

Hazard Recognition - Outreach Program Student Manual



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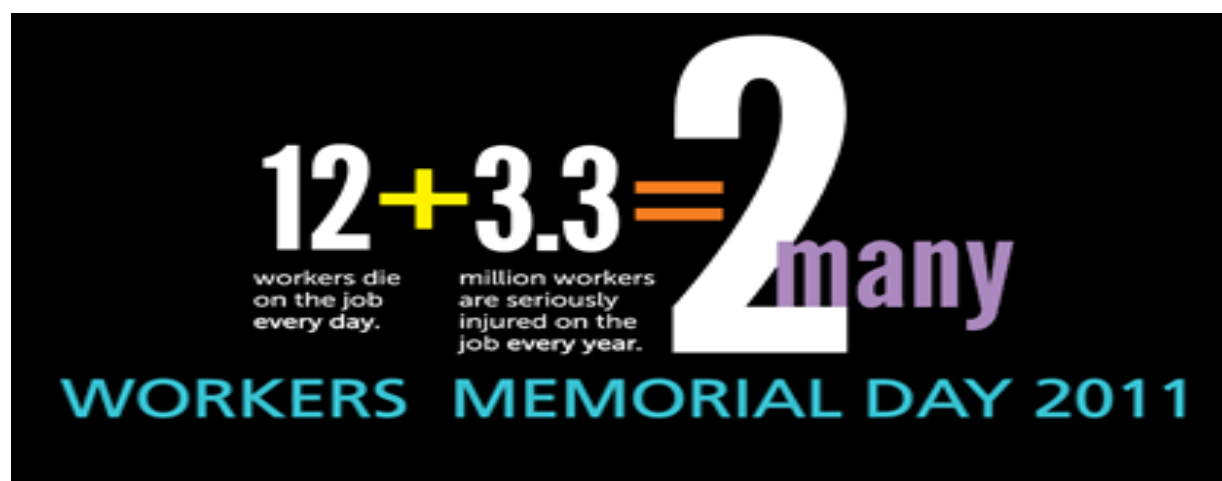
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Hazard Recognition – Outreach Program

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Section Objectives:

After this workshop, participants will:

- **Have a general understanding of the Health And Safety Rights provided by OSHA**
- **Understand some limitations of OSHA regulations**
- **Identify hazards in the workplace**
- **Understand OSHA Section 11(c), regarding retaliation (discharge, suspension, etc) for health and safety related activity**
- **Identify “Most Frequently Cited Violations”**
- **Be able to locate and apply OSHA Standards for specific hazards**

Job Safety and Health

It's the law!

OSHA
Occupational Safety
and Health Administration
U.S. Department of Labor

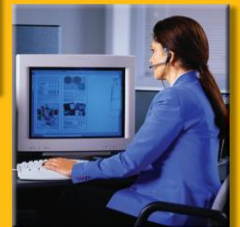
EMPLOYEES:

- You have the right to notify your employer or OSHA about workplace hazards. You may ask OSHA to keep your name confidential.
- You have the right to request an OSHA inspection if you believe that there are unsafe and unhealthful conditions in your workplace. You or your representative may participate in that inspection.
- You can file a complaint with OSHA within 30 days of retaliation or discrimination by your employer for making safety and health complaints or for exercising your rights under the *OSH Act*.
- You have the right to see OSHA citations issued to your employer. Your employer must post the citations at or near the place of the alleged violations.
- Your employer must correct workplace hazards by the date indicated on the citation and must certify that these hazards have been reduced or eliminated.
- You have the right to copies of your medical records and records of your exposures to toxic and harmful substances or conditions.
- Your employer must post this notice in your workplace.
- You must comply with all occupational safety and health standards issued under the *OSH Act* that apply to your own actions and conduct on the job.

EMPLOYERS:

- You must furnish your employees a place of employment free from recognized hazards.
- You must comply with the occupational safety and health standards issued under the *OSH Act*.

**This free poster available from OSHA –
The Best Resource for Safety and Health**



Free assistance in identifying and correcting hazards or complying with standards is available to employers, without citation or penalty, through OSHA-supported consultation programs in each state.

1-800-321-OSHA
www.osha.gov

OSHA 3165-12-06R



The Whistleblower Protection Program

The Occupational Safety and Health Act is designed to regulate employment conditions relating to occupational safety and health and to achieve safer and more healthful workplaces throughout the nation. The Act provides for a wide range of substantive and procedural rights for employees and representatives of employees. The Act also recognizes that effective implementation and achievement of its goals depend in large measure upon the active and orderly participation of employees, individually and through their representatives, at every level of safety and health activity.

To help ensure that employees are, in fact, free to participate in safety and health activities, Section 11(c) of the Act prohibits any person from discharging or in any manner discriminating against any employee because the employee has exercised rights under the Act.

These rights include complaining to OSHA and seeking an OSHA inspection, participating in an OSHA inspection, and participating or testifying in any proceeding related to an OSHA inspection.

OSHA also administers the whistleblowing provisions of sixteen other statutes, protecting employees who report violations of various trucking, airline, nuclear power, pipeline, environmental, rail, consumer product and securities laws.

A person filing a complaint of discrimination or retaliation will be required to show that he or she engaged in protected activity, the employer knew about that activity, the employer subjected him or her to an adverse employment action, and the protected activity contributed to the adverse action. Adverse employment action is generally defined as a material change in the terms or conditions of employment. Depending upon the circumstances of the case, "discrimination" can include:

- Firing or laying off
- Blacklisting
- Demoting
- Denying overtime or promotion
- Disciplining
- Denial of benefits
- Failure to hire or rehire
- Intimidation
- Reassignment affecting prospects for promotion
- Reducing pay or hours

Safety and Health Add Value

OSHA is committed to assuring - so far as possible - that every working man and woman in the nation has safe and healthful working conditions. OSHA believes that providing workers with a safe workplace is central to their ability to enjoy health, security and the opportunity to achieve the American dream. Addressing safety and health issues in the workplace also saves the employer money and adds value to the business. Recent estimates place the business costs associated with occupational injuries at close to \$170 billion-expenditures that come straight out of company profits.

When workers stay whole and healthy, the direct cost-savings to businesses include:

- lower workers' compensation insurance costs;
- reduced medical expenditures;
- smaller expenditures for return-to-work programs;
- fewer faulty products;
- lower costs for job accommodations for injured workers;
- less money spent for overtime benefits.

Safety and health also make big reductions in indirect costs, due to:

- increased productivity;
- higher quality products;
- increased morale;
- better labor/management relations;
- reduced turnover;
- better use of human resources.

Employees and their families benefit from safety and health because:

- their incomes are protected;
- their family lives are not hindered by injury;
- their stress is not increased.

Implementing an accident prevention program will allow a small business to learn first hand that the cost of accident prevention is far lower than the cost of accidents. Consultation offers free help in identifying workplace hazards and establishing or improving safety and health management systems corporate-wide.

Most Frequently Cited General Industry Standards

The following were the top 7 most frequently cited general industry standards in fiscal year 2010 (October 1, 2009 through September 30, 2010):

1. Hazard communication standard (1910.1200)
2. Respiratory protection (1910.134)
3. Control of hazardous energy (lockout/tagout) (1910.147)
4. Electrical, wiring methods, components & equipment (1910.305)
5. Powered industrial trucks (1910.178)
6. Electrical systems design, general requirements (1910.303)
7. Machines, general requirements (1910.212)

The following are the general industry standards for which OSHA assessed the highest penalties in fiscal year 2010 (October 1, 2009 through September 30, 2010):

1. Control of hazardous energy (lockout/tagout) (1910.147)
2. Machines, general requirements (1910.212)
3. General duty clause (Section 5(a)(1) of the OSH Act)
4. Lead (1910.1025)
5. Grain handling facilities (1910.272)

The Occupational Safety and Health Act

Read each question. Mark each correct response. Pair up with the person next to you and answer the questions together based on your experiences and knowledge.

1. **All workers in the United States are covered by the Occupational Safety and Health Act. (OSH Act).**

☐ True ☐ False

2. **Under the OSH Act, who is responsible for providing a safe and healthful workplace?**

☐ the employer ☐ the union
☐ the workers ☐ OSHA
 ☐ all of the above

3. **OSHA health standards establish a safe level of exposure to the substances that they cover.**

☐ True ☐ False

4. **If there is a hazard at a workplace, but there is no specific OSHA standard covering this hazard, OSHA can still cite and fine an employer for that hazard.**

☐ True ☐ False

5. **Under the OSH Act, workers have rights to which of the following safety and health information from their employer?**

☐ information on toxic or hazardous chemicals to which workers are exposed
☐ records of exposure testing (tests that show amount of particular chemicals, noise or other hazards present in the workplace)
☐ a worker's own medical records kept by the employer
☐ copies of injury and illness records for the workplace kept by the employer
☐ all of the above
☐ none of the above

6. **Workers have a right under the OSH Act to inspect their workplace immediately when they suspect an unsafe or unhealthy condition.**

☐ True ☐ False

7. **A worker has the right under the OSH Act to file a complaint with the Occupational Safety and Health Administration (OSHA), and remain anonymous if so desired.**
_____ True _____ False
8. **Someone who files an OSHA complaint must be directly affected by the hazard in question.**
_____ True _____ False
9. **An employer may refuse to allow an OSHA inspector into the workplace without a court-issued search warrant.**
_____ True _____ False
10. **Under the OSH Act, only management representatives are permitted to accompany an OSHA inspector during an inspection.**
_____ True _____ False
11. **Once OSHA has issued a citation, either the employer or the union/employees may contest the penalties, the time period for correction of the hazard(s), and/or the validity of the citation itself.**
_____ True _____ False
12. **If you suspect that something is hazardous in your workplace, the best course of action is to call OSHA right away.**
_____ True _____ False
13. **The OSH Act gives workers the right to refuse to do unsafe or unhealthful jobs.**
_____ True _____ False
14. **According to the Occupational Safety and Health Act, it is illegal for an employer to fire, discipline or discriminate against workers because they complain to supervisors about unsafe or unhealthy conditions on the job.**
_____ True _____ False
15. **The OSHA inspector must see the violation in order to cite the employer.**
_____ True _____ False

16. Under the OSHA Record Keeping Standard, the OSHA 300 log summary will only be posted during the month of February.
- _____ True _____ False
17. Even with the OSHA Record Keeping Standard, there is still no limit on how long management takes in responding to a request for copies of OSHA 300 logs.
- _____ True _____ False
18. If every workplace (in your state) was scheduled for a plant inspection by OSHA, how many years would it take to do the inspections?
- _____ 15 to 30 _____ 31 to 60 _____ 61 – 100 _____ more than 101
19. Which hazards listed below are on OSHA's "Most Frequently Cited" Top Seven list? (See Page 6)
- _____ Guarding _____ Electrical _____ HazCom _____ LOTO
20. When the Congress passed the "OSHA Act" there were 14,000 fatalities per year and over 300,000 new cases of occupational diseases reported per year.
- _____ True _____ False
21. In the past 10 years we have averaged roughly 5,500 fatalities per year and 50,000 new cases of Occupational illness / diseases reported per year.
- _____ True _____ False



Health and Safety Department

Workplace Fatalities since the passage of OSHA:

<u>Year</u>	<u>Work Deaths</u>	<u>Employment</u>	<u>Death Rate</u>
1970	13,800	77,700	18
1971	13,700	78,500	17
1972	14,000	81,300	17
1973	14,300	84,300	17
1974	13,500	86,200	16
1975	13,000	85,200	15
1976	12,500	88,100	14
1977	12,900	91,500	14
1978	13,100	95,500	14
1979	13,000	98,300	13
1980	13,200	98,800	13
1981	12,500	99,800	13
1982	11,900	98,800	12
1983	11,700	100,100	12
1984	11,500	104,300	11
1985	11,500	106,400	11
1986	11,100	108,900	10
1987	11,300	111,700	10
1988	10,800	114,300	9
1989	10,400	116,700	9
1990	10,500	117,400	9
1991	9,900	116,400	9
1992	6,217	117,000	7
1993	6,331	118,700	8
1994	6,632	122,400	5
1995	6,275	126,200	5
1996	6,202	127,997	4.8
1997	6,238	130,810	4.7
1998	6,055	132,684	4.5
1999	6,054	134,666	4.5
2000	5920	135,208	4.3
2001	5915	135,073	4.3
2002	5534	138,100	4.0
2003	5575	138,100	4.0
2004	5764	138,000	4.1
2005	5734	138,000	4.0
2006	5840	145,501	4.0
2007	5657	147,000	3.8
2008	5214	135979	3.7
2009	4551	139064	3.5

Recordkeeping

Employee Involvement. - 1904.35

1904.35(a) Basic requirement. Your employees and their representatives must be involved in the recordkeeping system in several ways.

1904.35(a)(1) You must inform each employee of how he or she is to report an injury or illness to you.

1904.35(a)(2) You must provide limited access to your injury and illness records for your employees and their representatives.

1904.35(b) Implementation.

1904.35(b)(1) What must I do to make sure that employees report work-related injuries and illnesses to me?

1904.35(b)(1)(i) You must set up a way for employees to report work-related injuries and illnesses promptly; and

1904.35(b)(1)(ii) You must tell each employee how to report work-related injuries and illnesses to you.

1904.35(b)(2) Do I have to give my employees and their representatives access to the OSHA injury and illness records? Yes, your employees, former employees, their personal representatives, and their authorized employee representatives have the right to access the OSHA injury and illness records, with some limitations, as discussed below.

1904.35(b)(2)(i)

Who is an authorized employee representative? An authorized employee representative is an authorized collective bargaining agent of employees.

1904.35(b)(2)(ii)

Who is a "personal representative" of an employee or former employee? A personal representative is:

1904.35(b)(2)(ii)(A)

Any person that the employee or former employee designates as such, in writing;

or 1904.35(b)(2)(ii)(B)

The legal representative of a deceased or legally incapacitated employee or former employee.

1904.35(b)(2)(iii)

If an employee or representative asks for access to the OSHA 300 Log, when do I have to provide it? When an employee, former employee, personal representative, or authorized employee representative asks for copies of your current or stored OSHA 300

Log(s) for an establishment the employee or former employee has worked in, you **must give the requester a copy of the relevant OSHA 300 Log(s) by the end of the next business day.**

1904.35(b)(2)(iv)

May I remove the names of the employees or any other information from the OSHA 300 Log before I give copies to an employee, former employee, or employee representative? No, you must leave the names on the 300 Log. However, to protect the privacy of injured and ill employees, you may not record the employee's name on the OSHA 300 Log for certain "privacy concern cases," as specified in paragraphs 1904.29(b)(6) through 1904.29(b)(9).

1904.35(b)(2)(v)

If an employee or representative asks for access to the OSHA 301 Incident Report, when do I have to provide it?

1904.35(b)(2)(v)(A)

When an employee, former employee, or personal representative asks for a copy of the OSHA 301 Incident Report describing an injury or illness to that employee or former employee, you must give the requester a copy of the OSHA 301 Incident Report containing that information by the end of the next business day.

1904.35(b)(2)(v)(B)

When an authorized employee representative asks for copies of the OSHA 301 Incident Reports for an establishment where the agent represents employees under a collective bargaining agreement, you must give copies of those forms to the authorized employee representative within 7 calendar days. You are only required to give the authorized employee representative information from the OSHA 301 Incident Report section titled "Tell us about the case." You must remove all other information from the copy of the OSHA 301 Incident Report or the equivalent substitute form that you give to the authorized employee representative.

1904.35(b)(2)(vi)

May I charge for the copies? No, you may not charge for these copies the first time they are provided. However, if one of the designated persons asks for additional copies, you may assess a reasonable charge for retrieving and copying the records.

[66 FR 6132, Jan. 19, 2001]

Standard Interpretation:

Employer obligation to provide access to entire OSHA 300 Logs, including names of both union and non-union employees.

September 9, 2005

Mr. Thomas D. O'Connor
National Labor Relations Board
Division of Advice - 10th Floor
1099 14th Street, NW
Washington, DC 20005

Dear Mr. O'Connor:

This is in response to your August 5, 2005 e-mail question to the Department of Labor's Office of the Solicitor concerning the Occupational Safety and Health Administration's (OSHA's) injury and illness recordkeeping requirements at 29 CFR 1904. Your inquiry has been forwarded to this office so that OSHA may provide you with an official interpretation of its regulation.

In your e-mail you ask whether employee representatives have access to OSHA 300 Log information for both union and non-union employees. Specifically, you ask whether an employer may redact names of non-union employees when it turns over the OSHA 300 Log to an employee representative.

OSHA's regulation at 29 CFR 1904.35(b)(2) provides that employees, former employees, their personal representatives, and authorized employee representatives have the right to access the current OSHA 300 Log, as well as any stored OSHA 300 Log(s) for any establishment in which the employee or former employee has worked. The employer must provide to the requester one free copy of the OSHA 300 Log(s) by the end of the next business day.

Under Part 1904, the **employer must provide access to the entire OSHA 300 Log and may not delete the names** and cases of non-union employees. Section 1904.35(b)(2)(iv) states:

(iv) May I remove the names of the employees or any other information from the OSHA 300 log before I give copies to an employee, former employee, or employee representative?

No, you must leave the names on the OSHA 300 Log. However, to protect the privacy of injured and ill employees, you may not record the employee's name on the OSHA 300 Log for certain "privacy concern cases," as specified in paragraphs 1904.29(b)(6) through 1904.29(b)(9). OSHA has determined that it is important for employees, former employees, and their representatives to have complete access to the entire 300 Log, including all names of employees listed on the form. The Agency's long standing practice of providing access to all of the information on the 300 Log permits employees and their representatives to be totally informed about the employer's recordkeeping practices, and the occupational injuries and illnesses recorded in the workplace. The data included on the 300 Log assists employees and their representatives in their voluntary efforts to uncover and eliminate workplace safety and health hazards. In addition, the name of the employee listed on the 300 Log is important in

understanding and verifying recordable cases. In many cases it may be necessary to speak with a specific employee to determine the conditions that lead to the injury or illness, and this is impossible without access to employee names. The removal of non-union employees listed on the 300 Log would diminish an employee representative's ability to uncover and prevent safety and health hazards in the workplace.

We note that for certain injuries and illnesses addressed in 29 CFR 1904.29, the employer is required to protect personal privacy by omitting the employee's name from the OSHA 300 Log. Instead, the employer enters "privacy case," and keeps a separate, confidential list containing the identifying information. An employee, former employee, personal representative, or authorized employee representative is not entitled to see, or obtain a copy of, the confidential list of names and case numbers for privacy cases. If you have any further questions, please contact the Division of Recordkeeping Requirements at 202-693-1889.

Sincerely,
Keith Goddard, Director
Directorate of Evaluation and Analysis

Note: The "ACT" is not reproduced in it's entirety

Public Law 91-596
84 STAT. 1590
91st Congress, S.2193
December 29, 1970,
as amended through January 1, 2004. (1)

An Act

To assure safe and healthful working conditions for working men and women; by authorizing enforcement of the standards developed under the Act; by assisting and encouraging the States in their efforts **to assure safe and healthful working conditions;** by providing for research, information, education, and training in the field of occupational safety and health; and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That this Act may be cited as the "Occupational Safety and Health Act of 1970."

SEC. 2. Congressional Findings and Purpose

(a) The Congress finds that personal injuries and illnesses arising out of work situations impose a substantial burden upon, and are a hindrance to, interstate commerce in terms of lost production, wage loss, medical expenses, and disability compensation payments.

(b) The Congress declares it to be its purpose and policy, through the exercise of its powers to regulate commerce among the several States and with foreign nations and to provide for the general welfare, **to assure so far as possible every working man and woman in the Nation safe and healthful working conditions and to preserve our human resources --**

(1) by encouraging employers and employees in their efforts to reduce the number of occupational safety and health hazards at their places of employment, and to stimulate employers and employees to institute new and to perfect existing programs for providing safe and healthful working conditions

(2) by providing that employers and employees have separate but dependent responsibilities and rights with respect to achieving safe and healthful working conditions;

(3) by authorizing the Secretary of Labor to set mandatory occupational safety and health standards applicable to businesses affecting interstate commerce, and by creating an Occupational Safety and Health Review Commission for carrying out adjudicatory functions under the Act;

(4) by building upon advances already made through employer and employee initiative for providing safe and healthful working conditions;

(5) by providing for research in the field of occupational safety and health, including the psychological factors involved, and by developing innovative methods, techniques, and approaches for dealing with occupational safety and health problems;

(6) by exploring ways to discover latent diseases, establishing causal connections between diseases and work in environmental conditions, and conducting other research relating to health problems, in recognition of the fact that occupational health standards present problems often different from those involved in occupational safety;

(7) by providing medical criteria which will assure insofar as practicable that no employee will suffer diminished health, functional capacity, or life expectancy as a result of his work experience;

(8) by providing for training programs to increase the number and competence of personnel engaged in the field of occupational safety and health; affecting the OSH Act since its passage in 1970 through January 1, 2004.

(9) by providing for the development and promulgation of occupational safety and health standards;

(10) by providing an effective enforcement program which shall include a prohibition against giving advance notice of any inspection and sanctions for any individual violating this prohibition;

(11) by encouraging the States to assume the fullest responsibility for the administration and enforcement of their occupational safety and health laws by providing grants to the States to assist in identifying their needs and responsibilities in the area of occupational safety and health, to develop plans in accordance with the provisions of this Act, to improve the administration and enforcement of State occupational safety and health laws, and to conduct experimental and demonstration projects in connection therewith;

(12) by providing for appropriate reporting procedures with respect to occupational safety and health which procedures will help achieve the objectives of this Act and accurately describe the nature of the occupational safety and health problem;

(13) by encouraging joint labor-management efforts to reduce injuries and disease arising out of employment.

SEC. 3. Definitions (Not all included in this publication)

For the purposes of this Act –

(6) The term "employee" means an employee of an employer who is employed in a business of his employer which affects commerce.

(8) The term "occupational safety and health standard" means a standard which requires conditions, or 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.

(10) The term "established Federal standard" means any operative occupational safety and health standard established by any agency of the United States and presently in effect, or contained in any Act of Congress in force on the date of enactment of this Act.

(14) The term "Workmen's Compensation Commission" means the National Commission on State Workmen's Compensation Laws established under this Act.

SEC. 4. Applicability of This Act

(a) This Act shall apply with respect to employment performed in a workplace in a State, the District of Columbia, the Commonwealth of Puerto Rico, the Virgin Islands, American Samoa, Guam, the Trust Territory of the Pacific Islands, Wake Island, Outer Continental Shelf Lands defined in the Outer Continental Shelf Lands Act, Johnston Island, and the Canal Zone. The Secretary of the Interior shall, by regulation, provide for judicial enforcement of this Act by the courts established for areas in which there are no United States district courts having jurisdiction.

SEC. 5. Duties

(a) **Each employer --**

(1) **shall furnish to each of his employees employment and a place of employment which are free from recognized hazards that are causing or are likely to cause death or serious physical harm to his employees;**

(2) shall comply with occupational safety and health standards promulgated under this Act.

(b) **Each employee** shall comply with occupational safety and health standards and all rules, regulations, and orders issued pursuant to this Act which are applicable to his own actions and conduct.

6. Occupational Safety and Health Standards (Selected information only)

(a) Without regard to chapter 5 of title 5, United States Code, or to the other subsections of this section, the Secretary shall, as soon as practicable during the period beginning with the effective date of this Act and ending two years after such date, by rule promulgate as an occupational safety or health standard any national consensus standard, and any established Federal standard, unless he determines that the promulgation of such a standard would not result in improved safety or health for specifically designated employees. In the event of conflict among any such standards, the Secretary shall promulgate the standard which assures the greatest protection of the safety or health of the affected employees.

(2) The Secretary shall publish a proposed rule promulgating, modifying, or revoking an occupational safety or health standard in the Federal Register and shall afford

interested persons a period of thirty days after publication to submit written data or comments. Where an advisory committee is appointed and the Secretary determines that a rule should be issued, he shall publish the proposed rule within sixty days after the submission of the advisory committee's recommendations or the expiration of the period prescribed by the Secretary for such submission.

SEC. 7. Advisory Committees; Administration

(a) (1) There is hereby established a National Advisory Committee on Occupational Safety and Health consisting of twelve members appointed by the Secretary, four of whom are to be designated by the Secretary of Health and Human Services, without regard to the provisions of title 5, United States Code, governing appointments in the competitive service, and composed of representatives of management, labor, occupational safety and occupational health professions, and of the public. The Secretary shall designate one of the public members as Chairman. The members shall be selected upon the basis of their experience and competence in the field of occupational safety and health.

