



**Occupational
Safety and Health
Administration**

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Training Requirements in OSHA Standards





Occupational Safety and Health Act of 1970

“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.”

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This publication provides a general overview of a variety of standards-related topics. This publication does not alter or determine compliance responsibilities which are set forth in OSHA standards, and the *Occupational Safety and Health Act*. Moreover, because interpretations and enforcement policy may change over time, for additional guidance on OSHA compliance requirements, the reader should consult current administrative interpretations and decisions by the Occupational Safety and Health Review Commission and the courts.

This guidance document is not a standard or regulation, and it creates no new legal obligations. It contains descriptions of mandatory safety and health standards. The Occupational Safety and Health Act requires employers to comply with safety and health standards and regulations promulgated by OSHA or by a state with an OSHA-approved state plan. In addition, the Act's General Duty Clause, Section 5(a)(1), requires employers to provide their employees with a workplace free from recognized hazards likely to cause death or serious physical harm.

Training Requirements in OSHA Standards

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



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Training Requirements for Workplace Safety

Under the *Occupational Safety and Health Act of 1970*, employers are responsible for providing a safe and healthful workplace. No person should ever have to be injured, become ill, or die for a paycheck.

OSHA's mission is to ensure the protection of workers and prevent work-related injuries, illnesses, and deaths by setting and enforcing standards, and by providing training, outreach, education and assistance. Many OSHA standards, which have prevented countless workplace tragedies, include explicit safety and health training requirements to ensure that workers have the required skills and knowledge to safely do their work. These requirements reflect OSHA's belief that training is an essential part of every employer's safety and health program for protecting workers from injuries and illnesses. Researchers conclude that those who are new on the job have a higher rate of injuries and illnesses than more experienced workers.

To assist employers, safety and health professionals, training directors and others with a need to know, OSHA's training-related requirements have been excerpted and collected in this updated booklet. Requirements for posting information, warning signs, labels, and the like are excluded, as are most references to the qualifications of people assigned to test workplace conditions or equipment.

Training in the safe way for workers to do their jobs well is an investment that will pay back over and over again in fewer injuries and illnesses, better morale, lower insurance premiums and more.

It is a good idea to keep a record of all safety and health training. Documentation can also supply an answer to one of the first questions an incident investigator will ask: "Did the employee receive adequate training to do the job?"

OSHA Standards: Protection on the Job

In this booklet, the training requirements contained in OSHA's standards are organized into five categories of OSHA standards: General Industry, Maritime, Construction, Agriculture, and Federal Employee Programs. An example of a training requirement is found in the revised Hazard Communication standard (Title 29 Code of Federal Regulations, Part 1910.1200, effective May 25, 2012), which improves the quality and consistency of hazard information in the workplace. This standard states:

Employers shall provide employees with effective information and training on hazardous chemicals in their work area at the time of their initial assignment, and whenever a new chemical hazard the employees have not previously been trained about is introduced into their work area. Information and training may be designed to cover categories of hazards (e.g., flammability, carcinogenicity) or specific chemicals. Chemical-specific information must always be available through labels and safety data sheets.

This booklet identifies the training requirements in specific OSHA standards. For information on training techniques and resources for developing training programs, please see *Resource for Development and Delivery of Training to Workers*.

Injury and Illness Prevention Programs

Training and education are elements of a strong injury and illness prevention program that can help employers find and fix workplace hazards before workers get hurt.

Injury and illness prevention programs are systems that can substantially reduce the number and severity of workplace injuries and illnesses while reducing costs to employers. Thousands of employers across the United States already manage safety using injury and illness prevention programs, and OSHA believes that all employers can and should do the same. Thirty-four states have requirements or voluntary guidelines for workplace injury and illness prevention programs.

Most successful injury and illness prevention programs are based on a common set of key elements. These include management leadership, worker participation, hazard identification, hazard prevention and control, education and training, and program evaluation and improvement. Visit OSHA's Injury and Illness Prevention Programs web page at www.osha.gov/dsg/topics/safetyhealth for more information.

Educational Information

OSHA has many types of educational materials in English, Spanish, Vietnamese and other languages available in print or online. These include:

- Brochures/booklets;
- Fact Sheets;
- Guidance documents that provide detailed examinations of specific safety and health issues;
- Online Safety and Health Topics pages;
- Posters;
- Small, laminated QuickCards™ that provide brief safety and health information; and
- *QuickTakes*, OSHA's free, twice-monthly online newsletter with the latest news about OSHA initiatives and products to assist employers and workers in finding and preventing workplace hazards. To sign up for *QuickTakes*, visit www.osha.gov/quicktakes.

To view materials available online or for a listing of free publications, visit www.osha.gov/publications. You can also call 1-800-321-OSHA (6742) to order publications.

OSHA's web site also has information on job hazards and injury and illness prevention for employers and workers. To learn more about OSHA's safety and health resources online, visit www.osha.gov or www.osha.gov/html/a-z-index.html.

OSHA Training Institute (OTI) Education Centers

OTI Education Centers are nonprofit organizations authorized by OSHA to deliver occupational safety and health training to workers, supervisors and employers. These organizations are selected through a competitive process based on various criteria, including their occupational safety and health training experience, location and training facilities, and ability to provide training throughout a given region.

The OTI Education Centers offer courses and seminars on a variety of safety and health topics. They also contribute to the OSHA training mission through other safety and health programs, including community outreach efforts, courses offered in Spanish, and various youth initiatives.

The OTI Education Centers also support the Voluntary OSHA Outreach Training Program by offering trainer courses and processing trainer requests for course completion cards. The Outreach Training Program is a voluntary program that is not

required by OSHA—nor does it fulfill any OSHA requirements. Still the outreach program can provide basic safety and health information and education. However, under the OSHA law, all required training must be provided by and paid for by employers. Through the outreach program, safety professionals can become authorized to deliver 10-hour and 30-hour classes on the recognition, avoidance, abatement, and prevention of safety and health hazards in workplaces. The program also provides information about workers' rights, employer responsibilities, and how to file a complaint. **It is important to note that this is a voluntary program and does not meet training requirements for any OSHA standards.** Although some states, municipalities, or organizations may require outreach training as a condition of employment, it is not an OSHA requirement. None of the courses within the Outreach Training Program is considered a certification.

For more information, including course descriptions and prerequisites, class schedules, tuition and fees, and featured organizations, visit OSHA's website: www.osha.gov/otiec.

Worker Participation in Developing Training Programs

Training programs help ensure that *safe jobs are no accident*. Safe jobs exist because employers make a conscious decision, each and every day of the year, to make protecting workers a priority in the workplace. When this effort includes participation from workers, workplace injury and illness prevention programs are improved because workers can identify missing safety procedures, make recommendations for changes and help ensure a safe workplace. When workers have a voice in the workplace and input about how training is developed, training programs are more accurately focused on specific workplace hazards.

Readers with questions concerning worker safety and health training should contact their OSHA Regional or Area office listed at the end of this publication and on OSHA's website: www.osha.gov.



Photo: Sheryl Quatermas, New Jersey State Plan

General Industry

The following training requirements have been excerpted from **Title 29, Code of Federal Regulations Part 1910**. Note that additional training requirements may appear in certain other standards (ANSI, NFPA, etc.) adopted by reference in **Part 1910** and therefore are mandatory.

29 CFR 1910

Subpart E – Exit Routes and Emergency Planning

1910.38 Emergency action plans

- (a) through (f)
- (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.
 - (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.
 - (c) **Minimum elements of an emergency action plan.** An emergency action plan must include at a minimum:
 - (1) Procedures for reporting a fire or other emergency;
 - (2) Procedures for emergency evacuation, including type of evacuation and exit route assignments;

- (3) Procedures to be followed by employees who remain to operate critical plant operations before they evacuate;
 - (4) Procedures to account for all employees after evacuation;
 - (5) Procedures to be followed by employees performing rescue or medical duties; and
 - (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.
- (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.
- (e) **Training.** An employer must designate and train employees to assist in a safe and orderly evacuation of other employees.
- (f) **Review of emergency action plan.** An employer must review the emergency action plan with each employee covered by the plan:
- (1) When the plan is developed or the employee is assigned initially to a job;
 - (2) When the employee's responsibilities under the plan change; and
 - (3) When the plan is changed

1910.39 Fire prevention plans

- (a) through (d)
- (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.
- (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.
- (c) **Minimum elements of a fire prevention plan.** A fire prevention plan must include:
- (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;
 - (2) Procedures to control accumulations of flammable and combustible waste materials;

- (3) Procedures for regular maintenance of safeguards installed on heat-producing equipment to prevent the accidental ignition of combustible materials;
 - (4) The name or job title of employees responsible for maintaining equipment to prevent or control sources of ignition or fires; and
 - (5) The name or job title of employees responsible for the control of fuel source hazards.
- (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.

Subpart F – Powered Platforms, Manlifts, and Vehicle-Mounted Work Platforms

1910.66 Powered platforms for building maintenance

- (i) and (j) (i) **Operations**
 - (1) *Training.*
 - (i) Working platforms shall be operated only by persons who are proficient in the operation, safe use and inspection of the particular working platform to be operated.
 - (ii) All employees who operate working platforms shall be trained in the following:
 - (A) Recognition of, and preventive measures for, the safety hazards associated with their individual work tasks.
 - (B) General recognition and prevention of safety hazards associated with the use of working platforms, including the provisions in the section relating to the particular working platform to be operated.
 - (C) Emergency action plan procedures required in paragraph (e)(9) of this section.
 - (D) Work procedures required in paragraph (i)(1)(iv) of this section.
 - (E) Personal fall arrest system inspection, care, use and system performance.

- (iii) Training of employees in the operation and inspection of working platforms shall be done by a competent person.
 - (iv) Written work procedures for the operation, safe use and inspection of working platforms shall be provided for employee training. Pictorial methods of instruction may be used, in lieu of written work procedures, if employee communication is improved using this method. The operating manuals supplied by manufacturers for platform system components can serve as the basis for these procedures.
 - (v) The employer shall certify that employees have been trained in operating and inspecting a working platform by preparing a certification record which includes the identity of the person trained, the signature of the employer or the person who conducted the training and the date that training was completed. The certification record shall be prepared at the completion of the training required in paragraph (i)(1)(ii) of this section, and shall be maintained in a file for the duration of the employee's employment. The certification record shall be kept readily available for review by the Assistant Secretary of Labor or the Assistant Secretary's representative.
- (2) *Use*
- (i) Working platforms shall not be loaded in excess of the rated load, as stated on the platform load rating plate.
 - (ii) Employees shall be prohibited from working on snow, ice, or other slippery material covering platforms, except for the removal of such materials.
 - (iii) Adequate precautions shall be taken to protect the platform, wire ropes and life lines from damage due to acids or other corrosive substances, in accordance with the recommendations of the corrosive substance producer, supplier, platform manufacturer or other equivalent information sources. Platform members which have been exposed to acids or other corrosive substances shall be washed down with a neutralizing solution, at a frequency recommended by the corrosive substance producer or supplier.
 - (iv) Platform members, wire ropes and life lines shall be protected when using a heat producing process. Wire ropes and life lines which have been contacted by the heat producing process shall be considered to be permanently damaged and shall not be used.

- (v) The platform shall not be operated in winds in excess of 25 miles per hour (40.2 km/hr) except to move it from an operating to a storage position. Wind speed shall be determined based on the best available information, which includes on-site anemometer readings and local weather forecasts which predict wind velocities for the area.
- (vi) On exterior installations, an anemometer shall be mounted on the platform to provide information of on-site wind velocities prior to and during the use of the platform. The anemometer may be a portable (hand held) unit which is temporarily mounted during platform use.
- (vii) Tools, materials and debris not related to the work in progress shall not be allowed to accumulate on platforms. Stabilizer ties shall be located so as to allow unencumbered passage along the full length of the platform and shall be of such length so as not to become entangled in rollers, hoists or other machinery.
- (j) **Personal fall protection.** Employees on working platforms shall be protected by a personal fall arrest system meeting the requirements of appendix C, section I, of this standard, and as otherwise provided by this standard.

