-828-060	AMD	94-11-108	246-839-365	PREP	94-10-056
246-454-080	AMD	94-12-089	246-828-065	NEW-P	94-08-037	246-839-365	PREP	94-11-079
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246-807-125	NEW-P	94-11-080	246-838-090	AMD	94-08-050	246-869	PREP	94-11-090
246-807-135	NEW-P	94-11-080	246-838-110	AMD-P	94-05-033	246-875	PREP	94-11-091
246-807-173	AMD-P	94-11-080	246-838-110	AMD	94-08-050	246-878-010	NEW-P	94-02-079
246-807-300	AMD-P	94-11-080	246-838-180	AMD-P	94-05-033	246-878-010	NEW	94-08-101
246-815-030	AMD	94-05-053	246-838-180	AMD	94-08-050	246-878-020	NEW-P	94-02-079
246-815-300	NEW	94-04-005	246-838-990	AMD-P	94-05-035	246-878-020	NEW	94-08-101
246-815-990	AMD	94-02-059	246-838-990	AMD	94-08-102	246-878-030	NEW-P	94-02-079
246-816-015	NEW-P	94-03-045	246-839-020	AMD	94-07-012	246-878-030	NEW	94-08-101
246-816-015	NEW	94-12-038	246-839-020	PREP	94-10-057	246-878-040	NEW-P	94-02-079
246-818	PREP	94-13-005	246-839-030	AMD	94-07-012	246-878-040	NEW	94-08-101
246-818-015	NEW-P	94-03-044	246-839-040	AMD	94-07-012	246-878-050	NEW-P	94-02-079
246-818-015	NEW	94-08-011	246-839-050	AMD	94-07-012	246-878-050	NEW	94-08-101
246-818-020	AMD-P	94-06-046	246-839-060	AMD	94-07-012	246-878-060	NEW-P	94-02-079
246-818-020	AMD	94-11-088	246-839-070	AMD	94-07-012	246-878-060	NEW	94-08-101
246-818-990	REP	94-02-058	246-839-080	AMD	94-07-012	246-878-070	NEW-P	94-02-079
246-818-991	NEW	94-02-058	246-839-090	AMD	94-07-012	246-878-070	NEW	94-08-101
246-824	PREP	94-10-026	246-839-300	PREP	94-10-056	246-878-080	NEW-P	94-02-079
246-824-200	NEW-P	94-02-057	246-839-300	PREP	94-11-079	246-878-080	NEW	94-08-101

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246-878-090	NEW	94-08-101	246-922-415	NEW	94-14-082	246-930-220	AMD-P	94-09-027
246-878-100	NEW-P	94-02-079	246-922-500	NEW-P	94-05-081	246-930-220	AMD	94-13-179
246-878-100	NEW	94-08-101	246-922-500	NEW	94-09-008	246-930-300	AMD-P	94-09-027
246-878-110	NEW-P	94-02-079	246-922-990	PREP	94-15-063	246-930-300	AMD	94-13-179
246-878-110	NEW	94-08-101	246-924-020	AMD-P	94-08-039	246-930-301	AMD-P	94-09-027
246-878-120	NEW-P	94-02-079	246-924-020	AMD	94-12-039	246-930-301	AMD	94-13-179
246-878-120	NEW	94-08-101	246-924-040	AMD-P	94-08-039	246-930-310	AMD-P	94-09-027
246-883-030	AMD-P	94-02-078	246-924-040	AMD	94-12-039	246-930-310	AMD	94-13-179
246-883-030	AMD	94-08-100	246-924-050	AMD-P	94-08-039	246-930-320	AMD-P	94-09-027
246-886-030	AMD	94-02-060	246-924-050	AMD	94-12-039	246-930-320	AMD	94-13-179
246-887	AMD-C	94-02-089	246-924-080	AMD-P	94-08-039	246-930-330	AMD-P	94-09-027
246-887-100	AMD-P	94-04-111	246-924-080	AMD	94-12-039	246-930-330	AMD	94-13-179
246-887-100	AMD	94-07-105	246-924-095	NEW-P	94-08-039	246-930-340	AMD-P	94-09-027
246-887-100	AMD	94-08-098	246-924-095	NEW-E	94-09-024	246-930-340	AMD	94-13-179
246-887-133	NEW	94-08-098	246-924-095	NEW	94-12-039	246-930-410	AMD-P	94-09-027
246-887-140	AMD-P	94-04-111	246-924-110	AMD-P	94-08-039	246-930-410	AMD	94-13-179
246-887-140	AMD	94-07-105	246-924-110	AMD	94-12-039	246-930-420	NEW-P	94-09-027
246-887-150	AMD-P	94-04-111	246-924-120	AMD-P	94-08-039	246-930-420	NEW	94-13-179
246-887-150	AMD	94-07-105	246-924-120	AMD	94-12-039	246-930-430	NEW-P	94-09-027
246-887-160	AMD	94-08-098	246-924-130	AMD-P	94-08-039	246-930-430	NEW	94-13-179
246-887-170	AMD	94-08-098	246-924-130	AMD	94-12-039	246-930-490	NEW-P	94-09-027
246-889-020	AMD-P	94-04-111	246-924-190	REP-P	94-08-039	246-930-490	NEW	94-13-179
246-889-020	AMD	94-07-105	246-924-190	REP	94-12-039	246-930-990	AMD-P	94-09-027
246-901-010	NEW-P	94-04-112	246-924-200	REP-P	94-08-039	246-930-990	AMD	94-13-179
246-901-010	NEW	94-08-097	246-924-200	REP	94-12-039	246-937-020	NEW-E	94-08-051
246-901-020	AMD-P	94-04-112	246-924-210	REP-P	94-08-039	246-937-020	NEW-P	94-08-052
246-901-020	AMD	94-08-097	246-924-210	REP	94-12-039	246-937-030	NEW-E	94-08-051
246-901-030	AMD-P	94-04-112	246-924-220	REP-P	94-08-039	246-937-030	NEW-P	94-08-052
246-901-030	AMD	94-08-097	246-924-220	REP	94-12-039	246-937-040	NEW-E	94-08-051
246-901-035	NEW-P	94-04-112	246-924-230	AMD-P	94-08-039	246-937-040	NEW-P	94-08-052
246-901-035	NEW	94-08-097	246-924-230	AMD	94-12-039	246-937-070	NEW-E	94-08-051
246-901-100	AMD-P	94-04-112	246-924-240	AMD-P	94-08-039	246-937-070	NEW-P	94-08-052
246-901-100	AMD	94-08-097	246-924-240	AMD	94-12-039	246-937-080	NEW-E	94-08-051
246-901-130	AMD-P	94-04-112	246-924-250	AMD-P	94-08-039	246-937-080	NEW-P	94-08-052
246-901-130	AMD	94-08-097	246-924-250	AMD	94-12-039	246-937-090	NEW-E	94-08-051
246-907-020	AMD-P	94-08-096	246-924-260	REP-P	94-08-039	246-937-090	NEW-P	94-08-052
246-907-020	AMD	94-14-038	246-924-260	REP	94-12-039	246-937-990	NEW-P	94-08-076
246-907-030	AMD	94-05-036	246-924-270	REP-P	94-08-039	246-937-990	NEW-E	94-08-077
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246-915-050	AMD	94-05-014	246-924-280	REP-P	94-08-039	247-04-010	NEW	94-15-053
246-915-078	NEW	94-05-014	246-924-280	REP	94-12-039	247-04-020	NEW-P	94-12-021
246-915-085	NEW	94-05-014	246-924-290	AMD-P	94-08-039	247-04-020	NEW	94-15-053
246-915-090	AMD	94-05-014	246-924-290	AMD	94-12-039	247-04-030	NEW-P	94-12-021
246-915-120	AMD	94-05-014	246-924-300	AMD-P	94-08-039	247-04-030	NEW	94-15-053
246-915-140	AMD	94-05-014	246-924-300	AMD	94-12-039	247-04-040	NEW-P	94-12-021
246-915-160	AMD	94-05-014	246-924-310	REP-P	94-08-039	247-04-040	NEW	94-15-053
246-915-340	NEW	94-05-014	246-924-310	REP	94-12-039	247-04-040	NEW	94-15-053
246-917-100	AMD-P	94-08-095	246-924-320	AMD-P	94-08-039	247-06-010	NEW-P	94-12-022
246-917-100	AMD	94-15-064	246-924-320	AMD	94-12-039	247-06-010	NEW	94-15-054
246-917-120	AMD-P	94-08-095	246-924-460	REP-P	94-08-039	247-06-020	NEW-P	94-12-022
246-917-120	AMD	94-15-064	246-924-460	REP	94-12-039	247-06-020	NEW	94-15-054
246-918-095	NEW-P	94-08-094	246-924-490	NEW-P	94-08-039	247-06-030	NEW-P	94-12-022
246-918-095	NEW	94-15-065	246-924-490	NEW	94-12-039	247-06-030	NEW	94-15-054
246-918-105	NEW-P	94-08-094	246-930-010	AMD-P	94-09-027	250-40	AMD-P	94-09-058
246-918-105	NEW	94-15-065	246-930-010	AMD	94-13-179	250-40	AMD	94-14-006
246-920-115	NEW-P	94-07-011	246-930-020	AMD-P	94-09-027	250-40-020	AMD-P	94-09-058
246-922-032	NEW	94-05-051	246-930-020	AMD	94-13-179	250-40-020	AMD	94-14-006
246-922-033	NEW	94-05-051	246-930-030	AMD-P	94-09-027	250-40-040	AMD-P	94-09-058
246-922-100	AMD	94-05-051	246-930-030	AMD	94-13-179	250-40-040	AMD	94-14-006
246-922-110	REP	94-05-051	246-930-040	AMD-P	94-09-027	250-40-050	AMD-P	94-09-058
246-922-120	AMD	94-05-051	246-930-040	AMD	94-13-179	250-40-050	AMD	94-14-006
246-922-220	REP	94-05-051	246-930-050	AMD-P	94-09-027	250-40-070	AMD-P	94-09-058
246-922-250	REP	94-05-051	246-930-050	AMD	94-13-179	250-40-070	AMD	94-14-006
246-922-260	AMD	94-05-051	246-930-060	AMD-P	94-09-027	250-44	AMD-C	94-15-033
246-922-300	AMD	94-05-051	246-930-060	AMD	94-13-179	250-44-050	AMD-P	94-10-001
246-922-310	AMD	94-05-051	246-930-070	AMD-P	94-09-027	250-44-110	AMD-P	94-10-001
246-922-400	NEW-P	94-08-079	246-930-070	AMD	94-13-179	250-44-130	AMD-P	94-10-001
246-922-400	NEW	94-14-082	246-930-075	AMD-P	94-09-027	250-62-010	NEW-W	94-06-018
246-922-405	NEW-P	94-08-079	246-930-075	AMD	94-13-179	250-62-020	NEW-W	94-06-018
246-922-405	NEW	94-14-082	246-930-200	AMD-P	94-09-027	250-62-030	NEW-W	94-06-018
246-922-410	NEW-P	94-08-079	246-930-200	AMD	94-13-179	250-62-040	NEW-W	94-06-018
246-922-410	NEW	94-14-082	246-930-210	AMD-P	94-09-027	250-62-050	NEW-W	94-06-018
						250-62-060	NEW-W	94-06-018

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250-62-080	NEW-W	94-06-018	260-70-026	PREP	94-15-097	275-56-240	REP-P	94-12-005
250-62-090	NEW-W	94-06-018	260-70-040	AMD	94-04-002	275-56-245	REP-P	94-12-005
250-62-100	NEW-W	94-06-018	260-72-020	AMD	94-04-003	275-56-260	REP-P	94-12-005
250-62-110	NEW-W	94-06-018	275-16-030	AMD-P	94-13-051	275-56-275	REP-P	94-12-005
250-62-120	NEW-W	94-06-018	275-16-030	AMD-E	94-14-005	275-56-285	REP-P	94-12-005
250-62-130	NEW-W	94-06-018	275-27-220	AMD	94-04-092	275-56-290	REP-P	94-12-005
250-62-140	NEW-W	94-06-018	275-27-221	NEW	94-04-092	275-56-295	REP-P	94-12-005
250-62-150	NEW-W	94-06-018	275-27-223	AMD	94-04-092	275-56-300	REP-P	94-12-005
250-62-160	NEW-W	94-06-018	275-30-020	AMD-P	94-12-026	275-56-305	REP-P	94-12-005
250-62-170	NEW-W	94-06-018	275-30-020	AMD	94-15-002	275-56-335	REP-P	94-12-005
250-62-180	NEW-W	94-06-018	275-35-030	AMD-P	94-08-007	275-56-340	REP-P	94-12-005
250-62-190	NEW-W	94-06-018	275-35-030	AMD	94-11-065	275-56-355	REP-P	94-12-005
250-62-200	NEW-W	94-06-018	275-35-060	AMD-P	94-08-007	275-56-365	REP-P	94-12-005
250-62-210	NEW-W	94-06-018	275-35-060	AMD	94-11-065	275-56-385	REP-P	94-12-005
250-66-030	AMD-P	94-09-060	275-35-070	AMD-P	94-08-007	275-56-400	REP-P	94-12-005
250-66-030	AMD	94-14-007	275-35-070	AMD	94-11-065	275-56-425	REP-P	94-12-005
250-78-010	AMD-P	94-09-061	275-35-080	AMD-P	94-08-007	275-56-445	REP-P	94-12-005
250-78-010	AMD	94-14-008	275-35-080	AMD	94-11-065	275-56-447	REP-P	94-12-005
250-78-020	AMD-P	94-09-061	275-47-010	NEW-P	94-12-066	275-56-465	REP-P	94-12-005
250-78-020	AMD	94-14-008	275-47-010	NEW	94-15-009	275-56-475	REP-P	94-12-005