(b) An advisory committee may be appointed by the Secretary to assist him in his standard-setting functions under section 6 of this Act. Each such committee shall consist of not more than fifteen members and shall include as a member one or more designees of the Secretary of Health and Human Services, and shall include among its members an equal number of persons qualified by experience and affiliation to present the viewpoint of the employers involved, and of persons similarly qualified to present the viewpoint of the workers involved, as well as one or more representatives of health and safety agencies of the States. An advisory committee may also include such other persons as the Secretary may appoint who are qualified by knowledge and experience to make a useful contribution to the work of such committee, including one or more representatives of professional organizations of technicians or professionals specializing in occupational safety or health, and one or more representatives of nationally recognized standards producing organizations, but the number of persons so appointed to any such advisory committee shall not exceed the number appointed to such committee as representatives of Federal and State agencies. Persons appointed to advisory committees from private life shall be compensated in the same manner as consultants or experts under section 3109 of title 5, United States Code. The Secretary shall pay to any State which is the employer of a member of such a committee who is a representative of the health or safety agency of that State, reimbursement sufficient to cover the actual cost to the State resulting from such representative's membership on such committee. Any meeting of such committee shall be open to the public and an accurate record shall be kept and made available to the public. No member of such committee (other than representatives of employers and employees) shall have an economic interest in any proposed rule.

SEC. 8. Inspections, Investigations, and Recordkeeping

(a) In order to carry out the purposes of this Act, the Secretary, upon presenting appropriate credentials to the owner, operator, or agent in charge, is authorized --

(1) to enter without delay and at reasonable times any factory, plant, establishment, construction site, or other area, workplace or environment where work is performed by an employee of an employer; and

(2) to inspect and investigate during regular working hours and at other reasonable times, and within reasonable limits and in a reasonable manner, any such place of employment and all pertinent conditions, structures, machines, apparatus, devices, equipment, and materials therein, and to question privately any such employer, owner, operator, agent or employee.

(b) In making his inspections and investigations under this Act the Secretary may require the attendance and testimony of witnesses and the production of evidence under oath. Witnesses shall be paid the same fees and mileage that are paid witnesses in the courts of the United States. In case of a contumacy, failure, or refusal of any person to obey such an order, any district court of the United States or the United States courts of any territory or possession, within the jurisdiction of which such person is found, or resides or transacts business, upon the application by the Secretary, shall have jurisdiction to issue to such person an order requiring such person to appear to produce evidence if, as, and when so ordered, and to give testimony relating to the matter under investigation or in question, and any failure to obey such order of the court may be punished by said court as a contempt thereof.

(c) (1) Each employer shall make, keep and preserve, and make available to the Secretary or the Secretary of Health and Human Services, such records regarding his activities relating to this Act as the Secretary, in cooperation with the Secretary of Health and Human Services, may prescribe by regulation as necessary or appropriate for the enforcement of this Act or for developing information regarding the causes and prevention of occupational accidents and illnesses. In order to carry out the provisions of this paragraph such regulations may include provisions requiring employers to conduct periodic inspections. The Secretary shall also issue regulations requiring that employers, through posting of notices or other appropriate means, keep their employees informed of their protections and obligations under this Act, including the provisions of applicable standards.

(2) The Secretary, in cooperation with the Secretary of Health and Human Services, shall prescribe regulations requiring employers to maintain accurate records of, and to make periodic reports on, work-related deaths, injuries and illnesses other than minor injuries requiring only first aid treatment and which do not involve medical treatment, loss of consciousness, restriction of work or motion, or transfer to another job.

(3) The Secretary, in cooperation with the Secretary of Health and Human Services, shall issue regulations requiring employers to maintain accurate records of employee exposures to potentially toxic materials or harmful physical agents which are required to be monitored or measured under section 6. Such regulations shall provide employees or their representatives with an opportunity to observe such monitoring or measuring, and to have access to the records thereof. Such regulations shall also make appropriate provision for each employee or former employee to have access to such records as will indicate his own exposure to toxic materials or harmful physical agents. Each employer shall promptly notify any employee who has been or is being exposed to toxic materials or harmful physical agents in concentrations or at levels which exceed those prescribed by an applicable occupational safety and health standard promulgated under section 6,

and shall inform any employee who is being thus exposed of the corrective action being taken.

(e) Subject to regulations issued by the Secretary, a representative of the employer and a representative authorized by his employees shall be given an opportunity to accompany the Secretary or his authorized representative during the physical inspection of any workplace under subsection (a) for the purpose of aiding such inspection. Where there is no authorized employee representative, the Secretary or his authorized representative shall consult with a reasonable number of employees concerning matters of health and safety in the workplace.

(f) (1) Any employees or representative of employees who believe that a violation of a safety or health standard exists that threatens physical harm, or that an imminent danger exists, may request an inspection by giving notice to the Secretary or his authorized representative of such violation or danger. 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 employees or representative of employees, and a copy shall be provided the employer or his agent no later than at the time of inspection, except that, upon the request of the person giving such notice, his 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 pursuant to subsection (g) of this section. If upon receipt of such notification the Secretary determines there are reasonable grounds to believe that such violation or danger exists, he shall make a special inspection in accordance with the provisions of this section as soon as practicable, to determine if such violation or danger exists. If the Secretary determines there are no reasonable grounds to believe that a violation or danger exists he shall notify the employees or representative of the employees in writing of such determination

(2) Prior to or during any inspection of a workplace, any employees or representative of employees employed in such workplace may notify the Secretary or any representative of the Secretary responsible for conducting the inspection, in writing, of any violation of this Act which they have reason to believe exists in such workplace. The Secretary shall, by regulation, establish procedures for informal review of any refusal by a representative of the Secretary to issue a citation with respect to any such alleged violation and shall furnish the employees or representative of employees requesting such review a written statement of the reasons for the Secretary's final disposition of the case.

(h) The Secretary shall not use the results of enforcement activities, such as the number of citations issued or penalties assessed, to evaluate employees directly involved in enforcement activities under this Act or to impose quotas or goals with regard to the results of such activities.

SEC. 9. Citations

(a) If, upon inspection or investigation, the Secretary or his authorized representative believes that an employer has violated a requirement of section 5 of this Act, of any standard, rule or order promulgated pursuant to section 6 of this Act, or of any regulations prescribed pursuant to this Act, he shall with reasonable promptness issue a citation to the employer. Each citation shall be in writing and shall describe with particularity the nature of the violation, including a reference to the provision of the Act,

standard, rule, regulation, or order alleged to have been violated. In addition, the citation shall fix a reasonable time for the abatement of the violation. The Secretary may prescribe procedures for the issuance of a notice in lieu of a citation with respect to de minimis violations which have no direct or immediate relationship to safety or health.

(b) Each citation issued under this section, or a copy or copies thereof, shall be prominently posted, as prescribed in regulations issued by the Secretary, at or near each place a violation referred to in the citation occurred.

(c) No citation may be issued under this section after the expiration of six months following the occurrence of any violation.

SEC. 10. Procedure for Enforcement

(a) If, after an inspection or investigation, the Secretary issues a citation under section 9(a), he shall, within a reasonable time after the termination of such inspection or investigation, notify the employer by certified mail of the penalty, if any, proposed to be assessed under section 17 and that the employer has fifteen working days within which to notify the Secretary that he wishes to contest the citation or proposed assessment of penalty. If, within fifteen working days from the receipt of the notice issued by the Secretary the employer fails to notify the Secretary that he intends to contest the citation or proposed assessment of penalty, and no notice is filed by any employee or representative of employees under subsection (c) within such time, the citation and the assessment, as proposed, shall be deemed a final order of the Commission and not subject to review by any court or agency.

(b) If the Secretary has reason to believe that an employer has failed to correct a violation for which a citation has been issued within the period permitted for its correction (which period shall not begin to run until the entry of a final order by the Commission in the case of any review proceedings under this section initiated by the employer in good faith and not solely for delay or avoidance of penalties), the Secretary shall notify the employer by certified mail of such failure and of the penalty proposed to be assessed under section 17 by reason of such failure, and that the employer has fifteen working days within which to notify the Secretary that he wishes to contest the Secretary's notification or the proposed assessment of penalty. If, within fifteen working days from the receipt of notification issued by the Secretary, the employer fails to notify the Secretary that he intends to contest the notification or proposed assessment of penalty, the notification and assessment, as proposed, shall be deemed a final order of the Commission and not subject to review by any court or agency.

(c) If an employer notifies the Secretary that he intends to contest a citation issued under section 9(a) or notification issued under subsection (a) or (b) of this section, or if, within fifteen working days of the issuance of a citation under section 9(a), any employee or representative of employees files a notice with the Secretary alleging that the period of time fixed in the citation for the abatement of the violation is unreasonable, the Secretary shall immediately advise the Commission of such notification, and the Commission shall afford an opportunity for a hearing (in accordance with section 554 of title 5, United States Code, but without regard to subsection (a)(3) of such section). The Commission shall thereafter issue an order, based on findings of fact, affirming, modifying, or vacating the Secretary's citation or proposed penalty, or directing other appropriate relief, and such order shall become final thirty days after its issuance. Upon

a showing by an employer of a good faith effort to comply with the abatement requirements of a citation, and that abatement has not been completed because of factors beyond his reasonable control, the Secretary, after an opportunity for a hearing as provided in this subsection, shall issue an order affirming or modifying the abatement requirements in such citation. The rules of procedure prescribed by the Commission shall provide affected employees or representatives of affected employees an opportunity to participate as parties to hearings under this subsection.

SEC. 11. Judicial Review

(a) Any person adversely affected or aggrieved by an order of the Commission issued under subsection (c) of section 10 may obtain a review of such order in any United States court of appeals for the circuit in which the violation is alleged to have occurred or where the employer has its principal office, or in the Court of Appeals for the District of Columbia Circuit, by filing in such court within sixty days following the issuance of such order a written petition praying that the order be modified or set aside. A copy of such petition shall be forthwith transmitted by the clerk of the court to the Commission and to the other parties, and thereupon the Commission shall file in the court the record in the proceeding as provided in section 2112 of title 28, United States Code. Upon such filing, the court shall have jurisdiction of the proceeding and of the question determined therein, and shall have power to grant such temporary relief or restraining order as it deems just and proper, and to make and enter upon the pleadings, testimony, and proceedings set forth in such record a decree affirming, modifying, or setting aside in whole or in part, the order of the Commission and enforcing the same to the extent that such order is affirmed or modified. The commencement of proceedings under this subsection shall not, unless ordered by the court, operate as a stay of the order of the Commission. No objection that has not been urged before the Commission shall be considered by the court, unless the failure or neglect to urge such objection shall be excused because of extraordinary circumstances. The findings of the Commission with respect to questions of fact, if supported by substantial evidence on the record considered as a whole, shall be conclusive. If any party shall apply to the court for leave to adduce additional evidence and shall show to the satisfaction of the court that such additional evidence is material and that there were reasonable grounds for the failure to adduce such evidence in the hearing before the Commission, the court may order such additional evidence to be taken before the Commission and to be made a part of the record. The Commission may modify its findings as to the facts, or make new findings, by reason of additional evidence so taken and filed, and it shall file such modified or new findings, which findings with respect to questions of fact, if supported by substantial evidence on the record considered as a whole, shall be conclusive, and its recommendations, if any, for the modification or setting aside of its original order. Upon the filing of the record with it, the jurisdiction of the court shall be exclusive and its judgment and decree shall be final, except that the same shall be subject to review by the Supreme Court of the United States, as provided in section 1254 of title 28, United States Code.

(b) The Secretary may also obtain review or enforcement of any final order of the Commission by filing a petition for such relief in the United States court of appeals for the circuit in which the alleged violation occurred or in which the employer has its principal office, and the provisions of subsection (a) shall govern such proceedings to the extent applicable. If no petition for review, as provided in subsection (a), is filed within sixty days after service of the Commission's order, the Commission's findings of

fact and order shall be conclusive in connection with any petition for enforcement which is filed by the Secretary after the expiration of such sixty-day period. In any such case, as well as in the case of a noncontested citation or notification by the Secretary which has become a final order of the Commission under subsection (a) or (b) of section 10, the clerk of the court, unless otherwise ordered by the court, shall forthwith enter a decree enforcing the order and shall transmit a copy of such decree to the Secretary and the employer named in the petition. In any contempt proceeding brought to enforce a decree of a court of appeals entered pursuant to this subsection or subsection (a), the court of appeals may assess the penalties provided in section 17, in addition to invoking any other available remedies.

(c) (1) **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 Act or has testified or is about to testify in any such proceeding or because of the exercise by such employee on behalf of himself or others of any right afforded by this Act.

(2) Any employee who believes that he has been discharged or otherwise discriminated against by any person in violation of this subsection may, within thirty days after such violation occurs, file a complaint with the Secretary alleging such discrimination. Upon receipt of such complaint, the Secretary shall cause such investigation to be made as he deems appropriate. If upon such investigation, the Secretary determines that the provisions of this subsection have been violated, he shall bring an action in any appropriate United States district court against such person. In any such action the United States district courts shall have jurisdiction, for cause shown to restrain violations of paragraph (1) of this subsection and order all appropriate relief including rehiring or reinstatement of the employee to his former position with back pay.

(3) Within 90 days of the receipt of a complaint filed under this subsection the Secretary shall notify the complainant of his determination under paragraph 2 of this subsection.

SEC. 12. The Occupational Safety and Health Review Commission

(a) The Occupational Safety and Health Review Commission is hereby established. The Commission shall be composed of three members who shall be appointed by the President, by and with the advice and consent of the Senate, from among persons who by reason of training, education, or experience are qualified to carry out the functions of the Commission under this Act. The President shall designate one of the members of the Commission to serve as Chairman.

SEC. 13. Procedures to Counteract Imminent Dangers

(a) The United States district courts shall have jurisdiction, upon petition of the Secretary, to restrain any conditions or practices in any place of employment which are such that a danger exists which could reasonably be expected to cause death or serious physical harm immediately or before the imminence of such danger can be eliminated through the enforcement procedures otherwise provided by this Act. Any order issued under this section may require such steps to be taken as may be necessary to avoid, correct, or remove such imminent danger and prohibit the employment or presence of any individual in locations or under conditions where such imminent danger exists, except individuals whose presence is necessary to avoid,

correct, or remove such imminent danger or to maintain the capacity of a continuous process operation to resume normal operations without a complete cessation of operations, or where a cessation of operations is necessary, to permit such to be accomplished in a safe and orderly manner.

(b) Upon the filing of any such petition the district court shall have jurisdiction to grant such injunctive relief or temporary restraining order pending the outcome of an enforcement proceeding pursuant to this Act. The proceeding shall be as provided by Rule 65 of the Federal Rules, Civil Procedure, except that no temporary restraining order issued without notice shall be effective for a period longer than five days.

(c) Whenever and as soon as an inspector concludes that conditions or practices described in subsection (a) exist in any place of employment, he shall inform the affected employees and employers of the danger and that he is recommending to the Secretary that relief be sought.

(d) If the Secretary arbitrarily or capriciously fails to seek relief under this section, any employee who may be injured by reason of such failure, or the representative of such employees, might bring an action against the Secretary in the United States district court for the district in which the imminent danger is alleged to exist or the employer has its principal office, or for the District of Columbia, for a writ of mandamus to compel the Secretary to seek such an order and for such further relief as may be appropriate.

SEC. 14. Representation in Civil Litigation

Except as provided in section 518(a) of title 28, United States Code, relating to litigation before the Supreme Court, the Solicitor of Labor may appear for and represent the Secretary in any civil litigation brought under this Act but all such litigation shall be subject to the direction and control of the Attorney General.

SEC. 15. Confidentiality of Trade Secrets

All information reported to or otherwise obtained by the Secretary or his representative in connection with any inspection or proceeding under this Act which contains or which might reveal a trade secret referred to in section 1905 of title 18 of the United States Code shall be considered confidential for the purpose of that section, except that such information may be disclosed to other officers or employees concerned with carrying out this Act or when relevant in any proceeding under this Act. In any such proceeding the Secretary, the Commission, or the court shall issue such orders as may be appropriate to protect the confidentiality of trade secrets.

16. Variations, Tolerances, and Exemptions

The Secretary, on the record, after notice and opportunity for a hearing may provide such reasonable limitations and may make such rules and regulations allowing reasonable variations, tolerances, and exemptions to and from any or all provisions of this Act as he may find necessary and proper to avoid serious impairment of the national defense. Such action shall not be in effect for more than six months without notification to affected employees and an opportunity being afforded for a hearing.

SEC. 17. Penalties

(a) Any employer who willfully or repeatedly violates the requirements of section 5 of this Act, any standard, rule, or order promulgated pursuant to section 6 of this Act, or regulations prescribed pursuant to this Act, may be assessed a civil penalty of not more than \$70,000 for each violation, but not less than \$5,000 for each willful violation.

(b) Any employer who has received a citation for a serious violation of the requirements of section 5 of this Act, of any standard, rule, or order promulgated pursuant to section 6 of this Act, or of any regulations prescribed pursuant to this Act, shall be assessed a civil penalty of up to \$7,000 for each such violation.

(c) Any employer who has received a citation for a violation of the requirements of section 5 of this Act, of any standard, rule, or order promulgated pursuant to section 6 of this Act, or of regulations prescribed pursuant to this Act, and such violation is specifically determined not to be of a serious nature, may be assessed a civil penalty of up to \$7,000 for each violation.

(d) Any employer who fails to correct a violation for which a citation has been issued under section 9(a) within the period permitted for its correction (which period shall not begin to run until the date of the final order of the Commission in the case of any review proceeding under section 10 initiated by the employer in good faith and not solely for delay or avoidance of penalties), may be assessed a civil penalty of not more than \$7,000 for each day during which such failure or violation continues.

(e) Any employer who willfully violates any standard, rule, or order promulgated pursuant to section 6 of this Act, or of any regulations prescribed pursuant to this Act, and that violation caused death to any employee, shall, upon conviction, be punished by a fine of not more than \$10,000 or by imprisonment for not more than six months, or by both; except that if the conviction is for a violation committed after a first conviction of such person, punishment shall be by a fine of not more than \$20,000 or by imprisonment for not more than one year, or by both.

(f) Any person who gives advance notice of any inspection to be conducted under this Act, without authority from the Secretary or his designees, shall, upon conviction, be punished by a fine of not more than \$1,000 or by imprisonment for not more than six months, or by both.

(g) Whoever knowingly makes any false statement, representation, or certification in any application, record, report, plan, or other document filed or required to be maintained pursuant to this Act shall, upon conviction, be punished by a fine of not more than \$10,000, or by imprisonment for not more than six months, or by both.

(i) Any employer who violates any of the posting requirements, as prescribed under the provisions of this Act, shall be assessed a civil penalty of up to \$7,000 for each violation.

(j) The Commission shall have authority to assess all civil penalties provided in this section, giving due consideration to the appropriateness of the penalty with respect to the size of the business of the employer being charged, the gravity of the violation, the good faith of the employer, and the history of previous violations.

(k) For purposes of this section, a serious violation shall be deemed to exist in a place of employment if there is a substantial probability that death or serious physical harm could result from a condition which exists, or from one or more practices, means, methods, operations, or processes which have been adopted or are in use, in such place of employment unless the employer did not, and could not with the exercise of reasonable diligence, know of the presence of the violation.

(l) Civil penalties owed under this Act shall be paid to the Secretary for deposit into the Treasury of the United States and shall accrue to the United States and may be recovered in a civil action in the name of the United States brought in the United States district court for the district where the violation is alleged to have occurred or where the employer has its principal office.

SEC. 18. State Jurisdiction and State Plans

(a) Nothing in this Act shall prevent any State agency or court from asserting jurisdiction under State law over any occupational safety or health issue with respect to which no standard is in effect under section 6.

(b) Any State which, at any time, desires to assume responsibility for development and enforcement therein of occupational safety and health standards relating to any occupational safety or health issue with respect to which a Federal standard has been promulgated under section 6 shall submit a State plan for the development of such standards and their enforcement.

SEC. 19. Federal Agency Safety Programs and Responsibilities

(a) It shall be the responsibility of the head of each Federal agency (not including the United States Postal Service) to establish and maintain an effective and comprehensive occupational safety and health program which is consistent with the standards promulgated under section 6.

(b) The Secretary shall report to the President a summary or digest of reports submitted to him under subsection (a)(5) of this section, together with his evaluations of and recommendations derived from such reports.

(c) Section 7902(c)(1) of title 5, United States Code, is amended by inserting after "agencies" the following: "and of labor organizations representing employees".

(d) The Secretary shall have access to records and reports kept and filed by Federal agencies pursuant to subsections (a)(3) and (5) of this section unless those records and reports are specifically required by Executive order to be kept secret in the interest of the national defense or foreign policy, in which case the Secretary shall have access to such information as will not jeopardize national defense or foreign policy.

SEC. 20. Research and Related Activities

(a) (1) The Secretary of Health and Human Services, after consultation with the Secretary and with other appropriate Federal departments or agencies, shall conduct (directly or by grants or contracts) research, experiments, and demonstrations relating to occupational safety and health, including studies of psychological factors involved, and relating to innovative methods, techniques, and approaches for dealing with occupational safety and health problems.

(2) The Secretary of Health and Human Services shall from time to time consult with the Secretary in order to develop specific plans for such research, demonstrations, and experiments as are necessary to produce criteria, including criteria identifying toxic substances, enabling the Secretary to meet his responsibility for the formulation of safety and health standards under this Act; and the Secretary of Health and Human Services, on the basis of such research, demonstrations, and experiments and any other information available to him, shall develop and publish at least annually such criteria as will effectuate the purposes of this Act.

(3) The Secretary of Health and Human Services, on the basis of such research, demonstrations, and experiments, and any other information available to him, shall develop criteria dealing with toxic materials and harmful physical agents and substances which will describe exposure levels that are safe for various periods of employment, including but not limited to the exposure levels at which no employee will suffer impaired health or functional capacities or diminished life expectancy as a result of his work experience.

(5) The Secretary of Health and Human Services, in order to comply with his responsibilities under paragraph (2), and in order to develop needed information regarding potentially toxic substances or harmful physical agents, may prescribe regulations requiring employers to measure, record, and make reports on the exposure of employees to substances or physical agents which the Secretary of Health and Human Services reasonably believes may endanger the health or safety of employees. The Secretary of Health and Human Services also is authorized to establish such programs of medical examinations and tests as may be necessary for determining the incidence of occupational illnesses and the susceptibility of employees to such illnesses. Nothing in this or any other provision of this Act shall be deemed to authorize or require medical examination, immunization, or treatment for those who object thereto on religious grounds, except where such is necessary for the protection of the health or safety of others. Upon the request of any employer who is required to measure and record exposure of employees to substances or physical agents as provided under this subsection, the Secretary of Health and Human Services shall furnish full financial or other assistance to such employer for the purpose of defraying any additional expense incurred by him in carrying out the measuring and recording as provided in this subsection.

(6) The Secretary of Health and Human Services shall publish within six months of enactment of this Act and thereafter as needed but at least annually a list of all known toxic substances by generic family or other useful grouping, and the concentrations at which such toxicity is known to occur. He shall determine following a written request by

any employer or authorized representative of employees, specifying with reasonable particularity the grounds on which the request is made, whether any substance normally found in the place of employment has potentially toxic effects in such concentrations as used or found; and shall submit such determination both to employers and affected employees as soon as possible. If the Secretary of Health and Human Services determines that any substance is potentially toxic at the concentrations in which it is used or found in a place of employment, and such substance is not covered by an occupational safety or health standard promulgated under section 6, the Secretary of Health and Human Services shall immediately submit such determination to the Secretary, together with all pertinent criteria.

(b) The Secretary of Health and Human Services is authorized to make inspections and question employers and employees as provided in section 8 of this Act in order to carry out his functions and responsibilities under this section.

EXPANDED RESEARCH ON WORKER SAFETY AND HEALTH

The Secretary of Health and Human Services (referred to in this section as the "Secretary"), acting through the Director of the National Institute of Occupational Safety and Health, shall enhance and expand research as deemed appropriate on the health and safety of workers who are at risk for bioterrorist threats or attacks in the workplace, including research on the health effects of measures taken to treat or protect such workers for diseases or disorders resulting from a bioterrorist threat or attack. Nothing in this section may be construed as establishing new regulatory authority for the Secretary or the Director to issue or modify any occupational safety and health rule or regulation.

SEC. 21. Training and Employee Education

(a) The Secretary of Health and Human Services, after consultation with the Secretary and with other appropriate Federal departments and agencies, shall conduct, directly or by grants or contracts --

(1) education programs to provide an adequate supply of qualified personnel to carry out the purposes of this Act, and

(2) informational programs on the importance of and proper use of adequate safety and health equipment.

(b) The Secretary is also authorized to conduct, directly or by grants or contracts, short-term training of personnel engaged in work related to his responsibilities under this Act.