Appendix C to 1910.66 — Personal fall arrest system

Section I (Mandatory)

(e) Care and Use

- (9) Before using a personal fall arrest system, and after any component or system is changed, employees shall be trained in accordance with the requirements of paragraph 1910.66(i)(1), in the safe use of the system.

Subpart G – Occupational Health and Environmental Control

1910.95 Occupational noise exposure

(i)(4);
(k) and (l)

(i) Hearing protectors

- (4) The employer shall provide training in the use and care of all hearing protectors provided to employees.

(k) Training program

- (1) The employer shall institute a training program for all employees who are exposed to noise at or above an 8-hour time weighted average of 85 decibels, and shall ensure employee participation in such program.
- (2) The training program shall be repeated annually for each employee included in the hearing conservation program. Information provided in the training program shall be updated to be consistent with changes in protective equipment and work processes.
- (3) The employer shall ensure that each employee is informed of the following:
 - (i) The effects of noise on hearing;
 - (ii) The purpose of hearing protectors, the advantages, disadvantages, and attenuation of various types, and instructions on selection, fitting, use, and care; and
 - (iii) The purpose of audiometric testing, and an explanation of the test procedures.

(l) Access to Information and Training Materials

- (1) The employer shall make available to affected employees or their representatives copies of this standard and shall also post a copy in the workplace.
- (2) The employer shall provide to affected employees any informational materials pertaining to the standard that are supplied to the employer by the Assistant Secretary.
- (3) The employer shall provide, upon request, all materials related to the employer's training and education program pertaining to this standard to the Assistant Secretary and the Director.

Subpart H – Hazardous Materials

1910.106 Flammable liquids

(b)(5)(vi)(v)
(2) and (3) **(b) Tank storage**

- (5) Supports, foundations, and anchorage for all tank locations –
 - (vi) *Flood areas.* Where a tank is located in an area that may be subjected to flooding, the applicable precautions outlined in this subdivision shall be observed.
 - (v) *Inspections.* The Assistant Secretary or his designated representative shall make periodic inspections of all plants where the storage of flammable liquids is such as to require compliance with the foregoing requirements, in order to assure the following:
 - (2) That detailed printed instructions of what to do in flood emergencies are properly posted.
 - (3) That station operators and other employees depended upon to carry out such instructions are thoroughly informed as to the location and operation of such valves and other equipment necessary to effect these requirements.

1910.109 Explosive and blasting agents

(d)(3)(i) and
(iii), (g)(3)(iii)
(a), (g)(6)(ii),
and (h)(4)(ii)(b) **(d) Transportation of explosives**

- (3) *Operation of transportation vehicles.*
 - (i) Vehicles transporting explosives shall only be driven by and be in the charge of a driver who is familiar with the traffic regulations, State laws, and the provisions of this section.
 - (iii) Every motor vehicle transporting any quantity of Class A or Class B explosives shall, at all times, be attended by a driver or other attendant of the motor carrier. This attendant shall have been made aware of the class of the explosive material in the vehicle and of its inherent dangers, and shall have been instructed in the measures and procedures to be followed in order to protect the public from those dangers. He shall have been made familiar with the vehicle he is assigned, and shall be trained, supplied with the necessary means, and authorized to move the vehicle when required.

(g) Blasting agents

(3) *Bulk delivery and mixing vehicles.*

(iii) Operation of bulk delivery vehicles shall conform to the requirements of this subdivision. These include the placarding requirements as specified by Department of Transportation.

(a) The operator shall be trained in the safe operation of the vehicle together with its mixing, conveying, and related equipment. The employer shall assure that the operator is familiar with the commodities being delivered and the general procedure for handling emergency situations.

(6) *Transportation of packaged blasting agents.*

(ii) Vehicles transporting blasting agents shall only be driven by and be in the charge of a driver in possession of a valid motor vehicle operator's license. Such a person shall also be familiar with the State's vehicle and traffic laws.

(h) Water gel (Slurry) explosives and blasting agents

(4) *Bulk delivery and mixing vehicles.*

(ii) Operation of bulk delivery and mixing vehicles shall comply with the requirements of this subdivision.

(b) The operator shall be trained in the safe operation of the vehicle together with its mixing, conveying, and related equipment. He shall be familiar with the commodities being delivered and the general procedure for handling emergency situations.

1910.110 Storage and handling of liquefied petroleum gases

(b)(16),
(d)(12)(i)

(b) Basic rules

(16) *Instructions.* Personnel performing installation, removal, operation, and maintenance work shall be properly trained in such functions.

(d) Storage systems using containers other than DOT containers

(12) General provisions applicable to systems in industrial plants (of 2,000 gallons water capacity and more) and to bulk filling plants.

(i) When standard watch service is provided, it shall be extended to the LP-Gas installation and personnel properly trained.

1910.111 Storage and handling of anhydrous ammonia

(b)(13)(ii) **(b) Basic rules.** This paragraph applies to all paragraphs of this section unless otherwise noted.

(13) Tank car unloading points and operations

- (ii) The employer shall insure that unloading operations are performed by reliable persons properly instructed and given the authority to monitor careful compliance with all applicable procedures.

1910.119 Process safety management of highly hazardous chemicals

(g), (h)(3)(i)
through (iv),
and (j)(3) **(g) Training**

(1) *Initial training.*

- (i) Each employee presently involved in operating a process, and each employee before being involved in operating a newly assigned process, shall be trained in an overview of the process and in the operating procedures as specified in paragraph (f) of this section. The training shall include emphasis on the specific safety and health hazards, emergency operations including shutdown, and safe work practices applicable to the employee's job tasks.
- (ii) In lieu of initial training for those employees already involved in operating a process on May 26, 1992, an employer may certify in writing that the employee has the required knowledge, skills, and abilities to safely carry out the duties and responsibilities as specified in the operating procedures.

(2) *Refresher training.* Refresher training shall be provided at least every three years, and more often if necessary, to each employee involved in operating a process to assure that the employee understands and adheres to the current operating procedures of the process. The employer, in consultation with the employees involved in operating the process, shall determine the appropriate frequency of refresher training.

(3) *Training documentation.* The employer shall ascertain that each employee involved in operating a process has received and understood the training required by this paragraph. The employer shall prepare a record which contains the identity of the employee, the date of training, and the means used to verify that the employee understood the training.

(h) Contractors

(3) *Contract employer responsibilities.*

- (i) The contract employer shall assure that each contract employee is trained in the work practices necessary to perform his/her job.
- (ii) The contract employer shall assure that each contract employee is instructed in the known potential fire, explosion, or toxic release hazards related to his/her job and the process, and the applicable provisions of the emergency action plan.
- (iii) The contract employer shall document that each contract employee has received and understood the training required by this paragraph. The contract employer shall prepare a record which contains the identity of the contract employee, the date of training, and the means used to verify that the employee understood the training.
- (iv) The contract employer shall assure that each contract employee follows the safety rules of the facility including the safe work practices required by paragraph (f)(4) of this section.

(j) Mechanical integrity

- (3) *Training for process maintenance activities.* The employer shall train each employee involved in maintaining the ongoing integrity of process equipment in an overview of that process and its hazards and in the procedures applicable to the employee's job tasks to assure that the employee can perform the job tasks in a safe manner.

1910.120 Hazardous waste operations and emergency response

(e)(1) through
(9); (o)(1);
(p)(7); (p)(8)(iii);
(q)(4) through
(8), and (11)

(e) Training

(1) *General.*

- (i) All employees working on site (such as but not limited to equipment operators, general laborers and others) exposed to hazardous substances, health hazards, or safety hazards and their supervisors and management responsible for the site shall receive training meeting the requirements of this paragraph before they are permitted to engage in hazardous waste operations that could expose them to hazardous substances, safety, or health hazards, and they shall receive review training as specified in this paragraph.

- (ii) Employees shall not be permitted to participate in or supervise field activities until they have been trained to a level required by their job function and responsibility.
- (2) *Elements to be covered.* The training shall thoroughly cover the following:
 - (i) Names of personnel and alternates responsible for site safety and health;
 - (ii) Safety, health and other hazards present on the site;
 - (iii) Use of personal protective equipment;
 - (iv) Work practices by which the employee can minimize risks from hazards;
 - (v) Safe use of engineering controls and equipment on the site;
 - (vi) Medical surveillance requirements, including recognition of symptoms and signs which might indicate overexposure to hazards; and
 - (vii) The contents of paragraphs (G) through (J) of the site safety and health plan set forth in paragraph (b)(4)(ii) of this section.
- (3) *Initial training.*
 - (i) General site workers (such as equipment operators, general laborers and supervisory personnel) engaged in hazardous substance removal or other activities which expose or potentially expose workers to hazardous substances and health hazards shall receive a minimum of 40 hours of instruction off the site, and a minimum of three days actual field experience under the direct supervision of a trained, experienced supervisor.
 - (ii) Workers on site only occasionally for a specific limited task (such as, but not limited to, ground water monitoring, land surveying, or geophysical surveying) and who are unlikely to be exposed over permissible exposure limits and published exposure limits shall receive a minimum of 24 hours of instruction off the site, and the minimum of one day actual field experience under the direct supervision of a trained, experienced supervisor.
 - (iii) Workers regularly on site who work in areas which have been monitored and fully characterized indicating that exposures are under permissible exposure limits and published exposure limits where respirators are not necessary, and the

characterization indicates that there are no health hazards or the possibility of an emergency developing, shall receive a minimum of 24 hours of instruction off the site and the minimum of one day actual field experience under the direct supervision of a trained, experienced supervisor.

- (iv) Workers with 24 hours of training who are covered by paragraphs (e)(3)(ii) and (e)(3)(iii) of this section, and who become general site workers or who are required to wear respirators, shall have the additional 16 hours and two days of training necessary to total the training specified in paragraph (e)(3)(i).
- (4) *Management and supervisor training.* On-site management and supervisors directly responsible for, or who supervise employees engaged in, hazardous waste operations shall receive 40 hours initial training, and three days of supervised field experience (the training may be reduced to 24 hours and one day if the only area of their responsibility is employees covered by paragraphs (e)(3)(ii) and (e)(3)(iii)) and at least eight additional hours of specialized training at the time of job assignment on such topics as, but not limited to, the employer's safety and health program and the associated employee training program, personal protective equipment program, spill containment program, and health hazard monitoring procedure and techniques.
- (5) *Qualifications for trainers.* Trainers shall be qualified to instruct employees about the subject matter that is being presented in training. Such trainers shall have satisfactorily completed a training program for teaching the subjects they are expected to teach, or they shall have the academic credentials and instructional experience necessary for teaching the subjects. Instructors shall demonstrate competent instructional skills and knowledge of the applicable subject matter.
- (6) *Training certification.* Employees and supervisors that have received and successfully completed the training and field experience specified in paragraphs (e)(1) through (e)(4) of this section shall be certified by their instructor or the head instructor and trained supervisor as having successfully completed the necessary training. A written certificate shall be given to each person so certified. Any person who has not been so certified or who does not meet the requirements of paragraph (e)(9) of this section shall be prohibited from engaging in hazardous waste operations.