250-78-030	AMD-P	94-09-061	275-47-020	NEW-P	94-12-066	275-56-485	REP-P	94-12-005
250-78-030	AMD	94-14-008	275-47-020	NEW	94-15-009	275-56-495	REP-P	94-12-005
250-78-040	AMD-P	94-09-061	275-47-030	NEW-P	94-12-066	275-56-505	REP-P	94-12-005
250-78-040	AMD	94-14-008	275-47-030	NEW	94-15-009	275-56-515	REP-P	94-12-005
250-78-050	AMD-P	94-09-061	275-47-040	NEW-P	94-12-066	275-56-600	NEW	94-07-020
250-78-050	AMD	94-14-008	275-47-040	NEW	94-15-009	275-56-600	REP-P	94-12-005
250-78-060	AMD-P	94-09-061	275-55-221	NEW-E	94-03-004	275-56-610	NEW	94-07-020
250-78-060	AMD	94-14-008	275-55-221	NEW-P	94-03-005	275-56-610	REP-P	94-12-005
250-79-010	NEW-C	94-04-093	275-55-221	NEW	94-06-025	275-56-630	NEW	94-07-020
250-79-010	NEW	94-14-064	275-56-005	REP-P	94-12-005	275-56-630	REP-P	94-12-005
251-04-040	AMD-P	94-12-059	275-56-010	REP-P	94-12-005	275-56-640	NEW	94-07-020
251-04-105	AMD-P	94-12-057	275-56-015	AMD	94-07-020	275-56-640	REP-P	94-12-005
251-06-020	AMD-P	94-12-058	275-56-015	REP-P	94-12-005	275-56-650	NEW	94-07-020
251-08-112	AMD-P	94-12-058	275-56-016	REP-P	94-12-005	275-56-650	REP-P	94-12-005
251-23-010	REP-W	94-04-010	275-56-017	REP-P	94-12-005	275-56-660	NEW	94-07-020
251-23-015	REP-W	94-04-010	275-56-020	REP-P	94-12-005	275-56-660	REP-P	94-12-005
251-23-020	REP-W	94-04-010	275-56-025	REP-P	94-12-005	275-56-670	NEW	94-07-020
251-23-030	REP-W	94-04-010	275-56-035	REP-P	94-12-005	275-56-670	REP-P	94-12-005
251-23-040	REP-W	94-04-010	275-56-040	REP-P	94-12-005	275-56-680	NEW	94-07-020
251-23-050	REP-W	94-04-010	275-56-042	REP-P	94-12-005	275-56-680	REP-P	94-12-005
251-23-060	REP-W	94-04-010	275-56-043	REP-P	94-12-005	275-56-690	NEW	94-07-020
253-02-040	AMD-P	94-12-092	275-56-050	REP-P	94-12-005	275-56-690	REP-P	94-12-005
253-16-090	AMD-P	94-12-092	275-56-055	REP-P	94-12-005	275-56-700	NEW	94-07-020
259-04-060	AMD-E	94-07-059	275-56-060	REP-P	94-12-005	275-56-700	REP-P	94-12-005
259-04-060	AMD-P	94-07-096	275-56-065	REP-P	94-12-005	275-56-710	NEW	94-07-020
259-04-060	AMD	94-12-029	275-56-070	REP-P	94-12-005	275-56-710	REP-P	94-12-005
260-12-010	AMD-W	94-09-003	275-56-075	REP-P	94-12-005	275-56-720	NEW	94-07-020
260-12-090	REP-W	94-09-003	275-56-080	REP-P	94-12-005	275-56-720	REP-P	94-12-005
260-24-010	AMD-W	94-09-003	275-56-085	REP-P	94-12-005	275-57-010	NEW-P	94-12-005
260-24-080	AMD-W	94-09-003	275-56-087	REP-P	94-12-005	275-57-020	NEW-P	94-12-005
260-24-110	AMD-W	94-09-003	275-56-088	REP-P	94-12-005	275-57-030	NEW-P	94-12-005
260-24-120	AMD-W	94-09-003	275-56-089	REP-P	94-12-005	275-57-040	NEW-P	94-12-005
260-24-140	AMD-W	94-09-003	275-56-090	REP-P	94-12-005	275-57-050	NEW-P	94-12-005
260-24-150	AMD-W	94-09-003	275-56-095	REP-P	94-12-005	275-57-060	NEW-P	94-12-005
260-24-170	AMD-W	94-09-003	275-56-100	REP-P	94-12-005	275-57-070	NEW-P	94-12-005
260-24-180	AMD-W	94-09-003	275-56-105	REP-P	94-12-005	275-57-080	NEW-P	94-12-005
260-24-200	AMD-W	94-09-003	275-56-110	REP-P	94-12-005	275-57-090	NEW-P	94-12-005
260-24-210	AMD-W	94-09-003	275-56-115	REP-P	94-12-005	275-57-100	NEW-P	94-12-005
260-24-285	AMD-W	94-09-003	275-56-135	REP-P	94-12-005	275-57-110	NEW-P	94-12-005
260-24-290	AMD-W	94-09-003	275-56-150	REP-P	94-12-005	275-57-120	NEW-P	94-12-005
260-24-315	AMD-W	94-09-003	275-56-170	REP-P	94-12-005	275-57-130	NEW-P	94-12-005
260-24-440	AMD-W	94-09-003	275-56-175	REP-P	94-12-005	275-57-140	NEW-P	94-12-005
260-24-460	AMD-W	94-09-003	275-56-180	REP-P	94-12-005	275-57-150	NEW-P	94-12-005
260-24-470	AMD-W	94-09-003	275-56-185	REP-P	94-12-005	275-57-160	NEW-P	94-12-005
260-24-500	AMD-W	94-09-003	275-56-195	REP-P	94-12-005	275-57-170	NEW-P	94-12-005
260-24-510	AMD-W	94-09-003	275-56-200	REP-P	94-12-005	275-57-180	NEW-P	94-12-005
260-24-520	AMD-W	94-09-003	275-56-205	REP-P	94-12-005	275-57-190	NEW-P	94-12-005
260-34-030	AMD-W	94-09-003	275-56-210	REP-P	94-12-005	275-57-200	NEW-P	94-12-005
260-36-080	AMD	94-04-002	275-56-215	REP-P	94-12-005	275-57-210	NEW-P	94-12-005
260-48-322	AMD-P	94-05-077	275-56-220	REP-P	94-12-005	275-57-220	NEW-P	94-12-005
260-48-324	AMD-P	94-05-076	275-56-225	REP-P	94-12-005	275-57-230	NEW-P	94-12-005
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275-57-260	NEW-P	94-12-005	284-10-080	NEW-W	94-03-085	284-17-410	AMD	94-14-033
275-57-270	NEW-P	94-12-005	284-10-090	NEW-E	94-03-084	284-17-420	AMD-P	94-11-100
275-57-280	NEW-P	94-12-005	284-10-090	NEW-W	94-03-085	284-17-420	AMD	94-14-033
275-57-290	NEW-P	94-12-005	284-10-090	NEW-P	94-04-126	284-23-600	NEW-P	94-15-105
275-57-300	NEW-P	94-12-005	284-10-090	NEW	94-08-060	284-23-610	NEW-P	94-15-105
275-57-310	NEW-P	94-12-005	284-10-100	NEW-W	94-03-085	284-23-620	NEW-P	94-15-105
275-57-320	NEW-P	94-12-005	284-10-110	NEW-W	94-03-085	284-23-630	NEW-P	94-15-105
275-57-330	NEW-P	94-12-005	284-10-120	NEW-W	94-03-085	284-23-640	NEW-P	94-15-105
275-57-340	NEW-P	94-12-005	284-10-130	NEW-W	94-03-085	284-23-650	NEW-P	94-15-105
275-57-350	NEW-P	94-12-005	284-10-140	NEW-W	94-03-085	284-23-660	NEW-P	94-15-105
275-57-360	NEW-P	94-12-005	284-10-150	NEW-W	94-03-085	284-23-670	NEW-P	94-15-105
275-57-370	NEW-P	94-12-005	284-10-160	NEW-W	94-03-085	284-23-680	NEW-P	94-15-105
275-57-380	NEW-P	94-12-005	284-10-170	NEW-W	94-03-085	284-23-690	NEW-P	94-15-105
275-57-390	NEW-P	94-12-005	284-10-180	NEW-W	94-03-085	284-23-700	NEW-P	94-15-105
275-57-400	NEW-P	94-12-005	284-10-190	NEW-W	94-03-085	284-23-710	NEW-P	94-15-105
275-57-410	NEW-P	94-12-005	284-10-200	NEW-W	94-03-085	284-23-720	NEW-P	94-15-105
275-57-420	NEW-P	94-12-005	284-12-090	AMD-P	94-11-100	284-23-730	NEW-P	94-15-105
275-57-430	NEW-P	94-12-005	284-12-090	AMD	94-14-110	284-30	PREP	94-05-056
275-57-440	NEW-P	94-12-005	284-12-270	AMD-P	94-11-100	284-30-450	PREP	94-05-070
275-57-450	NEW-P	94-12-005	284-12-270	AMD	94-14-110	284-30-450	NEW-P	94-15-104
275-57-460	NEW-P	94-12-005	284-13-110	REP-P	94-05-089	284-43-040	NEW-P	94-10-077
275-57-470	NEW-P	94-12-005	284-13-110	REP-C	94-08-013	284-44	PREP	94-05-056
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275-59-072	NEW-P	94-03-005	284-13-110	REP	94-12-077	284-46	PREP	94-05-056
275-59-072	NEW	94-06-025	284-13-120	REP-P	94-05-089	284-46-500	NEW-P	94-15-103
275-156-010	AMD-P	94-07-087	284-13-120	REP-C	94-08-013	284-50-330	AMD-P	94-15-103
275-156-010	AMD	94-12-006	284-13-120	REP-C	94-10-024	284-51-010	AMD-P	94-11-122
275-156-015	AMD-P	94-07-087	284-13-120	REP	94-12-077	284-51-015	NEW-P	94-11-122
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275-156-020	AMD-P	94-07-087	284-13-130	REP-C	94-08-013	284-51-030	AMD-P	94-11-122
275-156-020	AMD	94-12-006	284-13-130	REP-C	94-10-024	284-51-040	AMD-P	94-11-122
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275-156-025	AMD	94-12-006	284-13-140	REP-P	94-05-089	284-51-050	AMD-P	94-11-122
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275-156-030	AMD	94-12-006	284-13-140	REP-C	94-10-024	284-51-070	REP-P	94-11-122
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284-07-110	AMD	94-04-045	284-13-150	REP-C	94-08-013	284-51-130	AMD-P	94-11-122
284-07-130	AMD	94-04-045	284-13-150	REP-C	94-10-024	284-51-140	AMD-P	94-11-122
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284-10-010	NEW-W	94-03-085	284-13-810	NEW-C	94-10-024	284-54-150	AMD-P	94-09-050
284-10-010	NEW-P	94-04-126	284-13-810	NEW-W	94-12-077	284-54-150	AMD-S	94-11-096
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284-10-020	NEW-E	94-03-084	284-13-830	NEW-C	94-08-013	284-54-210	NEW-S	94-11-096
284-10-020	NEW-W	94-03-085	284-13-830	NEW-C	94-10-024	284-54-210	NEW	94-14-100
284-10-020	NEW-P	94-04-126	284-13-830	NEW-W	94-12-077	284-54-260	NEW-P	94-09-050
284-10-020	NEW	94-08-060	284-17-120	AMD-P	94-11-100	284-54-260	NEW-S	94-11-096
284-10-030	NEW-E	94-03-084	284-17-120	AMD	94-14-033	284-54-260	NEW	94-14-100
284-10-030	NEW-W	94-03-085	284-17-121	AMD-P	94-11-100	284-54-270	NEW-P	94-09-050
284-10-030	NEW-P	94-04-126	284-17-121	AMD	94-14-033	284-54-270	NEW-S	94-11-096
284-10-030	NEW	94-08-060	284-17-220	AMD-P	94-11-100	284-54-270	NEW	94-14-100
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284-97-110	PREP	94-05-071	286-40-050	NEW-P	94-13-196	296-17-519	AMD-P	94-07-128
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286-04-050	AMD-P	94-13-196	292-06-070	PREP	94-15-039	296-17-536	AMD-P	94-07-128
286-04-060	AMD-P	94-13-196	292-06-080	PREP	94-15-039	296-17-536	AMD	94-12-063
286-04-065	NEW-P	94-13-196	292-06-090	PREP	94-15-039	296-17-558	REP-P	94-07-128
286-04-070	AMD-P	94-13-196	292-06-100	PREP	94-15-039	296-17-558	REP	94-12-063
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286-04-090	NEW-P	94-13-196	292-06-130	PREP	94-15-039	296-17-56101	AMD	94-12-063
286-06-010	REP-P	94-13-196	292-06-140	PREP	94-15-039	296-17-650	AMD-P	94-07-128
286-06-030	REP-P	94-13-196	292-06-160	PREP	94-15-039	296-17-650	AMD	94-12-063
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286-06-050	AMD-P	94-13-196	292-06-190	PREP	94-15-039	296-17-66003	NEW	94-12-051
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286-06-065	NEW-P	94-13-196	292-06-210	PREP	94-15-039	296-17-686	AMD	94-12-063
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286-06-120	AMD-P	94-13-196	292-06-280	PREP	94-15-039	296-17-779	AMD	94-12-063