SEC. 22. National Institute for Occupational Safety and Health

(a) It is the purpose of this section to establish a National Institute for Occupational Safety and Health in the Department of Health and Human Services in order to carry out the policy set forth in section 2 of this Act and to perform the functions of the Secretary of Health and Human Services under sections 20 and 21 of this Act.

(b) There is hereby established in the Department of Health and Human Services a National Institute for Occupational Safety and Health. The Institute shall be headed by a Director who shall be appointed by the Secretary of Health and Human Services, and

who shall serve for a term of six years unless previously removed by the Secretary of Health and Human Services.

(f) The Director shall submit to the Secretary of Health and Human Services, to the President, and to the Congress an annual report of the operations of the Institute under this Act, which shall include a detailed statement of all private and public funds received and expended by it, and such recommendations as he deems appropriate.

WORKERS' FAMILY PROTECTION

(a) Short title

This section may be cited as the "Workers' Family Protection Act".

(b) Findings and purpose

(A) hazardous chemicals and substances that can threaten the health and safety of workers are being transported out of industries on workers' clothing and persons;

(B) these chemicals and substances have the potential to pose an additional threat to the health and welfare of workers and their families;

SEC. 23. Grants to the States

(h) Prior to June 30, 1973, the Secretary shall, after consultation with the Secretary of Health and Human Services, transmit a report to the President and to the Congress, describing the experience under the grant programs authorized by this section and making any recommendations he may deem appropriate.

SEC. 24. Statistics

(a) In order to further the purposes of this Act, the Secretary, in consultation with the Secretary of Health and Human Services, shall develop and maintain an effective program of collection, compilation, and analysis of occupational safety and health statistics. Such program may cover all employments whether or not subject to any other provisions of this Act but shall not cover employments excluded by section 4 of the Act. The Secretary shall compile accurate statistics on work injuries and illnesses which shall include all disabling, serious, or significant injuries and illnesses, whether or not involving loss of time from work, other than minor injuries requiring only first aid treatment and which do not involve medical treatment, loss of consciousness, restriction of work or motion, or transfer to another job.

SEC. 25. Audits

(a) Each recipient of a grant under this Act shall keep such records as the Secretary or the Secretary of Health and Human Services shall prescribe, including records which fully disclose the amount and disposition by such recipient of the proceeds of such grant, the total cost of the project or undertaking in connection with which such grant is made or used, and the amount of that portion of the cost of the project or undertaking supplied by other sources, and such other records as will facilitate an effective audit.

(b) The Secretary or the Secretary of Health and Human Services, and the Comptroller General of the United States, or any of their duly authorized representatives, shall have access for the purpose of audit and examination to any books, documents, papers, and records of the recipients of any grant under this Act that are pertinent to any such grant.

SEC. 26. Annual Report

Within one hundred and twenty days following the convening of each regular session of each Congress, the Secretary and the Secretary of Health and Human Services shall each prepare and submit to the President for transmittal to the Congress a report upon the subject matter of this Act, the progress toward achievement of the purpose of this Act, the needs and requirements in the field of occupational safety and health, and any other relevant information. Such reports shall include information regarding occupational safety and health standards, and criteria for such standards, developed during the preceding year; evaluation of standards and criteria previously developed under this Act, defining areas of emphasis for new criteria and standards; an evaluation of the degree of observance of applicable occupational safety and health standards, and a summary of inspection and enforcement activity undertaken; analysis and evaluation of research activities for which results have been obtained under governmental and nongovernmental sponsorship; an analysis of major occupational diseases; evaluation of available control and measurement technology for hazards for which standards or criteria have been developed during the preceding year; description of cooperative efforts undertaken between Government agencies and other interested parties in the implementation of this Act during the preceding year; a progress report on the development of an adequate supply of trained manpower in the field of occupational safety and health, including estimates of future needs and the efforts being made by Government and others to meet those needs; listing of all toxic substances in industrial usage for which labeling requirements, criteria, or standards have not yet been established; and such recommendations for additional legislation as are deemed necessary to protect the safety and health of the worker and improve the administration of this Act.

SEC. 32. Separability

If any provision of this Act, or the application of such provision to any person or circumstance, shall be held invalid, the remainder of this Act, or the application of such provision to persons or circumstances other than those as to which it is held invalid, shall not be affected thereby.

SEC. 33. Appropriations

There are authorized to be appropriated to carry out this Act for each fiscal year such sums as the Congress shall deem necessary.

SEC. 34. Effective Date

This Act shall take effect one hundred and twenty days after the date of its enactment.

Walking/Working Surfaces—Sub-Part “D”

Activity #1

Answer the following questions in your group using your own experience and pages following the Activity.

1. Slips, trips and falls make up 13% of all accidental deaths in General Industry.
True_____ **False**_____
2. Aisles and passageways shall be kept clear and in good repair, appropriately marked and sufficiently wide where material handling equipment is used.
True_____ **False**_____
3. Storing material on top of the supervisor's office requires what to be posted? _____
4. What is the difference between a “Floor Hole” and a “Floor Opening” ?

5. Floor openings that require standard railing that consist of a top rail, mid rail and toe board have what dimensions: **Top rail**_____ **Mid rail**_____ **Toe board**_____
6. Floor openings always have to be guarded with standard railings and toe boards? **True**_____ **False**_____
7. All platforms and open-sided floors have to be guarded? **True**____ **False**_____
8. When is “Standard Stair Railings” and “Standard Handrails” required?

9. What are the dimensions of Standard Stair Railings and Standard Handrails?
Vertical height_____
10. Where are fixed stairs required? _____

11. What are some things to watch for during an inspection of fixed stairs?

12. What is the biggest hazard when using a portable ladder? _____

13. One requirement for portable ladders is that they be inspected daily. **True**_____ **False**_____
14. What are some precautions you would suggest for using ladders?

15. What is a "Fixed Ladder"? _____

16. How often do fixed ladders need to be inspected? _____
17. When setting up scaffolding and one support isn't level it is OK to use a concrete block or brick to level it out. **True**_____ **False**_____
18. When are guardrails, midrails and toeboards required on scaffolding?

19. What does "Other Working Surfaces" include? _____



Sub Part “D”

WALKING-WORKING SURFACES (SLIPS, TRIPS, AND FALLS)

General Requirements

- Housekeeping
- Aisles and Passageways
- Covers and Guardrails
- Floor Loading Protection

Guarding Floor and Wall Openings and Holes

- Definitions
- Protection for Floor Openings
- Protection of Open-Sided Floors, Platforms, and Runways
- Stairway Railings and Guards

Fixed Industrial Stairs

Portable Ladders

Fixed Ladders

Safety Requirements for Scaffolding

Manually Propelled Mobile Ladder Stands and Scaffolds (Towers)

Other Working Surfaces

WALKING-WORKING SURFACES (SLIPS, TRIPS, AND FALLS)

Slips, trips, and falls constitute the majority of general industry accidents. They cause 13% of all accidental deaths (BLS 2008), and are second only to motor vehicles as a cause of fatalities. The OSHA standards for walking and working surfaces apply to all permanent places of employment, except where domestic, mining, or agricultural work only is performed.

GENERAL REQUIREMENTS

Housekeeping

Some of the most frequently overlooked general requirements involve housekeeping:

- All places of employment, passageways, storerooms, and service rooms shall be kept clean and orderly and in a sanitary condition.
- The floor of every workroom shall be maintained in a clean and, so far as possible, a dry condition. Where wet processes are used, drainage shall be maintained and gratings, mats, or raised platforms shall be provided.
- Every floor, working place and passageway shall be kept free from protruding nails, splinters, holes, or loose boards.

Aisles and Passageways

- Aisles and passageways shall be kept clear and in good repair with no obstruction across or in aisles that could create a hazard.
- Permanent aisles and passageways shall be appropriately marked.
- Where mechanical handling equipment is used, aisles shall be sufficiently wide. Improper aisle widths coupled with poor housekeeping and vehicle traffic can cause injury to employees, damage the equipment and material, and can limit egress in emergencies.

Covers and Guardrails

Covers and/or guardrails shall be provided to protect personnel from the hazards of open pits, tanks, vats, ditches, and the like.

Floor Loading Protection

Load rating limits shall be marked on plates and conspicuously posted. 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.

GUARDING FLOOR AND WALL OPENINGS AND HOLES

Floor openings and holes, wall openings and holes, and the open sides of platforms may create hazards. People may fall through the openings or over the sides to the level below. Objects, such as tools or parts, may fall through the holes and strike people or damage machinery on lower levels.

OSHA standards for guarding openings and holes use the following definitions:

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.

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.

Platform. A working space for persons, elevated above the surrounding floor or ground.

Wall hole. An opening less than 30 inches but more than 1 inch high, of unrestricted width, in any wall or partition.

Wall opening. An opening at least 30 inches high and 18 inches wide, in any wall or partition, through which persons may fall.

Protection for Floor Openings

Standard railings shall be provided on all exposed sides of a stairway opening, except at the stairway entrance. For infrequently used stairways, where traffic across the opening prevents the use of a fixed standard railing, the guard shall consist of a hinged floor opening cover of standard strength and construction along with removable standard railings on all exposed sides, except at the stairway entrance.

A "standard railing" consists of top rail, mid rail, and posts, and shall have a vertical height of 42 inches nominal from the upper surface of top rail to floor, platform, runway, or ramp level. Nominal height of mid rail is 21 inches.

A "standard toeboard" is 4 inches nominal in vertical height, with not more than ¼-inch clearance above floor level.

Floor openings may be covered rather than guarded with rails. When the floor opening cover is removed, a temporary guardrail shall be in place, or an attendant shall be stationed at the opening to warn personnel. Every floor hole into which persons can accidentally walk shall be guarded by either:

- A standard railing with toeboard, or
- A floor hole cover of standard strength and construction.

While the cover is not in place, the floor hole shall be constantly attended by someone or shall be protected by a removable standard railing.

Protection of Open-Sided Floors, Platforms, and Runways

One of the most frequently overlooked requirements in walking-working surfaces is the requirement that every open-sided floor or platform 4 feet or more above adjacent floor or ground level shall be guarded by a standard railing on all open sides, except where there is an entrance to a ramp, stairway, or fixed ladder. The railing shall be provided with a toeboard wherever, beneath the open sides:

- Persons can pass,
- There is moving machinery, or
- There is equipment with which falling materials could create a hazard.

Every runway shall be guarded by a standard railing, or the equivalent, on all 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 toeboard shall also be provided on each exposed side.

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 toeboard.

Stairway Railings and Guards

Every flight of stairs with four or more risers shall have standard stair railings or standard handrails as specified below. Stair width is measured clear of all obstructions except handrails.

- On stairways less than 44 inches wide having both sides enclosed, at least one handrail shall be affixed, preferably on the right side descending.
- On stairways less than 44 inches wide with one open side, at least one stair rail shall be affixed on the open side.
- On stairways less than 44 inches wide having both sides open, two stair rails shall be provided, one for each side.
- On stairways more than 44 inches wide, but less than 88 inches, one handrail shall be provided on each enclosed side and one stair rail on each open side.
- On stairways 88 inches or more in width, one handrail shall be provided on each enclosed side, one stair rail on each open side, and one intermediate stair rail placed approximately in the middle of the stairs.

A "standard stair railing" (stair rail) shall be of construction similar to a standard railing, but the vertical height shall be not more than 34 inches nor less than 30 inches from the upper surface of the top rail to the surface of the tread in line with the face of the riser at the forward edge of the tread.

A "standard handrail" consists of a lengthwise member mounted directly on a wall or partition by means of brackets attached to the lower side of the handrail in order to keep a smooth, unobstructed surface along the top and both sides of the handrail. They shall hold the rail 3 inches from the wall and be no more than 8 feet apart.

The height of handrails shall be no more than 34 inches nor less than 30 inches from the upper surface of the handrail to the surface of the tread in line with the face of the riser or to the surface of the ramp.

Winding stairs shall have a handrail that is offset to prevent people from walking on any portion of the treads where the width is less than 6 inches.

FIXED INDUSTRIAL STAIRS

This section contains specifications for the safe design and construction of fixed general industrial stairs. This includes interior and exterior stairs around machinery, tanks, and other equipment, and stairs leading to or from floors, platforms or pits. This section does not apply to stairs used for fire exit purposes, to construction operations, to private residences, or to articulated stairs, such as may be installed on floating roof tanks, the angle of which changes with the rise and fall of the base support.

Where are fixed stairs required?

Fixed Industrial Stairs shall be provided for access to and from places of work where operations necessitate regular travel between levels. OSHA requirements include:

- Fixed industrial stairs shall be strong enough to carry five times the normal anticipated live load.

- At the very minimum, any fixed stairway shall be able to carry safely a moving concentrated load of 1000 pounds.
- All fixed stairways shall have a minimum width of 22 inches.
- Fixed stairs shall be installed at angles to the horizontal of between 30° and 50°.
- Vertical clearance above any stair tread to an overhead obstruction shall be at least 7 feet measured from the leading edge of the tread.

When inspecting the condition of stairways in your place of work, here are some items to watch out for.

- Handrails and Stair rails:
 - A. Lack of
 - B. Placement
 - C. Smoothness of surface
 - D. Strength
 - E. Clearance between rail and wall or other object
- Treads:
 - A. Strength
 - B. Slip resistance
 - C. Dimensions
 - D. Evenness of surface
 - E. Visibility of leading edge
- Improper/inadequate design, construction or location of staircases.
- Wet, slippery, or damaged walking or grasping surfaces.
- Improper illumination...there is no general OSHA standard for illumination levels. The Illuminating Engineering Society publications should be consulted for recommendations.
- Poor housekeeping

The length of a staircase is important. Long flights of steps without landings should be avoided whenever possible.

The OSHA standards do not specify any exact number or placement of landings. The National Safety Council recommends landings at every tenth or twelfth tread.

Intermediate landings and platforms on stairways shall be no less than the stair width and a minimum of 30 inches in length measured in the direction of travel.

PORTABLE LADDERS

The chief hazard when using a ladder is falling. A poorly designed, maintained, or improperly used ladder may collapse under the load placed upon it and cause the employee to fall.

A ladder is an appliance consisting of two side rails joined at regular intervals by crosspieces on which a person may step to ascend or descend.

The various types of portable ladders include:

- Stepladder - A self-supporting portable ladder, non-adjustable in length, having flat steps and hinged back.
- Single Ladder - A non self-supporting portable ladder, nonadjustable in length, consisting of but one section. Its size is designed by overall length of the side rail.
- Extension Ladder - A non self-supporting portable ladder adjustable in length.

OSHA's requirements for portable ladders include:

- Portable stepladders longer than 20 feet shall not be used.
- Stepladders shall be equipped with a metal spreader or locking device of sufficient size and strength to securely hold the front and back sections in open position.
- Single ladders longer than 30 feet shall not be used.
- Extension ladders longer than 60 feet shall not be used.
- Ladders shall be maintained in good condition at all times.
- 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."

Proper use of ladders is essential in preventing accidents. Even a good ladder can be a serious safety hazard when used by workers in a dangerous way.

OSHA standards require the following safety precautions for ladder use:

- Ladders shall be placed with a secure footing, or they shall be lashed, or held in position.
- Ladders used to gain access to a roof or other area shall extend at least 3 feet above the point of support.
- The foot of a ladder 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 support). See figure above.
- The worker shall always *face* the ladder when climbing up or down.
- Short ladders shall not be spliced together to make long ladders.
- Ladders shall never be used in the horizontal position as scaffolds or work platforms.
- The top of a regular stepladder shall not be used as a step.
- Use both hands when climbing or descending ladders.
- Metal ladders shall never be used near electrical equipment.

"General Duty Citation":

Section 5(a)(1) of the Occupational Safety and Health Act of 1970: The employer did not furnish employment and a place of employment which were free from recognized hazards that were causing or likely to cause death or serious physical harm to employees in that employees were exposed to falls while carrying objects on ladders and stepping off ladders onto platforms: a) Stock Room - Employees were exposed to falls while they carried stock items up and down ladders without maintaining 3 point contact at all times with the ladder. Ladders were used to carry items to elevated storage locations. b) The two-step ladder

was used to reach extended heights without maintaining 3 point contact for support to prevent falls. c) Employees were exposed to falls while they stepped off the ladder onto the platform without the ladder extending at least 3 feet above the platform surface or without handholds or grab bars in place for safe access to the platform. Among the feasible control measures included: 1) Use portable stairs with railings or some other safe access for carrying items to the elevated storage shelves. 2) Use a material handling device to lift materials to the elevated shelves. 3) Provide safe access to the platform with a portable or fixed stair, a fixed ladder, or a portable ladder extending at least 3 feet above the platform, or providing handholds or grab bars for safe access.

FIXED LADDERS

A fixed ladder is a ladder permanently attached to a structure, building or equipment.

A point to remember is that fixed ladders, with a length of more than 20 feet to a maximum unbroken length of 30 feet shall be equipped with cages or a ladder safety device.

A "cage" is a guard 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.

Cages shall extend a minimum of 42 inches above the top of a landing, unless other acceptable protection is provided.

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.

A ladder safety device is any device, other than a cage or well, designed to eliminate or reduce the possibility of accidental falls and may incorporate such features as life belts, friction brakes, and sliding attachments.

Another feature of fixed ladders is the landing platform which provides a means of interrupting a free fall and serves as a resting place during long climbs.

When fixed 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, when cages are used, 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.

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.

The preferred pitch of fixed ladders shall be considered to come in the range of 75 degrees and 90 degrees with the horizontal. Fixed ladders shall be considered to be substandard if they are installed within the pitch range of 60 and 75 degrees with the horizontal. Substandard fixed ladders are permitted only where it is found necessary to meet conditions of installation. This substandard pitch range shall be considered as a critical range to be avoided, if possible.

Ladders having a pitch in excess of 90 degrees with the horizontal are prohibited.

As with all ladders, fixed ladders shall be maintained in a safe condition and inspected regularly.

SAFETY REQUIREMENTS FOR SCAFFOLDING

This section establishes safety requirements for the construction, operation, maintenance, and use of scaffolds used in the maintenance of buildings and structures.

There are a number of different types of scaffolds available. No attempt will be made here to deal with every unit individually.

It is important, however, to note some of the general requirements which apply to all scaffolds, namely:

- 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.
- Scaffolds and their components shall be capable of supporting at least *four times* the maximum intended load.
- Scaffolds shall be maintained in a safe condition and shall not be altered or moved horizontally while they are in use or occupied.
- Damaged or weakened scaffolds shall be immediately repaired and shall not be used until repairs have been completed.
- A safe means must be provided to gain access to the working platform level through the use of a ladder, ramp, etc.
- Overhead protection must be provided for personnel on a scaffold exposed to overhead hazards.
- Guardrails, midrails, and toeboards must be installed on all open sides and ends of platforms more than 10 feet above the ground or floor. Wire mesh must be installed between the toeboard and the guardrail along the entire opening, where persons are required to work or pass under the scaffolds.
- Employees shall not work on scaffolds during storms or high winds or when covered with ice or snow.
- As noted earlier, there are a number of scaffold types, and 1910.28 should be reviewed carefully for special requirements that apply to each type.

MANUALLY PROPELLED MOBILE LADDER STANDS AND SCAFFOLDS (TOWERS)

This section contains requirements for the design, construction, and use of mobile work platforms (including ladder stands but not including aerial ladders) and rolling (mobile) scaffolds (towers). As in the previous section, there is a wide variety of materials and design possibilities involved, and no attempt will be made to discuss detailed design criteria at this time.

General requirements include:

- All exposed surfaces of mobile ladder stands and scaffolds shall be free from sharp edges, burrs, or other safety hazards.
- The maximum work height shall not exceed four times the minimum base dimension unless outriggers, guys or braces are added to provide stability.
- This standard requires guardrails and toeboards for work levels 10 feet or more above the ground or floor.

OTHER WORKING SURFACES

An important requirement, which can prevent many serious accidents is contained in this section: portable dockboards (bridge plates) shall be secured in position, either by being anchored or equipped with devices which will prevent their slipping. Movement of the dockboard during material handling operations has resulted in forklifts overturning, or falling off the dock, often with serious injury or death to the driver and damage to equipment and material.

A major contribution to accident experience comes from material handling. Handholds shall be provided on portable dockboards to permit safe handling when the dockboard must be repositioned or relocated.



Sub Part “E”

Exit Routes, Emergency Action Plans & Fire Protection Plans

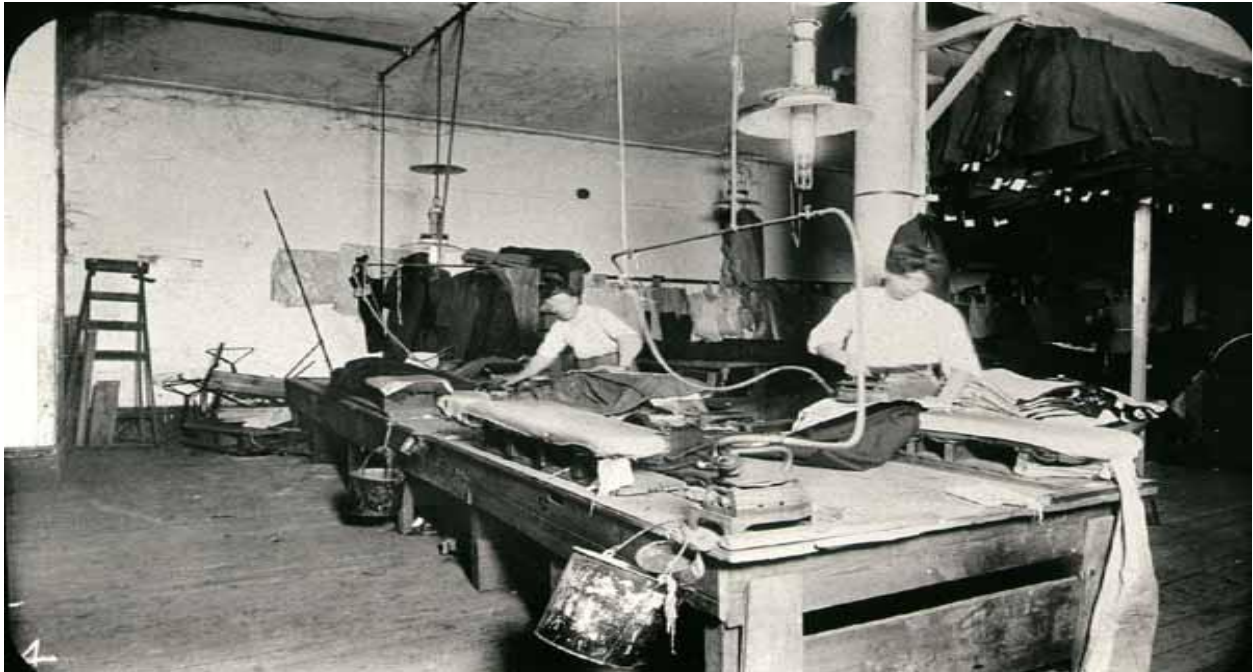
1. What is Sup Part E’s definition of an “EXIT ROUTE”? _____.
2. An “Exit Route” consists of three parts: Exit Access, the Exit and _____.
3. What are the three design and construction requirements for Exit Routes?
 - _____
 - _____
 - _____
4. How many Exit Routes must be available? _____.
5. What are the three basic requirements for “EXIT DISCHARGE”?
 - _____
 - _____
 - _____
6. When is it OK to have exit doors locked? _____.
7. It is OK to have exit routes through double doors leading to a single door for exit discharge. _____True _____False
8. Exit Routes must be at least 7 foot 6 inches high and at least 28 inches wide **“at all points”**. _____True _____False
9. It is OK to sit material in an exit route for a few minutes. _____True _____False
- 10.If the sprinkler system or alarm systems are not working, it is still acceptable to work in the facility. _____True _____False
- 11.What are the requirements for lighting and marking of exit routes.
- 12.What are the six minimum elements of an “Emergency Response Plan (ERP)”?
 - _____
 - _____
 - _____
 - _____
 - _____
 - _____
- 13.How many employees must be trained to assist in a safe and orderly evacuation?
_____.

14. When does the ERP have to be reviewed with employees?

- _____
- _____
- _____
- _____
- _____

15. What are the five basic elements of a Fire Prevention Plan (FPP)?

- _____
- _____
- _____
- _____
- _____



On Saturday, March 25, 1911, a fire broke out on the top floors of the Triangle Shirtwaist factory. Firefighters arrived at the scene, but their ladders weren't tall enough to reach the upper floors of the 10-story building. Trapped inside because the owners had locked the fire escape exit doors, workers jumped to their deaths. In a half an hour, the fire was over, and 146 of the 500 workers—mostly young women—were dead.

OSHA - Sub Part "E"

1910. 33 - Table of Contents

This section lists the sections and paragraph headings contained in §§ 1910.34 through 1910.39.