- (7) *Emergency response.* Employees who are engaged in responding to hazardous emergency situations at hazardous waste cleanup sites that may expose them to hazardous substances shall be trained in how to respond to such expected emergencies.
 - (8) *Refresher training.* Employees specified in paragraph (e)(1) of this section, and managers and supervisors specified in paragraph (e)(4) of this section, shall receive eight hours of refresher training annually on the items specified in paragraph (e)(2) and/or (e)(4) of this section, critiques of incidents that have occurred in the past year that can serve as training examples of any related work, and other relevant topics.
 - (9) *Equivalent training.* Employers who can show by documentation or certification that an employee's work experience and/or training has resulted in training equivalent to that training required in paragraphs (e)(1) through (e)(4) of this section shall not be required to provide the initial training requirements of those paragraphs to such employees and shall provide a copy of the certification or documentation to the employee upon request. However, certified employees or employees with equivalent training new to a site shall receive appropriate, site specific training before site entry and have appropriate supervised field experience at the new site. Equivalent training includes any academic training or the training that existing employees might have already received from actual hazardous waste site experience.
- (o) New technology programs**
- (1) The employer shall develop and implement procedures for the introduction of effective new technologies and equipment developed for the improved protection of employees working with hazardous waste clean-up operations, and the same shall be implemented as part of the site safety and health program to assure that employee protection is being maintained.
- (p) Certain Operations Conducted Under the Resource Conservation and Recovery Act of 1976 (RCRA).** Employers conducting operations at treatment, storage and disposal (TSD) facilities specified in paragraph (a)(1)(iv) of this section shall provide and implement the programs specified in this paragraph. See the "Notes and Exceptions" to paragraph (a)(2)(iii) of this section for employers not covered.

(7) *Training Program.*

- (i) *New employees.* The employer shall develop and implement a training program, which is part of the employer's safety and health program, for employees exposed to health hazards or hazardous substances at TSD operations to enable the employees to perform their assigned duties and functions in a safe and healthful manner so as not to endanger themselves or other employees. The initial training shall be for 24 hours and refresher training shall be for eight hours annually. Employees who have received the initial training required by this paragraph shall be given a written certificate attesting that they have successfully completed the necessary training.
- (ii) *Current employees.* Employers who can show by an employee's previous work experience and/or training that the employee has had training equivalent to the initial training required by this paragraph, shall be considered as meeting the initial training requirements of this paragraph as to that employee. Equivalent training includes the training that existing employees might have already received from actual site work experience. Current employees shall receive eight hours of refresher training annually.
- (iii) *Trainers.* Trainers who teach initial training shall have satisfactorily completed a training course for teaching the subjects they are expected to teach or they shall have the academic credentials and instruction experience necessary to demonstrate a good command of the subject matter of the courses and competent instructional skills.

(8) *Emergency Response Program.*

- (iii) *Training.*
 - (A) Training for emergency response employees shall be completed before they are called upon to perform in real emergencies. Such training shall include the elements of the emergency response plan, standard operating procedures the employer has established for the job, the personal protective equipment to be worn and procedures for handling emergency incidents.
Note: Exception #1: An employer need not train all employees to the degree specified if the employer divides the work force in a manner such

that a sufficient number of employees who have responsibility to control emergencies have the training specified, and all other employees, who may first respond to an emergency incident, have sufficient awareness training to recognize that an emergency response situation exists and that they are instructed in that case to summon the fully trained employees and not attempt control activities for which they are not trained.

Note: Exception #2: An employer need not train all employees to the degree specified if arrangements have been made in advance for an outside fully trained emergency response team to respond in a reasonable period and all employees, who may come to the incident first, have sufficient awareness training to recognize that an emergency response situation exists and they have been instructed to call the designated outside, fully trained emergency response team for assistance.

- (B) Employee members of TSD [treatment, storage and disposal] facility emergency response organizations shall be trained to a level of competence in the recognition of health and safety hazards to protect themselves and other employees. This would include training in the methods used to minimize the risk from safety and health hazards; in the safe use of control equipment; in the selection and use of appropriate personal protective equipment; in the safe operating procedures to be used at the incident scene; in the techniques of coordination with other employees to minimize risks; in the appropriate response to overexposure from health hazards or injury to themselves and other employees; and in the recognition of subsequent symptoms which may result from overexposures.
- (C) The employer shall certify that each covered employee has attended and successfully completed the training required in paragraph (p)(8)(iii) of this section, or shall certify the employee's competency for certification of training shall be recorded and maintained by the employer.

(q) Emergency response to hazardous substance releases

- (4) *Skilled support personnel.* Personnel, not necessarily an employer's own employees, who are skilled in the operation of certain equipment, such as mechanized earth moving or digging equipment or crane and hoisting equipment, and who are needed temporarily to perform immediate emergency support work that cannot reasonably be performed in a timely fashion by an employer's own employees, and who will be or may be exposed to the hazards at an emergency response scene, are not required to meet the training required in this paragraph for the employer's regular employees. However, these personnel shall be given an initial briefing at the site prior to their participation in any emergency response. The initial briefing shall include instruction in the wearing of appropriate personal protective equipment, what chemical hazards are involved, and what duties are to be performed. All other appropriate safety and health precautions provided to the employer's own employees shall be used to assure the safety and health of these personnel.
- (5) *Specialist employees.* Employees who, in the course of their regular job duties, work with and are trained in the hazards of specific hazardous substances, and who will be called upon to provide technical advice or assistance at a hazardous substance release incident to the individual in charge, shall receive training or demonstrate competency in the area of their specialization annually.
- (6) *Training.* Training shall be based on the duties and function to be performed by each responder of an emergency response organization. The skill and knowledge levels required for all new responders, those hired after the effective date of this standard, shall be conveyed to them through training before they are permitted to take part in actual emergency operations on an incident. Employees who participate, or are expected to participate in emergency response, shall be given training in accordance with the following paragraphs:
- (i) *First responder awareness level.* First responders at the awareness level are individuals who are likely to witness or discover a hazardous substance release and who have been trained to initiate an emergency response sequence by notifying the proper authorities of the release. First

responders at the awareness level shall have sufficient training or have had sufficient experience to objectively demonstrate competency in the following areas:

- (A) An understanding of what hazardous substances are, and the risks associated with them in an incident.
 - (B) An understanding of the potential outcomes associated with an emergency created when hazardous substances are present.
 - (C) The ability to recognize the presence of hazardous substances in an emergency.
 - (D) The ability to identify the hazardous substances, if possible.
 - (E) An understanding of the role of the first responder awareness individual in the employer's emergency response plan including site security and control and the U.S. Department of Transportation's Emergency Response Guidebook.
 - (F) The ability to realize the need for additional resources, and to make appropriate notifications to the communications center.
- (ii) *First responder operations level.* First responders at the operations level are individuals who respond to releases or potential releases of hazardous substances as part of the initial response to the site for the purpose of protecting nearby persons, property, or the environment from the effects of the release. They are trained to respond in a defensive fashion without actually trying to stop the release. Their function is to contain the release from a safe distance, keep it from spreading, and prevent exposures. First responders at the operational level shall have received at least eight hours of training or have had sufficient experience to objectively demonstrate competency in the following areas in addition to those listed for the awareness level and the employer shall so certify:
- (A) Knowledge of the basic hazard and risk assessment techniques.
 - (B) Know how to select and use proper personal protective equipment provided to the first responder operational level

- (C) An understanding of basic hazardous materials terms.
 - (D) Know how to perform basic control, containment and/or confinement operations within the capabilities of the resources and personal protective equipment available to the unit.
 - (E) Know how to implement basic decontamination procedures.
 - (F) An understanding of the relevant standard operating procedures and termination procedures.
- (iii) *Hazardous materials technician.* Hazardous materials technicians are individuals who respond to releases or potential releases for the purpose of stopping the release. They assume a more aggressive role than a first responder at the operations level in that they will approach the point of release in order to plug, patch or otherwise stop the release of a hazardous substance. Hazardous materials technicians shall have received at least 24 hours of training equal to the first responder operations level and in addition have competency in the following areas and the employer shall so certify:
- (A) Know how to implement the employer's emergency response plan.
 - (B) Know the classification, identification and verification of known and unknown materials by using field survey instruments and equipment.
 - (C) Be able to function within an assigned role in the Incident Command System.
 - (D) Know how to select and use proper specialized chemical personal protective equipment provided to the hazardous materials technician.
 - (E) Understand hazard and risk assessment techniques.
 - (F) Be able to perform advance control, containment, and/or confinement operations within the capabilities of the resources and personal protective equipment available to the unit.
 - (G) Understand and implement decontamination.
 - (H) Understand termination procedures.
 - (I) Understand basic chemical and toxicological terminology and behavior.

- (iv) *Hazardous materials specialist.* Hazardous materials specialists are individuals who respond with and provide support to hazardous materials technicians. Their duties parallel those of the hazardous materials technician, however, those duties require a more directed or specific knowledge of the various substances they may be called upon to contain. The hazardous materials specialist would also act as the site liaison with federal, state, local and other government authorities for site activities. Hazardous materials specialists shall have received at least 24 hours of training equal to the technician level and in addition have competency in the following areas and the employer shall so certify:
- (A) Know how to implement the local emergency response plan.
 - (B) Understand classification, identification and verification of known and unknown materials by using advanced survey instruments and equipment.
 - (C) Know the state emergency response plan.
 - (D) Be able to select and use proper specialized chemical personal protective equipment provided to the hazardous materials specialist.
 - (E) Understand in-depth hazard and risk assessment techniques.
 - (F) Be able to perform specialized control, containment, and/or confinement operations within the capabilities of the resources and personal protective equipment available.
 - (G) Be able to determine and implement decontamination procedures.
 - (H) Have the ability to develop a site safety and control plan.
 - (I) Understand chemical, radiological and toxicological terminology and behavior.
- (v) *On scene incident commander.* Incident commanders, who will assume control of the incident scene beyond the first responder awareness level, shall receive at least 24 hours of training equal to the first responder operations level and in addition have competency in the following areas and the employer shall so certify:

- (A) Know and be able to implement the employer's incident command system.
 - (B) Know how to implement the employer's emergency response plan.
 - (C) Know and understand the hazards and risks associated with employees working in chemical protective clothing.
 - (D) Know how to implement the local emergency response plan.
 - (E) Know of the state emergency response plan and of the Federal Regional Response Team.
 - (F) Know and understand the importance of decontamination procedures.
- (7) *Trainers.* Trainers who teach any of the above training subjects shall have satisfactorily completed a training course for teaching the subjects they are expected to teach, such as the courses offered by the U.S. National Fire Academy, or they shall have the training and/or academic credentials and instructional experience necessary to demonstrate competent instructional skills and a good command of the subject matter of the courses they are to teach.
- (8) *Refresher Training.*
- (i) Those employees who are trained in accordance with paragraph (q)(6) of this section shall receive annual refresher training of sufficient content and duration to maintain their competencies, or shall demonstrate their competency in those areas at least yearly.
 - (ii) A statement shall be made on the training or competency, and if a statement of competency is made, the employer shall keep a record of the methodology used to demonstrate competency.
- (11) *Post-emergency response operations.* Upon completion of the emergency response, if it is determined that it is necessary to remove hazardous substances, health hazards and materials contaminated with them (such as contaminated soil or other elements of the natural environment) from the site of the incident, the employer conducting the clean-up shall comply with one of the following:

- (i) Meet all the requirements of paragraphs (b) through (o) of this section; or
- (ii) Where the clean-up is done on plant property using plant or workplace employees, such employees shall have completed the training requirements of the following: 29 CFR 1910.38, 1910.134, 1910.1200, and other appropriate safety and health training made necessary by the tasks they are expected to perform such as personal protective equipment and decontamination procedures.

Appendix C to 1910.120 — Compliance guidelines

1. *Occupational Safety and Health Program.* Each hazardous waste site clean-up effort will require an occupational safety and health program headed by the site coordinator or the employer's representative. The purpose of the program will be the protection of employees at the site and will be an extension of the employer's overall safety and health program...

...Each site or workplace safety and health program will need to include the following...

...(4) means for the training of supervisors and employees to develop the needed skills and knowledge to perform their work in a safe and healthful manner...

2. *Training.* The training program for employees subject to the requirements of paragraph (e) of this standard should address:
 - the safety and health hazards employees should expect to find on hazardous waste clean-up sites;
 - what control measures or techniques are effective for those hazards;
 - what monitoring procedures are effective in characterizing exposure levels;
 - what makes an effective employer's safety and health program;
 - what a site safety and health program should include;
 - hands-on training with personal protective equipment and clothing they may be expected to use;
 - the contents of the OSHA standards relevant to the employee's duties and functions; and
 - employee's responsibilities under OSHA and other regulations.