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286-06-140	REP-P	94-13-196	292-08-020	PREP	94-15-039	296-17-895	AMD	94-12-051
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286-13-010	NEW-P	94-13-196	292-08-050	PREP	94-15-039	296-20-01505	NEW-P	94-07-126
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286-13-050	NEW-P	94-13-196	292-12-040	PREP	94-15-039	296-20-135	AMD	94-03-008
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286-13-070	NEW-P	94-13-196	292-12-060	PREP	94-15-039	296-20-380	AMD	94-03-073
286-13-080	NEW-P	94-13-196	292-12-070	PREP	94-15-039	296-20-385	NEW	94-03-073
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286-13-100	NEW-P	94-13-196	292-12-110	PREP	94-15-039	296-21-015	REP	94-14-044
286-13-110	NEW-P	94-13-196	292-12-120	PREP	94-15-039	296-21-025	REP-P	94-07-126
286-13-115	NEW-P	94-13-196	292-12-130	PREP	94-15-039	296-21-025	REP	94-14-044
286-13-120	NEW-P	94-13-196	292-12-140	PREP	94-15-039	296-21-026	REP-P	94-07-126
286-26-010	AMD-P	94-13-196	292-12-150	PREP	94-15-039	296-21-026	REP	94-14-044
286-26-020	AMD-P	94-13-196	292-12-160	PREP	94-15-039	296-21-027	REP-P	94-07-126
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286-26-060	REP-P	94-13-196	296-15-020	AMD	94-05-042	296-21-085	REP-P	94-07-126
286-26-070	REP-P	94-13-196	296-15-02601	AMD-P	94-12-096	296-21-085	REP	94-14-044
286-26-080	NEW-P	94-13-196	296-15-02606	NEW-C	94-03-006	296-21-240	REP-P	94-07-126
286-26-090	NEW-P	94-13-196	296-15-02606	NEW	94-05-042	296-21-240	REP	94-14-044
286-26-100	NEW-P	94-13-196	296-15-030	AMD-C	94-03-006	296-21-250	REP-P	94-07-126
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286-30-020	NEW-P	94-13-196	296-15-060	AMD-P	94-12-096	296-21-260	REP-P	94-07-126
286-30-030	NEW-P	94-13-196	296-15-070	AMD-P	94-12-096	296-21-260	REP	94-14-044
286-30-040	NEW-P	94-13-196	296-15-072	AMD-P	94-12-096	296-21-270	REP-P	94-07-126
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286-35-050	NEW-P	94-13-196	296-17-350	AMD	94-12-050	296-21-310	REP-P	94-07-126
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296-24-81013	AMD	94-15-096	296-27-080	AMD-P	94-10-010	296-45-67503	AMD-P	94-15-095
296-24-82501	AMD-P	94-10-010	296-27-080	AMD	94-15-096	296-45-67505	AMD-P	94-15-095
296-24-82501	AMD	94-15-096	296-27-090	AMD-P	94-10-010	296-45-67507	AMD-P	94-15-095
296-24-82503	AMD-P	94-10-010	296-27-090	AMD-P	94-15-095	296-45-67521	AMD-P	94-15-095
296-24-82503	AMD	94-15-096	296-27-110	AMD-P	94-10-010	296-45-67527	AMD-P	94-15-095
296-24-82513	AMD-P	94-10-010	296-27-110	AMD	94-15-096	296-45-67531	AMD-P	94-15-095
296-24-82513	AMD	94-15-096	296-27-120	AMD-P	94-10-010	296-45-67535	AMD-P	94-15-095
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296-24-82519	AMD	94-15-096	296-27-15501	AMD-P	94-10-010	296-45-695	NEW-P	94-15-095
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296-24-84005	AMD	94-15-096	296-32-230	AMD-P	94-10-010	296-62-05411	AMD-P	94-11-124
296-24-84007	AMD-P	94-10-010	296-32-230	AMD	94-15-096	296-62-05413	AMD-P	94-11-124
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296-24-87015	AMD-P	94-10-010	296-32-300	AMD	94-15-096	296-62-07105	AMD	94-15-096
296-24-87015	AMD	94-15-096	296-32-320	AMD-P	94-10-010	296-62-07302	AMD-P	94-10-010
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296-24-88501	AMD	94-15-096	296-37-510	AMD-P	94-10-010	296-62-07337	AMD-P	94-10-010
296-24-88505	AMD-P	94-10-010	296-37-510	AMD	94-15-096	296-62-07337	AMD	94-15-096
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296-24-93503	AMD	94-15-096	296-45-65011	AMD-P	94-15-095	296-62-07533	AMD	94-15-096
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296-24-94001	AMD	94-15-096	296-45-65015	AMD-P	94-15-095	296-62-07540	AMD	94-15-096
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296-24-95605	AMD	94-15-096	296-45-65023	AMD-P	94-15-095	296-62-07617	AMD-P	94-15-095
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296-306-175	AMD-P	94-12-095	308-62-010	REP-P	94-04-017	308-330-400	AMD-P	94-14-041
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315-11A-118	AMD-P	94-12-082	332-18-010	AMD	94-14-051	332-120-070	NEW	94-06-034
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315-11A-119	AMD-P	94-12-082	332-18-01002	NEW	94-14-051	352-28-005	AMD	94-10-012
315-11A-119	AMD	94-15-049	332-18-01003	NEW-P	94-09-062	352-28-010	AMD-P	94-06-049
315-11A-120	NEW-P	94-03-099	332-18-01003	NEW	94-14-051	352-28-010	AMD	94-10-012
315-11A-120	NEW	94-07-029	332-18-01004	NEW-P	94-09-062	352-32-010	AMD-P	94-03-097
315-11A-120	AMD-P	94-12-082	332-18-01004	NEW	94-14-051	352-32-010	AMD-C	94-06-010
315-11A-120	AMD	94-15-049	332-18-01005	NEW-P	94-09-062	352-32-010	AMD	94-08-036
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315-11A-121	NEW	94-07-029	332-18-015	REP-P	94-09-062	352-32-045	AMD-C	94-06-010
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356-09-040	REP-W	94-04-010	359-39-030	NEW	94-13-091	388-24-052	REP-P	94-07-114
356-09-050	REP-W	94-04-010	359-39-040	NEW-P	94-06-065	388-24-052	REP	94-10-065
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356-10-045	AMD-P	94-12-060	359-39-050	NEW	94-13-091	388-24-060	REP-P	94-07-114
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356-26-070	AMD	94-10-008	365-140-045	NEW-P	94-13-022	388-24-074	REP	94-10-065
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356-30-315	NEW	94-04-011	365-140-050	AMD-P	94-13-022	388-24-090	REP	94-10-065
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388-24-2070	NEW-E	94-12-009	388-28-360	REP-P	94-07-114	388-28-500	REP	94-10-065
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388-24-210	REP	94-10-065	388-28-365	REP-P	94-07-114	388-28-515	REP	94-10-065
388-24-2100	NEW-P	94-13-008	388-28-365	REP	94-10-065	388-28-520	REP-P	94-07-114
388-24-2100	NEW-E	94-12-009	388-28-370	REP	94-04-043	388-28-520	REP	94-10-065
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388-24-2150	NEW-E	94-12-009	388-28-380	REP	94-10-065	388-28-530	REP	94-10-065
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388-24-220	REP	94-10-065	388-28-385	REP	94-10-065	388-28-532	REP	94-10-065
388-24-2200	NEW-P	94-13-008	388-28-390	AMD-P	94-05-069	388-28-535	REP-P	94-07-114
388-24-2200	NEW-E	94-12-009	388-28-390	REP-P	94-07-114	388-28-535	REP	94-10-065
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388-24-225	REP	94-10-065	388-28-390	REP	94-10-065	388-28-555	REP	94-10-065
388-24-2250	NEW-P	94-13-008	388-28-392	REP-P	94-07-114	388-28-560	AMD-P	94-05-019
388-24-2250	NEW-E	94-12-009	388-28-392	REP	94-10-065	388-28-560	REP-P	94-07-114
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388-24-2350	NEW-E	94-12-009	388-28-410	REP	94-10-065	388-28-570	REP	94-10-065
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388-24-252	REP	94-06-026	388-28-435	REP	94-10-065	388-28-580	REP	94-10-065
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388-26-050	REP	94-10-065	388-28-463	REP	94-04-043	388-29-080	REP-P	94-06-035
388-26-055	REP-P	94-07-114	388-28-464	REP	94-04-043	388-29-080	REP	94-09-001
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388-26-105	REP	94-10-065	388-28-475	REP	94-10-065	388-29-150	REP-P	94-06-035
388-26-120	REP-P	94-07-114	388-28-480	REP-P	94-07-114	388-29-150	REP	94-09-001
388-26-120	REP	94-10-065	388-28-480	REP	94-10-065	388-29-160	REP-P	94-06-035
388-26-145	REP-P	94-07-114	388-28-481	REP-P	94-07-114	388-29-160	REP	94-09-001
388-26-145	REP	94-10-065	388-28-481	REP	94-10-065	388-29-180	REP-P	94-06-035
388-26-149	REP-P	94-07-114	388-28-482	REP-P	94-07-114	388-29-180	REP	94-09-001
388-26-149	REP	94-10-065	388-28-482	REP	94-10-065	388-29-200	REP-P	94-06-035
388-28-005	REP-P	94-07-114	388-28-483	REP-P	94-07-114	388-29-200	REP	94-09-001
388-28-005	REP	94-10-065	388-28-483	REP	94-10-065	388-29-210	REP-P	94-06-035
			388-28-484	AMD-P	94-05-029	388-29-210	REP	94-09-001





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388-49-500	AMD	94-12-042	388-81-070	REP	94-10-065	388-83-033	AMD-P	94-08-044
388-49-505	PREP	94-13-194	388-81-100	REP-P	94-07-114	388-83-033	REP	94-10-065
388-49-505	AMD-P	94-15-048	388-81-100	REP	94-10-065	388-83-033	AMD-W	94-11-059
388-49-535	AMD-P	94-03-041	388-81-175	REP-P	94-07-114	388-83-036	RESCIND	94-11-063
388-49-535	AMD-W	94-06-023	388-81-200	REP-P	94-07-114	388-83-036	REP-P	94-07-114
388-49-550	AMD-P	94-12-083	388-82-006	REP-P	94-07-114	388-83-036	REP	94-10-065
388-49-590	AMD-P	94-03-050	388-82-006	REP	94-10-065	388-83-041	REP-P	94-07-114
388-49-590	AMD-C	94-06-027	388-82-008	REP-P	94-07-114	388-83-041	REP	94-10-065
388-49-590	AMD	94-07-080	388-82-008	REP	94-10-065	388-83-046	REP-P	94-07-114
388-49-630	PREP	94-15-043	388-82-010	REP-P	94-07-114	388-83-046	REP	94-10-065
388-49-630	AMD-P	94-15-057	388-82-010	REP	94-10-065	388-83-130	REP-P	94-07-114
388-49-670	AMD-P	94-13-024	388-82-115	REP-P	94-07-114	388-83-130	REP	94-10-065
388-53-010	REP	94-04-036	388-82-115	REP	94-10-065	388-83-200	REP-P	94-07-114
388-53-050	REP	94-04-036	388-82-126	REP-P	94-07-114	388-83-200	REP	94-10-065
388-59-010	REP	94-04-033	388-82-126	REP	94-10-065	388-83-210	REP-P	94-07-114
388-59-020	REP	94-04-033	388-82-130	REP-P	94-07-114	388-83-210	REP	94-10-065