§ 1910.34 Coverage and definitions.

- (a) Every employer is covered.*
- (b) Exit routes are covered.*
- (c) Definitions.*

§ 1910.35 Compliance with NFPA 101-2000, Life Safety Code.

§ 1910.36 Design and construction requirements for exit routes.

- (a) Basic requirements.*
- (b) The number of exit routes must be adequate.*
- (c) Exit discharge.*
- (d) An exit door must be unlocked.*
- (e) A side-hinged exit door must be used.*
- (f) The capacity of an exit route must be adequate.*
- (g) An exit route must meet minimum height and width requirements.*
- (h) An outdoor exit route is permitted.*

§ 1910.37 Maintenance, safeguards, and operational features for exit routes.

- (a) The danger to employees must be minimized.*
- (b) Lighting and marking must be adequate and appropriate.*
- (c) The fire retardant properties of paints or solutions must be maintained.*
- (d) Exit routes must be maintained during construction, repairs, or alterations.*
- (e) An employee alarm system must be operable.*

§ 1910.38 Emergency action plans.

- (a) Application.*
- (b) Written and oral emergency action plans.*
- (c) Minimum elements of an emergency action plan.*
- (d) Employee alarm system.*
- (e) Training.*
- (f) Review of emergency action plan.*

§ 1910.39 Fire prevention plans.

- (a) Application.*
- (b) Written and oral fire prevention plans.*
- (c) Minimum elements of a fire prevention plan.*
- (d) Employee information.*

[67 FR 67961, Nov. 7, 2002]

Coverage and definitions. - 1910.34

1910.34(a)

Every employer is covered. Sections 1910.34 through 1910.39 apply to workplaces in general industry except mobile workplaces such as vehicles or vessels.

1910.34(b)

Exits routes are covered. The rules in §§ 1910.34 through 1910.39 cover the minimum requirements for exit routes that employers must provide in their workplace so that employees may evacuate the workplace safely during an emergency. Sections 1910.34 through 1910.39 also cover the minimum requirements for emergency action plans and fire prevention plans.

1910.34(c)***Definitions.***

Electroluminescent means a light-emitting capacitor. Alternating current excites phosphor atoms when placed between the electrically conductive surfaces to produce light. This light source is typically contained inside the device.

Exit means that portion of an exit route that is generally separated from other areas to provide a protected way of travel to the exit discharge. An example of an exit is a two-hour fire resistance-rated enclosed stairway that leads from the fifth floor of an office building to the outside of the building.

Exit access means that portion of an exit route that leads to an exit. An example of an exit access is a corridor on the fifth floor of an office building that leads to a two-hour fire resistance-rated enclosed stairway (the Exit).

Exit discharge means the part of the exit route that leads directly outside or to a street, walkway, refuge area, public way, or open space with access to the outside. An example of an exit discharge is a door at the bottom of a two-hour fire resistance-rated enclosed stairway that discharges to a place of safety outside the building.

Exit route means a continuous and unobstructed path of exit travel from any point within a workplace to a place of safety (including refuge areas). An exit route consists of three parts: The exit access; the exit; and, the exit discharge. (An exit route includes all vertical and horizontal areas along the route.)

High hazard area means an area inside a workplace in which operations include high hazard materials, processes, or contents.

Occupant load means the total number of persons that may occupy a workplace or portion of a workplace at any one time. The occupant load of a workplace is calculated by dividing the gross floor area of the workplace or portion of a workplace by the occupant load factor for that particular type of workplace occupancy.

Information regarding "Occupant load" is located in NFPA 101-2000, Life Safety Code.

Refuge area means either:

1910.34(c)(1)

A space along an exit route that is protected from the effects of fire by separation from other spaces within the building by a barrier with at least a one-hour fire resistance-rating; or

1910.34(c)(2)

A floor with at least two spaces, separated from each other by smoke-resistant partitions, in a building protected throughout by an automatic sprinkler system that complies with § 1910.159 of this part.

Self-luminous means a light source that is illuminated by a self-contained power source (e.g., tritium) and that operates independently from external power sources. Batteries are not acceptable self-contained power sources. The light source is typically contained inside the device.

[FR 67 67962, Nov. 7, 2002]

Compliance with NFPA 101-2000, Life Safety Code. -
1910.35

An employer who demonstrates compliance with the exit route provisions of NFPA 101-2000, the Life Safety Code, will be deemed to be in compliance with the corresponding requirements in §§ 1910.34, 1910.36, and 1910.37.

[39 FR 23502, June 27, 1974, as amended at 45 FR 60703, Sept. 12, 1980; 53 FR 12121, Apr. 12, 1988; 67 FR 67962, Nov. 7, 2002]

Design and construction requirements for exit routes. -
1910.36

1910.36(a)

Basic requirements. Exit routes must meet the following design and construction requirements:

1910.36(a)(1)

*An **exit route** must be permanent.* Each exit route must be a permanent part of the workplace.

1910.36(a)(2)

*An exit must be separated by **fire resistant materials**.* Construction materials used to separate an exit from other parts of the workplace must have a one-hour fire resistance-rating if the exit connects three or fewer stories and a two-hour fire resistance-rating if the exit connects four or more stories.

1910.36(a)(3)

Openings into an exit must be limited. An exit is permitted to have only those openings necessary to allow access to the exit from occupied areas of the workplace, or to the exit discharge. An opening into an exit must be protected by a self-closing fire door that remains closed or automatically closes in an emergency upon the sounding of a fire alarm or employee alarm system. Each fire door, including its frame and hardware, must be listed or approved by a nationally recognized testing laboratory. Section 1910.155(c)(3)(iv)(A) of this part defines "listed" and § 1910.7 of this part defines a "nationally recognized testing laboratory."

1910.36(b)

The number of exit routes must be adequate.

1910.36(b)(1)

Two exit routes. At least two exit routes must be available in a workplace to permit prompt evacuation of employees and other building occupants during an emergency, except as allowed in paragraph (b)(3) of this section. The exit routes must be located as far away as practical from each other so that if one exit route is blocked by fire or smoke, employees can evacuate using the second exit route.

1910.36(b)(2)

More than two exit routes. More than two exit routes must be available in a workplace if the number of employees, the size of the building, its occupancy, or the arrangement of the workplace is such that all employees would not be able to evacuate safely during an emergency.

1910.36(b)(3)

A single exit route. A single exit route is permitted where the number of employees, the size of the building, its occupancy, or the arrangement of the workplace is such that all employees would be able to evacuate safely during an emergency. Note to paragraph 1910.36(b): For assistance in determining the number of exit routes necessary for your workplace, consult NFPA 101-2000, Life Safety Code.

1910.36(c)

Exit discharge.

1910.36(c)(1)

Each exit discharge must lead directly outside or to a street, walkway, refuge area, public way, or open space with access to the outside.

1910.36(c)(2)

The street, walkway, refuge area, public way, or open space to which an exit discharge leads must be large enough to accommodate the building occupants likely to use the exit route.

1910.36(c)(3)

Exit stairs that continue beyond the level on which the exit discharge is located must be interrupted at that level by doors, partitions, or other effective means that clearly indicate the direction of travel leading to the exit discharge.

1910.36(d)

An exit door must be unlocked.

1910.36(d)(1)

Employees must be able to open an exit route door from the inside at all times without keys, tools, or special knowledge. A device such as a panic bar that locks only from the outside is permitted on exit discharge doors.

1910.36(d)(2)

Exit route doors must be free of any device or alarm that could restrict emergency use of the exit route if the device or alarm fails.

1910.36(d)(3)

An exit route door may be locked from the inside only in mental, penal, or correctional facilities and then only if supervisory personnel are continuously on duty and the employer has a plan to remove occupants from the facility during an emergency.

1910.36(e)

A side-hinged exit door must be used.

1910.36(e)(1)

A side-hinged door must be used to connect any room to an exit route.

1910.36(e)(2)

The door that connects any room to an exit route must swing out in the direction of exit travel if the room is designed to be occupied by more than 50 people or if the room is a high hazard area (*i.e.*, contains contents that are likely to burn with extreme rapidity or explode).

1910.36(f)

The capacity of an exit route must be adequate.

1910.36(f)(1)

Exit routes must support the maximum permitted occupant load for each floor served.

1910.36(f)(2)

The capacity of an exit route may not decrease in the direction of exit route travel to the exit discharge. Note to paragraph 1910.36(f): Information regarding "Occupant load" is located in NFPA 101-2000, Life Safety Code.

1910.36(g)

An exit route must meet minimum height and width requirements.

1910.36(g)(1)

The ceiling of an exit route must be at least seven feet six inches (2.3 m) high. Any projection from the ceiling must not reach a point less than six feet eight inches (2.0 m) from the floor.

1910.36(g)(2)

An exit access must be at least 28 inches (71.1 cm) wide at all points. Where there is only one exit access leading to an exit or exit discharge, the width of the exit and exit discharge must be at least equal to the width of the exit access.

1910.36(g)(3)

The width of an exit route must be sufficient to accommodate the maximum permitted occupant load of each floor served by the exit route.

1910.36(g)(4)

Objects that project into the exit route must not reduce the width of the exit route to less than the minimum width requirements for exit routes.

1910.36(h)

An outdoor exit route is permitted.

1910.36(h)(1)

The outdoor exit route must have guardrails to protect unenclosed sides if a fall hazard exists;

1910.36(h)(2)

The outdoor exit route must be covered if snow or ice is likely to accumulate along the route, unless the employer can demonstrate that any snow or ice accumulation will be removed before it presents a slipping hazard;

1910.36(h)(3)

The outdoor exit route must be reasonably straight and have smooth, solid, substantially level walkways; and

1910.36(h)(4)

The outdoor exit route must not have a dead-end that is longer than 20 feet (6.2 m).

[FR 67 67962, Nov. 7, 2002]

Maintenance, safeguards, and operational features for exit routes. - 1910.37

1910.37(a)

The danger to employees must be minimized.

1910.37(a)(1)

Exit routes must be kept free of explosive or highly flammable furnishings or other decorations.

1910.37(a)(2)

Exit routes must be arranged so that employees will not have to travel toward a high hazard area, unless the path of travel is effectively shielded from the high hazard area by suitable partitions or other physical barriers.

1910.37(a)(3)

Exit routes must be free and unobstructed. No materials or equipment may be placed, either permanently or temporarily, within the exit route. The exit access must not go through a room that can be locked, such as a bathroom, to reach an exit or exit discharge, nor may it lead into a dead-end corridor. Stairs or a ramp must be provided where the exit route is not substantially level.

1910.37(a)(4)

Safeguards designed to protect employees during an emergency (e.g., sprinkler systems, alarm systems, fire doors, exit lighting) must be in proper working order at all times.

1910.37(b)

Lighting and marking must be adequate and appropriate.

1910.37(b)(1)

Each exit route must be adequately lighted so that an employee with normal vision can see along the exit route.

1910.37(b)(2)

Each exit must be clearly visible and marked by a sign reading "Exit."

1910.37(b)(3)

Each exit route door must be free of decorations or signs that obscure the visibility of the exit route door.

1910.37(b)(4)

If the direction of travel to the exit or exit discharge is not immediately apparent, signs must be posted along the exit access indicating the direction of travel to the nearest exit and exit discharge. Additionally, the line-of-sight to an exit sign must clearly be visible at all times.

1910.37(b)(5)

Each doorway or passage along an exit access that could be mistaken for an exit must be marked "Not an Exit" or similar designation, or be identified by a sign indicating its actual use (e.g., closet).

1910.37(b)(6)

Each exit sign must be illuminated to a surface value of at least five foot-candles (54 lux) by a reliable light source and be distinctive in color. Self-luminous or electroluminescent signs that have a minimum luminance surface value of at least .06 footlamberts (0.21 cd/m²) are permitted.

1910.37(b)(7)

Each exit sign must have the word "Exit" in plainly legible letters not less than six inches (15.2 cm) high, with the principal strokes of the letters in the word "Exit" not less than three-fourths of an inch (1.9 cm) wide.

1910.37(c)

The fire retardant properties of paints or solutions must be maintained. Fire retardant paints or solutions must be renewed as often as necessary to maintain their fire retardant properties.

1910.37(d)

Exit routes must be maintained during construction, repairs, or alterations.

1910.37(d)(1)

During new construction, employees must not occupy a workplace until the exit routes required by this subpart are completed and ready for employee use for the portion of the workplace they occupy.

1910.37(d)(2)

During repairs or alterations, employees must not occupy a workplace unless the exit routes required by this subpart are available and existing fire protections are maintained, or until alternate fire protection is furnished that provides an equivalent level of safety.

1910.37(d)(3)

Employees must not be exposed to hazards of flammable or explosive substances or equipment used during construction, repairs, or alterations, that are beyond the normal permissible conditions in the workplace, or that would impede exiting the workplace.

1910.37(e)

An employee alarm system must be operable. Employers must install and maintain an operable employee alarm system that has a distinctive signal to warn employees of fire or other emergencies, unless employees can promptly see or smell a fire or other hazard in time to provide adequate warning to them. The employee alarm system must comply with § 1910.165.

[39 FR 23502, June 27, 1974, as amended at 45 FR 60703, Sept. 12, 1980; 67 FR 67963, Nov. 7, 2002]

Emergency action plans. - 1910.38

1910.38(a)

Application. An employer must have an emergency action plan whenever an OSHA standard in this part requires one. The requirements in this section apply to each such emergency action plan.

1910.38(b)

Written and oral emergency action plans. An emergency action plan must be in writing, kept in the workplace, and available to employees for review. However, an employer with 10 or fewer employees may communicate the plan orally to employees.

1910.38(c)

Minimum elements of an emergency action plan. An emergency action plan must include at a minimum:

1910.38(c)(1)

Procedures for reporting a fire or other emergency;

1910.38(c)(2)

Procedures for emergency evacuation, including type of evacuation and exit route assignments;

1910.38(c)(3)

Procedures to be followed by employees who remain to operate critical plant operations before they evacuate;

1910.38(c)(4)

Procedures to account for all employees after evacuation;

1910.38(c)(5)

Procedures to be followed by employees performing rescue or medical duties; **and**

1910.38(c)(6)

The name or job title of every employee who may be contacted by employees who need more information about the plan or an explanation of their duties under the plan.

1910.38(d)

Employee alarm system. An employer must have and maintain an employee alarm system. The employee alarm system must use a distinctive signal for each purpose and comply with the requirements in § 1910.165.

1910.38(e)

Training. An employer must designate and train employees to assist in a safe and orderly evacuation of other employees.

1910.38(f)

Review of emergency action plan. An employer must review the emergency action plan with each employee covered by the plan:

1910.38(f)(1)

When the plan is developed or the employee is assigned initially to a job;

1910.38(f)(2)

When the employee's responsibilities under the plan change; and

1910.38(f)(3)

When the plan is changed.

[45 FR 60703, Sept. 12, 1980; FR 67 67963, Nov. 7, 2002]

Fire prevention plans. - 1910.39

1910.39(a)

Application. An employer must have a fire prevention plan when an OSHA standard in this part requires one. The requirements in this section apply to each such fire prevention plan.

1910.39(b)

Written and oral fire prevention plans. A fire prevention plan must be in writing, be kept in the workplace, and be made available to employees for review. However, an employer with 10 or fewer employees may communicate the plan orally to employees.

1910.39(c)

Minimum elements of a fire prevention plan. A fire prevention plan must include:

1910.39(c)(1)

A list of all major fire hazards, proper handling and storage procedures for hazardous materials, potential ignition sources and their control, and the type of fire protection equipment necessary to control each major hazard;

1910.39(c)(2)

Procedures to control accumulations of flammable and combustible waste materials;

1910.39(c)(3)

Procedures for regular maintenance of safeguards installed on heat-producing equipment to prevent the accidental ignition of combustible materials;

1910.39(c)(4)

The name or job title of employees responsible for maintaining equipment to prevent or control sources of ignition or fires; and

1910.39(c)(5)

The name or job title of employees responsible for the control of fuel source hazards.

1910.39(d)

Employee information. An employer must inform employees upon initial assignment to a job of the fire hazards to which they are exposed. An employer must also review with each employee those parts of the fire prevention plan necessary for self-protection.

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November 15, 2007 – Pay for PPE - Final Rule

General Industry PART 1910--[AMENDED]

Sec. 1910.132 General requirements.

(h) Payment for protective equipment.

(1) Except as provided by paragraphs (h)(2) through (h)(6) of this section, the protective equipment, including personal protective equipment (PPE), used to comply with this part, shall be provided by the employer at no cost to employees.

(2) The employer is not required to pay for non-specialty safety-toe protective footwear (including steel-toe shoes or steel-toe boots) and non-specialty prescription safety eyewear, provided that the employer permits such items to be worn off the job-site.

(3) When the employer provides metatarsal guards and allows the employee, at his or her request, to use shoes or boots with built-in metatarsal protection, the employer is not required to reimburse the employee for the shoes or boots.

(4) The employer is not required to pay for:

- (i) The logging boots required by 29 CFR 1910.266(d)(1)(v);
- (ii) Everyday clothing, such as long-sleeve shirts, long pants, street shoes, and normal work boots; or
- (iii) Ordinary clothing, skin creams, or other items, used solely for protection from weather, such as winter coats, jackets, gloves, parkas, rubber boots, hats, raincoats, ordinary sunglasses, and sunscreen.

(5) The employer must pay for replacement PPE, except when the employee has lost or intentionally damaged the PPE.

(6) Where an employee provides adequate protective equipment he or she owns pursuant to paragraph (b) of this section, the employer may allow the employee to use it and is not required to reimburse the employee for that equipment. The employer shall not require an employee to provide or pay for his or her own PPE, unless the PPE is excepted by paragraphs (h)(2) through (h)(5) of this section.

(7) This paragraph (h) shall become effective on February 13, 2008.
Employers must implement the PPE payment requirements no later than May 15, 2008.

Note to Sec. 1910.132(h): When the provisions of another OSHA standard specify whether or not the employer must pay for specific equipment, the payment provisions of that standard shall prevail.

**OSHA Standards that Require PPE,
29 CFR 1910, General Industry**

1910.28.....	Safety requirements for scaffolds.
1910.66.....	Powered platforms for building maintenance.
1910.67.....	Vehicle-mounted elevating and rotating work platforms.
1910.94.....	Ventilation.
1910.95.....	Occupational noise exposure.
1910.119.....	Process safety management of highly hazardous chemicals.
1910.120.....	Hazardous waste operations and emergency response.
1910.132.....	General requirements (personal protective equipment).
1910.133.....	Eye and face protection.
1910.134.....	Respiratory protection.
1910.135.....	Occupational Head protection.
1910.136.....	Occupational foot protection.
1910.137.....	Electrical protective equipment.
1910.138.....	Hand protection.
1910.146.....	Permit-required confined spaces.
1910.156.....	Fire brigades.
1910.157.....	Portable fire extinguishers.
1910.160.....	Fixed extinguishing systems, general.
1910.183.....	Helicopters.
1910.218.....	Forging machines.
1910.242.....	Hand and portable powered tools and equipment, general.
1910.243.....	Guarding of portable power tools.
1910.252.....	General requirements (welding, cutting and brazing).
1910.261.....	Pulp, paper, and paperboard mills.
1910.262.....	Textiles.
1910.265.....	Sawmills.
1910.266.....	Logging operations.
1910.268.....	Telecommunications.
1910.269.....	Electric power generation, transmission and distribution.
1910.272.....	Grain handling facilities.
1910.333.....	Selection and use of work practices.
1910.335.....	Safeguards for personnel protection.
1910.1000.....	Air contaminants.
1910.1001.....	Asbestos.
1910.1003.....	13 carcinogens, etc.
1910.1017.....	Vinyl chloride.
1910.1018.....	Inorganic Arsenic.
1910.1025.....	Lead.
1910.1026.....	Chromium (VI).
1910.1027.....	Cadmium.
1910.1028.....	Benzene.
1910.1029.....	Coke oven emissions.
1910.1030.....	Bloodborne pathogens.
1910.1043.....	Cotton dust.
1910.1044.....	1,2-dibromo-3-chloropropane.
1910.1045.....	Acrylonitrile.
1910.1047.....	Ethylene oxide.
1910.1048.....	Formaldehyde.
1910.1050.....	Methylenedianiline.
1910.1051.....	1,3-Butadiene.
1910.1052.....	Methylene chloride.
1910.1096.....	Ionizing radiation.
1910.1450.....	Occupational exposure to chemicals in laboratories.

2008 OCCUPATIONAL FATALITIES IN UAW REPRESENTED WORKPLACES

1. **January 8, 2008 – William D. LaVanway** (died 2-4-08): **54** years old; Electrician; 14 years seniority; **Robert Bosch Corp. Chassis Systems**; St. Joseph, Michigan; **LU 383, Region 1D**. The victim was assigned to investigate a “hot spot” found by thermograph scans on a power distribution panelboard in Dept. 48. He was working on a fusible switch bucket to determine the problem in the fuse block. The victim followed established procedures placing the disconnect switch in the off position prior to opening the bucket door and tested to verify power was off to both the load side and line side of the fuse block. The fusible switch bucket is an older design which does not have visible switch blades for positive identification of their position. He was using a screw driver to demonstrate to his supervisor that the fuse clip had good compression and was not loose when an arc fault explosion occurred.
2. **February 20, 2008 – David Wentz**: **38** years old; Maintenance Mechanic; 11 years seniority; **AK Steel Coshocton Works**; Coshocton, Ohio; **LU 3462, Region 2B**. The victim was assigned to check torque on a nut in the fan assembly at the base of a bell furnace prior to the loading of coiled flat steel. The bell furnace base is located in an 11 foot deep pit. This task had become necessary before each load cycle because preventive maintenance resources have been reduced. Also, prior to the reductions two Maintenance Mechanics were assigned to perform this task. As the victim bent over tightening the bolt, an overhead trolley crane positioned and lowered a 17 ton roll of steel on to the base, crushing him. The victim was working alone at the time of the incident.
3. **March 13, 2008 – Hiram Torres**: **61** years old; Warehouse Worker; 9 years seniority; **Jose Santiago**; Catano, Puerto Rico; **LU 3401, Region 9A**. The victim was assigned as a helper to deliver food products and materials to a second floor cafeteria at a customer location. His normal job was in the warehouse and he was filling in for the regular worker that day. The driver and victim unloaded material from the delivery truck, placed it on a powered lift platform using a two-wheeled hand truck, closed the lift doors and activated the lift. Both workers walked to the second floor and opened the lift doors to unload materials. The victim stepped onto the lift platform to position himself behind the hand truck and fell through an unguarded 28” x 78” opening between the lift platform and the back wall. The second floor area has poor lighting and this was both workers first time delivering to this location.
4. **May 9, 2008 – Luis Ruiz Otero**: **37** years old; Road Worker; 4 years seniority; **Department of Transportation and Public Works (DTOP)**; Yauco, Puerto Rico; **Local 2341, Region 9A**. The victim was working on an asphalt patching crew in the left lane of eastbound PR-2 when he and another worker were struck by a car. He sustained a skull fracture at the scene and died as a result of his injuries. Highway PR-2 is a 4-lane divided highway separated by a guard rail on a narrow median. Initial investigation revealed the work zone safety plan was inadequate. The work zone was condensed, traffic control devices such as barricades and barriers were not in use and DTOP workers assigned to roadway operations received little or no training.
5. **May 22, 2008 – Abel J. Gonzales** (died 6-6-08): **55** years old; Truck Driver 300; 7 years seniority; **City of Lansing**; Lansing, MI; **Local 2256, Region 1C**. The victim was assigned to drive a tandem-axle dump truck to remove material from a ‘dig-down’ site on a public roadway. When he arrived at the site, another dump truck (single-axle) was present in the work zone. The dump trucks had to back up to the ‘dig-down’ site one at a time to be loaded. The route through the work zone to the loading location was curved and slightly up hill. The victim had difficulty maneuvering the truck backwards up the route and was unable to reach the loading location. He normally drove a smaller, single-axle, dump truck. The job site supervisor instructed the drivers to switch trucks. The drivers parked the trucks side by side near the entrance to the work zone and in position to back up to the loading site. The victim gathered personal items, exited his truck and walked around behind both trucks as they switched. As he passed behind the second truck he was switching to, witnesses observed him drop some papers which blew behind the vehicle he just left. As he went to retrieve the papers, the other truck, which had just started to back up, struck him and knocked him to the ground.
6. **July 23, 2008 – Frederick A. Todd**: **39** years old; Die Setter; 19 years seniority; **Ford Woodhaven Stamping**; Trenton, MI; **Local 387, Region 1A**. The victim and other maintenance workers were preparing four dies for placement into a transfer press. The dies are moved using transfer bolsters. The transfer bolster in use was positioned in a staging area near the press doors, and parallel to a second transfer bolster. The transfer bolsters are air driven and controlled by a two-button pendant with directional movement set by three air valves. The pendant had been set down on the bolster work platform. The victim walked on the platform path (approximately 1’ wide) between the two transfer bolsters to the air supply valve located 14-feet away. He turned the valve, located between the bolsters, to the on position. The transfer bolster he was working on unexpectedly moved toward the second, stationary bolster trapping the victim. He died of crushing injuries when he was caught between the pillars of the two transfer bolsters.