Supervisors will need training in their responsibilities under the safety and health program and its subject areas such as the spill containment program, the personal protective equipment program, the medical surveillance program, and the emergency response plan and other areas.

The training programs for employees subject to the requirements of paragraph (p) of this standard should address:

- the employer's safety and health program elements impacting employees;
- the hazard communication program;
- the medical surveillance program;
- the hazards and the controls for such hazards that employees need to know for their job duties and functions.

All require annual refresher training.

The training programs for employees covered by the requirements of paragraph (q) of this standard should address those competencies required for the various levels of response such as:

- hazards associated with hazardous substances;
- hazard identification and awareness;
- notification of appropriate persons;
- need for and use of personal protective equipment including respirators;
- decontamination procedures to be used;
- preplanning activities for hazardous substance incidents including the emergency response plan;
- company standard operating procedures for hazardous substance emergency responses;
- use of the incident command system and other subjects.

Hands-on training should be stressed whenever possible. Critiques done after an incident which include an evaluation of what worked and what did not and how could the incident be better handled the next time may be counted as training time.

For hazardous materials specialists (usually members of hazardous materials teams), the training should address the care, use and/or testing of chemical protective clothing including totally encapsulating suits, the medical surveillance program, the standard operating procedures for the hazardous materials team including the use of plugging and patching equipment and other subject areas.

Officers and leaders who may be expected to be in charge at an incident should be fully knowledgeable of their company's incident command system. They should know where and how to obtain additional assistance and be familiar with the local district's emergency response plan and the state emergency response plan.

Specialist employees such as technical experts, medical experts or environmental experts that work with hazardous materials in their regular jobs, who may be sent to the incident scene by the shipper, manufacturer or governmental agency to advise and assist the person in charge of the incident should have training on an annual basis. Their training should include the care and use of personal protective equipment including respirators; knowledge of the incident command system and how they are to relate to it; and those areas needed to keep them current in their respective field as it relates to safety and health involving specific hazardous substances.

Those skilled support personnel, such as employees who work for public works departments or equipment operators who operate bulldozers, sand trucks, backhoes, etc., who may be called to the incident scene to provide emergency support assistance, should have at least a safety and health briefing before entering the area of potential or actual exposure. These skilled support personnel, who have not been a part of the emergency response plan and do not meet the training requirements, should be made aware of the hazards they face and should be provided all necessary protective clothing and equipment required for their tasks.

There are two National Fire Protection Association standards, NFPA 472—“Standard for Professional Competence of Responders to Hazardous Material Incidents” and NFPA 471—“Recommended Practice for Responding to Hazardous Material Incidents,” which are excellent resource documents to aid fire departments and other emergency response organizations in developing their training program materials. NFPA 472 provides guidance on the skills and knowledge needed for first responder awareness level, first responder operations level, hazmat technicians, and hazmat specialist. It also offers guidance for the officer corp who will be in charge of hazardous substance incidents.

Appendix E to 1910.120 — Training curriculum guidelines

The following non-mandatory general criteria may be used for assistance in developing site-specific training curriculum used to meet the training requirements of 29 CFR 1910.120(e); 29 CFR 1910.120(p)(7), (p)(8)(iii); and 29 CFR 1910.120(q)(6), (q)(7), and (q)(8). These are generic guidelines and they are not presented as a complete training curriculum for any specific employer. Site-specific training programs must be developed on the basis of a needs assessment of the hazardous waste site, RCRA/TSD, or emergency response operation in accordance with 29 CFR 1910.120.

It is noted that the legal requirements are set forth in the regulatory text of §1910.120. The guidance set forth here presents a highly effective program that in the areas covered would meet or exceed the regulatory requirements. In addition, other approaches could meet the regulatory requirements.

Suggested General Criteria

Definitions:

“Competent” means possessing the skills, knowledge, experience, and judgment to perform assigned tasks or activities satisfactorily as determined by the employer.

“Demonstration” means the showing by actual use of equipment or procedures.

“Hands-on training” means training in a simulated work environment that permits each student to have experience performing tasks, making decisions, or using equipment appropriate to the job assignment for which the training is being conducted.

“Initial training” means training required prior to beginning work.

“Lecture” means an interactive discourse with a class led by an instructor.

“Proficient” means meeting a stated level of achievement.

“Site-specific” means individual training directed to the operations of a specific job site.

“Training hours” means the number of hours devoted to lecture, learning activities, small group work sessions, demonstration, evaluations, or hands-on experience.

Suggested core criteria:

1. Training facility.

The training facility should have available sufficient resources, equipment, and site locations to perform didactic and hands-on training when appropriate. Training facilities should have sufficient organization, support staff, and services to conduct training in each of the courses offered.

2. Training Director.

Each training program should be under the direction of a training director who is responsible for the program. The Training Director should have a minimum of two years of employee education experience.

3. Instructors.

Instructors should be deemed competent on the basis of:

- previous documented experience in their area of instruction,
- successful completion of a “train-the-trainer” program specific to the topics they will teach,
- evaluation of instructional competence by the Training Director.

Instructors should be required to maintain professional competency by participating in continuing education or professional development programs or by completing successfully an annual refresher course and having an annual review by the Training Director.

The annual review by the Training Director should include

- observation of an instructor’s delivery,
- a review of those observations with the trainer, and
- an analysis of any instructor or class evaluations completed by the students during the previous year.

4. Course materials.

The Training Director should approve all course materials to be used by the training provider. Course materials should be reviewed and updated at least annually. Materials and equipment should be in good working order and maintained properly.

All written and audio-visual materials in training curricula should be peer reviewed by technically competent outside reviewers or by a standing advisory committee.

Reviewers should possess expertise in the following disciplines were applicable:

- occupational health,
- industrial hygiene and safety,
- chemical/environmental engineering,
- employee education, or emergency response.

One or more of the peer reviewers should be an employee experienced in the work activities to which the training is directed.

5. Students.

The program for accepting students should include:

- a. Assurance that the student is or will be involved in work where chemical exposures are likely and that the student possesses the skills necessary to perform the work.
- b. A policy on the necessary medical clearance.

6. Ratios.

Student-instructor ratios should not exceed 30 students per instructor. Hands-on activity requiring the use of personal protective equipment should have the following student-instructor ratios:

- For Level C or Level D personal protective equipment the ratio should be 10 students per instructor.
- For Level A or Level B personal protective equipment the ratio should be 5 students per instructor.

7. Proficiency assessment.

Proficiency should be evaluated and documented by the use of a written assessment and a skill demonstration selected and developed by the Training Director and training staff. The assessment and demonstration should evaluate the knowledge and individual skills developed in the course of training. The level of minimum achievement necessary for proficiency shall be specified in writing by the Training Director.

If a written test is used, there should be a minimum of 50 questions. If a written test is used in combination with a skills demonstration, a minimum of 25 questions should be used. If a skills demonstration is used, the tasks chosen and the means to rate successful completion should be fully documented by the Training Director.

The content of the written test or of the skill demonstration shall be relevant to the objectives of the course. The written test and skill demonstration should be updated as necessary to reflect changes in the curriculum and any update should be approved by the Training Director.

The proficiency assessment methods, regardless of the approach or combination of approaches used, should be justified, documented and approved by the Training Director.

The proficiency of those taking the additional courses for supervisors should be evaluated and documented by using proficiency assessment methods acceptable to the Training Director. These proficiency assessment methods must reflect the additional responsibilities borne by supervisory personnel in hazardous waste operations or emergency response.

8. Course certificate.

Written documentation should be provided to each student who satisfactorily completes the training course. The documentation should include:

- a. Student's name.
- b. Course title.
- c. Course date.
- d. Statement that the student has successfully completed the course.
- e. Name and address of the training provider.
- f. An individual identification number for the certificate.
- g. List of the levels of personal protective equipment used by the student to complete the course.

This documentation may include a certificate and an appropriate wallet-sized laminated card with a photograph of the student and the above information. When such course certificate cards are used, the individual identification number for the training certificate should be shown on the card.

9. Recordkeeping.

Training providers should maintain records that list:

- the dates courses were presented,
- the names of the individual course attenders,
- the names of those students successfully completing each course, and
- the number of training certificates issued to each successful student.

These records should be maintained for a minimum of five years after the date an individual participated in a training program offered by the training provider. These records should be available and provided upon the student's request or as mandated by law.

10. Program quality control.

The Training Director should conduct or direct an annual written audit of the training program. Program modifications to address deficiencies, if any, should be documented, approved, and implemented by the training provider. The audit and the program modification documents should be maintained at the training facility.

Suggested Program Quality Control Criteria

Factors listed here are suggested criteria for determining the quality and appropriateness of employee health and safety training for hazardous waste operations and emergency response.

A. Training Plan.

Adequacy and appropriateness of the training program's curriculum development, instructor training, distribution of course materials, and direct student training should be considered, including:

1. The duration of training, course content, and course schedules/agendas;
2. The different training requirements of the various target populations, as specified in the appropriate generic training curriculum;
3. The process for the development of curriculum, which includes appropriate technical input, outside review, evaluation, program pretesting;
4. The adequate and appropriate inclusion of hands-on, demonstration, and instruction methods;
5. Adequate monitoring of student safety, progress, and performance during the training.

B. Program management, Training Director, staff, and consultants.

Adequacy and appropriateness of staff performance and delivering an effective training program should be considered, including:

1. Demonstration of the training director's leadership in assuring quality of health and safety training.
2. Demonstration of the competency of the staff to meet the demands of delivering high quality hazardous waste employee health and safety training.
3. Organization charts establishing clear lines of authority.
4. Clearly defined staff duties including the relationship of the training staff to the overall program.
5. Evidence that the training organizational structure suits the needs of the training program.
6. Appropriateness and adequacy of the training methods used by the instructors.
7. Sufficiency of the time committed by the training director and staff to the training program.
8. Adequacy of the ratio of training staff to students.

9. Availability and commitment of the training program of adequate human and equipment resources in the areas of
 - a. Health effects,
 - b. Safety,
 - c. Personal protective equipment (PPE),
 - d. Operational procedures,
 - e. Employee protection practices/procedures.
10. Appropriateness of management controls.
11. Adequacy of the organization and appropriate resources assigned to assure appropriate training.
12. In the case of multiple-site training programs, adequacy of satellite centers management.

C. Training facilities and resources.

Adequacy and appropriateness of the facilities and resources for supporting the training program should be considered, including:

1. Space and equipment to conduct the training.
2. Facilities for representative hands-on training.
3. In the case of multiple-site programs, equipment and facilities at the satellite centers.
4. Adequacy and appropriateness of the quality control and evaluations program to account for instructor performance.
5. Adequacy and appropriateness of the quality control and evaluation program to ensure appropriate course evaluation, feedback, updating, and corrective action.
6. Adequacy and appropriateness of disciplines and expertise being used within the quality control and evaluation program.
7. Adequacy and appropriateness of the role of student evaluations to provide feedback for training program improvement.

D. Quality control and evaluation.

Adequacy and appropriateness of quality control and evaluation plans for training programs should be considered, including:

1. A balanced advisory committee and/or competent outside reviewers to give overall policy guidance.
2. Clear and adequate definition of the composition and active programmatic role of the advisory committee or outside reviewers.

3. Adequacy of the minutes or reports of the advisory committee or outside reviewers' meetings or written communication.
4. Adequacy and appropriateness of the quality control and evaluations program to account for instructor performance.
5. Adequacy and appropriateness of the quality control and evaluation program to ensure appropriate course evaluation, feedback, updating, and corrective action.
6. Adequacy and appropriateness of disciplines and expertise being used within the quality control and evaluation program.
7. Adequacy and appropriateness of the role of student evaluations to provide feedback for training program improvement.

E. Students

Adequacy and appropriateness of the program for accepting students should be considered, including:

1. Assurance that the student already possess the necessary skills for their job, including necessary documentation.
2. Appropriateness of methods the program uses to ensure that recruits are capable of satisfactorily completing training.
3. Review and compliance with any medical clearance policy.