388-59-030	REP	94-04-033	388-82-130	REP	94-10-065	388-83-220	REP-P	94-07-114
388-59-040	REP	94-04-033	388-82-135	REP-P	94-07-114	388-83-220	REP	94-10-065
388-59-045	REP	94-04-033	388-82-135	REP	94-10-065	388-84-105	REP-P	94-07-114
388-59-048	REP	94-04-033	388-82-140	REP-P	94-07-114	388-84-105	REP	94-10-065
388-59-050	REP	94-04-033	388-82-140	AMD-E	94-08-043	388-84-110	REP-P	94-07-114
388-59-060	REP	94-04-033	388-82-140	AMD-P	94-08-044	388-84-110	REP	94-10-065
388-59-070	REP	94-04-033	388-82-140	REP	94-10-065	388-84-115	AMD-P	94-05-026
388-59-080	REP	94-04-033	388-82-140	REP-W	94-11-059	388-84-115	REP-P	94-07-114
388-59-090	REP	94-04-033	388-82-140	RESCIND	94-11-063	388-84-115	AMD	94-07-132
388-59-100	REP	94-04-033	388-82-150	REP-P	94-07-114	388-84-115	REP	94-10-065
388-80-002	REP-P	94-07-114	388-82-150	AMD-E	94-08-043	388-84-120	REP-P	94-07-114
388-80-002	REP	94-10-065	388-82-150	AMD-P	94-08-044	388-84-120	REP	94-10-065
388-80-005	REP-P	94-07-114	388-82-150	REP	94-10-065	388-85-105	REP-P	94-07-114
388-80-005	REP	94-10-065	388-82-150	AMD-W	94-11-059	388-85-105	REP	94-10-065
388-81-005	REP-P	94-07-114	388-82-150	RESCIND	94-11-063	388-85-110	REP-P	94-07-114
388-81-005	REP	94-10-065	388-82-160	REP-P	94-07-114	388-85-110	REP	94-10-065
388-81-010	REP-P	94-07-114	388-82-160	AMD-E	94-08-043	388-85-115	REP-P	94-07-114
388-81-010	REP	94-10-065	388-82-160	AMD-P	94-08-044	388-85-115	REP	94-10-065
388-81-015	REP-P	94-07-114	388-82-160	REP	94-10-065	388-86-030	AMD-C	94-04-031
388-81-015	REP	94-10-065	388-82-160	AMD-W	94-11-059	388-86-030	AMD-C	94-05-044
388-81-017	REP-P	94-07-114	388-82-160	RESCIND	94-11-063	388-86-030	AMD-C	94-07-021
388-81-017	REP	94-10-065	388-83-005	REP-P	94-07-114	388-86-030	AMD	94-07-122
388-81-020	REP-P	94-07-114	388-83-005	REP	94-10-065	388-86-040	REP-C	94-05-043
388-81-020	REP	94-10-065	388-83-006	REP-P	94-07-114	388-86-040	REP	94-07-022
388-81-025	REP-P	94-07-114	388-83-006	REP	94-10-065	388-86-04001	NEW-C	94-05-043
388-81-025	REP	94-10-065	388-83-010	REP-P	94-07-114	388-86-04001	NEW	94-07-022
388-81-030	REP-P	94-07-114	388-83-010	REP	94-10-065	388-86-045	AMD	94-03-052
388-81-030	REP	94-10-065	388-83-012	REP-P	94-07-114	388-86-073	AMD-P	94-04-022
388-81-035	REP-P	94-07-114	388-83-012	REP	94-10-065	388-86-073	AMD-E	94-04-023
388-81-035	REP	94-10-065	388-83-013	REP-P	94-07-114	388-86-073	AMD	94-07-030
388-81-038	REP-P	94-07-114	388-83-013	REP	94-10-065	388-86-082	PREP	94-13-105
388-81-038	REP	94-10-065	388-83-014	REP-P	94-07-114	388-86-090	AMD-P	94-04-022
388-81-040	REP-P	94-07-114	388-83-014	REP	94-10-065	388-86-090	AMD-E	94-04-023
388-81-040	REP	94-10-065	388-83-015	REP-P	94-07-114	388-86-090	AMD	94-07-030
388-81-042	REP-P	94-07-114	388-83-015	REP	94-10-065	388-86-098	AMD-P	94-04-022
388-81-042	REP	94-10-065	388-83-017	REP-P	94-07-114	388-86-098	AMD-E	94-04-023
388-81-043	REP-P	94-07-114	388-83-017	REP	94-10-065	388-86-098	AMD	94-07-030
388-81-043	REP	94-10-065	388-83-020	REP-P	94-07-114	388-87-300	REP-E	94-08-045
388-81-044	REP-P	94-07-114	388-83-020	REP	94-10-065	388-87-300	REP-P	94-08-046
388-81-044	REP	94-10-065	388-83-025	REP-P	94-07-114	388-87-300	REP	94-11-057
388-81-047	REP-P	94-07-114	388-83-025	REP	94-10-065	388-92-005	REP-P	94-07-114
388-81-047	REP	94-10-065	388-83-026	REP-P	94-07-114	388-92-005	REP	94-10-065
388-81-050	REP-P	94-07-114	388-83-026	REP	94-10-065	388-92-015	REP-P	94-07-114
388-81-050	REP	94-10-065	388-83-029	REP-P	94-07-114	388-92-015	REP	94-10-065
388-81-052	REP-P	94-07-114	388-83-029	REP	94-10-065	388-92-025	REP-P	94-07-114
388-81-052	REP	94-10-065	388-83-031	REP-P	94-07-114	388-92-025	REP	94-10-065
388-81-055	REP-P	94-07-114	388-83-031	REP	94-10-065	388-92-027	REP-P	94-07-114
388-81-055	REP	94-10-065	388-83-03101	REP-P	94-07-114	388-92-027	REP	94-10-065
388-81-060	REP-P	94-07-114	388-83-03101	REP	94-10-065	388-92-030	REP-P	94-07-114
388-81-060	REP	94-10-065	388-83-032	REP-P	94-07-114	388-92-030	REP	94-10-065
388-81-065	REP-P	94-07-114	388-83-032	AMD-E	94-08-043	388-92-034	REP-P	94-07-114
388-81-065	REP-E	94-08-045	388-83-032	AMD-P	94-08-044	388-92-034	REP	94-10-065
388-81-065	REP-P	94-08-046	388-83-032	REP	94-10-065	388-92-036	REP-P	94-07-114
388-81-065	REP	94-10-065	388-83-032	AMD-W	94-11-059	388-92-036	AMD-E	94-08-041
388-81-065	REP-W	94-11-058	388-83-032	RESCIND	94-11-063	388-92-036	AMD-P	94-08-042
388-81-065	RESCIND	94-11-061	388-83-033	REP-P	94-07-114	388-92-036	REP	94-10-065
388-81-070	REP-P	94-07-114	388-83-033	AMD-E	94-08-043	388-92-036	AMD-W	94-11-060



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388-92-040	REP-P	94-07-114	388-96-010	AMD-P	94-07-109	388-97-055	NEW-P	94-13-052
388-92-040	REP	94-10-065	388-96-010	AMD	94-12-043	388-97-060	NEW-P	94-13-052
388-92-041	AMD-E	94-05-027	388-96-113	AMD-P	94-07-109	388-97-065	NEW-P	94-13-052
388-92-041	AMD-P	94-05-028	388-96-113	AMD	94-12-043	388-97-070	NEW-P	94-13-052
388-92-041	REP-P	94-07-114	388-96-134	AMD-P	94-07-109	388-97-075	NEW-P	94-13-052
388-92-041	AMD	94-07-131	388-96-134	AMD	94-12-043	388-97-080	NEW-P	94-13-052
388-92-041	REP	94-10-065	388-96-217	AMD-P	94-07-109	388-97-085	NEW-P	94-13-052
388-92-045	REP-P	94-07-114	388-96-217	AMD	94-12-043	388-97-090	NEW-P	94-13-052
388-92-045	REP	94-10-065	388-96-221	AMD-P	94-07-109	388-97-095	NEW-P	94-13-052
388-92-050	REP-P	94-07-114	388-96-221	AMD	94-12-043	388-97-100	NEW-P	94-13-052
388-92-050	REP	94-10-065	388-96-226	AMD-P	94-07-109	388-97-105	NEW-P	94-13-052
388-93-005	REP-P	94-07-114	388-96-226	AMD	94-12-043	388-97-110	NEW-P	94-13-052
388-93-005	REP	94-10-065	388-96-228	AMD-P	94-07-109	388-97-115	NEW-P	94-13-052
388-93-010	REP-P	94-07-114	388-96-228	AMD	94-12-043	388-97-120	NEW-P	94-13-052
388-93-010	REP	94-10-065	388-96-525	AMD-P	94-07-109	388-97-125	NEW-P	94-13-052
388-93-015	REP-P	94-07-114	388-96-525	AMD	94-12-043	388-97-130	NEW-P	94-13-052
388-93-015	REP	94-10-065	388-96-533	AMD-P	94-07-109	388-97-135	NEW-P	94-13-052
388-93-020	REP-P	94-07-114	388-96-533	AMD	94-12-043	388-97-140	NEW-P	94-13-052
388-93-020	REP	94-10-065	388-96-534	AMD-P	94-07-109	388-97-145	NEW-P	94-13-052
388-93-025	REP-P	94-07-114	388-96-534	AMD	94-12-043	388-97-150	NEW-P	94-13-052
388-93-025	REP	94-10-065	388-96-559	AMD-P	94-07-109	388-97-155	NEW-P	94-13-052
388-93-030	REP-P	94-07-114	388-96-559	AMD	94-12-043	388-97-160	NEW-P	94-13-052
388-93-030	REP	94-10-065	388-96-565	AMD-P	94-07-109	388-97-165	NEW-P	94-13-052
388-93-035	REP-P	94-07-114	388-96-565	AMD	94-12-043	388-97-170	NEW-P	94-13-052
388-93-035	REP	94-10-065	388-96-585	AMD-P	94-07-109	388-97-175	NEW-P	94-13-052
388-93-040	REP-P	94-07-114	388-96-585	AMD	94-12-043	388-97-180	NEW-P	94-13-052
388-93-040	REP	94-10-065	388-96-704	AMD-P	94-07-109	388-97-185	NEW-P	94-13-052
388-93-045	REP-P	94-07-114	388-96-704	AMD	94-12-043	388-97-190	NEW-P	94-13-052
388-93-045	REP	94-10-065	388-96-707	REP-P	94-07-109	388-97-195	NEW-P	94-13-052
388-93-050	REP-P	94-07-114	388-96-707	REP	94-12-043	388-97-205	NEW-P	94-13-052
388-93-050	REP	94-10-065	388-96-709	AMD-P	94-07-109	388-97-210	NEW-P	94-13-052
388-93-055	REP-P	94-07-114	388-96-709	AMD	94-12-043	388-97-220	NEW-P	94-13-052
388-93-055	REP	94-10-065	388-96-710	AMD-P	94-07-109	388-97-225	NEW-P	94-13-052
388-93-060	REP-P	94-07-114	388-96-710	AMD	94-12-043	388-97-230	NEW-P	94-13-052
388-93-060	REP	94-10-065	388-96-719	AMD-P	94-07-109	388-97-235	NEW-P	94-13-052
388-93-065	REP-P	94-07-114	388-96-719	AMD	94-12-043	388-97-240	NEW-P	94-13-052
388-93-065	REP	94-10-065	388-96-721	REP-P	94-07-109	388-97-245	NEW-P	94-13-052
388-93-075	REP-P	94-07-114	388-96-721	REP	94-12-043	388-97-250	NEW-P	94-13-052
388-93-075	REP	94-10-065	388-96-722	AMD-P	94-07-109	388-97-255	NEW-P	94-13-052
388-93-080	REP-P	94-07-114	388-96-722	AMD	94-12-043	388-97-260	NEW-P	94-13-052
388-93-080	REP	94-10-065	388-96-727	AMD-P	94-07-109	388-97-265	NEW-P	94-13-052
388-95-300	REP-P	94-07-114	388-96-727	AMD	94-12-043	388-97-270	NEW-P	94-13-052
388-95-300	REP	94-10-065	388-96-735	AMD-P	94-07-109	388-97-275	NEW-P	94-13-052
388-95-310	REP-P	94-07-114	388-96-735	AMD	94-12-043	388-97-280	NEW-P	94-13-052
388-95-310	REP	94-10-065	388-96-737	AMD-P	94-07-109	388-97-285	NEW-P	94-13-052
388-95-320	REP-P	94-07-114	388-96-737	AMD	94-12-043	388-97-290	NEW-P	94-13-052
388-95-320	REP	94-10-065	388-96-745	AMD-P	94-07-109	388-97-295	NEW-P	94-13-052
388-95-335	REP-P	94-07-114	388-96-745	AMD	94-12-043	388-97-300	NEW-P	94-13-052
388-95-335	REP	94-10-065	388-96-753	NEW-P	94-07-109	388-97-305	NEW-P	94-13-052
388-95-337	AMD-P	94-05-025	388-96-753	NEW	94-12-043	388-97-310	NEW-P	94-13-052
388-95-337	REP-P	94-07-114	388-96-754	AMD-P	94-07-109	388-97-315	NEW-P	94-13-052
388-95-337	AMD	94-07-130	388-96-754	AMD	94-12-043	388-97-320	NEW-P	94-13-052
388-95-337	REP	94-10-065	388-96-763	AMD-P	94-07-109	388-97-325	NEW-P	94-13-052
388-95-340	REP-P	94-07-114	388-96-763	AMD	94-12-043	388-97-330	NEW-P	94-13-052
388-95-340	AMD-E	94-08-041	388-96-774	AMD-P	94-07-109	388-97-335	NEW-P	94-13-052
388-95-340	AMD-P	94-08-042	388-96-774	AMD	94-12-043	388-97-340	NEW-P	94-13-052
388-95-340	REP	94-10-065	388-96-774	AMD	94-14-016	388-97-345	NEW-P	94-13-052
388-95-340	AMD-W	94-11-060	388-96-776	NEW-P	94-07-109	388-97-350	NEW-P	94-13-052