REPORTED OCCUPATIONAL FATALITIES IN UAW REPRESENTED WORKPLACES 2009

1. **May 20, 2009 – Jeff Malins: 51** years old; Toolmaker; 7 years seniority; **Detroit Diesel Corp.**; Redford, Michigan; **LU 163, Region 1A**. The victim was working inside a machine, assisting two other toolmakers un-jamming a parts feeder, when the machine cycled, striking and trapping his head. The machine was not locked out and an access gate equipped with an interlock device was open. The interlock device was bypassed with a “cheat key” (actuator). The use of “cheat keys” to bypass interlock devices was a common, well known and accepted practice in this facility.
2. **December 26, 2009 - Ron Cassidy** - Pipefitter – **Ford**; Louisville, KY; **Local 862, Region 3** Final Assembly at KTP was killed this morning when struck by an 11 foot piece of I beam. A team was in the process of removing the piece of I beam from the ceiling. Cassidy who was on the ground spotting was struck when the final cut was made and the beam slid off the lift.



REPORTED OCCUPATIONAL FATALITIES IN UAW REPRESENTED WORKPLACES 2010

1. **March 19, 2010 – Roger Brooner: 58** years old; Maintenance Mechanic; 3 years seniority (30 year diesel mechanic) ; **Spirit AeroSystems**; Tulsa, Oklahoma; **LU 952, Region 5**. The victim was working on a semi-tractor outside the maintenance shop when the vehicle went into motion striking and trapping him underneath. The vehicle was being serviced for a leak in the air system and the victim had finished replacing the “air brake DOT” fitting just prior to the fatal incident. The final step in repair is to charge the air system by starting the vehicle and letting it run for a short time; turning the truck off and listening for air leaks. It appears the truck did not start properly and the victim used a battery booster in an attempt to jump-start the engine. At some point the victim was either standing just in front of or positioned laying under the truck as it took off dragging him approximately three hundred feet. The vehicle was chocked and the victim was working alone at the time of the incident.
3. **Dec. 31, 2010 - Claude Brock Jr. of, 61**, was a millwright with 16 years of seniority at **Chrysler LLC’s Kokomo Casting; Kokomo, IN., LU 1166, Region 3**. The victim and another millwright were assigned to troubleshoot and repair an incline scrap conveyor in a die cast area. The conveyor transports scrap castings from a recovery system located in a basement area to a scrap gondola (also known as a roll-off container) on the first floor. They had just finished welding reinforcements to the side chutes on the conveyor when Brock walked around the back to look at the completed work. Brock lost his footing, fell backward toward the lubrication system and over a guardrail protecting an opening to the basement area – about 20 feet to the basement floor below.



REPORTED OCCUPATIONAL FATALITIES IN UAW REPRESENTED WORKPLACES 2011

(as of 4-1-11)

1. **January 5, 2011** (died 1-18-2011) – **Anthony Marshall: 45** years old; Machine Operator; 5 years seniority; **Allied Metals**; Troy, Michigan; **LU 155, Region 1**. The victim was operating a metal washing/sorting system. His workstation was positioned beside a belt conveyor and a shaker table and regular job tasks included reaching into the shaker table to remove non conforming metal. While performing this task the victim's clothing became entangled in the end of a belt conveyor and he was pulled head first into the equipment between the belt conveyor and a reciprocating conveyor. He was trapped for approximately 10 minutes as coworkers, police and fire rescue attempted to extract him. The victim suffered strangulation and was unconscious by the time rescue personnel extracted him from the machinery. Emergency stop pull cords on the side rails of the conveyor were disconnected at the time of the incident.
2. **March 10, 2011** (died 3-13-2011) – **Talmadge Sadler: 68** years old; Heavy Truck Driver; 45 years seniority; **Triumph Aerosystems-Vought Aircraft**; Dallas, Texas; **LU 848, Region 5**. The victim and a co-worker were preparing a modified flatbed trailer to transport an airplane wing. He was beginning to tie down a tarp on the empty flatbed trailer when he fell approximately six (6') feet to the ground, landing on his head. The victim tripped on a contoured tool, which is part of a rib structure designed to secure the wing in place. A platform used for accessing flatbed trailers was not available at the time of the incident because this trailer was parked in a different location than normal.
3. **March 23, 2011** (died 3-24-2011) – **John Bernady: 49** years old; Production worker; 3 years seniority; **Fairfield Manufacturing**; Lafayette, Ind.; **LU 2317, Region 3**. The victim was found unconscious caught in the doors of a turning machine. Apparently he suffered cardiac arrest. He was taken to the hospital where he was pronounced dead.

What Is Electricity?

Electricity is everywhere in our lives. Electricity lights up our homes, cooks our food, powers our computers, television sets, and other electronic devices. Electricity from batteries keeps our cars running and makes our flashlights shine in the dark.

But what is electricity? Where does it come from? How does it work? Before we understand all that, we need to know a little bit about atoms and their structure

All matter is made up of atoms, and atoms are made up of smaller particles. The three main particles making up an atom are the proton, the neutron and the electron.

Electrons spin around the center, or nucleus, of atoms, in the same way the moon spins around the earth. The nucleus is made up of neutrons and protons.

Electrons contain a negative charge, protons a positive charge. Neutrons are neutral -- they have neither a positive nor a negative charge.

Each atom has a specific number of electrons, protons and neutrons. But no matter how many particles an atom has, the number of electrons usually needs to be the same as the number of protons. If the numbers are the same, the atom is called balanced, and it is very stable.

So, if an atom had six protons, it should also have six electrons. The element with six protons and six electrons is called carbon. Carbon is found in abundance in the sun, stars, comets, atmospheres of most planets, and the food we eat. Coal is made of carbon; so are diamonds

Some kinds of atoms have loosely attached electrons. An atom that loses electrons has more protons than electrons and is positively charged. An atom that gains electrons has more negative particles and is negatively charge. A "charged" atom is called an "ion."

Electrons can be made to move from one atom to another. When those electrons move between the atoms, a current of electricity is created. The electrons move from one atom to another in a "flow." One electron is attached and another electron is lost.

Since all atoms want to be balanced, the atom that has been "unbalanced" will look for a free electron to fill the place of the missing one. We say that this unbalanced atom has a "positive charge" (+) because it has too many protons.

Since it got kicked off, the free electron moves around waiting for an unbalanced atom to give it a home. The free electron charge is negative, and has no proton to balance it out, so we say that it has a "negative charge" (-).

So what do positive and negative charges have to do with electricity?

The more positive atoms or negative electrons you have, the stronger the attraction for the other. Since we have both positive and negative charged groups attracted to each other, we call the total attraction "charge."

When electrons move among the atoms of matter, a current of electricity is created. This is what happens in a piece of wire. The electrons are passed from atom to atom, creating an electrical current from one end to other.

Short definition of "ELECTRICITY": is *the flow of electrons through a conductor.*

Electricity is conducted through some things better than others do. Its resistance measures how well something conducts electricity. Some things hold their electrons very tightly. Electrons do not move through them very well. These things are called insulators. Rubber, plastic, cloth, glass and dry air are good insulators and have very high resistance.

Other materials have some loosely held electrons, which move through them very easily. These are called conductors. Most metals -- like copper, aluminum or steel -- are good conductors.

Where Does the Word 'Electricity' Come From?

Electrons, electricity, electronic and other words that begin with "electr..." all originate from the Greek word "elektor," meaning "beaming sun." In Greek, "elektron" is the word for amber.

Amber is a very pretty goldish brown "stone" that sparkles orange and yellow in sunlight. Amber is actually fossilized tree sap!

Ancient Greeks discovered that amber behaved oddly - like attracting feathers - when rubbed by fur or other objects. They didn't know what it was that caused this phenomenon. But the Greeks had discovered one of the first examples of static electricity

The Latin word, **electricus**, means to "produce from amber by friction."

The English word **electricity** is from Greek and Latin words that were about amber.

From Federal Register February 14, 2007:

Department of Labor
Occupational Safety and Health Administration
29 CFR Part 1910; **Electrical Standard**; Final Rule

ACTION: Final rule.

SUMMARY:

The Occupational Safety and Health Administration (OSHA) is revising the general industry electrical installation standard found in Subpart S of 29 CFR Part 1910. The Agency has determined that electrical hazards in the workplace pose a significant risk of injury or death to employees, and that the requirements in the revised standard, which draw heavily from the 2000 edition of the National Fire Protection Association's (NFPA) Electrical Safety Requirements for Employee Workplaces (NFPA 70E), and the 2002 edition of the National Electrical Code (NEC), are reasonably necessary to provide protection from these hazards. This final rule focuses on safety in the design and installation of electric equipment in the workplace. This revision will provide the first update of the installation requirements in the general industry electrical installation standard since 1981.

DATES: This final rule becomes *effective on August 13, 2007*.

Background for Revised Standards: **Hazards Associated With Electricity**

Electricity is widely recognized as a serious workplace hazard, exposing employees to electric shock, burns, fires, and explosions. According to the Bureau of Labor Statistics, 289 employees were killed by contact with electric current in 2002. Other employees have been killed or injured in fires and explosions caused by electricity.

It is well known that the human body will conduct electricity. If direct body contact is made with an electrically energized part while a similar contact is made simultaneously with another conductive surface that is maintained at a different electrical potential, a current will flow, entering the body at one contact point, traversing the body, and then exiting at the other contact point, usually the ground. Each year many employees suffer pain, injuries, and death from such electric shocks.

Current through the body, even at levels as low as 3 milliamperes, can also cause injuries of an indirect or secondary nature in which involuntary muscular reaction from the electric shock can cause bruises, bone fractures and even death resulting from collisions or falls.

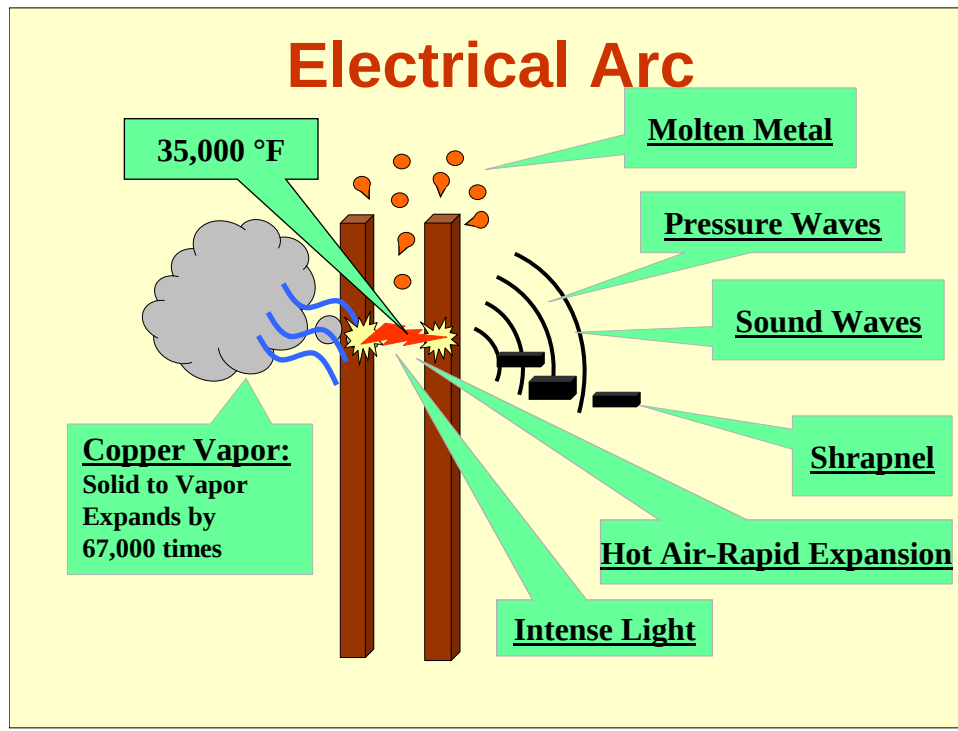
Shock

Current, Not Voltage causes Electric Shock

<u>mA</u>	<u>Affect on Person</u>
0.5 - 3	- Tingling sensations
3 - 10	- Muscle contractions and pain
→ 10 - 40	- “Let-go” threshold
30 - 75	- Respiratory paralysis
→ 100 - 200	- Ventricular fibrillation
200 - 500	- Heart clamps tight
1500 +	- Tissue and Organs start to burn

Burns suffered in electrical accidents can be very serious. These burns may be of **three basic types: electrical burns, arc burns, and thermal contact burns**. **Electrical burns** are the result of the electric current flowing in the tissues, and may be either skin deep or may affect deeper layers (such as muscles and bones) or both. Tissue damage is caused by the heat generated from the current flow; if the energy delivered by the electric shock is high, the body cannot dissipate the heat, and the tissue is burned. Typically, such electrical burns are slow to heal. **Arc burns** are the result of high temperatures produced by electric arcs or by explosions close to the body. Finally, **thermal contact burns** are those normally experienced from the skin contacting hot surfaces of overheated electric conductors, conduits, or other energized equipment. In some circumstances, all three types of burns may be produced simultaneously.

If the current involved is great enough, electric arcs can start a fire. Fires can also be created by overheating equipment or by conductors carrying too much current. Extremely high-energy arcs can damage equipment, causing fragmented metal to fly in all directions. In atmospheres that contain explosive gases or vapors or combustible dusts, even low-energy arcs can cause violent explosions.



Nature of Electrical Accidents

Electrical accidents, when initially studied, often appear to be caused by circumstances that are varied and peculiar to the particular incidents involved. However, further consideration usually reveals the underlying cause to be a combination of three possible factors: work involving unsafe equipment and installations; workplaces made unsafe by the environment; and unsafe work performance. The first two factors are sometimes considered together and simply referred to as unsafe conditions. Thus, electrical accidents can be generally considered as being caused by unsafe conditions, unsafe work performance or, in what is usually the case, combinations of the two. It should also be noted that inadequate maintenance can cause equipment or installations that were originally considered safe to deteriorate, resulting in an unsafe condition.

Some unsafe electric equipment and installations can be identified, for example, by the presence of faulty insulation, improper grounding, loose connections, defective parts, ground faults in equipment, unguarded live parts, and underrated equipment. The environment can also be a contributory factor to electrical accidents in a number of ways. Environments containing flammable vapors, liquids, or gases; areas containing corrosive atmospheres; and wet and damp locations are some unsafe environments affecting electrical safety. Finally, unsafe acts include the failure to deenergize electric equipment when it is being repaired or inspected or the use of tools or equipment too close to energized parts.

As stated earlier, electricity has long been recognized as a serious workplace hazard exposing employees to dangers such as electric shock, electrocution, fires, and explosions. The 100-year-long history of the National Electrical Code, originally formulated and periodically updated by industry consensus, attests to this fact. The

NEC has represented the continuing efforts of experts in electrical safety to address these hazards and provide standards for limiting exposure in all electrical installations, including workplaces. OSHA has determined that electrical hazards in the workplace pose a significant risk of injury or death to employees and that this final rule, which draws heavily on the experience of the NEC, will substantially reduce this risk.

While the number of deaths and injuries associated with electrical hazards has declined, contact with electric current still poses a significant risk to employees in the workplace, as evidenced by the numbers of deaths and serious injuries still occurring due to contact with electric current. This final rule will help further reduce the number of deaths and injuries associated with electrical hazards by providing additional requirements for installation safety and by recognizing alternative means of compliance.

On February 16, 1972, OSHA incorporated the 1971 edition of the National Fire Protection Association's (NFPA) National Electrical Code (NEC), NFPA 70-1971, by reference as its electrical standard for general industry. The Agency followed the procedures outlined in Section 6(a) of the Occupational Safety and Health Act of 1970, which directed the Secretary to adopt existing national consensus standards as OSHA standards within 2 years of the effective date of the OSH Act. In incorporating the 1971 NEC by reference, OSHA made the entire 1971 NEC applicable to all covered electrical installations made after March 15, 1972. For covered installations made before that date, OSHA listed about 16 provisions from the 1971 NEC that applied. No other provisions of the 1971 NEC applied to these older installations. Thus, older installations were "grandfathered" so that they did not need to meet most of the requirements in the consensus standard.

On January 16, 1981, OSHA revised its electrical installation standard for general industry. This revision replaced the incorporation by reference of the 1971 NEC with relevant requirements from Part I of the 1979 edition of NFPA 70E. The revision simplified and clarified the electrical standard and updated its provisions to match the 1978 NEC (the latest edition available at the time). The standard was written to reduce the need for frequent revision and to avoid technological obsolescence. These goals were achieved--NFPA 70E had only minor changes over its initial 15 years of existence. The first substantial changes were introduced in the 1995 edition of NFPA 70E.

The 2000 edition of NFPA 70E contains a number of significant revisions, including a new, alternative method for classifying and installing equipment in Class I hazardous locations. NFPA has recommended that OSHA revise its general industry electrical standards to reflect the latest edition of NFPA 70E, arguing that such a revision would provide a needed update to the OSHA standards and would better protect employees. This final rule responds to NFPA's recommendations with regard to installation safety. It also reflects the Agency's commitment to update its electrical standards, keep them consistent with NFPA standards, and ensure that they appropriately protect employees. The Agency intends to extend this commitment by using NFPA 70E as a basis for future revisions to its electrical safety-related work practice requirements and new requirements for electrical maintenance and special equipment.

Final Sec. 1910.304(b)(3)(ii) contains requirements for providing ground-fault circuit interrupter protection for temporary wiring installations that are used during maintenance, remodeling, or repair of buildings, structures, or equipment or during similar activities

Branch Circuits--Ground-Fault Circuit-Interrupters for Employees

Each year many employees suffer electric shocks while using portable electric tools and equipment. The nature of the injuries ranges from minor burns to electrocution. Electric shocks produced by alternating currents (ac) at power line frequency passing through the body of an average adult from hand to foot for 1 second can cause various effects, starting from a condition of being barely perceptible at 1 milliamperes to loss of voluntary muscular control for currents

from 9 to 25 milliamperes. The passage of still higher currents, from 75 milliamperes to 4 amperes, can produce ventricular fibrillation of the heart; and, finally, immediate cardiac arrest at over 4 amperes. These injuries occur when employees contact electrically energized parts. Typically, the frame of a tool becomes accidentally energized because of an electrical fault (known as a ground fault) that provides a conductive path to the tool casing. For instance, with a grounded electric supply system, when the employee contacts the tool casing, the fault current takes a path through the employee to an electrically grounded object. The amount of current that flows through an employee depends, primarily, upon the resistance of the fault path within the tool, the resistance of the path through the employee's body, and the resistance of the paths, both line side and ground side, from the employee back to the electric power supply. Moisture in the atmosphere can contribute to the electrical fault by enhancing both the conductive path within the tool and the external ground path back to the electric power supply. Dry skin can have a resistance range of anywhere from about 500 to 500,000 ohms and wet skin can have a resistance range of about 200 to 20,000, depending on several factors, such as the physical characteristics and mass of the employee. More current will flow if the employee is perspiring or becomes wet because of environmental conditions. If the current is high enough, the employee will suffer a ground-fault electrocution.

One method of protection against injuries from electric shock is the ground-fault circuit-interrupter (GFCI). This device continually monitors the current flow to and from electric equipment. If the current going out to the protected equipment differs by approximately 0.005 amperes (5-milliamperes) from the current returning, then the GFCI will deenergize the equipment within as little as 25 milliseconds, quickly enough to prevent electrocution.

GFCI requirements. Paragraph (b)(3) of final Sec. 1910.304 sets new requirements for ground-fault circuit-interrupter protection of receptacles and cord connectors used in general industry. Paragraph (b)(3)(i) requires ground-fault circuit protection for all 125-volt, single-phase, 15- and 20-ampere receptacles installed in bathrooms and on rooftops. This provision only **applies to installations made after the effective date of the final rule**. Cord sets and cord- and plug-connected equipment in these locations can get wet and expose employees to severe ground-fault hazards. The NFPA 70E Technical Committee believes, and OSHA agrees, that using 125-volt, 15- and 20-ampere cord- and plug-connected equipment in these locations exposes employees to great enough risk of ground-fault electrocution to warrant the protection afforded by GFCIs.

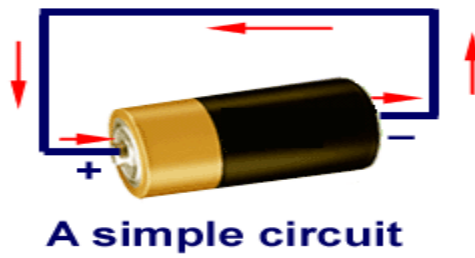
For more than 30 years, electrical hazards have been a target of OSHA rules. This rule will help to further reduce the number of deaths and injuries associated with electrical accidents, and ensure that a downward trend in these incidents is sustained.

To determine the extent to which the standard may reduce the number of deaths attributable to electrical accidents, OSHA examined its accident investigation reports for the States without any statewide electrical code. The most recent and complete reports cover 1990-1996, and provide detailed information on the cause of fatal electrical accidents. The accident cause can be used to ascertain whether the death would have been prevented by compliance with the final rule. As an initial screen, OSHA reviewed the reports for accidents that could have been prevented through the use of a GFCI. While OSHA expects that other provisions of the revised standard potentially will reduce deaths due to electrical accidents, this initial screen focused on GFCI-related accidents since they are relatively easy to isolate using a key word search through all reports. Thus, the accident report analysis is conservative in the sense that it likely understates the number of deaths preventable under the revision to Subpart S.

**Fatal and Nonfatal Occupational Injuries Attributable To Contact With Electric Current
(Private Industry)**

<u>Year</u>	<u>L.Time</u>	<u>% Total Injuries</u>	<u>Deaths</u>	<u>% Total Deaths</u>
1992.....	4,806	0.2	317	5.8
1993.....	4,995	0.2	303	5.4
1994.....	6,018	0.3	332	5.6
1995.....	4,744	0.2	327	6.0
1996.....	4,126	0.2	268	4.8
1997.....	3,170	0.2	282	5.0
1998.....	3,910	0.2	324	5.9
1999.....	4,224	0.2	259	4.7
2000.....	3,704	0.2	256	4.8
2001.....	3,394	0.2	285	4.8
2002.....	2,967	0.2	289	5.2
2003.....	2,390	0.2	246	4.4
2004.....	2,650	0.2	254	4.4

Source: U.S. Bureau of Labor Statistics, Survey of Occupational Injuries and Illnesses and the Census of Fatal



Circuits:

A simple circuit

Electrons with a negative charge, can't "jump" through the air to a positively charged atom. They have to wait until there is a link or bridge between the negative area and the positive area. We usually call this bridge a "circuit."

When a bridge is created, the electrons begin moving quickly. Depending on the resistance of the material making up the bridge, they try to get across as fast as they can. If you're not careful, too many electrons can go across at one time and destroy the "bridge" or the circuit, in the process.

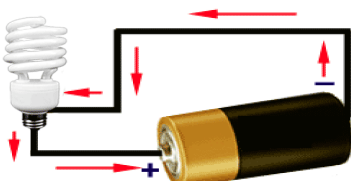
We can limit the number of electrons crossing over the "circuit," by letting only a certain number through at a time. And we can make electricity do something for us while they are on their way. For example, we can "make" the electrons "heat" a filament in a bulb, causing it to glow and give off light.

When we limit the number of electrons that can cross over our circuit, we say we are giving it "resistance.". We "resist" letting all the electrons through. This works something like a tollbooth on a freeway bridge. Copper wire is just one type of bridge we use in circuits.

Before electrons can move far, however, they can collide with one of the atoms along the way. This slows them down or even reverses their direction. As a result, they lose energy to the atoms. This energy appears as heat, and the scattering is a resistance to the current.

Think of the bridge as a garden hose. The current of electricity is the water flowing in the hose and the water pressure is the voltage of a circuit. The diameter of the hose is the determining factor for the resistance.

Current refers to the movement of charges. In an electrical circuit - electrons move from the negative pole to the positive. If you connected the positive pole of an electrical source to the negative pole, you create a circuit. This charge changes into electrical energy when the poles are connected in a circuit -- similar to connecting the two poles on opposite ends of a battery.



Along the circuit you can have a light bulb and an on-off switch. The light bulb changes the electrical energy into light and heat energy.