F. Institutional Environment and Administrative Support

The adequacy and appropriateness of the institutional environment and administrative support system for the training program should be considered, including:

1. Adequacy of the institutional commitment to the employee training program.
2. Adequacy and appropriateness of the administrative structure and administrative support.

G. Summary of Evaluation Questions

Key questions for evaluating the quality and appropriateness of an overall training program should include the following:

1. Are the program objectives clearly stated?
2. Is the program accomplishing its objectives?
3. Are appropriate facilities and staff available?
4. Is there an appropriate mix of classroom, demonstration, and hands-on training?
5. Is the program providing quality employee health and safety training that fully meets the intent of regulatory requirements?

6. What are the program's main strengths?
7. What are the program's main weaknesses?
8. What is recommended to improve the program?
9. Are instructors instructing according to their training outlines?
10. Is the evaluation tool current and appropriate for the program content?
11. Is the course material current and relevant to the target group?

Suggested Training Curriculum Guidelines

The following training curriculum guidelines are for those operations specifically identified in 29 CFR 1910.120 as requiring training. Issues such as qualifications of instructors, training certification, and similar criteria appropriate to all categories of operations addressed in 1910.120 have been covered in the preceding section and are not readdressed in each of the generic guidelines. Basic core requirements for training programs that are addressed include:

1. General Hazardous Waste Operations
2. Resource Conservation and Recovery Act (RCRA) operations—Treatment, storage, and disposal facilities.
3. Emergency Response.

A. General Hazardous Waste Operations and Site-specific Training

1. *Off-site training.* Training course content for hazardous waste operations, required by 29 CFR 1910.120(e), should include the following topics or procedures:
 - a. *Regulatory knowledge.*
 - (1) A review of 29 CFR 1910.120 and the core elements of an occupational safety and health program.
 - (2) The content of a medical surveillance program as outlined in 29 CFR 1910.120(f).
 - (3) The content of an effective site safety and health plan consistent with the requirements of 29 CFR 1910.120(b)(4)(ii).
 - (4) Emergency response plan and procedures as outlined in 29 CFR 1910.38 and 29 CFR 1910.120(l).
 - (5) Adequate illumination.
 - (6) Sanitation recommendation and equipment.
 - (7) Review and explanation of OSHA's Hazard Communication standard (29 CFR 1910.1200) and Lockout/Tagout standard (29 CFR 1910.147).

- (8) Review of other applicable standards including but not limited to those in the Construction standards (29 CFR part 1926).
 - (9) Rights and responsibilities of employers and employees under applicable OSHA and EPA laws.
- b. *Technical knowledge.*
- (1) Type of potential exposures to chemical, biological, and radiological hazards; types of human responses to these hazards and recognition of those responses; principles of toxicology and information about acute and chronic hazards; health and safety considerations of new technology.
 - (2) Fundamentals of chemical hazards including but not limited to vapor pressure, boiling points, flash points, ph, other physical and chemical properties.
 - (3) Fire and explosion hazards of chemicals.
 - (4) General safety hazards such as but not limited to electrical hazards, powered equipment hazards, motor vehicle hazards, walking-working surface hazards, excavation hazards, and hazards associated with working in hot and cold temperature extremes.
 - (5) Review and knowledge of confined space entry procedures in 29 CFR 1910.146.
 - (6) Work practices to minimize employee risk from site hazards.
 - (7) Safe use of engineering controls, equipment, and any new relevant safety technology or safety procedures.
 - (8) Review and demonstration of competency with air sampling and monitoring equipment that may be used in a site monitoring program.
 - (9) Container sampling procedures and safeguarding; general drum and container handling procedures including special requirement for laboratory waste packs, shock-sensitive wastes, and radioactive wastes.
 - (10) The elements of a spill control program.
 - (11) Proper use and limitations of material handling equipment.
 - (12) Procedures for safe and healthful preparation of containers for shipping and transport.
 - (13) Methods of communication including those used while wearing respiratory protection.

c. *Technical skills.*

- (1) Selection, use maintenance, and limitations of personal protective equipment including the components and procedures for carrying out a respirator program to comply with 29 CFR 1910.134.
- (2) Instruction in decontamination programs including personnel, equipment, and hardware; hands-on training including level A, B, and C ensembles and appropriate decontamination lines; field activities including the donning and doffing of protective equipment to a level commensurate with the employee's anticipated job function and responsibility and to the degree required by potential hazards.
- (3) Sources for additional hazard information; exercises using relevant manuals and hazard coding systems.

d. *Additional suggested items.*

- (1) A laminated, dated card or certificate with photo, denoting limitations and level of protection for which the employee is trained should be issued to those students successfully completing a course.
- (2) Attendance should be required at all training modules, with successful completion of exercises and a final written or oral examination with at least 50 questions.
- (3) A minimum of one-third of the program should be devoted to hands-on exercises.
- (4) A curriculum should be established for the 8-hour refresher training required by 29 CFR 1910.120(e)(8), with delivery of such courses directed toward those areas of previous training that need improvement or reemphasis.
- (5) A curriculum should be established for the required 8-hour training for supervisors. Demonstrated competency in the skills and knowledge provided in a 40-hour course should be a prerequisite for supervisor training.

2. *Refresher training.*

The 8-hour annual refresher training required in 29 CFR 1910.120(e)(8) should be conducted by qualified training providers. Refresher training should include at a minimum the following topics and procedures:

- (a) Review of and retraining on relevant topics covered in the 40-hour program, as appropriate, using reports by the students on their work experiences.

- (b) Update on developments with respect to material covered in the 40-hour course.
 - (c) Review of changes to pertinent provisions of EPA or OSHA standards or laws.
 - (d) Introduction of additional subject areas as appropriate.
 - (e) Hands-on review of new or altered PPE or decontamination equipment or procedures. Review of new developments in personal protective equipment.
 - (f) Review of newly developed air and contaminant monitoring equipment.
3. *On-site training.*
- a. The employer should provide employees engaged in hazardous waste site activities with information and training prior to initial assignment to their work area, as follows:
 - (1) The requirements of the hazard communication program including the location and availability of the written program, required lists of hazardous chemicals, and material safety data sheets.
 - (2) Activities and locations in their work area where hazardous substances may be present.
 - (3) Methods and observations that may be used to detect the presence or release of a hazardous chemical in the work area (such as monitoring conducted by the employer, continuous monitoring devices, visual appearances, or other evidence (sight, sound or smell) of hazardous chemicals being released, and applicable alarms from monitoring devices that record chemical releases.
 - (4) The physical and health hazards of substances known or potentially present in the work area.
 - (5) The measures employees can take to help protect themselves from work-site hazards, including specific procedures the employer has implemented.
 - (6) An explanation of the labeling system and material safety data sheets and how employees can obtain and use appropriate hazard information.
 - (7) The elements of the confined space program including special PPE, permits, monitoring requirements, communication procedures, emergency response, and applicable lock-out procedures.
 - b. The employer should provide hazardous waste employees information and training and should provide a review and access to the site safety and plan as follows:

- (1) Names of personnel and alternates responsible for site safety and health.
 - (2) Safety and health hazards present on the site.
 - (3) Selection, use, maintenance, and limitations of personal protective equipment specific to the site.
 - (4) Work practices by which the employee can minimize risks from hazards.
 - (5) Safe use of engineering controls and equipment available on site.
 - (6) Safe decontamination procedures established to minimize employee contact with hazardous substances, including:
 - (A) Employee decontamination,
 - (B) Clothing decontamination, and
 - (C) Equipment decontamination.
 - (7) Elements of the site emergency response plan, including:
 - (A) Pre-emergency planning.
 - (B) Personnel roles and lines of authority and communication.
 - (C) Emergency recognition and prevention.
 - (D) Safe distances and places of refuge.
 - (E) Site security and control.
 - (F) Evacuation routes and procedures.
 - (G) Decontamination procedures not covered by the site safety and health plan.
 - (H) Emergency medical treatment and first aid.
 - (I) Emergency equipment and procedures for handling emergency incidents.
- c. The employer should provide hazardous waste employees information and training on personal protective equipment used at the site, such as the following:
- (1) PPE to be used based upon known or anticipated site hazards.
 - (2) PPE limitations of materials and construction; limitations during temperature extremes, heat stress, and other appropriate medical considerations; use and limitations of respirator equipment as well as documentation procedures as outlined in 29 CFR 1910.134.
 - (3) PPE inspection procedures prior to, during, and after use.
 - (4) PPE donning and doffing procedures.
 - (5) PPE decontamination and disposal procedures.

- (6) PPE maintenance and storage.
- (7) Task duration as related to PPE limitations.
- d. The employer should instruct the employee about the site medical surveillance program relative to the particular site, including
 - (1) Specific medical surveillance programs that have been adapted for the site.
 - (2) Specific signs and symptoms related to exposure to hazardous materials on the site.
 - (3) The frequency and extent of periodic medical examinations that will be used on the site.
 - (4) Maintenance and availability of records.
 - (5) Personnel to be contacted and procedures to be followed when signs and symptoms of exposures are recognized.
- e. The employees will review and discuss the site safety plan as part of the training program. The location of the site safety plan and all written programs should be discussed with employees including a discussion of the mechanisms for access, review, and references described.

B. RCRA Operations Training for Treatment, Storage and Disposal Facilities.

- 1. As a minimum, the training course required in 29 CFR 1910.120(p) should include the following topics:
 - (a) Review of the applicable paragraphs of 29 CFR 1910.120 and the elements of the employer's occupational safety and health plan.
 - (b) Review of relevant hazards such as, but not limited to, chemical, biological, and radiological exposures; fire and explosion hazards; thermal extremes; and physical hazards.
 - (c) General safety hazards including those associated with electrical hazards, powered equipment hazards, lockout/tagout procedures, motor vehicle hazards and walking-working surface hazards.
 - (d) Confined space hazards and procedures.
 - (e) Work practices to minimize employee risk from workplace hazards.
 - (f) Emergency response plan and procedures including first aid meeting the requirements of paragraph (p)(8).
 - (g) A review of procedures to minimize exposure to hazardous waste and various type of waste streams, including the materials handling program and spill containment program.

- (h) A review of hazard communication programs meeting the requirements of 29 CFR 1910.1200.
 - (i) A review of medical surveillance programs meeting the requirements of 29 CFR 1910.120(p)(3) including the recognition of signs and symptoms of overexposure to hazardous substances including known synergistic interactions.
 - (j) A review of decontamination programs and procedures meeting the requirements of 29 CFR 1910.120(p)(4).
 - (k) A review of an employer's requirements to implement a training program and its elements.
 - (l) A review of the criteria and programs for proper selection and use of personal protective equipment, including respirators.
 - (m) A review of the applicable appendices to 29 CFR 1910.120.
 - (n) Principles of toxicology and biological monitoring as they pertain to occupational health.
 - (o) Rights and responsibilities of employees and employers under applicable OSHA and EPA laws.
 - (p) Hands-on exercises and demonstrations of competency with equipment to illustrate the basic equipment principles that may be used during the performance of work duties, including the donning and doffing of PPE.
 - (q) Sources of reference, efficient use of relevant manuals, and knowledge of hazard coding systems to include information contained in hazardous waste manifests.
 - (r) At least 8 hours of hands-on training.
 - (s) Training in the job skills required for an employee's job function and responsibility before they are permitted to participate in or supervise field activities.
2. The individual employer should provide hazardous waste employees with information and training prior to an employee's initial assignment into a work area. The training and information should cover the following topics:
- (a) The Emergency response plan and procedures including first aid.
 - (b) A review of the employer's hazardous waste handling procedures including the materials handling program and elements of the spill containment program, location of spill response kits or equipment, and the names of those trained to respond to releases.
 - (c) The hazardous communication program meeting the requirements of 29 CFR 1910.1200.