388-95-340	RESCIND	94-11-062	388-96-776	NEW	94-12-043	388-97-355	NEW-P	94-13-052
388-95-360	REP-P	94-07-114	388-96-777	NEW-P	94-07-109	388-97-360	NEW-P	94-13-052
388-95-360	AMD-E	94-08-043	388-96-777	NEW	94-12-043	388-97-365	NEW-P	94-13-052
388-95-360	AMD-P	94-08-044	388-96-904	AMD-P	94-07-109	388-97-370	NEW-P	94-13-052
388-95-360	REP	94-10-065	388-96-904	AMD	94-12-043	388-97-375	NEW-P	94-13-052
388-95-360	AMD-W	94-11-059	388-97-005	NEW-P	94-13-052	388-97-380	NEW-P	94-13-052
388-95-360	RESCIND	94-11-063	388-97-010	NEW-P	94-13-052	388-97-385	NEW-P	94-13-052
388-95-380	REP-P	94-07-114	388-97-015	NEW-P	94-13-052	388-97-390	NEW-P	94-13-052
388-95-380	REP	94-10-065	388-97-020	NEW-P	94-13-052	388-97-395	NEW-P	94-13-052
388-95-390	REP-P	94-07-114	388-97-025	NEW-P	94-13-052	388-97-400	NEW-P	94-13-052
388-95-390	REP	94-10-065	388-97-030	NEW-P	94-13-052	388-97-405	NEW-P	94-13-052
388-95-395	REP-P	94-07-114	388-97-035	NEW-P	94-13-052	388-97-410	NEW-P	94-13-052
388-95-395	REP	94-10-065	388-97-040	NEW-P	94-13-052	388-97-415	NEW-P	94-13-052
388-95-400	REP-P	94-07-114	388-97-045	NEW-P	94-13-052	388-97-420	NEW-P	94-13-052

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388-225-0020	NEW	94-06-026	388-245-1600	NEW-P	94-07-114	388-255-1300	NEW-P	94-06-035
388-225-0050	NEW-P	94-03-051	388-245-1600	NEW	94-10-065	388-255-1300	NEW	94-09-001
388-225-0050	NEW	94-06-026	388-245-1610	NEW-P	94-07-114	388-255-1350	NEW-P	94-06-035
388-225-0060	NEW-P	94-03-051	388-245-1610	NEW	94-10-065	388-255-1350	NEW	94-09-001
388-225-0060	NEW	94-06-026	388-245-1700	NEW-P	94-07-114	388-255-1400	NEW-P	94-06-035
388-225-0070	NEW-P	94-03-051	388-245-1700	NEW	94-10-065	388-255-1400	NEW	94-09-001
388-225-0070	NEW	94-06-026	388-245-1710	NEW-P	94-07-114	388-265	PREP	94-15-044
388-225-0080	NEW-P	94-03-051	388-245-1710	NEW	94-10-065	388-265-1010	NEW-P	94-07-114
388-225-0080	NEW	94-06-026	388-245-1715	NEW-P	94-07-114	388-265-1010	NEW	94-10-065
388-225-0090	NEW-P	94-03-051	388-245-1715	NEW	94-10-065	388-265-1050	NEW-P	94-07-114
388-225-0090	NEW	94-06-026	388-245-1720	NEW-P	94-07-114	388-265-1050	NEW	94-10-065
388-225-0100	NEW-P	94-03-051	388-245-1720	NEW	94-10-065	388-265-1100	NEW-P	94-07-114
388-225-0100	NEW	94-06-026	388-245-1730	NEW-P	94-07-114	388-265-1110	NEW	94-10-065
388-225-0120	NEW-P	94-03-051	388-245-1730	NEW	94-10-065	388-265-1150	NEW-P	94-07-114
388-225-0120	NEW	94-06-026	388-245-1740	NEW-P	94-07-114	388-265-1150	NEW	94-10-065
388-225-0150	NEW-P	94-03-051	388-245-1740	NEW	94-10-065	388-265-1200	NEW-P	94-07-114
388-225-0150	NEW	94-06-026	388-245-2010	NEW-P	94-07-114	388-265-1200	NEW	94-10-065
388-225-0160	NEW-P	94-03-051	388-245-2010	NEW	94-10-065	388-265-1250	NEW-P	94-07-114
388-225-0160	NEW	94-06-026	388-245-2020	NEW-P	94-07-114	388-265-1250	NEW	94-10-065
388-225-0170	NEW-P	94-03-051	388-245-2020	NEW	94-10-065	388-265-1300	NEW-P	94-07-114
388-225-0170	NEW	94-06-026	388-245-2030	NEW-P	94-07-114	388-265-1300	NEW	94-10-065
388-225-0180	NEW-P	94-03-051	388-245-2030	NEW	94-10-065	388-265-1350	NEW-P	94-07-114
388-225-0180	NEW	94-06-026	388-245-2040	NEW-P	94-07-114	388-265-1350	NEW	94-10-065
388-225-0190	NEW-P	94-03-051	388-245-2040	NEW	94-10-065	388-265-1400	NEW-P	94-07-114
388-225-0190	NEW	94-06-026	388-245-2050	NEW-P	94-07-114	388-265-1400	NEW	94-10-065
388-225-0300	NEW-P	94-03-051	388-245-2050	NEW	94-10-065	388-265-1450	NEW-P	94-07-114
388-225-0300	NEW	94-06-026	388-250-1010	NEW-P	94-06-035	388-265-1450	NEW	94-10-065
388-230-0090	AMD-P	94-13-008	388-250-1010	NEW	94-09-001	388-265-1500	NEW-P	94-07-114
388-230-0090	AMD-E	94-13-009	388-250-1050	NEW-P	94-06-035	388-265-1500	NEW	94-10-065
388-233-0060	AMD-P	94-13-008	388-250-1050	NEW	94-09-001	388-265-1550	NEW-P	94-07-114
388-233-0060	AMD-E	94-13-009	388-250-1100	NEW-P	94-06-035	388-265-1550	NEW	94-10-065
388-233-0070	AMD-P	94-13-008	388-250-1100	NEW	94-09-001	388-265-1600	NEW-P	94-07-114
388-233-0070	AMD-E	94-13-009	388-250-1150	NEW-P	94-06-035	388-265-1600	NEW	94-10-065
388-235-0070	AMD-P	94-13-008	388-250-1150	NEW	94-09-001	388-265-1650	NEW-P	94-07-114
388-235-0070	AMD-E	94-13-009	388-250-1200	NEW-P	94-06-035	388-265-1650	NEW	94-10-065
388-235-2000	AMD-P	94-13-008	388-250-1200	NEW	94-09-001	388-265-1700	NEW-P	94-07-114
388-235-2000	AMD-E	94-13-009	388-250-1250	NEW-P	94-06-035	388-265-1700	NEW	94-10-065
388-235-3000	AMD-P	94-13-008	388-250-1250	NEW	94-09-001	388-265-1750	NEW-P	94-07-114
388-235-3000	AMD-E	94-13-009	388-250-1300	NEW-P	94-06-035	388-265-1750	NEW	94-10-065
388-235-7300	AMD-P	94-11-024	388-250-1300	NEW	94-09-001	388-265-1800	NEW-P	94-07-114
388-235-7300	AMD	94-13-202	388-250-1350	NEW-P	94-06-035	388-265-1800	NEW	94-10-065
388-235-7400	NEW-P	94-11-024	388-250-1350	NEW	94-09-001	388-265-1850	NEW-P	94-07-114
388-235-7400	NEW	94-13-202	388-250-1400	NEW-P	94-06-035	388-265-1850	NEW	94-10-065
388-245-1000	NEW-P	94-07-114	388-250-1400	NEW	94-09-001	388-265-1900	NEW-P	94-07-114
388-245-1000	NEW	94-10-065	388-250-1450	NEW-P	94-06-035	388-265-1900	NEW	94-10-065
388-245-1150	NEW-P	94-07-114	388-250-1450	NEW	94-09-001	388-265-1950	NEW-P	94-07-114
388-245-1150	NEW	94-10-065	388-250-1500	NEW-P	94-06-035	388-265-1950	NEW	94-10-065
388-245-1160	NEW-P	94-07-114	388-250-1500	NEW	94-09-001	388-265-2000	NEW-P	94-07-114
388-245-1160	NEW	94-10-065	388-250-1550	NEW-P	94-06-035	388-265-2000	NEW	94-10-065
388-245-1170	NEW-P	94-07-114	388-250-1550	NEW	94-09-001	388-270-1005	NEW	94-05-045
388-245-1170	NEW	94-10-065	388-250-1600	NEW-P	94-06-035	388-270-1010	NEW	94-05-045
388-245-1210	NEW-P	94-07-114	388-250-1600	NEW	94-09-001	388-270-1025	NEW	94-05-045
388-245-1210	NEW	94-10-065	388-250-1650	NEW-P	94-06-035	388-270-1075	NEW	94-05-045
388-245-1300	NEW-P	94-07-114	388-250-1650	NEW	94-09-001	388-270-1100	NEW	94-05-045
388-245-1300	NEW	94-10-065	388-250-1700	NEW-P	94-06-035	388-270-1110	NEW	94-05-045
388-245-1310	NEW-P	94-07-114	388-250-1700	NEW	94-09-001	388-270-1125	NEW	94-05-045
388-245-1310	NEW	94-10-065	388-250-1700	AMD-P	94-12-004	388-270-1150	NEW	94-05-045
388-245-1315	NEW-P	94-07-114	388-250-1700	AMD-E	94-14-004	388-270-1200	NEW	94-05-045
388-245-1315	NEW	94-10-065	388-250-1700	AMD	94-15-003	388-270-1250	NEW	94-05-045
388-245-1320	NEW-P	94-07-114	388-250-1750	NEW-P	94-06-035	388-270-1300	NEW	94-05-045
388-245-1320	NEW	94-10-065	388-250-1750	NEW	94-09-001	388-270-1400	NEW	94-05-045
388-245-1350	NEW-P	94-07-114	388-255-1020	NEW-P	94-06-035	388-270-1500	NEW	94-05-045
388-245-1350	NEW	94-10-065	388-255-1020	NEW	94-09-001	388-270-1550	NEW	94-05-045
388-245-1400	NEW-P	94-07-114	388-255-1050	NEW-P	94-06-035	388-270-1600	NEW	94-05-045
388-245-1400	NEW	94-10-065	388-255-1050	NEW	94-09-001	388-275-0010	NEW	94-04-033
388-245-1410	NEW-P	94-07-114	388-255-1100	NEW-P	94-06-035	388-275-0020	NEW	94-04-033
388-245-1410	NEW	94-10-065	388-255-1100	NEW	94-09-001	388-275-0030	NEW	94-04-033
388-245-1500	NEW-P	94-07-114	388-255-1150	NEW-P	94-06-035	388-275-0040	NEW	94-04-033
388-245-1500	NEW	94-10-065	388-255-1150	NEW	94-09-001	388-275-0050	NEW	94-04-033
388-245-1510	NEW-P	94-07-114	388-255-1200	NEW-P	94-06-035	388-275-0060	NEW	94-04-033
388-245-1510	NEW	94-10-065	388-255-1200	NEW	94-09-001	388-275-0060	AMD-P	94-13-008
388-245-1520	NEW-P	94-07-114	388-255-1250	NEW-P	94-06-035	388-275-0060	AMD-E	94-13-009
388-245-1520	NEW	94-10-065	388-255-1250	NEW	94-09-001	388-275-0070	NEW	94-04-033

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WAC #	WSR #	WAC #	WSR #	WAC #	WSR #			
388-275-0080	NEW	94-04-033	388-504-0470	NEW-P	94-07-114	388-509-0960	PREP	94-13-102
388-275-0090	NEW	94-04-033	388-504-0470	NEW	94-10-065	388-509-0960	AMD-E	94-14-053
388-320-115	AMD-P	94-13-025	388-504-0480	NEW-P	94-07-114	388-509-0960	AMD-P	94-14-055
388-320-130	AMD-P	94-13-025	388-504-0480	NEW	94-10-065	388-509-0970	NEW-P	94-07-114
388-320-135	AMD-P	94-13-025	388-504-0485	NEW-P	94-07-114	388-509-0970	NEW	94-10-065
388-320-220	AMD-P	94-13-025	388-504-0485	NEW	94-10-065	388-510-1020	NEW-P	94-07-114
388-320-240	AMD-P	94-13-025	388-505-0501	NEW-P	94-07-114	388-510-1020	NEW	94-10-065
388-500-0005	NEW-P	94-07-114	388-505-0501	NEW	94-10-065	388-510-1030	NEW-P	94-07-114
388-500-0005	NEW	94-10-065	388-505-0505	NEW-P	94-07-114	388-510-1030	NEW	94-10-065
388-501-0105	NEW-P	94-07-114	388-505-0505	NEW	94-10-065	388-511-1105	NEW-P	94-07-114
388-501-0105	NEW	94-10-065	388-505-0510	NEW-P	94-07-114	388-511-1105	NEW	94-10-065
388-501-0110	NEW-P	94-07-114	388-505-0510	NEW	94-10-065	388-511-1110	NEW-P	94-07-114
388-501-0110	NEW	94-10-065	388-505-0520	NEW-P	94-07-114	388-511-1110	NEW	94-10-065
388-501-0125	NEW-P	94-07-114	388-505-0520	NEW	94-10-065	388-511-1115	NEW-P	94-07-114
388-501-0125	NEW	94-10-065	388-505-0530	NEW-P	94-07-114	388-511-1115	NEW	94-10-065
388-501-0130	NEW-P	94-07-114	388-505-0530	NEW	94-10-065	388-511-1130	NEW-P	94-07-114
388-501-0130	NEW	94-10-065	388-505-0540	NEW-P	94-07-114	388-511-1130	NEW	94-10-065
388-501-0135	NEW-P	94-07-114	388-505-0540	NEW	94-10-065	388-511-1140	NEW-P	94-07-114
388-501-0135	NEW	94-10-065	388-505-0560	NEW-P	94-07-114	388-511-1140	NEW	94-10-065
388-501-0140	NEW-P	94-07-114	388-505-0560	NEW	94-10-065	388-511-1150	NEW-P	94-07-114
388-501-0140	NEW	94-10-065	388-505-0570	NEW-P	94-07-114	388-511-1150	NEW	94-10-065