Simple circuit with light

The number of electrons we are willing to let across the circuit at one time is called "current". We measure current using amperes, or "Amps".

One AMP is defined as 625,000,000,000,000,000,000 (6.25 x 10¹⁸) electrons moving across your circuit every second!

Since no one wants to remember such a big number, that big number is called a "coulomb," after the scientist Charles A Coulomb who helped discover what a current of electricity is.

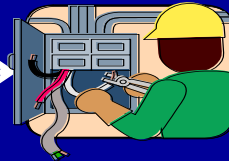
The amount of charge between the sides of the circuit is called "voltage." We measure Voltage in Volts. The word **volt** is named after another scientist, Alexander Volta, who built the world's first battery.

Well, one volt is defined as the amount of electrical charge needed to make one Coulomb (625,000,000,000,000,000,000 electrons) do one a specific amount of work -- which is labeled one joule.

Voltage, Current and Resistance are very important to circuits. If either voltage or current is too big you could break the circuit. But if either is too small, the circuit will not be able to work enough to be useful to us. In the same way, if the resistance is too big none of the electrons would be able to get through at all, but if it were too small, they would rush through all at once breaking the circuit on their way.

Electrical (S)

- **Properties of electricity:**
- **Must complete a circuit** →
- **Seeks easiest and "all" paths to ground**





UAW - Electrical Fatalities 1973-2008

1. **April 7, 1973 – Ralph Redmond; Chrysler – Hamtramck Assembly Plant, 1 year seniority; Electrician (Apprentice)** Electrical explosion and fire in electrical tunnel.
2. **October 1, 1975 – Larry Fights; GE Springdale Aircraft Engine Plant;** electrocuted
3. **July 1, 1976 – Philip Ziglar; Chrysler New Castle Machining; Pipe Fitter;** Electrocuted by energized Ignition tube.
4. **July 27, 1977 – Steve Repasy; GM-Danville Foundry; Pattern Maker 31 years seniority;** Electrocuted by energized 440-volt damaged power supply cable.
5. **August 9, 1977 – Dale Myers; Lindell Drop Forge; Electrician;** Electrocuted when he completed live path to ground.
6. **April 5, 1978 – Paul Caraway; 1 year seniority; GMAD Leeds; Electrician;** Electrocuted when cutting through a live cable.
7. **April 9, 1978 – Albert Kish; Ford-Woodhaven Stamping; Electrician;** Electrocuted when working on energized equipment.
8. **July 18, 1979 – E. Marcon; GM-Windsor Trim Paint; Machine Repair; 14 years seniority;** Electrocuted when he completed the circuit between two electrical connections.
9. **July 27, 1979 – Charles Walters; Fiat Allis-Springfield Plant; Scrap Operator;** Electrocuted when he touched an ungrounded portable electric welder.
10. **May 9, 1980 – Victor Ellul; GM-Fisher Body Fleetwood; Bricklayer; 27 years seniority;** Electrocuted when he provided electrical path between energized fence and building column.
11. **June 20, 1980 – Donald Williams; Chrysler-Warren Stamping; 12 years seniority; Electrician;** Electrocuted when working inside live control panel – Not locked out.
12. **July 11, 1980 – Howard Londberg; GM-Spring and Bumper; 18 years seniority; Electrician;** Electrocuted when working on live equipment – Not locked out.

13. **January 14, 1981 – Morton Petri, GM-Detroit Diesel Allison; 3 years seniority; Machine Operator;** Electrocuted when contacting live power rail and completing circuit.
14. **August 7, 1981 – Ernest Williams; Dongan Electric Manufacturing; 1 year seniority; Heavy Duty Builder;** Electrocuted testing 45 KVA Transformer.
15. **August 24, 1981 – David Johnson; Chrysler Machining; 12 years seniority; Electrician;** Electrocuted when contacting the circuits inside a panel – Not locked out.
16. **September 22, 1981 – Steve Scherk; GE-Evendale; Lab Technician;** Electrocuted by exposed live electrical parts of forming press.
17. **September 11, 1982 – James Campoli; GM-Detroit Diesel Allison; 16 years seniority; Electrician;** Electrocuted by high voltage source in laser cabinet.
18. **December 1, 1982 – Erbin Lipp; Sunstrand Aviation; Electrician;** Electrocuted by energized electrical circuits.
19. **September 7, 1983 – Mark Michalowski; GM Detroit Fleetwood; 7 years seniority; Electrician;** Electrocuted when working on live circuit – Not locked out.
20. **December 8, 1983 – James Campbell; Ford Atlanta Assembly; 15 years seniority; Electrician;** Electrocuted by stored energy in ignition tube.
21. **July 26, 1984 - Dimosthenis Kofsandis; 43 years old; Maintenance worker; seniority 0; U.S. Auto Radiator Corporation, Detroit, Michigan; LU. 351; Region 1;** Electrocuted when hanging energized light fixture - not locked out.
22. **April 16, 1993; Harry Prater; 56 years old; Seniority May 13, 1968; Electrician; Ford Motor Company, Saline, Michigan; Region 1A, LU.892;** Electrocuted while troubleshooting overhead crane trolley controls with power on.
23. **April 20, 1996 - Eddie McCorkle; 37 years old; Electrician (S/T); 3 years seniority; National Castings Company; Melrose Park, Illinois; LU.477 (Unit 81); Region 4;** Electrocuted while tightening connections on an energized 13,500 volts transformer.
24. **August 27, 1996- Michael J. Perry; 46 years old; Electrician; 7 years seniority; Harvard Industries; Tiffin, OH; LU 1644, Region 2-B;** Electrocuted while working on an electrical sub-station located outside of the plant.
25. **November 1, 1997 – Paul Robel; 49 years old; Electrician (S/T); 1 year seniority; General Motors Corporation, SPO Lansing; Lansing, Mi.; LU 1753, Region 1C;** The victim was in a lift a loft 15 feet above the floor preparing to install a buss plug. After removing an access cover an electrical explosion occurred severely burning the victim. He died 16 days later.

26. **November 7, 2003 – Concepcion Rodriguez; 55** years old: Arc Wash Welder; 16 years seniority; **Chicago Castings**; Cicero, Illinois; **Local 477, Region 4**. The victim was electrocuted while attempting to turn on a welding machine with the breaker switch mounted on the side of the equipment. Operators had experienced shocks from the equipment previously and maintenance had performed work on the equipment the previous day.

27. **January 8, 2008 – William D. LaVanway** (died 2-4-08): **54** years old; Electrician; 14 years seniority; **Robert Bosch Corp. Chassis Systems**; St. Joseph, Michigan; **LU 383, Region 1D**. The victim was assigned to investigate a “hot spot” found by thermograph scans on a power distribution panelboard in Dept. 48. He was working on a fusible switch bucket to determine the problem in the fuse block. The victim followed established procedures placing the disconnect switch in the off position prior to opening the bucket door and tested to verify power was off to both the load side and line side of the fuse block. The fusible switch bucket is an older design which does not have visible switch blades for positive identification of their position. He was using a screw driver to demonstrate to his supervisor that the fuse clip had good compression and was not loose when an arc fault explosion occurred.

Job Classifications of UAW “Electrical Fatalities”:

- 16 were Electricians
- 5 were Operators
- 6 were other maintenance

Summary of events causing fatalities:

- 5 objects/equipment “not grounded”
- 1 Stored electrical energy
- 3 Arc Flash
- 18 during service/maintenance – “Energy **not** disconnected, **locked out** and verified”



OSHA Requirements

OSHA requires employers to ensure the safety of all employees in the work environment. Eye and face protection must be provided whenever necessary to protect against chemical, environmental, and radiological hazards or mechanical irritants.

Ensuring worker safety includes conducting a workplace hazard assessment and providing adequate training for all workers who require eye and face protection. When employees are trained to work safely, through the following requirements, they should be able to anticipate and avoid injury from job related hazards.

- [OSHA Standards](#)
- [Training and Qualification of Employees](#)
- [Criteria for PPE](#)
- [Fitting of PPE](#)
- [Maintenance and Care of PPE](#)
- [Contacts and Prescription \(Rx\) Lenses](#)



OSHA Standards

The following OSHA standards provide mandatory requirements and compliance assistance for employers when selecting proper eye and face protection:

- [1910.132](#) -General requirements
- [1910.133](#) -General Industry
- [1915.153](#) -Maritime
- [1926.102](#) -Construction

The employer shall ensure that each affected employee uses 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. To select PPE for the workplace, see the [Hazard Assessment](#) module.

Training and Qualification of Employees

Employers must provide training for each employee who is required to use PPE in the workplace. [[1910.132\(f\)](#)]

- Each employee shall be trained to know at least the following:
 - When PPE is necessary
 - What PPE is necessary
 - How to properly don, doff, adjust, and wear PPE
 - Limitations of the PPE
 - Proper care, maintenance, useful life, and disposal of the PPE
- All training should be conducted by a knowledgeable designated person.
- All required training should be presented in a manner that the employee can understand.
- Each affected employee shall demonstrate an understanding of the training specified and the ability to use PPE properly, before being allowed to perform work requiring the use of PPE.
- Employers who allow their employees to wear eye and face protection on a voluntary basis when not required by OSHA or the employer must implement limited provisions of a PPE program. For all other voluntary users, an additional written eye and face protection program that covers proper maintenance procedures must be implemented.

Retraining

- When the employer has reason to believe that any affected employee who has already been trained does not have the understanding and skill required, the employer shall retrain that employee. Circumstances where retraining is required include, but are not limited to, situations where:
 - Changes in the workplace render previous training obsolete
 - Changes in the types of PPE to be used render previous training obsolete
 - Inadequacies in an affected employee's knowledge or use of assigned PPE indicate that the employee has not retained the requisite understanding or skill

Written Certification

- 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 the subject of the certification.

Handling Emergencies

- If an eye injury occurs, quick action can prevent a permanent disability. For this reason:
 - Emergency eyewashes should be placed in all hazardous areas
 - First-aid instructions should be posted close to potential danger spots
 - Employees must know where the closest eyewash station is and how to get there with restricted vision

Criteria for PPE

Eye and face protection must comply with the American National Standards Institute, ANSI Z87.1-1989 standard if purchased after July 5, 1994 or ANSI Z87.1-1968 if purchased before July 5, 1994. [[1910.133\(b\)\(1\)](#), [1915.153\(b\)](#), [1926.102\(a\)\(2\)](#)]

- Eye and face PPE shall be distinctly marked to facilitate identification of the manufacturer. [[1910.133\(a\)\(4\)](#)]
- The following minimum requirements must be met by all protective devices. Protectors shall:
 - Provide adequate protection against the particular hazards for which they are designed
 - Be of safe design and construction for the work to be performed
 - Be reasonably comfortable when worn under the designated conditions
 - Fit snugly and not unduly interfere with the movements of the wearer
 - Be durable
 - Be capable of being disinfected
 - Be easily cleanable
 - Be distinctly marked to facilitate identification only of the manufacturer

Fitting of PPE

Consideration should be given to comfort and fit. Poorly fitting eye and face protection will not offer the necessary protection. [[1926.102\(a\)\(6\)\(iii\)](#)]

- Fitting of goggles and safety spectacles should be done by someone skilled in the procedure.
 - Prescription safety spectacles should be fitted only by qualified optical personnel.
- Devices with adjustable features should be fitted on an individual basis to provide a comfortable fit that maintains the device in the proper position.
- Eye protection from dust and chemical splash should form a protective seal when fitted properly.
- Welding helmets and face shields must be properly fitted to ensure that they will not fall off during work operations.



Maintenance and Care of PPE

Employees must be trained in the proper care, maintenance, useful life, and disposal of PPE. [[1910.132\(f\)\(1\)\(v\)](#)]

Maintenance:

- PPE must be used and maintained in a sanitary and reliable condition.
- The use of equipment with structural or optical defects is prohibited. [[1926.102\(a\)\(4\)](#)]
- Pitted lenses, like dirty lenses, can be a source of reduced vision. They should be replaced. Deeply scratched or excessively pitted lenses are apt to break.
- Slack, worn-out, sweat-soaked, or twisted headbands do not hold the eye protector in proper position. Visual inspection can determine when the headband elasticity is reduced to a point below proper function.



Cleaning:

- Atmospheric conditions and the restricted ventilation of the protector can cause lenses to fog. Frequent cleansing may be necessary.
- Eye and face protection equipment that has been previously used should be disinfected before being issued to another employee.
- When employees are assigned protective equipment for extended periods, the equipment should be cleaned and disinfected regularly.
- Several methods for disinfecting eye-protective equipment are acceptable. The most effective method is to disassemble the goggles or spectacles and thoroughly clean all parts with soap and warm water.
 - Carefully rinse all traces of soap and replace defective parts with new ones.
 - Swab thoroughly or completely and immerse all parts for 10 minutes in a solution of germicidal deodorant fungicide.
 - Remove parts from solution and suspend in a clean place for air drying at room temperature or with heated air.
 - Do not rinse after removing parts from the solution because this will remove the germicidal residue that retains its effectiveness after drying.

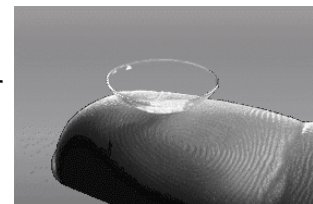
Storage:

- Goggles should be kept in a case when not in use. Spectacles, in particular, should be given the same care as one's own glasses, since the frame, nose pads, and temples can be damaged by rough usage.
- Items should be placed in a clean, dust-proof container, such as a box, bag, or plastic envelope, to protect them until reissue.

Contacts and Prescription (RX) Lenses

Employers must ensure that employees who wear prescription (Rx) lenses or contacts use PPE that incorporates the prescription or use eye protection that can be worn over prescription lenses. [[1910.133\(a\)\(3\)](#), [1915.153\(a\)\(3\)](#), [1926.102\(a\)\(3\)](#)]

- Workers who wear prescription glasses must also wear required eye protection.
 - Eye and face protection that fits comfortably over glasses is available.
 - Safety goggles and spectacles may incorporate prescription lenses.
- Dust and chemicals present additional hazards to contacts wearers. OSHA recommends that workers have an extra pair of contacts or eyeglasses in case of contact failure or loss.

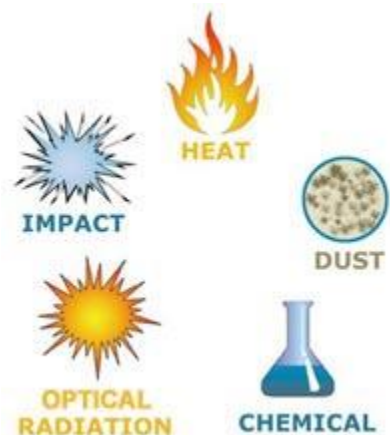


The employer shall ensure that each affected employee uses appropriate eye or face protection when exposed to eye or face hazards from flying particles, molten metal, liquid chemicals, acids or caustic liquids, chemical gases or vapors, or potentially injurious light radiation. To select PPE for the workplace, see the [Hazard Assessment](#) module.

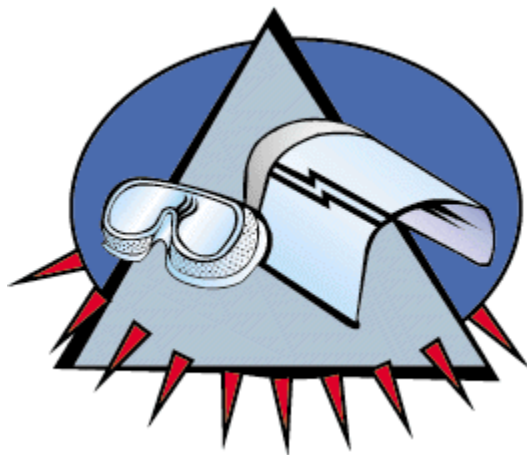
Selecting PPE for the Workplace

Personal protective equipment (PPE) for the eyes and face is designed to prevent or lessen the severity of injuries to workers. The employer must assess the workplace and determine if hazards that necessitate the use of eye and face protection are present or are likely to be present before assigning PPE to workers. [[1910.132\(d\)](#)]

A hazard assessment should determine the risk of exposure to eye and face hazards, including those which may be encountered in an emergency. Employers should be aware of the possibility of multiple and simultaneous hazard exposures and be prepared to protect against the highest level of each hazard. [[1910 Subpart I App B](#)]



Hazard Assessment		
Hazard type	Examples of Hazard	Common Related Tasks
<u>Impact</u>	Flying objects such as large chips, fragments, particles, sand, and dirt.	Chipping, grinding, machining, masonry work, wood working, sawing, drilling, chiseling, powered fastening, riveting, and sanding.
<u>Heat</u>	Anything emitting extreme heat.	Furnace operations, pouring, casting, hot dipping, and welding.
<u>Chemicals</u>	Splash, fumes, vapors, and irritating mists.	Acid and chemical handling, degreasing, plating, and working with blood.
<u>Dust</u>	Harmful Dust.	Woodworking, buffing, and general dusty conditions.
<u>Optical Radiation</u>	Radiant energy, glare, and intense light	Welding, torch-cutting, brazing, soldering, and laser work.



PPE Selection: Impact Hazards

The majority of impact injuries result from flying or falling objects, or sparks striking the eye. Most of these objects are smaller than a pin head and can cause serious injury such as punctures, abrasions, and contusions.

While working in a hazardous area where the worker is exposed to flying objects, fragments, and particles, primary protective devices such as safety spectacles with side shields or goggles must be worn. Secondary protective devices such as face shields are required in conjunction with primary protective devices during severe exposure to impact hazards.

PPE Devices for Impact Hazards	
<u>Spectacles</u>	Primary protectors intended to shield the eyes from a variety of impact hazards.
<u>Goggles</u>	Primary protectors intended to shield the eyes against flying fragments, objects, large chips, and particles.
<u>Face Shields</u>	Secondary protectors intended to protect the entire face against exposure to impact hazards.

PPE Selection: Heat

Heat injuries may occur to the eye and face when workers are exposed to high temperatures, splashes of molten metal, or hot sparks. Protect your eyes from heat when workplace operations involve pouring, casting, hot dipping, furnace operations, and other similar activities. Burns to eye and face tissue are the main concern when working with heat hazards.

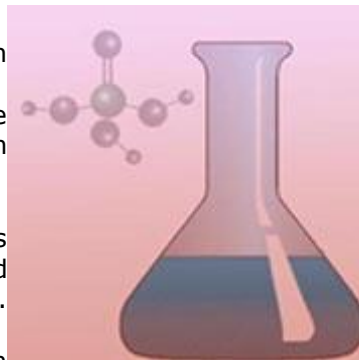
Working with heat hazards requires eye protection such as goggles or safety spectacles with special-purpose lenses and side shields. However, many heat hazard exposures require the use of a face shield *in addition* to safety spectacles or goggles. When selecting PPE, consider the source and intensity of the heat and the type of splashes that may occur in the workplace.



PPE Devices for Heat Hazards	
<u>Spectacles</u>	Primary protectors intended to shield the eyes from a variety of heat hazards.
<u>Goggles</u>	Primary protectors intended to shield the eyes against a variety of heat hazards.
<u>Face Shields</u>	Secondary protectors intended to shield the entire face against exposure to high temperatures, splash from molten metal, and hot sparks.

PPE Selection: Chemicals

A large percentage of eye injuries are caused by direct contact with chemicals. These injuries often result from an inappropriate choice of PPE, that allows a chemical substance to enter from around or under protective eye equipment. Serious and irreversible damage can occur when chemical substances contact the eyes in the form of splash, mists, vapors, or fumes. When working with or around chemicals, it is important to know the location of [emergency eyewash stations](#) and how to access them with restricted vision.



When fitted and worn correctly, goggles protect your eyes from hazardous substances. A face shield may be required in areas where workers are exposed to severe chemical hazards.

PPE Devices for Chemical Hazards	
Goggles	Primary protectors intended to shield the eyes against liquid or chemical splash, irritating mists, vapors, and fumes.
Face Shields	Secondary protectors intended to protect the entire face against exposure to chemical hazards.

PPE Selection: Dust

Dust is present in the workplace during operations such as woodworking and buffing. Working in a dusty environment can cause eye injuries and presents additional hazards to contact lens wearers.

Either eyecup or cover-type safety goggles should be worn when dust is present. Safety goggles are the only effective type of eye protection from nuisance dust because they create a protective seal around the eyes.



PPE Devices for Dust Hazards

Goggles

Primary protectors intended to protect the eyes against a variety of airborne particles and harmful dust.

PPE Selection: Optical Radiation

Laser work and similar operations create intense concentrations of heat, ultraviolet, infrared, and reflected light radiation. A laser beam, of sufficient power, can produce intensities greater than those experienced when looking directly at the sun. Unprotected laser exposure may result in eye injuries including retinal burns, cataracts, and permanent blindness. When lasers produce invisible ultraviolet, or other radiation, both employees and visitors should use appropriate eye protection at all times.

Determine the maximum power density, or intensity, lasers produce when workers are exposed to laser beams. Based on this knowledge, select lenses that protect against the maximum intensity. The selection of laser protection should depend upon the lasers in use and the operating conditions. Workers with exposure to laser beams must be furnished suitable laser protection.



Lens Requirements

When selecting filter lenses, begin with a shade too dark to see the welding zone. Then try lighter shades until one allows a sufficient view of the welding zone without going below the minimum protective shade.

- [1910.133\(a\)\(5\)](#) -General Industry
- [1915.153 \(a\)\(4\)](#) -Maritime
- [1926.102\(b\)\(1\)](#) -Construction

Glare Protection

Control Glare with:

- [Special-Purpose Spectacles](#) that include [filter](#) or special-purpose lenses to provide protection against eye strain
- Changes in your work area or lighting
- Tinted eyeglass lenses or visor-type shade

Hazard Communication - Activity # 1

Using your knowledge and your groups knowledge answer the following questions about the 1910.1200, HazCom Standard, in your group. Place an "X" in your groups' response(s). Remember that some states have added requirements to OSHA's—don't worry about those o this exercise. Note: In multiple choice questions, any number of answers might be correct. Pick a different recorder and reporter. Be prepared to defend your answers.

1. The OSHA HazCom Standard 1910.1200 (Right to Know) requires which groups to disclose information about hazardous chemicals?

- ☐ _____chemical manufacturers
- ☐ _____chemical distributors
- ☐ _____employers
- ☐ _____employees

2. Employers must have a written program on the HCS which is accessible to workers and the union. Which items have to be included in the program?

- ☐ _____a list of all hazardous chemicals at the worksite
- ☐ _____instructions on the hazards of non-routine tasks
- ☐ _____a list of all non-hazardous materials
- ☐ _____methods to inform the workers about the contents of piping

3. Which of these *containers* have to be labeled?

- ☐ _____pipes
- ☐ _____portable containers
- ☐ _____drums
- ☐ _____storage tanks
- ☐ _____boxes and bags

4. The HazCom standard requires what information to be on a “label”?

- ☐ _____manufacturer (name and address)
- ☐ _____product (chemical or trade name)
- ☐ _____hazards (all health and safety warnings)
- ☐ _____DOT and NFPA information

5. MSDS's are generally complete and accurate because they are approved by OSHA.

- ☐ True ☐ False

6. Which of the following items are MSDS's required to include?

- ☐ _____date MSDS was written
- ☐ _____all known health and safety hazards of ingredients
- ☐ _____name, address and phone number of responsible party
- ☐ _____identity of “hazardous ingredients”
- ☐ _____short and long term health effects

7. “Hazardous chemicals” might refer to which of the following under the HCS?

- ☐ _____coolants and cutting oils
- ☐ _____pesticides
- ☐ _____gasoline
- ☐ _____welding smoke
- ☐ _____water-based cleaning agents
- ☐ _____contact cement
- ☐ _____steel, aluminum, wood or other solid material

8. Under OSHA, which of the following are workers' rights?

- ☐ _____review MSDS's during their shift
- ☐ _____review the MSDS for a chemical before working with it
- ☐ _____keep a copy of a MSDS for their own records

9. OSHA requires employers to train workers about chemical hazards after they have been on the job a few months.

- ☐ _____ True _____ False

10. OSHA only mandates training for workers who work *directly* with chemicals.

- ☐ _____ True _____ False

11. Once workers receive Right to Know training, they never have to be trained again.

- ☐ _____ True _____ False

12. What should be the end result of training in hazardous chemicals?

- ☐ _____ Knowledge about the specific hazards of your job
- ☐ _____ Ideas on how to protect yourself from exposure
- ☐ _____ More responsibility put on workers, less on employers

13. Which agency or agencies enforce the Hazard Communication Standard?

- ☐ _____ EPA (Environmental Protection Agency)
- ☐ _____ CDC (Centers for Disease Control)
- ☐ _____ OSHA (Occupational Safety and Health Administration)
- ☐ _____ State Police



UAW Health & Safety Department

Powered Industrial Trucks.....CFR 1910.178

Exercise #1

List any near miss/hit with your plants Powered Industrial Trucks that you have heard about, observed or experienced. *Circle the (*)* if it could have or did result in a serious injury or death.