- (d) A review of the employer's medical surveillance program including the recognition of signs and symptoms of exposure to relevant hazardous substance including known synergistic interactions.
- (e) A review of the employer's decontamination program and procedures.
- (f) A review of the employer's training program and the parties responsible for that program.
- (g) A review of the employer's personal protective equipment program including the proper selection and use of PPE based upon specific site hazards.
- (h) All relevant site-specific procedures addressing potential safety and health hazards. This may include, as appropriate, biological and radiological exposures, fire and explosion hazards, thermal hazards, and physical hazards such as electrical hazards, powered equipment hazards, lockout/tagout hazards, motor vehicle hazards, and walking-working surface hazards.
- (i) Safe use engineering controls and equipment on site.
- (j) Names of personnel and alternates responsible for safety and health.

C. Emergency response training.

Federal OSHA standards in 29 CFR 1910.120(q) are directed toward private sector emergency responders. Therefore, the guidelines provided in this portion of the appendix are directed toward that employee population. However, they also impact indirectly through State OSHA or USEPA regulations some public sector emergency responders. Therefore, the guidelines provided in this portion of the appendix may be applied to both employee populations.

States with OSHA state plans must cover their employees with regulations at least as effective as the Federal OSHA standards. Public employees in states without approved state OSHA programs covering hazardous waste operations and emergency response are covered by the U.S. EPA under 40 CFR 311, a regulation virtually identical to §1910.120.

Since this is a non-mandatory appendix and therefore not an enforceable standard, OSHA recommends that those employers, employees or volunteers in public sector emergency response organizations outside Federal OSHA jurisdiction consider the following criteria in developing their own training programs. A unified approach to training at the community level between emergency response organizations covered by Federal OSHA and those not covered directly by Federal OSHA can help ensure an effective community response to the release or potential release of hazardous substances in the community.

a. *General considerations.*

Emergency response organizations are required to consider the topics listed in §1910.120(q)(6). Emergency response organizations may use some or all of the following topics to supplement those mandatory topics when developing their response training programs. Many of the topics would require an interaction between the response provider and the individuals responsible for the site where the response would be expected.

- (1) Hazard recognition, including:
 - (A) Nature of hazardous substances present,
 - (B) Practical applications of hazard recognition, including presentations on biology, chemistry, and physics.
- (2) Principles of toxicology, biological monitoring, and risk assessment.
- (3) Safe work practices and general site safety.
- (4) Engineering controls and hazardous waste operations.
- (5) Site safety plans and standard operating procedures.
- (6) Decontamination procedures and practices.
- (7) Emergency procedures, first aid, and self-rescue.
- (8) Safe use of field equipment.
- (9) Storage, handling, use and transportation of hazardous substances.
- (10) Use, care, and limitations of personal protective equipment.
- (11) Safe sampling techniques.
- (12) Rights and responsibilities of employees under OSHA and other related laws concerning right-to-know, safety and health, compensations and liability.
- (13) Medical monitoring requirements.
- (14) Community relations.

b. *Suggested criteria for specific courses.*

- (1) *First responder awareness level.*
 - (A) Review of and demonstration of competency in performing the applicable skills of 29 CFR 1910.120(q).
 - (B) Hands-on experience with the U.S. Department of Transportation's Emergency Response Guidebook (ERG) and familiarization with OSHA standard 29 CFR 1910.1201.

- (C) Review of the principles and practices for analyzing an incident to determine both the hazardous substances present and the basic hazard and response information for each hazardous substance present.
 - (D) Review of procedures for implementing actions consistent with the local emergency response plan, the organization's standard operating procedures, and the current edition of DOT's ERG including emergency notification procedures and follow-up communications.
 - (E) Review of the expected hazards including fire and explosions hazards, confined space hazards, electrical hazards, powered equipment hazards, motor vehicle hazards, and walking-working surface hazards.
 - (F) Awareness and knowledge of the competencies for the First Responder at the Awareness Level covered in the National Fire Protection Association's Standard No. 472, *Professional Competence of Responders to Hazardous Materials Incidents*.
- (2) *First responder operations level.*
- (A) Review of and demonstration of competency in performing the applicable skills of 29 CFR 1910.120(q).
 - (B) Hands-on experience with the U.S. Department of Transportation's Emergency Response Guidebook (ERG), manufacturer material safety data sheets, CHEMTREC/CANUTEC, shipper or manufacturer contacts, and other relevant sources of information addressing hazardous substance releases. Familiarization with OSHA standard 29 CFR 1910.1201.
 - (C) Review of the principles and practices for analyzing an incident to determine the hazardous substances present, the likely behavior of the hazardous substance and its container, the types of hazardous substance transportation containers and vehicles, the types and selection of the appropriate defensive strategy for containing the release.
 - (D) Review of procedures for implementing continuing response actions consistent with the local emergency response plan, the organization's standard operating procedures, and the current edition of DOT's ERG including extended emergency notification procedures and follow-up communications.
 - (E) Review of the principles and practice for proper selection and use of personal protective equipment.
 - (F) Review of the principles and practice of personnel and equipment decontamination.

- (G) Review of the expected hazards including fire and explosions hazards, confined space hazards, electrical hazards, powered equipment hazards, motor vehicle hazards, and walking-working surface hazards.
 - (H) Awareness and knowledge of the competencies for the First Responder at the Operations Level covered in the National Fire Protection Association's Standard No. 472, *Professional Competence of Responders to Hazardous Materials Incidents*.
- (3) *Hazardous materials technician.*
- (A) Review of and demonstration of competency in performing the applicable skills of 29 CFR 1910.120(q).
 - (B) Hands-on experience with written and electronic information relative to response decision making including but not limited to the U.S. Department of Transportation's *Emergency Response Guidebook* (ERG), manufacturer material safety data sheets, CHEMTREC/CANUTEC, shipper or manufacturer contacts, computer data bases and response models, and other relevant sources of information addressing hazardous substance releases. Familiarization with OSHA standard 29 CFR 1910.1201.
 - (C) Review of the principles and practices for analyzing an incident to determine the hazardous substances present, their physical and chemical properties, the likely behavior of the hazardous substance and its container, the types of hazardous substance transportation containers and vehicles involved in the release, the appropriate strategy for approaching release sites and containing the release.
 - (D) Review of procedures for implementing continuing response actions consistent with the local emergency response plan, the organization's standard operating procedures, and the current edition of DOT's ERG including extended emergency notification procedures and follow-up communications.
 - (E) Review of the principles and practice for proper selection and use of personal protective equipment.
 - (F) Review of the principles and practices of establishing exposure zones, proper decontamination and medical surveillance stations and procedures.
 - (G) Review of the expected hazards including fire and explosions hazards, confined space hazards, electrical hazards, powered equipment hazards, motor vehicle hazards, and walking-working surface hazards.

- (H) Awareness and knowledge of the competencies for the Hazardous Materials Technician covered in the National Fire Protection Association's Standard No. 472, *Professional Competence of Responders to Hazardous Materials Incidents*.
- (4) *Hazardous materials specialist*.
 - (A) Review of and demonstration of competency in performing the applicable skills of 29 CFR 1910.120(q).
 - (B) Hands-on experience with retrieval and use of written and electronic information relative to response decision making including but not limited to the U.S. Department of Transportation's *Emergency Response Guidebook* (ERG), manufacturer material safety data sheets, CHEMTREC/CANUTEC, shipper or manufacturer contacts, computer data bases and response models, and other relevant sources of information addressing hazardous substance releases. Familiarization with OSHA standard 29 CFR 1910.1201.
 - (C) Review of the principles and practices for analyzing an incident to determine the hazardous substances present, their physical and chemical properties, and the likely behavior of the hazardous substance and its container, vessel, or vehicle.
 - (D) Review of the principles and practices for identification of the types of hazardous substance transportation containers, vessels and vehicles involved in the release; selecting and using the various types of equipment available for plugging or patching transportation containers, vessels or vehicles; organizing and directing the use of multiple teams of hazardous material technicians and selecting the appropriate strategy for approaching release sites and containing or stopping the release.
 - (E) Review of procedures for implementing continuing response actions consistent with the local emergency response plan, the organization's standard operating procedures, including knowledge of the available public and private response resources, establishment of an incident command post, direction of hazardous material technician teams, and extended emergency notification procedures and follow-up communications.
 - (F) Review of the principles and practice for proper selection and use of personal protective equipment.
 - (G) Review of the principles and practices of establishing exposure zones and proper decontamination, monitoring and medical surveillance stations and procedures.

- (H) Review of the expected hazards including fire and explosions hazards, confined space hazards, electrical hazards, powered equipment hazards, motor vehicle hazards, and walking-working surface hazards.
 - (I) Awareness and knowledge of the competencies for the Off-site Specialist Employee covered in the National Fire Protection Association's Standard No. 472, *Professional Competence of Responders to Hazardous Materials Incidents*.
- (5) *Incident commander.*

The incident commander is the individual who, at any one time, is responsible for and in control of the response effort. This individual is the person responsible for the direction and coordination of the response effort. An incident commander's position should be occupied by the most senior, appropriately trained individual present at the response site. Yet, as necessary and appropriate by the level of response provided, the position may be occupied by many individuals during a particular response as the need for greater authority, responsibility, or training increases. It is possible for the first responder at the awareness level to assume the duties of incident commander until a more senior and appropriately trained individual arrives at the response site.

Therefore, any emergency responder expected to perform as an incident commander should be trained to fulfill the obligations of the position at the level of response they will be providing including the following:

- (A) Ability to analyze a hazardous substance incident to determine the magnitude of the response problem.
- (B) Ability to plan and implement an appropriate response plan within the capabilities of available personnel and equipment.
- (C) Ability to implement a response to favorably change the outcome of the incident in a manner consistent with the local emergency response plan and the organization's standard operating procedures.
- (D) Ability to evaluate the progress of the emergency response to ensure that the response objectives are being met safely, effectively, and efficiently.
- (E) Ability to adjust the response plan to the conditions of the response and to notify higher levels of response when required by the changes to the response plan.

Subpart I – Personal Protective Equipment

1910.132 General requirements

(f)(1) (f) **Training**
through (3)

- (1) The employer shall provide training to each employee who is required by this section to use PPE. Each such employee shall be trained to know at least the following:
 - (i) When PPE is necessary;
 - (ii) What PPE is necessary;
 - (iii) How to properly don, doff, adjust and wear PPE;
 - (iv) The limitations of the PPE; and,
 - (v) The proper care, maintenance, useful life, and disposal of the PPE.
- (2) Each affected employee shall demonstrate an understanding of the training specified in paragraph (f)(1) of this section and the ability to use PPE properly before being allowed to perform work requiring the use of PPE.
- (3) When the employer has reason to believe that any affected employee who has already been trained does not have the understanding and skill required by paragraph (f)(2) of this section, the employer shall retrain each such employee. Circumstances where retraining is required include, but are not limited to, situations where:
 - (i) Changes in the workplace render previous training obsolete, or
 - (ii) Changes in the types of PPE to be used render previous training obsolete; or
 - (iii) Inadequacies in an affected employee's knowledge or use of assigned PPE indicate that the employee has not retained the requisite understanding or skill.

Paragraphs (d) and (f) of this section apply only to 1910.133, 1910.135, 1910.136, and 1910.138. Paragraphs(d) and (f) of this section do not apply to 1910.134 and 1910.137.

1910.134 Respiratory protection

(k)(1)
through (6)

- (k) Training and information.** This paragraph requires the employer to provide effective training to employees who are required to use respirators. The training must be comprehensive, understandable, and recur annually, and more often if necessary. This paragraph also requires the employer to provide the basic information on respirators in Appendix D of this section to employees who wear respirators when not required by this section or by the employer to do so.
- 1) The employer shall ensure that each employee can demonstrate knowledge of at least the following:
 - (i) Why the respirator is necessary and how improper fit, usage, or maintenance can compromise the protective effect of the respirator;
 - (ii) What the limitations and capabilities of the respirator are;
 - (iii) How to use the respirator effectively in emergency situations, including situations in which the respirator malfunctions;
 - (iv) How to inspect, put on and remove, use, and check the seals of the respirator;
 - (v) What the procedures are for maintenance and storage of the respirator;
 - (vi) How to recognize medical signs and symptoms that may limit or prevent the effective use of respirators; and
 - (vii) The general requirements of this section.
 - (2) Training shall be conducted in a manner that is understandable to the employee.
 - (3) The employer shall provide the training prior to requiring the employee to use a respirator in the workplace.
 - (4) An employer who is able to demonstrate that a new employee has received training within the last 12 months that addresses the elements specified in paragraph (k)(1)(i) through (vii) is not required to repeat such training provided that, as required by paragraph (k)(1), the employee can demonstrate knowledge of those element(s). Previous training not repeated initially by the employer must be provided no later than 12 months from the date of the previous training.