388-501-0150	NEW-P	94-07-114	388-505-0570	NEW	94-10-065	388-511-1160	NEW-P	94-07-114
388-501-0150	NEW	94-10-065	388-505-0580	NEW-P	94-07-114	388-511-1160	NEW	94-10-065
388-501-0160	NEW-P	94-07-114	388-505-0580	NEW	94-10-065	388-511-1170	NEW-P	94-07-114
388-501-0160	NEW	94-10-065	388-505-0590	NEW-P	94-07-114	388-511-1170	NEW	94-10-065
388-501-0165	NEW-P	94-07-114	388-505-0590	NEW	94-10-065	388-512-1210	NEW-P	94-07-114
388-501-0165	NEW	94-10-065	388-505-0595	NEW-P	94-07-114	388-512-1210	NEW	94-10-065
388-501-0170	NEW-P	94-07-114	388-505-0595	NEW	94-10-065	388-512-1215	NEW-P	94-07-114
388-501-0170	NEW	94-10-065	388-506-0610	NEW-P	94-07-114	388-512-1215	NEW	94-10-065
388-501-0175	NEW-P	94-07-114	388-506-0610	NEW	94-10-065	388-512-1220	NEW-P	94-07-114
388-501-0175	NEW	94-10-065	388-506-0610	PREP	94-13-103	388-512-1220	NEW	94-10-065
388-501-0180	NEW-P	94-07-114	388-506-0610	AMD-E	94-14-054	388-512-1225	NEW-P	94-07-114
388-501-0180	NEW	94-10-065	388-506-0610	AMD-P	94-14-057	388-512-1225	NEW	94-10-065
388-501-0190	NEW-P	94-07-114	388-506-0620	NEW-P	94-07-114	388-512-1230	NEW-P	94-07-114
388-501-0190	NEW	94-10-065	388-506-0620	NEW	94-10-065	388-512-1230	NEW	94-10-065
388-501-0195	NEW-P	94-07-114	388-506-0630	NEW-P	94-07-114	388-512-1235	NEW-P	94-07-114
388-502-0205	NEW-P	94-07-114	388-506-0630	NEW	94-10-065	388-512-1235	NEW	94-10-065
388-502-0205	NEW	94-10-065	388-507-0710	NEW-P	94-07-114	388-512-1240	NEW-P	94-07-114
388-502-0210	NEW-P	94-07-114	388-507-0710	NEW	94-10-065	388-512-1240	NEW	94-10-065
388-502-0210	NEW	94-10-065	388-507-0720	NEW-P	94-07-114	388-512-1245	NEW-P	94-07-114
388-502-0220	NEW-P	94-07-114	388-507-0720	NEW	94-10-065	388-512-1245	NEW	94-10-065
388-502-0220	NEW	94-10-065	388-507-0730	NEW-P	94-07-114	388-512-1250	NEW-P	94-07-114
388-502-0230	NEW-P	94-07-114	388-507-0730	NEW	94-10-065	388-512-1250	NEW	94-10-065
388-502-0230	NEW	94-10-065	388-507-0740	NEW-P	94-07-114	388-512-1255	NEW-P	94-07-114
388-502-0250	NEW-P	94-07-114	388-507-0740	NEW	94-10-065	388-512-1255	NEW	94-10-065
388-502-0250	NEW	94-10-065	388-508-0805	NEW-P	94-07-114	388-512-1260	NEW-P	94-07-114
388-503-0305	NEW-P	94-07-114	388-508-0805	NEW	94-10-065	388-512-1260	NEW	94-10-065
388-503-0305	NEW	94-10-065	388-508-0810	NEW-P	94-07-114	388-512-1265	NEW-P	94-07-114
388-503-0310	NEW-P	94-07-114	388-508-0810	NEW	94-10-065	388-512-1265	NEW	94-10-065
388-503-0310	NEW	94-10-065	388-508-0820	NEW-P	94-07-114	388-512-1275	NEW-P	94-07-114
388-503-0310	PREP	94-13-102	388-508-0820	NEW	94-10-065	388-512-1275	NEW	94-10-065
388-503-0310	AMD-E	94-14-053	388-508-0830	NEW-P	94-07-114	388-512-1280	NEW-P	94-07-114
388-503-0310	AMD-P	94-14-055	388-508-0830	NEW	94-10-065	388-512-1280	NEW	94-10-065
388-503-0320	NEW-P	94-07-114	388-508-0835	NEW-P	94-07-114	388-513-1305	NEW-P	94-07-114
388-503-0320	NEW	94-10-065	388-508-0835	NEW	94-10-065	388-513-1305	NEW	94-10-065
388-503-0350	NEW-P	94-07-114	388-508-0840	NEW-P	94-07-114	388-513-1310	NEW-P	94-07-114
388-503-0350	NEW	94-10-065	388-508-0840	NEW	94-10-065	388-513-1310	NEW	94-10-065
388-503-0370	NEW-P	94-07-114	388-509-0905	NEW-P	94-07-114	388-513-1315	NEW-P	94-07-114
388-503-0370	NEW	94-10-065	388-509-0905	NEW	94-10-065	388-513-1315	NEW	94-10-065
388-504-0405	NEW-P	94-07-114	388-509-0910	NEW-P	94-07-114	388-513-1320	NEW-P	94-07-114
388-504-0405	NEW	94-10-065	388-509-0910	NEW	94-10-065	388-513-1320	NEW	94-10-065
388-504-0410	NEW-P	94-07-114	388-509-0910	PREP	94-13-102	388-513-1330	NEW-P	94-07-114
388-504-0410	NEW	94-10-065	388-509-0910	AMD-E	94-14-053	388-513-1330	NEW	94-10-065
388-504-0420	NEW-P	94-07-114	388-509-0910	AMD-P	94-14-055	388-513-1340	NEW-P	94-07-114
388-504-0420	NEW	94-10-065	388-509-0920	NEW-P	94-07-114	388-513-1340	NEW	94-10-065
388-504-0430	NEW-P	94-07-114	388-509-0920	NEW	94-10-065	388-513-1345	NEW-P	94-07-114
388-504-0430	NEW	94-10-065	388-509-0920	PREP	94-13-102	388-513-1345	NEW	94-10-065
388-504-0440	NEW-P	94-07-114	388-509-0920	AMD-E	94-14-053	388-513-1350	NEW-P	94-07-114
388-504-0440	NEW	94-10-065	388-509-0920	AMD-P	94-14-055	388-513-1350	NEW	94-10-065
388-504-0450	NEW-P	94-07-114	388-509-0940	NEW-P	94-07-114	388-513-1350	PREP	94-15-029
388-504-0450	NEW	94-10-065	388-509-0940	NEW	94-10-065	388-513-1360	NEW-P	94-07-114
388-504-0460	NEW-P	94-07-114	388-509-0960	NEW-P	94-07-114	388-513-1360	NEW	94-10-065
388-504-0460	NEW	94-10-065	388-509-0960	NEW	94-10-065	388-513-1365	NEW-P	94-07-114

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WAC #		WSR #	WAC #		WSR #	WAC #		WSR #
388-513-1365	NEW	94-10-065	388-523-2305	NEW	94-10-065	390-16-324	NEW-P	94-03-087
388-513-1365	PREP	94-15-030	388-523-2320	NEW-P	94-07-114	390-16-324	NEW-W	94-04-121
388-513-1380	NEW-P	94-07-114	388-523-2320	NEW	94-10-065	390-17-071	NEW	94-05-010
388-513-1380	NEW	94-10-065	388-524-2405	NEW-P	94-07-114	390-17-300	AMD-P	94-03-087
388-513-1395	NEW-P	94-07-114	388-524-2405	NEW	94-10-065	390-17-300	AMD-W	94-04-121
388-513-1395	NEW	94-10-065	388-524-2420	NEW-P	94-07-114	390-17-300	AMD	94-07-141
388-513-1396	NEW-P	94-07-114	388-524-2420	NEW	94-10-065	390-17-315	AMD-P	94-03-087
388-513-1396	NEW	94-10-065	388-525-2505	NEW-P	94-07-114	390-17-315	AMD-W	94-04-121
388-515-1505	NEW-P	94-07-114	388-525-2505	NEW	94-10-065	390-17-315	AMD	94-07-141
388-515-1505	NEW	94-10-065	388-525-2520	NEW-P	94-07-114	390-17-320	NEW-P	94-07-035
388-515-1510	NEW-P	94-07-114	388-525-2520	NEW	94-10-065	390-17-320	NEW	94-11-016
388-515-1510	NEW	94-10-065	388-525-2570	NEW-P	94-07-114	390-17-405	NEW-P	94-07-142
388-515-1530	NEW-P	94-07-114	388-525-2570	NEW	94-10-065	390-17-405	NEW	94-11-017
388-515-1530	NEW	94-10-065	388-526-2610	NEW-P	94-07-114	390-20-148	NEW-P	94-07-035
388-517-1710	NEW-P	94-07-114	388-526-2610	NEW	94-10-065	390-20-148	NEW	94-11-016
388-517-1710	NEW	94-10-065	388-527-2710	NEW-P	94-07-114	390-20-052	AMD-P	94-07-035
388-517-1715	NEW-P	94-07-114	388-527-2710	NEW	94-10-065	390-20-052	AMD	94-11-016
388-517-1715	NEW	94-10-065	388-527-2710	PREP	94-13-104	390-24-030	REP	94-05-010
388-517-1720	NEW-P	94-07-114	388-527-2710	AMD-E	94-14-052	390-24-031	REP	94-05-010
388-517-1720	NEW	94-10-065	388-527-2710	AMD-P	94-14-056	390-24-160	AMD	94-05-010
388-517-1730	NEW-P	94-07-114	388-527-2720	NEW-P	94-07-114	390-37-070	AMD	94-05-010
388-517-1730	NEW	94-10-065	388-527-2720	NEW	94-10-065	390-37-105	AMD	94-05-010
388-517-1740	NEW-P	94-07-114	388-527-2720	NEW	94-10-065	390-37-142	AMD	94-05-010
388-517-1740	NEW	94-10-065	388-528-2810	NEW-P	94-07-114	392-109	PREP	94-15-012
388-517-1750	NEW-P	94-07-114	388-528-2810	NEW	94-10-065	392-121-187	NEW-P	94-13-107
388-517-1750	NEW	94-10-065	388-529-2910	NEW-P	94-07-114	392-127-700	REP	94-04-096
388-517-1760	NEW-P	94-07-114	388-529-2910	NEW	94-10-065	392-127-703	REP	94-04-096
388-517-1760	NEW	94-10-065	388-529-2920	NEW-P	94-07-114	392-127-705	REP	94-04-096
388-518-1805	NEW-P	94-07-114	388-529-2920	NEW	94-10-065	392-127-710	REP	94-04-096
388-518-1805	NEW	94-10-065	388-529-2930	NEW-P	94-07-114	392-127-715	REP	94-04-096
388-518-1810	NEW-P	94-07-114	388-529-2930	NEW	94-10-065	392-127-720	REP	94-04-096
388-518-1810	NEW	94-10-065	388-529-2940	NEW-P	94-07-114	392-127-725	REP	94-04-096
388-518-1820	NEW-P	94-07-114	388-529-2950	NEW-P	94-07-114	392-127-730	REP	94-04-096
388-518-1820	NEW	94-10-065	388-529-2950	NEW	94-10-065	392-127-735	REP	94-04-096
388-518-1830	NEW-P	94-07-114	388-529-2960	NEW-P	94-07-114	392-127-740	REP	94-04-096
388-518-1830	NEW	94-10-065	388-529-2960	NEW	94-10-065	392-127-745	REP	94-04-096
388-518-1840	NEW-P	94-07-114	388-538-110	AMD	94-04-038	392-127-750	REP	94-04-096
388-518-1840	NEW	94-10-065	390-05-235	AMD-P	94-07-088	392-127-755	REP	94-04-096
388-518-1850	NEW-P	94-07-114	390-05-235	AMD	94-11-018	392-127-760	REP	94-04-096
388-518-1850	NEW	94-10-065	390-12-010	AMD	94-05-010	392-127-765	REP	94-04-096
388-519-1905	NEW-P	94-07-114	390-14-040	AMD	94-05-011	392-127-770	REP	94-04-096
388-519-1905	NEW	94-10-065	390-16-011	AMD	94-05-011	392-127-775	REP	94-04-096
388-519-1910	NEW-P	94-07-114	390-16-012	AMD	94-05-011	392-127-780	REP	94-04-096
388-519-1910	NEW	94-10-065	390-16-031	AMD	94-05-011	392-127-785	REP	94-04-096
388-519-1930	NEW-P	94-07-114	390-16-032	AMD	94-05-011	392-127-790	REP	94-04-096
388-519-1930	NEW	94-10-065	390-16-033	AMD	94-05-011	392-127-795	REP	94-04-096
388-519-1950	NEW-P	94-07-114	390-16-041	AMD	94-05-011	392-127-800	REP	94-04-096
388-519-1950	NEW	94-10-065	390-16-050	AMD	94-05-011	392-127-805	REP	94-04-096
388-521-2105	NEW-P	94-07-114	390-16-071	NEW-E	94-07-001	392-127-815	REP	94-04-096
388-521-2105	NEW	94-10-065	390-16-071	NEW-P	94-07-035	392-127-820	REP	94-04-096
388-521-2110	NEW-P	94-07-114	390-16-071	NEW	94-11-016	392-127-825	REP	94-04-096
388-521-2110	NEW	94-10-065	390-16-207	AMD-P	94-07-035	392-127-830	REP	94-04-096
388-521-2120	NEW-P	94-07-114	390-16-207	AMD	94-11-016	392-140-190	REP-P	94-11-066
388-521-2120	NEW	94-10-065	390-16-238	NEW-P	94-05-097	392-140-190	REP	94-14-050
388-521-2130	NEW-P	94-07-114	390-16-238	NEW	94-07-141	392-140-191	REP-P	94-11-066
388-521-2130	NEW	94-10-065	390-16-245	NEW-P	94-05-097	392-140-191	REP	94-14-050
388-521-2140	NEW-P	94-07-114	390-16-245	NEW	94-07-141	392-140-192	REP-P	94-11-066