*

*

*

*

*

*

Exercise #2

In your groups answer the following discussion questions. There may be more than one correct response! (**Circle** your groups response[s] and **explain** why you choose them.)

A.) Anyone can just jump on a forklift and take right off. It is not much different than driving a car! **TRUE or FALSE**

B.) If the break area is a long way off, it is OK to let someone ride on the lift with you. **TRUE or FALSE**

C.) If there isn't enough room on the lift, they can ride on the forks **TRUE or FALSE**

D.) If I can't see around the load I can lean over to one side and keep a clear view of travel. **TRUE or FALSE**

E.) What conditions in the plant affects the handling of a forklift?
1-water 2-oil 3-steel shot 4-dust 5-holes in the floor 6-Narrow aisles

F.) A forklift weighs (**MORE or LESS**) than a full-size car.

G.) If the back of the lift raises up while you are picking up a load, you should:

- | | |
|----------------------|---|
| 1.-set it back down | 2.-ask a co-worker to sit on the back of the lift |
| 3.-get a bigger lift | 4.-try again |

H.) Powered Industrial Trucks should be inspected at least once a day.

TRUE or FALSE

I.) If the brakes on the lift are bad you can still drive it. Throwing it in reverse will stop it

TRUE or FALSE

J.) It is OK to walk under the forks of a lift if it is blocking the aisle. **TRUE or FALSE**

K.) All forklifts have seatbelts on them. **TRUE or FALSE**

L.) Seatbelts do not have to be worn, it is up to the individual. **TRUE or FALSE**

M.) I have seen/or read my trucks owners manual. **TRUE or FALSE**

N.) Labels on forklifts indicate:

- | | | |
|-------------------------------------|-------------------|---------------------|
| 1.-TYPE OF LIFT | 2.- WEIGHT OF PIT | 3.-CAPACITY OF LIFT |
| 4.-IF ATTACHMENTS ARE OK TO BE USED | 5.-LOAD CENTER | |

O.) All Powered Industrial Trucks operate the same way, once you have been trained you can operate any of them.

True or False

P.) I can push containers up to an operator working on a machine, as long as I am careful.

True or False

Q.) How many forklift related fatalities happen each year in the United States?

45

85

100

How many are injured? 20,000-----10,000-----3,500

R.) Once a license has been issued, it is good for life. **True or False**

S.) Pedestrians are always visible to the Powered Truck operator.

True or False

T.) Refresher training must be done when:

- 1.-Observed operating in an unsafe manner
- 2.-Assigned to use a different type lift
- 3.-Evaluation indicates a problem
- 4.-New environmental hazard introduced into the workplace

OSHA Regulations (Standards - 29 CFR)

Handling materials - general. - 1910.176

- **SubPart Number:** N
- **SubPart Title:** Materials Handling and Storage

(a) Use of mechanical equipment. 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 repair, with no obstruction across or in aisles that could create a hazard. *Permanent aisles and passageways shall be appropriately marked.*

(b) Secure storage. *Storage of material shall not create a hazard.* Bags, containers, bundles, etc., stored in tiers shall be stacked, blocked, interlocked and limited in height so that they are stable and secure against sliding or collapse.

(c) Housekeeping. Storage areas shall be kept free from accumulation of materials that constitute hazards from tripping, fire, explosion, or pest harborage. Vegetation control will be exercised when necessary.

(d) [Reserved]

(e) Clearance limits. Clearance signs to warn of clearance limits shall be provided.

(f) Rolling railroad cars. Derail and/or bumper blocks shall be provided on spur railroad tracks where a rolling car could contact other cars being worked, enter a building, work or traffic area.

(g) Guarding. *Covers and/or guard- rails shall be provided to protect personnel* from the hazards of open pits, tanks, vats, ditches, etc.

[39 FR 23052, June 27, 1974, as amended at 43 FR 49749, Oct. 24, 1978]

1910.178 Powered Industrial Truck Standard:

Paragraph---- Subject:

- (a)....General Requirements**
- (b)....Designations**
- (c)....Designated Locations**
- (d)....Converted Lift Trucks**
- (e)....Safety Guards**
- (f)....Fuel Handling & Storage**
- (g)...Changing & Charging Storage Batteries**
- (h)...Lighting for Operating Areas**
- (i)....Control of Noxious Gases & Fumes**
- (j)....Dockboards**
- (k)...Trucks & Railroad Cars**
- (l)....Operator Training**
- (m)...Truck Operations**
- (n)....Traveling**
- (o)....Loading**
- (p)...Operation of the Truck**
- (q)...Maintenance of Industrial Truck**

Powered Industrial Trucks (PIT) - 1910.178

- **SubPart Number:** N
- **SubPart Title:** Materials Handling and Storage

(a) General requirements

(a)(1) This section contains safety requirements relating to fire protection, design, maintenance, and use of fork trucks, tractors, platform lift trucks, motorized hand trucks, and other specialized industrial trucks powered by electric motors or internal combustion engines. This section does not apply to compressed air or nonflammable compressed gas-operated industrial trucks, nor to farm vehicles, nor to vehicles intended primarily for earth moving or over-the-road hauling.

(a)(2) All new powered industrial trucks acquired and used by an employer after the effective date specified in paragraph (b) of 1910.182 shall meet the design and construction requirements for powered industrial trucks established in the "American National Standard for Powered Industrial Trucks, Part II, ANSI B56.1-1969", which is incorporated by reference as specified in Sec. 1910.6, except for vehicles intended primarily for earth moving or over-the-road hauling.

(a)(3) Approved trucks shall bear a label or some other identifying mark indicating approval by the testing laboratory. See paragraph (a)(7) of this section and paragraph 405 of "American National Standard for Powered Industrial Trucks, Part II, ANSI B56.1-1969", which is incorporated by reference in paragraph (a)(2) of this section and which provides that if the powered industrial truck is accepted by a nationally recognized testing laboratory it should be so marked.

(a)(4) Modifications and additions which affect capacity and safe operation shall not be performed by the customer or user without manufacturers prior written approval. Capacity, operation, and maintenance instruction plates, tags, or decals shall be changed accordingly.

(a)(5) If the truck is equipped with front-end attachments other than factory installed attachments, the **user shall request** that the truck be marked to identify the attachments and show the approximate weight of the truck and attachment combination at maximum elevation with load laterally centered.

(a)(6) The user shall see that all nameplates and markings are in place and are maintained in a legible condition.

(a)(7) As used in this section, the term, "approved truck" or "approved industrial truck" means a truck that is listed or approved for fire safety purposes for the intended use by a nationally recognized testing laboratory, using nationally recognized testing standards. Refer to 1910.155(c)(3)(iv)(A) for definition of nationally recognized testing laboratory.

(b) Designations. For the purpose of this standard there are **eleven different designations** of industrial trucks or tractors as follows: D, DS, DY, E, ES, EE, EX, G, GS, LP, and LPS.

(b)(1) The D designated units are units similar to the G units except that they are diesel engine powered instead of gasoline engine powered.

(b)(2) The DS designated units are diesel powered units that are provided with additional safeguards to the exhaust, fuel and electrical systems. They may be used in some locations where a D unit may not be considered suitable.

(b)(3) The DY designated units are diesel powered units that have all the safeguards of the DS units and in addition do not have any electrical equipment including the ignition and are equipped with temperature limitation features.

(b)(4) The E designated units are electrically powered units that have minimum acceptable safeguards against inherent fire hazards.

(b)(5) The ES designated units are electrically powered units that, in addition to all of the requirements for the E units, are provided with additional safeguards to the electrical system to prevent emission of hazardous sparks and to limit surface temperatures. They may be used in some locations where the use of an E unit may not be considered suitable.

(b)(6) The EE designated units are electrically powered units that have, in addition to all of the requirements for the E and ES units, the electric motors and all other electrical equipment completely enclosed. In certain locations the EE unit may be used where the use of an E and ES unit may not be considered suitable.

(b)(7) The EX designated units are electrically powered units that differ from the E, ES, or EE units in that the electrical fittings and equipment are so designed, constructed and assembled that the units may be used in certain atmospheres containing flammable vapors or dusts.

(b)(8) The G designated units are gasoline powered units having minimum acceptable safeguards against inherent fire hazards.

(b)(9) The GS designated units are gasoline powered units that are provided with additional safeguards to the exhaust, fuel, and electrical systems. They may be used in some locations where the use of a G unit may not be considered suitable.

(b)(10) The LP designated unit is similar to the G unit except that liquefied petroleum gas is used for fuel instead of gasoline.

(b)(11) The LPS designated units are liquefied petroleum gas powered units that are provided with additional safeguards to the exhaust, fuel, and electrical systems. They may be used in some locations where the use of an LP unit may not be considered suitable.

(b)(12) *The atmosphere or location shall have been classified as to whether it is hazardous or non-hazardous prior to the consideration of industrial trucks being used therein and the type of industrial truck required shall be as provided in paragraph (d) of this section for such location.*

(c) Designated locations.

(c)(1) The industrial trucks specified under subparagraph (2) of this paragraph are **the minimum types required but industrial trucks having greater safeguards may be used if desired.**

(c)(2) For specific areas of use see Table N-1 which tabulates the information contained in this section. References are to the corresponding classification as used in subpart S of this part.

Note: Complete Table N-1 is NOT included.

TABLE N-1. -- SUMMARY TABLE ON USE OF INDUSTRIAL TRUCKS
IN VARIOUS LOCATIONS

Classes	Unclassified	Class I locations	Class II locations	Class III locations
Description of classes.	Locations not possessing atmospheres as described in other columns.	Locations in which flammable gases or vapors are, or may be, present in the air in quantities sufficient to produce explosive or ignitable mixtures.	Locations which are hazardous because of the presence of combustible dust.	Locations where easily ignitable fibers or flyings are present but not likely to be in suspension in quantities sufficient to produce ignitable mixtures.

(d) Converted industrial trucks. Power-operated industrial trucks that have been originally approved for the use of gasoline for fuel, when converted to the use of liquefied petroleum gas fuel in accordance with paragraph (q) of this section, may be used in those locations where G, GS or LP, and LPS designated trucks have been specified in the preceding paragraphs.

(e) Safety guards.

(e)(1) High Lift Rider trucks shall be fitted with an overhead guard manufactured in accordance with paragraph (a) (2) of this section, unless operating conditions do not permit.

(e)(2) If the type of load presents a hazard, the user shall equip fork trucks with a vertical load backrest extension manufactured in accordance with paragraph (a) (2) of this section.

(f) Fuel handling and storage.

(f)(1) The storage and handling of liquid fuels such as gasoline and diesel fuel shall be in accordance with NFPA Flammable and Combustible Liquids Code (NFPA No. 30-1969), which is incorporated by reference as specified in Sec. 1910.6.

(f)(2) The storage and handling of liquefied petroleum gas fuel shall be in accordance with NFPA Storage and Handling of Liquefied Petroleum Gases (NFPA No. 58-1969), which is incorporated by reference as specified in Sec. 1910.6.

(g) Changing and charging storage batteries.

(g)(1) Battery charging installations **shall be located in areas designated for that purpose.**

(g)(2) Facilities **shall be provided for flushing and neutralizing spilled electrolyte, for fire protection, for protecting charging apparatus from damage by trucks, and for adequate ventilation for dispersal of fumes from gassing batteries.**

(g)(3) Reserved]

(g)(4) A conveyor, overhead hoist, or equivalent **material handling equipment shall be provided for handling batteries.**

(g)(5) Reinstalled batteries **shall be properly positioned and secured** in the truck.

(g)(6) A carboy tilter or siphon **shall be provided for handling electrolyte.**

(g)(7) When charging batteries, **acid shall be poured into water; water shall not be poured into acid.**

(g)(8) Trucks shall be properly positioned and brake applied before attempting to change or charge batteries.

(g)(9) Care shall be taken to assure that **vent caps are functioning.** The battery (or compartment) cover(s) shall be open to dissipate heat.

(g)(10) **Smoking shall be prohibited in the charging area.**

(g)(11) Precautions shall be taken to **prevent open flames, sparks, or electric arcs** in battery charging areas.

(g)(12) Tools and other metallic objects shall be kept away from the top of uncovered batteries.

(h) Lighting for operating areas. (h)(1) [Reserved]

(h)(2) Where **general lighting is less than 2 lumens per square foot**, auxiliary directional lighting shall be provided on the truck.

(i) Control of noxious gases and fumes.

(i)(1) **Concentration levels of carbon monoxide gas created** by powered industrial truck operations **shall not exceed the levels specified in 1910.1000.**

(j) Dockboards (bridge plates). See 1910.30(a).

(k) Trucks and railroad cars.

(k)(1) The **brakes** of highway trucks **shall be set and wheel chocks placed under the rear wheels** to prevent the trucks from rolling while they are boarded with powered industrial trucks.

(k)(2) Wheel stops or other recognized positive protection shall be provided to prevent railroad cars from moving during loading or unloading operations.

(k)(3) **Fixed jacks may be necessary to support a semitrailer and prevent upending** during the loading or unloading when the trailer is not coupled to a tractor.

(k)(4) Positive protection shall be provided to prevent railroad cars from being moved while dockboards or bridge plates are in position.

(l) Operator training.

(l)(1) Safe operation.

(l)(1)(i) The **employer shall ensure that each powered industrial truck operator is competent to operate a powered industrial truck safely**, as demonstrated by the successful completion of the training and evaluation specified in this paragraph (l).

(l)(1)(ii) Prior to permitting an employee to operate a powered industrial truck (except for training purposes), the employer shall ensure that each operator has successfully completed the training required by this paragraph (l), except as permitted by paragraph (l)(5).

(l)(2) Training program implementation.

(l)(2)(i) *Trainees may operate a powered industrial truck only:*

(l)(2)(i)(A) Under the direct supervision of persons who have the knowledge, training, and experience to train operators and evaluate their competence; and

(l)(2)(i)(B) Where such operation does not endanger the trainee or other employees.

(l)(2)(ii) Training shall consist of a combination of **formal instruction** (e.g., lecture, discussion, interactive computer learning, video tape, written material), **practical**

training (demonstrations performed by the trainer and practical exercises performed by the trainee), **and evaluation** of the operator's performance in the workplace.

(l)(2)(iii) All operator training and evaluation shall be conducted by persons who have the knowledge, training, and experience to train powered industrial truck operators and evaluate their competence.

(l)(3) Training program content. Powered industrial truck **operators shall receive initial training in the following topics**, except in topics which the employer can demonstrate are not applicable to safe operation of the truck in the employer's workplace.

(l)(3)(i) Truck-related topics:

(l)(3)(i)(A) Operating instructions, warnings, and precautions for the types of truck the operator will be authorized to operate;

(l)(3)(i)(B) Differences between the truck and the automobile;

(l)(3)(i)(C) Truck controls and instrumentation: where they are located, what they do, and how they work;

(l)(3)(i)(D) Engine or motor operation;

(l)(3)(i)(E) Steering and maneuvering;

(l)(3)(i)(F) Visibility (including restrictions due to loading);

(l)(3)(i)(G) Fork and attachment adaptation, operation, and use limitations;

(l)(3)(i)(H) Vehicle capacity;

(l)(3)(i)(I) Vehicle stability;

(l)(3)(i)(J) Any vehicle inspection and maintenance that the operator will be required to perform;

(l)(3)(i)(K) Refueling and/or charging and recharging of batteries;

(l)(3)(i)(L) Operating limitations;

(l)(3)(i)(M) Any other operating instructions, warnings, or precautions listed in the operator's manual for the types of vehicle that the employee is being trained to operate.

(l)(3)(ii) Workplace-related topics:

(l)(3)(ii)(A) Surface conditions where the vehicle will be operated;

(l)(3)(ii)(B) Composition of loads to be carried and load stability;

(l)(3)(ii)(C) Load manipulation, stacking, and unstacking;

- (l)(3)(ii)(D) Pedestrian traffic in areas where the vehicle will be operated;
- (l)(3)(ii)(E) Narrow aisles and other restricted places where the vehicle will be operated;
- (l)(3)(ii)(F) Hazardous (classified) locations where the vehicle will be operated;
- (l)(3)(ii)(G) Ramps and other sloped surfaces that could affect the vehicle's stability;
- (l)(3)(ii)(H) Closed environments and other areas where insufficient ventilation or poor vehicle maintenance could cause a buildup of carbon monoxide or diesel exhaust;
- (l)(3)(ii)(I) Other unique or potentially hazardous environmental conditions in the workplace that could affect safe operation.

(l)(3)(iii) *The requirements of this section.*

(l)(4) **Refresher training and evaluation.**

(l)(4)(i) Refresher training, including an evaluation of the effectiveness of that training, shall be conducted as required by paragraph (l)(4)(ii) to ensure that the operator has the knowledge and skills needed to operate the powered industrial truck safely.

(l)(4)(ii) Refresher training in relevant topics **shall be provided to the operator when:**

(l)(4)(ii)(A) The operator has been **observed to operate the vehicle in an unsafe manner;**

(l)(4)(ii)(B) The operator has been **involved in an accident or near-miss incident;**

(l)(4)(ii)(C) The operator has received an **evaluation** that reveals that the operator is **not operating the truck safely;**

(l)(4)(ii)(D) The operator is assigned to **drive a different type of truck;** or

(l)(4)(ii)(E) **A condition in the workplace changes in a manner that could affect safe operation of the truck.**

(l)(4)(iii) An **evaluation** of each powered industrial truck operator's performance shall be conducted **at least once every three years.**

(l)(5) **Avoidance of duplicative training.** If an operator has previously received training in a topic specified in paragraph (l)(3) of this section, and such training is appropriate to the truck and working conditions encountered, additional training in that topic is not required if the operator has been evaluated and found competent to operate the truck safely.

(l)(6) **Certification.** The employer shall certify that each operator has been trained and evaluated as required by this paragraph (l). The certification shall include the name of the operator, the date of the training, the date of the evaluation, and the identity of the person(s) performing the training or evaluation.

(l)(7) Dates. The employer shall ensure that operators of powered industrial trucks are trained, as appropriate, by the dates shown in the following table.

If the employee was hired:	The initial training and evaluation of that must be completed:
Before December 1, 1999 ...	By December 1, 1999.
After December 1, 1999	Before the employee is assigned to operate a
	powered industrial truck.

(l)(8) Appendix A to this section provides non-mandatory guidance to assist employers in implementing this paragraph (l). This appendix does not add to, alter, or reduce the requirements of this section.

(m) Truck operations.

(m)(1) Trucks shall not be driven up to anyone standing in front of a bench or other fixed object.

(m)(2) No person shall be allowed to stand or pass under the elevated portion of any truck, whether loaded or empty.

(m)(3) 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.

(m)(4) The employer shall **prohibit arms or legs** from being placed **between the uprights** of the mast **OR outside the running lines of the truck.**

(m)(5) Unattended

(m)(5)(i) When a powered industrial truck is left unattended, load engaging means shall be fully lowered, controls shall be neutralized, power shall be shut off, and brakes set. Wheels shall be blocked if the truck is parked on an incline.

(m)(5)(ii) A powered industrial truck is unattended when the operator is 25 ft. or more away from the vehicle which remains in his view, or whenever the operator leaves the vehicle and it is not in his view.

(m)(5)(iii) When the operator of an industrial truck is dismounted and within 25 ft. of the truck still in his view, the load engaging means shall be fully lowered, controls neutralized, and the brakes set to prevent movement.

(m)(6) A safe distance shall be maintained from the edge of ramps or platforms while on any elevated dock, or platform or freight car. Trucks shall not be used for opening or closing freight doors.

(m)(7) Brakes shall be set and wheel blocks shall be in place to prevent movement of trucks, trailers, or railroad cars while loading or unloading. Fixed jacks may be necessary to support a semi-trailer during loading or unloading when the trailer is not coupled to a tractor. **The flooring of trucks, trailers, and railroad cars shall be checked for breaks and weakness before they are driven onto.**

(m)(8) There shall be sufficient headroom under overhead installations, lights, pipes, sprinkler system, etc.

(m)(9) An overhead guard shall be used as protection against falling objects. It should be noted that an overhead guard is intended to offer protection from the impact of small packages, boxes, bagged material, etc., representative of the job application, but not to withstand the impact of a falling capacity load.

(m)(10) A load backrest extension shall be used whenever necessary to minimize the possibility of the load or part of it from falling rearward.

(m)(11) Only approved industrial trucks shall be used in hazardous locations.

(m)(12) [Reserved]

(m)(13) [Reserved]

(m)(14) **Fire aisles, access to stairways, and fire equipment shall be kept clear.**

(n) Traveling.

(n)(1) **All traffic regulations shall be observed**, including authorized plant speed limits. A safe distance shall be maintained approximately **three truck lengths from the truck ahead, and the truck shall be kept under control at all times.**

(n)(2) The right of way shall be yielded to ambulances, fire trucks, or other vehicles in emergency situations.

(n)(3) Other trucks traveling in the same direction at intersections, blind spots, or other dangerous locations **shall not be passed.**

(n)(4) The **driver shall be required to slow down and sound the horn at cross aisles** and other locations where vision is obstructed. If the load being carried obstructs forward view, the driver shall be required to travel with the load trailing.

(n)(5) Railroad tracks shall be crossed diagonally wherever possible. Parking closer than 8 feet from the center of railroad tracks is prohibited.

(n)(6) The **driver shall be required to look in the direction of, and keep a clear view of the path of travel.**

(n)(7) Grades shall be ascended or descended slowly.

(n)(7)(i) When ascending or descending grades in excess of 10 percent, loaded trucks shall be driven with the load upgrade.

(n)(7)(ii) [Reserved]

(n)(7)(iii) On all grades the load and load engaging means shall be tilted back if applicable, and raised only as far as necessary to clear the road surface.

(n)(8) Under all travel conditions the truck shall be operated at a speed that will permit it to be brought to a stop in a safe manner.

(n)(9) Stunt driving and horseplay shall not be permitted.

(n)(10) The driver shall be required to **slow down for wet and slippery floors.**

(n)(11) Dockboard or bridgeplates, shall be properly **secured** before they are driven over. Dockboard or bridgeplates shall be driven over carefully and slowly and their **rated capacity never exceeded.**

(n)(12) Elevators shall be approached slowly, and then entered squarely after the elevator car is properly leveled. Once on the elevator, the controls shall be neutralized, power shut off, and the brakes set.

(n)(13) Motorized hand trucks must enter elevator or other confined areas with load end forward.

(n)(14) Running over loose objects on the roadway surface shall be avoided.

(n)(15) While negotiating turns, speed shall be reduced to a safe level by means of turning the hand steering wheel in a smooth, sweeping motion. Except when maneuvering at a very low speed, the hand steering wheel shall be turned at a moderate, even rate.

(o) Loading.

(o)(1) Only stable or safely arranged loads shall be handled. Caution shall be exercised when handling off-center loads which cannot be centered.

(o)(2) Only loads within the rated capacity of the truck shall be handled.

(o)(3) The long or high (including multiple-tiered) loads which may affect capacity shall be adjusted.

(o)(4) Trucks equipped with attachments shall be operated as partially loaded trucks when not handling a load.

(o)(5) A load engaging means shall be placed under the load as far as possible; the mast shall be carefully tilted backward to stabilize the load.

(o)(6) Extreme care shall be used when tilting the load forward or backward, particularly when high tiering. Tilting forward with load engaging means elevated shall be prohibited except to pick up a load. An elevated load shall not be tilted forward except when the load is in a deposit position over a rack or stack. When stacking or tiering, only enough backward tilt to stabilize the load shall be used.

(p) Operation of the truck.

(p)(1) If at any time a powered industrial truck is **found to be in need of repair, defective, or in any way unsafe, the truck shall be taken out of service** until it has been restored to safe operating condition.

(p)(2) Fuel tanks shall not be filled while the engine is running. Spillage shall be avoided.

(p)(3) Spillage of oil or fuel shall be carefully washed away or completely evaporated and the fuel tank cap replaced before restarting engine.

(p)(4) No truck shall be operated with a leak in the fuel system until the leak has been corrected.

(p)(5) Open flames shall not be used for checking electrolyte level in storage batteries or gasoline level in fuel tanks.

(q) Maintenance of industrial trucks.

(q)(1) Any power-operated industrial truck not in safe operating condition shall be removed from service. All repairs shall be made by authorized personnel.

(q)(2) No repairs shall be made in Class I, II, and III locations.

(q)(3) Those repairs to the fuel and ignition systems of industrial trucks which involve fire hazards shall be conducted only in locations designated for such repairs.