- (5) Retraining shall be administered annually and when the following situations occur:
 - (i) Changes in the workplace or the type of respirator render previous training obsolete;
 - (ii) Inadequacies in the employee's knowledge or use of the respirator indicate that the employee has not retained the requisite understanding or skill; or
 - (iii) Any other situation arises in which retraining appears necessary to ensure safe respirator use.
- (6) The basic advisory information on respirators, as presented in Appendix D of this section, shall be provided by the employer in any written or oral format, to employees who wear respirators when such use is not required by this section or by the employer.

Subpart J – General Environmental Controls

1910.142 Temporary labor camps

(k)(1)(2) (k) **First aid**

- (1) Adequate first-aid facilities approved by a health authority shall be maintained and made available in every labor camp for the emergency treatment of injured persons.
- (2) Such facilities shall be in charge of a person trained to administer first aid and shall be readily accessible for use at all times.

1910.145 Specifications for accident prevention signs and tags

(c)(1)(ii), (2)
(ii) and (3) (c) **Classification of signs according to use**

- (1) *Danger signs.*
 - (ii) All employees shall be instructed that danger signs indicate immediate danger and that special precautions are necessary.
- (2) *Caution signs.*
 - (ii) All employees shall be instructed that caution signs indicate a possible hazard against which proper precautions should be taken.
- (3) *Safety instruction signs.* Safety instruction signs shall be used where there is a need for general instructions and suggestions relative to safety measures.

1910.146 Permit required confined spaces

(g) and (k)(1)(i)
through (iv)

(g) Training

- (1) The employer shall provide training so that all employees whose work is regulated by this section acquire the understanding, knowledge, and skills necessary for the safe performance of the duties assigned under this section.
- (2) Training shall be provided to each affected employee:
 - (i) Before the employee is first assigned duties under this section;
 - (ii) Before there is a change in assigned duties;
 - (iii) Whenever there is a change in permit space operations that presents a hazard about which an employee has not previously been trained;
 - (iv) Whenever the employer has reason to believe either that there are deviations from the permit space entry procedures required by paragraph (d)(3) of this section or that there are inadequacies in the employee's knowledge or use of these procedures.
- (3) The training shall establish employee proficiency in the duties required by this section and shall introduce new or revised procedures, as necessary, for compliance with this section.
- (4) The employer shall certify that the training required by paragraphs (g)(1) through (g)(3) of this section has been accomplished. The certification shall contain each employee's name, the signatures or initials of the trainers, and the dates of training. The certification shall be available for inspection by employees and their authorized representatives.

(k) Rescue and emergency services

- (1) An employer who designates rescue and emergency services, pursuant to paragraph (d)(9) of this section, shall:
 - (i) Evaluate a prospective rescuer's ability to respond to a rescue summons in a timely manner, considering the hazard(s) identified;

Note to paragraph (k)(1)(i): What will be considered timely will vary according to the specific hazards involved in each entry. For example, §1910.134, Respiratory Protection, requires that employers provide a standby person or persons capable of immediate action to rescue employee(s) wearing respiratory protection while in work areas defined as IDLH atmospheres.

- (ii) Evaluate a prospective rescue service's ability, in terms of proficiency with rescue-related tasks and equipment, to function appropriately while rescuing entrants from the particular permit space or types of permit spaces identified;
- (iii) Select a rescue team or service from those evaluated that:
 - (A) Has the capability to reach the victim(s) within a time frame that is appropriate for the permit space hazard(s) identified;
 - (B) Is equipped for and proficient in performing the needed rescue services;
- (iv) Inform each rescue team or service of the hazards they may confront when called on to perform rescue at the site.

1910.147 The control of hazardous energy (lockout/tagout)

(a)(3)(ii); (a)(4)(i); (c)
(6)(i)(D); (a)(7) and (8);
(e)(3); and (f)(2)(i)

(a) Scope, application, and purpose

(3) Purpose.

- (ii) When other standards in this part require the use of lockout or tagout, they shall be used and supplemented by the procedural and training requirements of this section.

(c) General

(4) Energy control procedure.

- (i) Procedures shall be developed, documented and utilized for the control of potentially hazardous energy when employees are engaged in the activities covered by this section.

Note: Exception: The employer need not document the required procedure for a particular machine or equipment, when all of the following elements exist: (1) The machine or equipment has no potential for stored or residual energy or reaccumulation of stored energy after shut down which could endanger employees; (2) the machine or equipment has a single energy source which can be readily identified and isolated; (3) the isolation and locking out of that energy source will completely deenergize and deactivate the machine or equipment; (4) the machine or equipment is isolated from that energy source and locked out during servicing or maintenance; (5) a single lockout device will achieve a locked-out condition; (6) the lockout device is under the exclusive control of the authorized

employee performing the servicing or maintenance; (7) the servicing or maintenance does not create hazards for other employees; and (8) the employer, in utilizing this exception, has had no accidents involving the unexpected activation or reenergization of the machine or equipment during servicing or maintenance.

(6) *Periodic Inspection.*

(i) The employer shall conduct a periodic inspection of the energy control procedure at least annually to ensure that the procedure and the requirements of this standard are being followed.

(D) Where tagout is used for energy control, the periodic inspection shall include a review, between the inspector and each authorized and affected employee, of that employee's responsibilities under the energy control procedure being inspected, and the elements set forth in paragraph (c)(7)(ii) of this section.

(7) *Training and communication.*

(i) The employer shall provide training to ensure that the purpose and function of the energy control program are understood by employees and that the knowledge and skills required for the safe application, usage, and removal of energy controls are acquired by employees. The training shall include the following:

(A) Each authorized employee shall receive training in the recognition of applicable hazardous energy sources, the type and magnitude of the energy available in the workplace, and the methods and means necessary for energy isolation and control.

(B) Each affected employee shall be instructed in the purpose and use of the energy control procedure.

(C) All other employees whose work operations are or may be in an area where energy control procedures may be utilized, shall be instructed about the procedure, and about the prohibition relating to attempts to restart or reenergize machines or equipment which are locked out or tagged out.

(ii) When tagout systems are used, employees shall also be trained in the following limitations of tags:

- (A) Tags are essentially warning devices affixed to energy isolating devices, and do not provide the physical restraint on those devices that is provided by a lock.
 - (B) When a tag is attached to an energy isolating means, it is not to be removed without authorization of the authorized person for it, and it is never to be bypassed, ignored, or otherwise defeated.
 - (C) Tags must be legible and understandable by all authorized employees, affected employees, and all other employees whose work operations are or may be in the area, in order to be effective.
 - (D) Tags and their means of attachment must be made of materials which will withstand the environmental conditions encountered in the workplace.
 - (E) Tags may evoke a false sense of security, and their meaning needs to be understood as part of the overall energy control program.
 - (F) Tags must be securely attached to energy isolating devices so that they cannot be inadvertently or accidentally detached during use.
- (iii) Employee retraining
- (A) Retraining shall be provided for all authorized and affected employees whenever there is a change in their job assignments, a change in machines, equipment or processes that present a new hazard, or when there is a change in the energy control procedures.
 - (B) Additional retraining shall also be conducted whenever a periodic inspection under paragraph (c) (6) of this section reveals, or whenever the employer has reason to believe, that there are deviations from or inadequacies in the knowledge or use of the energy control procedures.
 - (C) The retraining shall reestablish employee proficiency and introduce new or revised control methods and procedures, as necessary.
- (iv) The employer shall certify that employee training has been accomplished and is being kept up to date. The certification shall contain each employee's name and dates of training.

- (8) *Energy isolation.* Lockout or tagout shall be performed only by the authorized employees who are performing the servicing or maintenance.

(e) Release from lockout or tagout

- (3) *Lockout or tagout devices removal.* Each lockout or tagout device shall be removed from each energy isolating device by the employee who applied the device. *Exception to paragraph (e) (3):* When the authorized employee who applied the lockout or tagout device is not available to remove it, that device may be removed under the direction of the employer, provided that specific procedures and training for such removal have been developed, documented and incorporated into the employer's energy control program. The employer shall demonstrate that the specific procedure provides equivalent safety to the removal of the device by the authorized employee who applied it.

(f) Additional requirements

- (2) *Outside Personnel (contractors, etc.)*
- (i) Whenever outside servicing personnel are to be engaged in activities covered by the scope and application of this standard, the on-site employer and the outside employer shall inform each other of their respective lockout or tagout procedures.

Subpart K – Medical Services and First Aid

1910.151 Medical services and first aid

- (a)(b) (a) The employer shall ensure the ready availability of personnel for advice and consultation on matters of plant health.
- (b) In the absence of an infirmary, clinic, or hospital in near proximity to the workplace which is used for the treatment of all injured employees, a person or persons shall be adequately trained to render first aid. Adequate first aid supplies shall be readily available.

Subpart L – Fire Protection

1910.155 Fire protection

(c)(41) (c) **Definitions**

- (41) “Training” means the process of making proficient through instruction and hands-on practice in the operation of equipment, including respiratory protection equipment, that is expected to be used and in the performance of assigned duties.

1910.156 Fire brigades

(b)(1),
and (c)(1)
through (4) (b) **Organization**

- (1) *Organizational statement.* The employer shall prepare and maintain a statement or written policy which establishes the existence of a fire brigade; the basic organizational structure; the type, amount, and frequency of training to be provided to fire brigade members; the expected number of members in the fire brigade; and the functions that the fire brigade is to perform at the workplace. The organizational statement shall be available for inspection by the Assistant Secretary and by employees or their designated representatives.

(c) **Training and education**

- (1) The employer shall provide training and education for all fire brigade members commensurate with those duties and functions that fire brigade members are expected to perform. Such training and education shall be provided to fire brigade members before they perform fire brigade emergency activities. Fire brigade leaders and training instructors shall be provided with training and education which is more comprehensive than that provided to the general membership of the fire brigade.
- (2) The employer shall assure that training and education is conducted frequently enough to assure that each member of the fire brigade is able to perform the member’s assigned duties and functions satisfactorily and in a safe manner so as not to endanger fire brigade members or other employees. All fire brigade members shall be provided with training at least annually. In addition, fire brigade members who are expected to perform interior structural firefighting shall be provided with an education session or training at least quarterly.

- (3) The quality of the training and education program for fire brigade members shall be similar to those conducted by such fire training schools as the Maryland Fire and Rescue Institute; Iowa Fire Service Extension; West Virginia Fire Service Extension; Georgia Fire Academy; New York State Department, Fire Prevention and Control; Louisiana State University Firemen Training Program; or Washington State's Fire Service, Training Commission for Vocational Education. (For example, for the oil refinery industry, with its unique hazards, the training and education program for those fire brigade members shall be similar to those conducted by Texas A & M University, Lamar University, Reno Fire School, or the Delaware State Fire School.)
- (4) The employer shall inform fire brigade members about special hazards such as storage and use of flammable liquids and gases, toxic chemicals, radioactive sources, and water reactive substances, to which they may be exposed during fire and other emergencies. The fire brigade members shall also be advised of any changes that occur in relation to the special hazards. The employer shall develop and make available for inspection by fire brigade members, written procedures that describe the actions to be taken in situations involving the special hazards and shall include these in the training and education program.