388-521-2140	NEW	94-10-065	390-16-300	AMD-P	94-05-097	392-140-192	REP	94-14-050
388-521-2150	NEW-P	94-07-114	390-16-308	AMD-P	94-07-035	392-140-193	REP-P	94-11-066
388-521-2150	NEW	94-10-065	390-16-308	AMD-P	94-07-088	392-140-193	REP	94-14-050
388-521-2155	NEW-P	94-07-114	390-16-308	AMD-W	94-07-089	392-140-194	REP-P	94-11-066
388-521-2155	NEW	94-10-065	390-16-308	AMD	94-11-016	392-140-194	REP	94-14-050
388-521-2160	NEW-P	94-07-114	390-16-309	NEW-E	94-07-001	392-140-195	REP-P	94-11-066
388-521-2160	NEW	94-10-065	390-16-309	NEW-P	94-07-035	392-140-195	REP	94-14-050
388-521-2170	NEW-P	94-07-114	390-16-309	NEW-W	94-08-080	392-140-196	REP-P	94-11-066
388-521-2170	NEW	94-10-065	390-16-309	NEW	94-11-016	392-140-196	REP	94-14-050
388-522-2205	NEW-P	94-07-114	390-16-310	AMD-P	94-07-035	392-140-197	REP-P	94-11-066
388-522-2205	NEW	94-10-065	390-16-310	AMD-P	94-07-088	392-140-197	REP	94-14-050
388-522-2210	NEW-P	94-07-114	390-16-310	AMD-W	94-07-089	392-140-198	REP-P	94-11-066
388-522-2210	NEW	94-10-065	390-16-310	AMD	94-11-016	392-140-198	REP	94-14-050
388-522-2230	NEW-P	94-07-114	390-16-311	NEW-P	94-07-142	392-140-199	REP-P	94-11-066
388-522-2230	NEW	94-10-065	390-16-311	NEW	94-11-017	392-140-199	REP	94-14-050
388-523-2305	NEW-P	94-07-114	390-16-315	AMD-P	94-05-097	392-140-200	REP-P	94-11-066

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392-140-201	REP-P	94-11-066	392-157-010	NEW	94-04-097	392-169-120	NEW	94-04-095
392-140-201	REP	94-14-050	392-157-015	NEW	94-04-097	392-169-125	NEW	94-04-095
392-140-202	REP-P	94-11-066	392-157-020	NEW	94-04-097	392-196-011	AMD-P	94-11-120
392-140-202	REP	94-14-050	392-157-025	NEW	94-04-097	392-196-015	REP-P	94-11-120
392-140-500	NEW-P	94-04-122	392-157-030	NEW	94-04-097	392-196-020	AMD-P	94-11-120
392-140-500	NEW	94-12-002	392-157-035	NEW	94-04-097	392-196-025	REP-P	94-11-120
392-140-501	NEW-P	94-04-122	392-157-040	NEW	94-04-097	392-196-030	REP-P	94-11-120
392-140-501	NEW	94-12-002	392-157-045	NEW	94-04-097	392-196-035	REP-P	94-11-120
392-140-503	NEW-P	94-04-122	392-157-050	NEW	94-04-097	392-196-037	REP-P	94-11-120
392-140-503	NEW	94-12-002	392-157-055	NEW	94-04-097	392-196-040	REP-P	94-11-120
392-140-504	NEW-P	94-04-122	392-157-060	NEW	94-04-097	392-196-045	REP-P	94-11-120
392-140-504	NEW	94-12-002	392-157-065	NEW	94-04-097	392-196-050	REP-P	94-11-120
392-140-505	NEW-P	94-04-122	392-157-070	NEW	94-04-097	392-196-055	AMD-P	94-11-120
392-140-505	NEW	94-12-002	392-157-075	NEW	94-04-097	392-196-060	AMD-P	94-11-120
392-140-506	NEW-P	94-04-122	392-157-080	NEW	94-04-097	392-196-066	REP-P	94-11-120
392-140-506	NEW	94-12-002	392-157-085	NEW	94-04-097	392-196-077	NEW-P	94-11-120
392-140-507	NEW-P	94-04-122	392-157-090	NEW	94-04-097	392-196-080	REP-P	94-11-120
392-140-507	NEW	94-12-002	392-157-095	NEW	94-04-097	392-196-085	REP-P	94-11-120
392-140-508	NEW-P	94-04-122	392-157-100	NEW	94-04-097	392-196-086	NEW-P	94-11-120
392-140-508	NEW	94-12-002	392-157-105	NEW	94-04-097	392-196-089	NEW-P	94-11-120
392-140-509	NEW-P	94-04-122	392-157-110	NEW	94-04-097	392-196-095	REP-P	94-11-120
392-140-509	NEW	94-12-002	392-157-115	NEW	94-04-097	392-196-100	AMD-P	94-11-120
392-140-510	NEW-P	94-04-122	392-157-120	NEW	94-04-097	392-196-105	REP-P	94-11-120
392-140-510	NEW	94-12-002	392-157-125	NEW	94-04-097	392-320-005	NEW-P	94-04-025
392-140-511	NEW-P	94-04-122	392-157-130	NEW	94-04-097	392-320-005	NEW	94-07-102
392-140-511	NEW	94-12-002	392-157-135	NEW	94-04-097	392-320-010	NEW-P	94-04-025
392-140-512	NEW-P	94-04-122	392-157-140	NEW	94-04-097	392-320-010	NEW	94-07-102
392-140-512	NEW	94-12-002	392-157-145	NEW	94-04-097	392-320-015	NEW-P	94-04-025
392-140-516	NEW-P	94-04-122	392-157-150	NEW	94-04-097	392-320-015	NEW	94-07-102
392-140-516	NEW	94-12-002	392-157-155	NEW	94-04-097	392-320-020	NEW-P	94-04-025
392-140-517	NEW-P	94-04-122	392-157-160	NEW	94-04-097	392-320-020	NEW	94-07-102
392-140-517	NEW	94-12-002	392-157-165	NEW	94-04-097	392-320-025	NEW-P	94-04-025
392-140-518	NEW-P	94-04-122	392-157-170	NEW	94-04-097	392-320-025	NEW	94-07-102
392-140-518	NEW	94-12-002	392-157-175	NEW	94-04-097	392-320-030	NEW-P	94-04-025
392-140-519	NEW-P	94-04-122	392-157-180	NEW	94-04-097	392-320-030	NEW	94-07-102
392-140-519	NEW	94-12-002	392-163-400	AMD-P	94-04-094	392-320-035	NEW-P	94-04-025
392-140-525	NEW-P	94-11-066	392-163-400	AMD	94-07-103	392-320-035	NEW	94-07-102
392-140-525	NEW	94-14-050	392-163-405	AMD-P	94-04-094	392-320-040	NEW-P	94-04-025
392-140-527	NEW-P	94-11-066	392-163-405	AMD	94-07-103	392-320-040	NEW	94-07-102
392-140-527	NEW	94-14-050	392-163-440	AMD-P	94-04-094	392-320-045	NEW-P	94-04-025
392-140-529	NEW-P	94-11-066	392-163-440	AMD	94-07-103	392-320-045	NEW	94-07-102
392-140-529	NEW	94-14-050	392-163-445	AMD-P	94-04-094	392-320-050	NEW-P	94-04-025
392-140-530	NEW-P	94-11-066	392-163-445	AMD	94-07-103	392-320-050	NEW	94-07-102
392-140-530	NEW	94-14-050	392-163-530	AMD-P	94-04-094	392-320-055	NEW-P	94-04-025
392-140-531	NEW-P	94-11-066	392-163-530	AMD	94-07-103	392-320-055	NEW	94-07-102
392-140-531	NEW	94-14-050	392-163-580	AMD-P	94-04-094	392-320-060	NEW-P	94-04-025
392-140-533	NEW-P	94-11-066	392-163-580	AMD	94-07-103	392-320-060	NEW	94-07-102
392-140-533	NEW	94-14-050	392-169-005	NEW	94-04-095	392-330-010	NEW-P	94-08-074
392-140-535	NEW-P	94-11-066	392-169-010	NEW	94-04-095	392-330-010	NEW	94-12-019
392-140-535	NEW	94-14-050	392-169-015	NEW	94-04-095	392-330-020	NEW-P	94-08-074
392-140-536	NEW-P	94-11-066	392-169-020	NEW	94-04-095	392-330-020	NEW	94-12-019
392-140-536	NEW	94-14-050	392-169-022	NEW	94-04-095	392-330-030	NEW-P	94-08-074
392-140-537	NEW-P	94-11-066	392-169-023	NEW	94-04-095	392-330-030	NEW	94-12-019
392-140-537	NEW	94-14-050	392-169-025	NEW	94-04-095	392-330-040	NEW-P	94-08-074
392-140-538	NEW-P	94-11-066	392-169-030	NEW	94-04-095	392-330-040	NEW	94-12-019
392-140-538	NEW	94-14-050	392-169-035	NEW	94-04-095	392-330-050	NEW-P	94-08-074
392-140-540	NEW-P	94-13-210	392-169-040	NEW	94-04-095	392-330-050	NEW	94-12-019
392-140-542	NEW-P	94-13-210	392-169-045	NEW	94-04-095	392-330-060	NEW-P	94-08-074
392-140-543	NEW-P	94-13-210	392-169-050	NEW	94-04-095	392-330-060	NEW	94-12-019
392-140-544	NEW-P	94-13-210	392-169-055	NEW	94-04-095	392-330-070	NEW-P	94-08-074
392-140-545	NEW-P	94-13-210	392-169-057	NEW	94-04-095	392-330-070	NEW	94-12-019
392-140-548	NEW-P	94-13-210	392-169-060	NEW	94-04-095	392-330-080	NEW-P	94-08-074
392-140-549	NEW-P	94-13-210	392-169-065	NEW	94-04-095	392-330-080	NEW	94-12-019
392-140-551	NEW-P	94-13-210	392-169-070	NEW	94-04-095	415-02-030	AMD-P	94-05-012
392-140-552	NEW-P	94-13-210	392-169-075	NEW	94-04-095	415-02-030	AMD	94-09-039
392-140-553	NEW-P	94-13-210	392-169-080	NEW	94-04-095	415-02-110	NEW-P	94-05-012
392-140-555	NEW-P	94-13-210	392-169-085	NEW	94-04-095	415-02-110	NEW	94-09-039
392-140-557	NEW-P	94-13-210	392-169-090	NEW	94-04-095	415-100-190	NEW-P	94-07-143
392-140-559	NEW-P	94-13-210	392-169-095	NEW	94-04-095	415-100-190	NEW	94-11-008
392-141	PREP	94-14-076	392-169-100	NEW	94-04-095	415-104-111	NEW-P	94-05-013
392-141-160	AMD-P	94-14-093	392-169-105	NEW	94-04-095	415-104-111	NEW	94-09-040
392-141-175	AMD-P	94-14-093	392-169-110	NEW	94-04-095	415-108-010	AMD-P	94-07-144

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415-108-461	NEW-P	94-13-048	434-663-050	NEW-W	94-03-081	458-16-286	NEW	94-07-008
415-108-461	NEW-S	94-13-197	434-663-060	NEW-W	94-03-081	458-16-290	AMD	94-07-008
415-108-462	NEW-P	94-13-048	434-663-070	NEW-W	94-03-081	458-16-300	AMD	94-07-008
415-108-462	NEW-S	94-13-197	434-663-100	NEW	94-04-102	458-16-310	AMD	94-07-008
415-108-510	AMD-P	94-07-144	434-663-200	NEW	94-04-102	458-16-320	NEW	94-07-008
415-108-510	AMD	94-11-009	434-663-210	NEW	94-04-102	458-16-330	NEW	94-07-008
415-108-530	NEW-P	94-07-144	434-663-220	NEW	94-04-102	458-16A-010	PREP	94-10-060
415-108-530	NEW	94-11-009	434-663-230	NEW	94-04-102	458-16A-020	PREP	94-10-060
415-108-540	NEW-P	94-07-144	434-663-240	NEW	94-04-102	458-18-220	AMD	94-05-063
415-108-540	NEW	94-11-009	434-663-250	NEW	94-04-102	458-19-005	NEW	94-07-066
415-108-550	NEW-P	94-08-087	434-663-260	NEW	94-04-102	458-19-010	NEW	94-07-066
415-108-550	NEW	94-12-014	434-663-300	NEW	94-04-102	458-19-015	NEW	94-07-066
415-108-560	NEW-P	94-08-087	434-663-310	NEW	94-04-102	458-19-020	NEW	94-07-066
415-108-560	NEW	94-12-014	434-663-320	NEW	94-04-102	458-19-025	NEW	94-07-066
415-108-570	NEW-P	94-08-087	434-663-400	NEW	94-04-102	458-19-030	NEW	94-07-066
415-108-570	NEW	94-12-014	434-663-410	NEW	94-04-102	458-19-035	NEW	94-07-066
415-108-580	NEW-P	94-05-013	434-663-420	NEW	94-04-102	458-19-040	NEW	94-07-066
415-108-580	NEW	94-09-040	434-663-430	NEW	94-04-102	458-19-045	NEW	94-07-066
415-112-015	AMD-P	94-07-144	434-663-440	NEW	94-04-102	458-19-050	NEW	94-07-066
415-112-015	AMD	94-11-009	434-663-450	NEW	94-04-102	458-19-055	NEW	94-07-066
415-112-409	NEW-P	94-13-048	434-663-460	NEW	94-04-102	458-19-060	NEW	94-07-066
415-112-415	AMD-P	94-07-144	434-663-470	NEW	94-04-102	458-19-065	NEW	94-07-066
415-112-415	AMD	94-11-009	434-663-480	NEW	94-04-102	458-19-070	NEW	94-07-066
415-112-840	NEW-P	94-05-013	434-663-490	NEW	94-04-102	458-19-075	NEW	94-07-066
415-112-840	NEW-P	94-07-144	434-663-500	NEW	94-04-102	458-19-080	NEW	94-07-066