(q)(4) Trucks in need of repairs to the electrical system shall have the battery disconnected prior to such repairs.

(q)(5) All parts of any such industrial truck requiring replacement shall be replaced only by parts equivalent as to safety with those used in the original design.

(q)(6) **Industrial trucks shall not be altered** so that the relative positions of the various parts are different from what they were when originally received from the manufacturer, nor shall they be altered either by the addition of extra parts not provided by the manufacturer or by the elimination of any parts, except as provided in paragraph (q)(12)

of this section. **Additional counterweighting of fork trucks shall not be done unless approved by the truck manufacturer.**

(q)(7) Industrial trucks shall be examined before being placed in service, and shall not be placed in service if the examination shows any condition adversely affecting the safety of the vehicle. Such examination shall be made at least daily. **Where industrial trucks are used on a round-the-clock basis, they shall be examined after each shift.** Defects when found shall be immediately reported and corrected.

(q)(8) Water mufflers shall be filled daily or as frequently as is necessary to prevent depletion of the supply of water below 75 percent of the filled capacity. Vehicles with mufflers having screens or other parts that may become clogged shall not be operated while such screens or parts are clogged. Any vehicle that emits hazardous sparks or flames from the exhaust system shall immediately be removed from service, and not returned to service until the cause for the emission of such sparks and flames has been eliminated.

(q)(9) When the temperature of any part of any truck is found to be in excess of its normal operating temperature, thus creating a hazardous condition, the vehicle shall be removed from service and not returned to service until the cause for such overheating has been eliminated.

(q)(10) Industrial trucks shall be kept in a clean condition, free of lint, excess oil, and grease. Noncombustible agents should be used for cleaning trucks. Low flash point (below 100 deg. F.) solvents shall not be used. High flash point (at or above 100 deg. F.) solvents may be used. Precautions regarding toxicity, ventilation, and fire hazard shall be consonant with the agent or solvent used.

(q)(11) [Reserved]

(q)(12) Industrial trucks originally approved for the use of gasoline for fuel may be converted to liquefied petroleum gas fuel provided the complete conversion results in a truck which embodies the features specified for LP or LPS designated trucks. Such conversion equipment shall be approved. The description of the component parts of this conversion system and the recommended method of installation on specific trucks are contained in the "Listed by Report." 63 FR 66270, Dec. 1, 1998]

Powered Industrial Trucks - 1910.178AppA

- **SubPart Number:** N
- **SubPart Title:** Stability of Powered Industrial Trucks (Non-mandatory Appendix to Paragraph (I) of this section)

Appendix A -- Stability of Powered Industrial Trucks (Non-mandatory Appendix to Paragraph (I) of This Section)

A-1. Definitions.

The following definitions help to explain the principle of stability:

Center of gravity is the point on an object at which all of the object's weight is concentrated. For symmetrical loads, the center of gravity is at the middle of the load.

Counterweight is the weight that is built into the truck's basic structure and is used to offset the load's weight and to maximize the vehicle's resistance to tipping over.

Fulcrum is the truck's axis of rotation when it tips over.

Grade is the slope of a surface, which is usually measured as the number of feet of rise or fall over a hundred foot horizontal distance (the slope is expressed as a percent).

Lateral stability is a truck's resistance to overturning sideways.

Line of action is an imaginary vertical line through an object's center of gravity.

Load center is the horizontal distance from the load's edge (or the fork's or other attachment's vertical face) to the line of action through the load's center of gravity.

Longitudinal stability is the truck's resistance to overturning forward or rearward.

Moment is the product of the object's weight times the distance from a fixed point (usually the fulcrum). In the case of a powered industrial truck, the distance is measured from the point at which the truck will tip over to the object's line of action. The distance is always measured perpendicular to the line of action.

Track is the distance between the wheels on the same axle of the truck.

Wheelbase is the distance between the centerline of the vehicle's front and rear wheels.

A-2. General.

A-2.1. Determining the stability of a powered industrial truck is simple once a few basic principles are understood. There are many factors that contribute to a vehicle's stability: the vehicle's wheelbase, track, and height; the load's weight distribution; and the vehicle's counterweight location (if the vehicle is so equipped).

A-2.2. The "stability triangle," used in most stability discussions, demonstrates stability simply.

A-3. Basic Principles.

A-3.1. Whether an object is stable depends on the object's moment at one end of a system being greater than, equal to, or smaller than the object's moment at the system's other end. This principle can be seen in the way a see-saw or teeter-totter works: that is, if the product of the load and distance from the fulcrum (moment) is equal to the moment at the device's other end, the device is balanced and it will not move. However, if there is a greater moment at one end of the device, the device will try to move downward at the end with the greater moment.

A-3.2. The longitudinal stability of a counterbalanced powered industrial truck depends on the vehicle's moment and the load's moment. In other words, if the mathematic product of the load moment (the distance from the front wheels, the approximate point at which the vehicle would tip forward) to the load's center of gravity times the load's weight is less than the vehicle's moment, the system is balanced and will not tip forward. However, if the load's moment is greater than the vehicle's moment, the greater load-moment will force the truck to tip forward.

A-4. The Stability Triangle.

A-4.1. Almost all counterbalanced powered industrial trucks have a three-point suspension system, that is, the vehicle is supported at three points. This is true even if the vehicle has four wheels. The truck's steer axle is attached to the truck by a pivot pin in the axle's center. When the points are connected with imaginary lines, this three-point support forms a triangle called the stability triangle. Figure 1 depicts the stability triangle.

A-4.2. When the vehicle's line of action, or load center, falls within the stability triangle, the vehicle is stable and will not tip over. However, when the vehicle's line of action or the vehicle/load combination falls outside the stability triangle, the vehicle is unstable and may tip over.

A-5. Longitudinal Stability.

A-5.1. The axis of rotation when a truck tips forward is the front wheels' points of contact with the pavement. When a powered industrial truck tips forward, the truck will rotate about this line. When a truck is stable, the vehicle-moment must exceed the load-moment. As long as the vehicle-moment is equal to or exceeds the load-moment, the vehicle will not tip over. On the other hand, if the load moment slightly exceeds the vehicle-moment, the truck will begin to tip forward, thereby causing the rear to lose contact with the floor or ground and resulting in loss of steering control. If the load-moment greatly exceeds the vehicle moment, the truck will tip forward.

A-5.2. To determine the maximum safe load-moment, the truck manufacturer normally rates the truck at a maximum load at a given distance from the front face of the forks. The specified distance from the front face of the forks to the line of action of the load is commonly called the load center. Because larger trucks normally handle loads that are physically larger, these vehicles have greater load centers. Trucks with a capacity of 30,000 pounds or less are normally rated at a given load weight at a 24-inch load center. Trucks with a capacity greater than 30,000 pounds are normally rated at a given load weight at a 36- or 48-inch load center. To safely operate the vehicle, the operator should always check the data plate to determine the maximum allowable weight at the rated load center.

A-5.3. Although the true load-moment distance is measured from the front wheels, this distance is greater than the distance from the front face of the forks. Calculating the maximum allowable load-moment using the load-center distance always provides a lower load-moment than the truck was designed to handle. When handling unusual loads, such as those that are larger than 48 inches long (the center of gravity is greater than 24 inches) or that have an offset center of gravity, etc., a maximum allowable load-moment should be calculated and used to determine whether a load can be safely handled. **For example, if an operator is operating a 3000 pound capacity truck (with a 24-inch load center), the maximum allowable load-moment is 72,000 inch-pounds (3,000 times 24). If a load is 60 inches long (30-inch load center), then the maximum that this load can weigh is 2,400 pounds (72,000 divided by 30).**

A-6. Lateral Stability.

A-6.1. The vehicle's lateral stability is determined by the line of action's position (a vertical line that passes through the combined vehicle's and load's center of gravity) relative to the stability triangle. When the vehicle is not loaded, the truck's center of gravity location is the only factor to be considered in determining the truck's stability. As long as the line of action of the combined vehicle's and load's center of gravity falls within the stability triangle, the truck is stable and will not tip over. However, if the line of action falls outside the stability triangle, the truck is not stable and may tip over.

A-6.2. Factors that affect the vehicle's lateral stability include the load's placement on the truck, the height of the load above the surface on which the vehicle is operating, and the vehicle's degree of lean.

A-7. Dynamic Stability.

A-7.1. Up to this point, the stability of a powered industrial truck has been discussed without considering the dynamic forces that result when the vehicle and load are put into motion. The weight's transfer and the resultant shift in the center of gravity due to the dynamic forces created when the machine is moving, braking, cornering, lifting, tilting, and lowering loads, etc., are important stability considerations.

A-7.2. When determining whether a load can be safely handled, the operator should exercise extra caution when handling loads that cause the vehicle to approach its maximum design characteristics. For example, if an operator must handle a maximum load, the load should be carried at the lowest position possible, the truck should be accelerated slowly and evenly, and the forks should be tilted forward cautiously. However, no precise rules can be formulated to cover all of these eventualities.

[63 FR 66270, Dec. 1, 1998]



What's the Difference??

Automobile



Powered Industrial Truck (PIT)



- 1.
2. . _____
3. . _____
4. . _____
5. . _____
6. . _____
7. . _____
8. . _____
9. . _____

Powered Industrial Trucks

TRAVEL SPEEDS

1. Internal Combustion Lift Trucks.....Top Speed 9 MPH (13' Per Second)
2. Electric Lift Trucks.....Top Speed 6 MPH (10' Per Second)
3. Walker Pallet Trucks.....Top Speed 3 MPH (5' Per Second)

STOPPING DISTANCE

- REACTION TIME:
 1. **YOUNG**-----Under 1 Second
 2. **OLDER**-----Over 1 Second
- BRAKE APPLIED DISTANCE TRAVELED:
 1. I.C.....15—17 FEET
 2. ELECTRIC.....8---12 FEET
 3. WALKER.....4---6 FEET
- TOTAL STOPPING DISTANCE:
 1. I.C.....30 FEET
 2. ELECTRIC....20 FEET
 3. WALKER.....10 FEET

Note:

- * Expect the unexpected from pedestrians and other P.I.T.'s.
- * Most plants share the aisles for both P.I.T.'s and pedestrians.
- * Storage at cross-aisles obstruct your view, stop and look in both directions before entering aisleways.
- * Pedestrians think if they see you, you must see them.....FALSE!

The Hierarchy of Health & Safety Controls

A heated debate often occurs between labor and management in the health and safety arena that is sometimes referred to as the “**Do we fix the workplace or the worker?**” issue.

Management’s tendency, given its focus on workers’ behavior and short-term cost reduction, is to argue for “fixing the worker” solutions: protective gear and discipline for failure to follow procedures. The Union considers this to be “blaming the victim” and advocates for solutions that “fix the workplace.”

Research indicates that the latter approach is actually more effective and less expensive in the long run. One reason is that human behavior can never be completely regulated and controlled, so solutions based on compliance with procedures will always lead to mishaps. Machine controls and replacement of hazardous materials are much more capable of guaranteeing safety and health. The UAW’s and OSHA’s analysis of control effectiveness is captured in the graph below.

MOST EFFECTIVE ↓ ↓ ↓	1. Elimination or Substitution	• substitute for hazardous material • change process to eliminate noise • perform task at ground level • automated material handling
	2. Engineering Controls	• ventilation systems • machine guarding • sound enclosures • circuit breakers • platforms and guard railing • interlocks • lift tables, conveyors, balancers
	3. Warnings	• computer warnings • odor in natural gas • signs • back-up alarms • beepers • horns • labels
	4. Training Procedures &	• Safe job procedures • Safety equipment inspections • Hazard Communications Training • Lock-out • Confined Space Entry, etc...
LEAST EFFECTIVE	5. Personal Protective Equipment	• safety glasses • ear plugs • face shields • safety harnesses and lanyards • knee pads

1. What is the most effective way to fix “blind corners?”_____

2. What is the most effective way to keep pedestrians from walking out in front or behind you as an operator?_____

3. What is the most effective way to enforce the speed limit of a powered industrial truck?_____

Automotive Industry Action Group-Excerpts OHS-2

AIAG - Pedestrian and Vehicle Safety Guideline

Facility Assessments

In general, powered industrial trucks, other in-plant powered vehicles, and pedestrian traffic should be separated wherever possible. In areas where this is not possible, added safety controls (physical and visual) should be required to reduce pedestrian risks. It is important to realize that on-site facility assessments are necessary in order to identify those areas requiring pedestrian/vehicular safety controls and to ensure that the process is consistently implemented.

A detailed facility assessment should focus on:

- 1) High pedestrian traffic areas (e.g., adjacent to offices, cafeterias, locker rooms, employee entrances, etc.)
- 2) High powered industrial-truck and/or finished- product traffic areas (e.g., receiving/shipping docks, warehouses and marketplaces (stock storage), pre-delivery areas, etc.).

The following elements from this Guideline are addressed in more detail:

- Facilities - On-site facilities assessments are necessary to identify areas requiring pedestrian/vehicular safety controls. Consistency in marking and separating these areas is a key to improved awareness of and conformance to the guidelines.
- Equipment - Equipment specifications have an impact on how readily a vehicle is observed by pedestrians. For example, recent studies have shown that certain paint colors can make a vehicle up to four times more visible to the human eye.

Facility Design

- Aisle widths and color-coded demarcation lines
- Personnel access doorway locations
- Service doorway locations
- Material storage locations (e.g., marketplaces, material warehouse, line side storage, etc.)
- Plant floor office locations including personnel access doorways
- Individual departmental locations including supervisory locations
- Employee service locations (e.g., shop floor entrances, break rooms, cafeterias, canteens, locker rooms, main entrances for employees and non-employees, medical, parking lot entrances, restrooms, secured accesses for employees and non-employees)
- Powered industrial-truck repair staging
- Shipping dock locations (e.g., loading bays, personnel access doorways, shipping offices, etc.)
- Receiving dock locations (e.g., unloading bays, personnel access doorways, shipping offices, etc.)
- Stairwell locations
- Permanent ladder locations
- Drinking fountain locations

Facility Layout

Pedestrian walkways should be marked with widths of no less than 3 feet wide, using demarcation stripe widths of 4-inch minimum.

Shared “vehicular and pedestrian” aisles are to include a marked pedestrian aisle/walkway with boundaries striped yellow.

Pedestrian Barriers

Barriers/railings painted Target Yellow should be installed at pedestrian access points to aisles in which powered industrial truck traffic is present (e.g., from stairways, vestibules, offices, canteens, cafeterias, locker rooms, employee entrances, etc.). The purpose of such barriers is to impede forward momentum for pedestrians entering powered industrial-truck traffic aisles or zones. Note: Barriers shall comply with local/state/federal zoning ordinances.

Mirrors

- 360-degree dome (spherical) mirrors and/or convex mirrors (Figure 1.9) are to be installed at powered industrial-truck/pedestrian intersections to enhance visibility.
- When possible, mirrors should be mounted a maximum of 12 feet above the floor to the bottom of the dome.

Powered Industrial-Truck Application

Every powered industrial-truck main chassis/frame should be painted a high-visibility color.

Powered Industrial-Truck Operator

Operators should avoid creating blind corners and intersections due to staging tall piles of stock at these locations.

Company radio dispatch systems installed in powered industrial trucks should be used only when the powered industrial truck is brought to a complete stop.

In operations where two-way traffic (or the potential for passing) exists, it is suggested that all vehicles that tow carts be equipped with some type of cone or other device that provides passing drivers a warning to give clearance.

If you stop your vehicle to talk to a pedestrian, the “2-Foot Rule” should be enforced. This rule requires an operator to maintain a minimum distance of 2 feet (or outstretched arm’s length) between the vehicle and the pedestrian being communicated with. In the case of a high-lift powered industrial truck, the load engaging means should be completely lowered, the directional control placed in neutral, and the power supply to either motor or engine turned off before the pedestrian is allowed closer than two feet to the vehicle.

Operators should wear high visibility safety vests in all designated powered industrial-truck traffic areas, restricted zones, and any other congested areas as determined by each facility assessment. Examples might include shipping/receiving docks, cafeteria perimeters, battery charging/changing areas, security gate personnel entrances, etc.

Pedestrians should be instructed that they possess the "*right-of-way*" only when they are in the pedestrian walkway or an identified crosswalk.

Pedestrians should maintain a distance of 2 feet (or outstretched arm's length) from any powered industrial truck in operation.

Pedestrians should cross at designated crossings, when available.

Pedestrians should wear high-visibility fluorescent green safety vests in all designated, powered industrial-truck traffic areas, restricted zones, and any other congested areas as determined by each facility assessment.

Material Flow and Storage

Material stored at all line side workstation areas that is stacked more than 4feet high should have some type of guard (e.g., wire/synthetic mesh or screen) on the workstation side to prevent accidental falling of any stored material.

Material should not be stored within the demarcation lines of any aisle or walkway.

Powered industrial trucks should not be used to push material along any aisle way or storage area.

Incident Tracking and Categorization

A uniform, consistent means by which to track ongoing events involving the Pedestrian and Vehicles Safety Program.

- Powered Industrial Truck and Dock Incident Severity - By Category
- Equipment Type Involved in Incidents – By Truck Classification
- Pedestrian Severity – By Category
- Equipment Involved in Serious/Fatal Pedestrian Incidents
- Dock/Hi-way Trailer Related Incident Severity – By Category
- Industrial Truck Incident Types – By Category

Follow-Up Training

Follow-up training must be required when:

- The operator has been observed to operate the vehicle in an unsafe manner. The observation may be made by anyone.
- The operator has been involved in an accident. The accident may be reported by anyone.
- The operator has been involved in a near-miss incident. The incident may be reported by anyone.
- The operator has received an evaluation that reveals that the operator is not operating the truck safely.
- A condition in the workplace changes in a manner that could affect safe operation of the powered industrial truck.
- The operator is assigned to a powered industrial truck with operating functions not provided in previous operator training.
- The existing powered industrial truck in operation has been modified.

Facility Assessments

Benchmarks for designing the optimum plant layout include but are not limited to the following guidelines:

- Design for optimum pedestrian aisle space and crosswalks. Completely segregate pedestrian from powered industrial truck traffic wherever possible.
- Locate drinking fountains away from active aisles.
- Do not store any material within 8 feet of aisle intersections, thus improving visibility of the approaching intersection.
- Use 360-degree dome mirrors or convex mirrors at blind/congested intersections.
- Locate all personnel access doors away from the main aisles for powered industrial-truck traffic. Access from doors should not lead immediately into an aisle.
- Wherever possible, dedicate aisles as material flow traffic aisles only.
- Identify space at dock locations as non-pedestrian areas only.
- Define tool operator space with an escape path and protection from equipment encroachment.
- Identify potential problem areas and mark them with signs, paint, or cross-hatching to alert powered-equipment operators and pedestrians of potential hazard areas (e.g., use stop signs, foot paths on floor, flashing light at intersections, etc.).
- Provide safe clearance between pedestrians and powered overhead equipment (e.g., conveyors, etc).
- Provide railings around corners and high pedestrian areas to protect from trailing dollies being towed. Ensure that railings do not result in tripping hazards.
- Provide dedicated zones for dolly drop-off.
- Provide adequate lighting for existing working conditions.
- Provide windows on each corner of all inter-plant offices located at aisle intersections to eliminate blind corners.
- Dedicate one personnel access door for over-the-road truck drivers to enter/exit. Access should lead directly to and from Shipping and Receiving offices. The personnel access door should be located close to the respective offices to eliminate drivers walking across loading/unloading bays. Install information signs instructing drivers to proceed to holding areas (canteen, break room, waiting room, etc.) until summoned.
- Stairs located near powered industrial-truck traffic aisles and descending from elevated floor levels should exit pedestrians parallel to the aisle, never perpendicular.
- Locate information signs stating "Place No Stock" in areas where storage of such material will create blind spots.
- Wherever possible, provide aisles that can safely support two-way traffic and a separate pedestrian aisle (twice the width of the maximum load handled + 18 inches load-to-load clearance + a 3-foot pedestrian walkway). Aisle demarcation lines should be painted in accordance with the mandatory requirements of Section 1.2.
- Fire extinguishers and related fire-fighting equipment should be mounted to the inside of vertical structural support columns and not directly on the column adjacent to powered industrial-truck traffic aisles.
- Picnic tables, rest areas, vending machines, etc., should be located away from powered industrial- truck traffic aisles. If this is not possible, protective guards/barriers should be installed as needed.
- Eliminate "pedestrian flow shortcuts" in production line areas. Design to prevent pedestrians from cutting through production lines and into main powered industrial traffic aisles.

Facility Layout

Minimum Aisle Widths			
	Assembly / Machining	Body shop	Stamping
Aisles along building perimeter wall	15 feet (4.6m)	15 feet (4.6m)	20 ft. (6.1m)
Cross aisles and storage areas	12 feet (3.7m)	15 feet (4.6m)	15 feet (4.6m)
Service aisles	8 feet (2.4m)	8 feet (2.4m)	8 feet (2.4m)

The truck dock apron and aisles that are used to service the truck unloading process should be classified as "Authorized Personnel Only"

The minimum aisle width for aisles servicing the truck dock apron is two times the widest load handled, plus 3 feet (0.9m).

The minimum overhead clearance is 18 feet (5.5m) throughout the dock apron and 12 feet (3.6m) overhead clearance in adjacent aisles.

Facilities for over-the-road truck drivers and the shipping office should be provided so that non-company personnel are contained.

The dock apron should contain no building columns.

The minimum spacing between docks is 15 feet (4.6m), center to center.

For docks where full-length in-plant trailer trains are to be used, the distance from the dock the opposite side of the apron should be: [8 feet (2.4m) dock plate, plus 15 feet (4.6m)

Point-of-use docks should not unload directly into the building perimeter aisle. The dock area should be isolated from other traffic and marked as such according to the Pedestrian and Vehicle Safety Guideline. The minimum depth of the unloading area is 35 feet (10.7m) from the dock face to the perimeter aisle [8 feet (2.4m) dock plate, 27 feet (8.2m) apron].

The rail dock apron is the interior area, which extends from the edge of the rail well to the edge of the main plant aisle parallel to the rail spur. The apron should be a minimum of 20 feet (6.1m) wide [2 feet (0.6m) clear, plus 18 feet (5.5m) maneuvering zone], although a wider apron may be required if the rack length is greater than 108 inches

Shared Pedestrian and PMHV Aisles - Minimum Aisle Width Considerations and General Rules of Thumb

Aisles of adequate width should be provided for efficient material handling operations. Note that 3-foot dedicated pedestrian aisles and in-plant trailer drop-off zones are incremental to these numbers.

General Aisle Recommendations

Pedestrians entering the aisle from critical areas, including stairways, vestibules, offices, canteens, cafeterias, locker rooms, restrooms, employee entrances, etc., should enter the aisle moving parallel to aisle traffic. Using barriers such as railings or guardrails may accomplish this. Under no condition should this impede emergency egress from the building.

Cross aisles should be provided at least every 500 feet (152.4m).

Perimeter aisles should be located a minimum of 4 feet (1.2m) away from the wall to permit safe pedestrian access to the aisles and access to emergency fire-fighting equipment (e.g., hoses and extinguishers, mains, plumbing, power boxes, light switches, etc.) that may be located on a perimeter wall.

Service aisles permit egress for mobile service equipment. They are not designated for the movement of materials. Service aisles are typically 8 feet (2.4m) wide but may be wider if needed for service requirements.

Overhead clearance in aisles used for the movement of production materials should be a minimum of 12 feet to allow for the unobstructed movement of trailer trains

Visual Factory (A Place for Everything and Everything in its Place)

- Establish and identify Pedestrian-only Aisles and Pedestrian/Powered Industrial-Truck Shared Aisles.
- Establish Powered Industrial-Truck only Aisles.

Identify Pedestrian restricted areas

Identify vehicle and equipment parking and charging areas, (with yellow markings, department number and powered industrial truck number).

It is recommended that all in-plant vehicles operate with headlights on.

"No stock" signs should be posted near aisle intersections and in areas where dunnage creates blind spots.

Pedestrian

All pedestrians gaining access to a production facility using powered industrial trucks should be given a brief training session.

Facility Assessments

In-plant office structures located at aisle intersections should not create blind spots for approaching powered industrial trucks or pedestrians. Corner walls should not be solid. Long, rectangular windows should be installed to all corner walls. Office structures should be set back from the intersecting aisles to open up visibility from the aisles.

For more information www.aiag.org

Developing a One Year Plan

<u>Month # 1</u>	<u>Month # 2</u>	<u>Month # 3</u>	<u>Month # 4</u>	<u>Month # 5</u>	<u>Month # 6</u>
<u>Month # 7</u>	<u>Month # 8</u>	<u>Month # 9</u>	<u>Month # 10</u>	<u>Month # 11</u>	<u>Month # 12</u>