415-112-840	NEW	94-09-040	434-663-510	NEW	94-04-102	458-20-102	AMD-E	94-05-083
415-112-850	NEW	94-11-009	434-663-520	NEW	94-04-102	458-20-102	AMD-P	94-06-004
419-70-010	AMD-P	94-13-043	434-663-530	NEW	94-04-102	458-20-102	AMD-E	94-13-030
419-70-020	AMD-P	94-13-043	434-663-600	NEW	94-04-102	458-20-102	AMD	94-13-031
419-70-040	AMD-P	94-13-043	434-663-610	NEW	94-04-102	458-20-121	AMD	94-13-033
419-72-010	AMD-P	94-13-044	434-663-620	NEW	94-04-102	458-20-122	AMD-P	94-03-035
419-72-015	AMD-P	94-13-044	434-663-630	NEW	94-04-102	458-20-122	AMD	94-07-049
419-72-020	AMD-P	94-13-044	440-22-205	NEW-W	94-07-072	458-20-125	REP-P	94-03-037
419-72-025	AMD-P	94-13-044	446-65	AMD-P	94-05-023	458-20-125	REP	94-07-051
419-72-030	AMD-P	94-13-044	446-65	AMD	94-08-004	458-20-165	AMD	94-09-016
419-72-035	AMD-P	94-13-044	446-65-005	AMD-P	94-05-023	458-20-166	AMD	94-05-001
419-72-040	AMD-P	94-13-044	446-65-005	AMD	94-08-004	458-20-167	AMD-P	94-03-047
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419-72-050	AMD-P	94-13-044	448-13-210	AMD-W	94-07-073	458-20-168	AMD-E	94-05-084
419-72-055	AMD-P	94-13-044	456-09-010	AMD-P	94-03-056	458-20-168	AMD	94-11-097
419-72-060	AMD-P	94-13-044	456-09-010	AMD	94-07-044	458-20-174	AMD-P	94-07-023
419-72-065	AMD-P	94-13-044	456-09-325	AMD-P	94-03-056	458-20-17401	NEW-P	94-07-024
419-72-068	NEW-P	94-13-044	456-09-325	AMD	94-07-044	458-20-179	AMD	94-13-034
419-72-070	AMD-P	94-13-044	456-09-365	AMD-P	94-03-056	458-20-185	AMD-P	94-07-025
419-72-075	AMD-P	94-13-044	456-09-365	AMD	94-07-044	458-20-185	AMD	94-10-061
419-72-080	AMD-P	94-13-044	456-10-010	AMD-P	94-03-057	458-20-186	AMD-P	94-07-026
419-72-090	REP-P	94-13-044	456-10-010	AMD	94-07-043	458-20-186	AMD	94-10-062
419-72-095	REP-P	94-13-044	456-10-325	AMD-P	94-03-057	458-20-209	AMD-P	94-03-036
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434-60-215	NEW	94-07-018	456-10-360	AMD	94-07-043	458-20-210	AMD	94-07-048
434-60-220	NEW	94-07-018	458-16-100	AMD	94-07-008	458-20-226	AMD-P	94-10-013
434-60-230	NEW	94-07-018	458-16-110	AMD	94-07-008	458-20-238	PREP	94-03-046
434-60-240	NEW	94-07-018	458-16-111	AMD	94-07-008	458-20-258	AMD-E	94-05-086
434-60-250	NEW	94-07-018	458-16-130	AMD	94-07-008	458-20-258	AMD-E	94-13-029
434-60-260	NEW	94-07-018	458-16-150	AMD	94-07-008	458-20-261	NEW-P	94-07-027
434-60-270	NEW	94-07-018	458-16-165	NEW	94-07-008	458-20-901	NEW-E	94-05-085
434-60-280	NEW	94-07-018	458-16-180	AMD	94-07-008	458-20-901	NEW-E	94-13-032
434-60-290	NEW	94-07-018	458-16-190	AMD	94-07-008	458-30-200	PREP	94-13-096
434-60-300	NEW	94-07-018	458-16-200	AMD	94-07-008	458-30-205	PREP	94-13-096
434-60-310	NEW	94-07-018	458-16-210	AMD	94-07-008	458-30-210	PREP	94-13-096
434-60-320	NEW	94-07-018	458-16-215	PREP	94-07-123	458-30-215	PREP	94-13-096
434-60-330	NEW	94-07-018	458-16-215	NEW-P	94-11-099	458-30-220	PREP	94-13-096
434-60-340	NEW	94-07-018	458-16-215	NEW	94-15-041	458-30-225	PREP	94-13-096
434-60-350	NEW	94-07-018	458-16-220	AMD	94-07-008	458-30-230	PREP	94-13-096
434-110-070	AMD-E	94-12-086	458-16-230	AMD	94-07-008	458-30-232	PREP	94-13-096
434-110-075	AMD-E	94-12-086	458-16-240	AMD	94-07-008	458-30-235	PREP	94-13-096
434-120-120	NEW-W	94-10-054	458-16-245	NEW	94-07-008	458-30-240	PREP	94-13-096
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434-663-001	NEW-W	94-03-081	458-16-270	AMD	94-07-008	458-30-245	PREP	94-13-096
434-663-005	NEW-W	94-03-081	458-16-280	AMD	94-07-008	458-30-250	PREP	94-13-096
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458-30-267	PREP	94-13-096	458-61-360	REP	94-04-088	463-39-005	AMD-P	94-12-036
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458-30-290	PREP	94-13-096	458-61-380	REP	94-04-088	463-54-020	AMD-P	94-12-036
458-30-295	PREP	94-13-096	458-61-390	REP	94-04-088	463-54-040	AMD-P	94-12-036
458-30-300	PREP	94-13-096	458-61-400	AMD	94-04-088	463-54-050	AMD-P	94-12-036
458-30-305	PREP	94-13-096	458-61-410	AMD	94-04-088	463-54-060	AMD-P	94-12-036
458-30-310	PREP	94-13-096	458-61-411	NEW	94-04-088	463-54-070	AMD-P	94-12-036
458-30-315	PREP	94-13-096	458-61-412	NEW	94-04-088	468-10-010	REP-P	94-12-070
458-30-317	PREP	94-13-096	458-61-420	AMD	94-04-088	468-10-010	REP	94-14-101
458-30-320	PREP	94-13-096	458-61-425	AMD	94-04-088	468-10-020	REP-P	94-12-070
458-30-325	PREP	94-13-096	458-61-430	AMD	94-04-088	468-10-020	REP	94-14-101
458-30-330	PREP	94-13-096	458-61-440	REP	94-04-088	468-10-030	REP-P	94-12-070
458-30-335	PREP	94-13-096	458-61-450	REP-W	94-13-089	468-10-030	REP	94-14-101
458-30-340	PREP	94-13-096	458-61-460	REP	94-04-088	468-10-040	REP-P	94-12-070
458-30-345	PREP	94-13-096	458-61-470	AMD	94-04-088	468-10-040	REP	94-14-101
458-30-350	PREP	94-13-096	458-61-480	AMD	94-04-088	468-10-050	REP-P	94-12-070
458-30-355	PREP	94-13-096	458-61-490	REP	94-04-088	468-10-050	REP	94-14-101
458-30-500	PREP	94-13-096	458-61-500	REP	94-04-088	468-10-060	REP-P	94-12-070
458-30-510	PREP	94-13-096	458-61-510	AMD	94-04-088	468-10-060	REP	94-14-101
458-30-520	PREP	94-13-096	458-61-520	AMD	94-04-088	468-10-070	REP-P	94-12-070
458-30-530	PREP	94-13-096	458-61-530	REP	94-04-088	468-10-070	REP	94-14-101
458-30-540	PREP	94-13-096	458-61-540	AMD	94-04-088	468-10-080	REP-P	94-12-070
458-30-550	PREP	94-13-096	458-61-545	AMD	94-04-088	468-10-080	REP	94-14-101
458-30-560	PREP	94-13-096	458-61-548	NEW-W	94-13-089	468-10-090	REP-P	94-12-070
458-30-570	PREP	94-13-096	458-61-550	AMD	94-04-088	468-10-090	REP	94-14-101
458-30-580	PREP	94-13-096	458-61-553	NEW	94-04-088	468-10-100	REP-P	94-12-070
458-30-590	AMD-P	94-08-082	458-61-555	AMD	94-04-088	468-10-100	REP	94-14-101
458-30-590	AMD	94-11-098	458-61-560	REP	94-04-088	468-10-110	REP-P	94-12-070
458-40-650	AMD-P	94-10-063	458-61-570	REP	94-04-088	468-10-110	REP	94-14-101
458-40-650	AMD	94-14-048	458-61-590	AMD	94-04-088	468-10-120	REP-P	94-12-070
458-40-660	AMD-P	94-10-063	458-61-600	AMD	94-04-088	468-10-120	REP	94-14-101
458-40-660	AMD	94-14-048	458-61-610	AMD	94-04-088	468-10-130	REP-P	94-12-070
458-40-670	AMD-P	94-10-063	458-61-620	REP	94-04-088	468-10-130	REP	94-14-101
458-40-670	AMD	94-14-048	458-61-630	REP	94-04-088	468-10-140	REP-P	94-12-070
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458-61-010	REP	94-04-088	458-61-650	AMD	94-04-088	468-10-150	REP-P	94-12-070
458-61-015	NEW	94-04-088	458-61-660	AMD	94-04-088	468-10-150	REP	94-14-101
458-61-020	REP	94-04-088	458-61-670	AMD	94-04-088	468-10-160	REP-P	94-12-070
458-61-025	NEW	94-04-088	458-61-680	REP	94-04-088	468-10-160	REP	94-14-101
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458-61-040	REP	94-04-088	460-44A-500	AMD	94-03-061	468-10-170	REP	94-14-101
458-61-050	AMD	94-04-088	460-44A-501	AMD	94-03-061	468-10-180	REP-P	94-12-070
458-61-060	AMD	94-04-088	460-44A-502	AMD	94-03-061	468-10-180	REP	94-14-101
458-61-070	AMD	94-04-088	460-44A-504	AMD	94-03-061	468-10-190	REP-P	94-12-070
458-61-080	AMD	94-04-088	460-44A-505	AMD	94-03-061	468-10-190	REP	94-14-101
458-61-090	AMD	94-04-088	460-44A-506	AMD	94-03-061	468-10-200	REP-P	94-12-070
458-61-100	AMD	94-04-088	461-08-001	NEW-E	94-07-060	468-10-200	REP	94-14-101
458-61-110	REP	94-04-088	461-08-001	NEW-P	94-07-095	468-10-210	REP-P	94-12-070
458-61-120	AMD	94-04-088	461-08-001	NEW	94-12-028	468-10-210	REP	94-14-101
458-61-130	AMD	94-04-088	461-08-047	NEW-E	94-07-060	468-10-220	REP-P	94-12-070
458-61-140	REP	94-04-088	461-08-047	NEW-P	94-07-095	468-10-220	REP	94-14-101
458-61-150	AMD	94-04-088	461-08-047	NEW	94-12-028	468-10-230	REP-P	94-12-070
458-61-200	AMD	94-04-088	461-08-144	NEW-E	94-07-060	468-10-230	REP	94-14-101
458-61-210	AMD	94-04-088	461-08-144	NEW-P	94-07-095	468-10-232	REP-P	94-12-070
458-61-220	AMD	94-04-088	461-08-144	NEW	94-12-028	468-10-232	REP	94-14-101
458-61-225	NEW	94-04-088	461-08-156	NEW-E	94-07-060	468-10-234	REP-P	94-12-070
458-61-230	AMD	94-04-088	461-08-156	NEW-P	94-07-095	468-10-234	REP	94-14-101
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458-61-240	REP	94-04-088	461-08-160	AMD-E	94-07-060	468-10-240	REP	94-14-101
458-61-250	AMD	94-04-088	461-08-160	AMD-P	94-07-095	468-10-250	REP-P	94-12-070
458-61-255	NEW	94-04-088	461-08-160	AMD	94-12-028	468-10-250	REP	94-14-101
458-61-270	REP	94-04-088	461-08-165	REP-E	94-07-060	468-10-260	REP-P	94-12-070
458-61-280	REP	94-04-088	461-08-165	REP-P	94-07-095	468-10-260	REP	94-14-101
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468-10-410	NEW-P	94-12-070	480-12-045	AMD	94-11-022	480-90-051	PREP	94-15-100
468-10-410	NEW	94-14-101	480-12-050	AMD-P	94-07-135	480-90-071	PREP	94-15-100
468-10-420	NEW-P	94-12-070	480-12-050	AMD	94-11-022	480-90-072	PREP	94-15-100
468-10-420	NEW	94-14-101	480-12-083	AMD-P	94-11-103	480-90-096	PREP	94-15-100
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468-10-450	NEW	94-14-101	480-12-180	AMD-P	94-11-104	480-100-051	PREP	94-15-099
468-10-460	NEW-P	94-12-070	480-12-180	AMD	94-14-013	480-100-071	PREP	94-15-099
468-10-460	NEW	94-14-101	480-12-190	AMD-P	94-07-135	480-100-072	PREP	94-15-099
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468-10-470	NEW	94-14-101	480-12-260	AMD	94-03-002	480-100-141	PREP	94-15-099
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