1910.157 Portable fire extinguishers

(g)(1)
through (4)

(g) Training and education

- (1) Where the employer has provided portable fire extinguishers for employee use in the workplace, the employer shall also provide an educational program to familiarize employees with the general principles of fire extinguisher use and the hazards involved with incipient stage firefighting.
- (2) The employer shall provide the education required in paragraph (g)(1) of this section upon initial employment and at least annually thereafter.
- (3) The employer shall provide employees who have been designated to use fire fighting equipment as part of an emergency action plan with training in the use of the appropriate equipment.
- (4) The employer shall provide the training required in paragraph (g)(3) of this section upon initial assignment to the designated group of employees and at least annually thereafter.

1910.158 Standpipe and hose systems

(e)(2)(iv) **(e) Tests and maintenance**

(2) *Maintenance.*

- (vi) The employer shall designate trained persons to conduct all inspections required under this section.

1910.160 Fixed extinguishing systems

(b)(10) **(b) General requirements**

- (10) The employer shall train employees designated to inspect, maintain, operate, or repair fixed extinguishing systems and annually review their training to keep them up-to-date in the functions they are to perform.

1910.164 Fire detection systems

(c)(4) **(c) Maintenance and testing**

- (4) The employer shall assure that the servicing, maintenance and testing of fire detection systems, including cleaning and necessary sensitivity adjustments, are performed by a trained person knowledgeable in the operations and functions of the system.

1910.165 Employee alarm systems

(d)(5) **(d) Maintenance and testing**

- (5) The employer shall assure that the servicing, maintenance, and testing of employee alarms are done by persons trained in the designed operation and functions necessary for reliable and safe operation of the system.

Subpart N – Materials handling and Storage

1910.177 Servicing of multi-piece and single-piece rim wheels

(c)(1)
through (3) **(c) Employee training**

- (1) The employer shall provide a training program to train all employees who service rim wheels in the hazards involved in servicing those rim wheels and the safety procedures to be followed.
- (i) The employer shall assure that no employee services any rim wheel unless the employee has been trained and

- instructed in correct procedures of servicing the type of wheel being serviced, and in the safe operating procedures described in paragraphs (f) and (g) of this section.
- (ii) Information to be used in the training program shall include at a minimum, the applicable data contained in the charts (rim manuals) and the contents of this standard.
 - (iii) Where an employer knows or has reason to believe that any of his employees is unable to read and understand the charts or rim manual, the employer shall assure that the employee is instructed concerning the contents of the charts and rim manual in a manner which the employee is able to understand.
- (2) The employer shall assure that each employee demonstrates and maintains the ability to service multi-piece rim wheels safely, including performance of the following tasks:
- (i) Demounting of tires (including deflation);
 - (ii) Inspection and identification of rim wheel components;
 - (iii) Mounting of tires (including inflation within a restraining device or other safeguards required by this section);
 - (iv) Use of the restraining device or barrier, and other equipment required by this section;
 - (v) Handling of rim wheels;
 - (vi) Inflation of tire when a single piece rim wheel is mounted on a vehicle;
 - (vii) An understanding of the necessity of standing outside the trajectory both during the inflation of the tire and during inspection of the rim wheel following inflation; and
 - (viii) Installation and removal of rim wheels.
- (3) The employer shall evaluate each employee's ability to perform these tasks and to service rim wheels safely and shall provide additional training as necessary to assure that each employee maintains his or her proficiency.
- (f) **Safe operating procedure — multi-piece rim wheels.** The employer shall establish a safe operating procedure for servicing multi-piece rim wheels and shall assure that employees are instructed in and follow that procedure. The procedure shall include at least the following elements:
- (1) Tires shall be completely deflated before demounting by removal of the valve core.

- (2) Tires shall be completely deflated by removing the valve core before a rim wheel is removed from the axle in either of the following situations:
 - (i) When the tire has been driven underinflated at 80% or less of its recommended pressure, or
 - (ii) When there is obvious or suspected damage to the tire or wheel components.
- (3) Rubber lubricant shall be applied to bead and rim mating surfaces during assembly of the wheel and inflation of the tire, unless the tire or wheel manufacturer recommends against it.
- (4) If a tire on a vehicle is underinflated but has more than 80% of the recommended pressure, the tire may be inflated while the rim wheel is on the vehicle provided remote control inflation equipment is used, and no employees remain in the trajectory during inflation.
- (5) Tires shall be inflated outside a restraining device only to a pressure sufficient to force the tire bead onto the rim ledge and create an airtight seal with the tire and bead.
- (6) Whenever a rim wheel is in a restraining device the employee shall not rest or lean any part of his body or equipment on or against the restraining device.
- (7) After tire inflation, the tire and wheel components shall be inspected while still within the restraining device to make sure that they are properly seated and locked. If further adjustment to the tire or wheel components is necessary, the tire shall be deflated by removal of the valve core before the adjustment is made.
- (8) No attempt shall be made to correct the seating of side and lock rings by hammering, striking or forcing the components while the tire is pressurized.
- (9) Cracked, broken, bent or otherwise damaged rim components shall not be reworked, welded, brazed, or otherwise heated.
- (10) Whenever multi-piece rim wheels are being handled, employees shall stay out of the trajectory unless the employer can demonstrate that performance of the servicing makes the employee's presence in the trajectory necessary.
- (11) No heat shall be applied to a multi-piece wheel or wheel component.

- (g) **Safe operating procedure — single piece rim wheels.** The employer shall establish a safe operating procedure for servicing single piece rim wheels and shall assure that employees are instructed in and follow that procedure. The procedure shall include at least the following elements:
- (1) Tires shall be completely deflated by removal of the valve core before demounting.
 - (2) Mounting and demounting of the tire shall be done only from the narrow ledge side of the wheel. Care shall be taken to avoid damaging the tire beads while mounting tires on wheels. Tires shall be mounted only on compatible wheels of matching bead diameter and width.
 - (3) Nonflammable rubber lubricant shall be applied to bead and wheel mating surfaces before assembly of the rim wheel, unless the tire or wheel manufacturer recommends against the use of any rubber lubricant.
 - (4) If a tire changing machine is used, the tire shall be inflated only to the minimum pressure necessary to force the tire bead onto the rim ledge while on the tire changing machine.
 - (5) If a bead expander is used, it shall be removed before the valve core is installed and as soon as the rim wheel becomes airtight (the tire bead slips onto the bead seat).
 - (6) Tires may be inflated only when contained within a restraining device, positioned behind a barrier or bolted on the vehicle with the lug nuts fully tightened.
 - (7) Tires shall not be inflated when any flat, solid surface is in the trajectory and within one foot of the sidewall.
 - (8) Employees shall stay out of the trajectory when inflating a tire.
 - (9) Tires shall not be inflated to more than the inflation pressure stamped in the sidewall unless a higher pressure is recommended by the manufacturer.
 - (10) Tires shall not be inflated above the maximum pressure recommended by the manufacturer to seat the tire bead firmly against the rim flange.
 - (11) No heat shall be applied to a single piece wheel.
 - (12) Cracked, broken, bent, or otherwise damaged wheels shall not be reworked, welded, brazed, or otherwise heated.

1910.178 Powered industrial trucks

(l)(1)
through (7)

(l) Operator training

(1) *Safe Operation.*

- (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).
- (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).

(2) *Training Program Implementation.*

- (i) Trainees may operate a powered industrial truck only:
 - (A) Under the direct supervision of persons who have the knowledge, training, and experience to train operators and evaluate their competence.
 - (B) Where such operation does not endanger the trainee or other employees.
- (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.
- (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.

(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.

- (i) Truck-related topics:
 - (A) Operating instructions, warnings, and precautions for the types of truck the operator will be authorized to operate;
 - (B) Differences between the truck and the automobile;

- (C) Truck controls and instrumentation: where they are located, what they do, and how they work;
 - (D) Engine or motor operation;
 - (E) Steering and maneuvering;
 - (F) Visibility (including restrictions due to loading);
 - (G) Fork and attachment adaptation, operation, and use limitations;
 - (H) Vehicle capacity;
 - (I) Vehicle stability;
 - (J) Any vehicle inspection and maintenance that the operator will be required to perform;
 - (K) Refueling and/or charging and recharging of batteries;
 - (L) Operating limitations;
 - (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.
- (ii) Workplace-related topics:
- (A) Surface conditions where the vehicle will be operated;
 - (B) Composition of loads to be carried and load stability;
 - (C) Load manipulation, stacking, and unstacking;
 - (D) Pedestrian traffic in areas where the vehicle will be operated;
 - (E) Narrow aisles and other restricted places where the vehicle will be operated;
 - (F) Hazardous (classified) locations where the vehicle will be operated;
 - (G) Ramps and other sloped surfaces that could affect the vehicle's stability;
 - (H) Closed environments and other areas where insufficient ventilation or poor vehicle maintenance could cause a buildup of carbon monoxide or diesel exhaust;
 - (I) Other unique or potentially hazardous environmental conditions in the workplace that could affect safe operation.
- (iii) The requirements of this section.

- (4) *Refresher training and evaluation*
- (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.
 - (ii) Refresher training in relevant topics shall be provided to the operator when:
 - (A) The operator has been observed to operate the vehicle in an unsafe manner;
 - (B) The operator has been involved in an accident or near-miss incident;
 - (C) The operator has received an evaluation that reveals that the operator is not operating the truck safely;
 - (D) The operator is assigned to drive a different type of truck;
 - (E) A condition in the workplace changes in a manner that could affect safe operation of the truck.
 - (iii) An evaluation of each powered industrial truck operator's performance shall be conducted at least once every three years.
- (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.
- (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.
- (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.

1910.179 Overhead and gantry cranes

(n)(3)(ix) and
(o)(3)

(n) Handling the load

(3) *Moving the load.*

(ix) When two or more cranes are used to lift a load, one qualified responsible person shall be in charge of the operation. He shall analyze the operation and instruct all personnel involved in the proper positioning, rigging of the load, and the movements to be made.

(o) Other requirements — fire extinguishers

(3) *Fire extinguishers.* The employer shall insure that operators are familiar with the operation and care of fire extinguishers provided.

1910.180 Crawler locomotive and truck cranes

(i)(5)(ii)

(i) Other requirements

(5) *Fire extinguishers.*

(ii) Operating and maintenance personnel shall be made familiar with the use and care of the fire extinguishers provided.

Subpart O – Machinery and Machine Guarding

1910.217 Mechanical power presses

(e)(2) and (3);
(f)(2); (h)(13)

(e) Inspection, maintenance, and modification of presses

(2) *Modification.* It shall be the responsibility of any person modifying a power press to furnish instructions with the modification to establish new or changed guidelines for use and care of the power press so modified.

(3) *Training of maintenance personnel.* It shall be the responsibility of the employer to insure the original and continuing competence of personnel caring for, inspecting, and maintaining power presses.

(f) Operation of power presses

(2) *Instruction to operators.* The employer shall train and instruct the operator in the safe method of work before starting work on any operation covered by this section. The employer shall insure by adequate supervision that correct operating procedures are being followed.

(h) Presence sensing device initiation (PSDI)

(13) Operator training.

- (i) The operator training required by paragraph (f)(2) of this section shall be provided to the employee before the employee initially operates the press and as needed to maintain competence, but not less than annually thereafter. It shall include instruction relative to the following items for presses used in the PSDI mode:
 - (A) The manufacturer's recommended test procedures for checking operation of the presence sensing device. This shall include the use of the test rod required by paragraph (h)(10)(i) of this section.
 - (B) The safety distance required.
 - (C) The operation, function and performance of the PSDI mode.
 - (D) The requirements for hand tools that may be used in the PSDI mode.
 - (E) The severe consequences that can result if an operator attempts to circumvent or bypass any of the safeguard or operating functions of the PSDI system.
- (ii) The employer shall certify that employees have been trained by preparing a certification record which includes the identity of the person trained, the signature of the employer or the person who conducted the training, and the date the training was completed. The certification record shall be prepared at the completion of training and shall be maintained on file for the duration of the employee's employment. The certification record shall be made available upon request to the Assistant Secretary for Occupational Safety and Health.

1910.218 Forging machines

(a)(2)(iii) (a) General requirements

- (2) *Inspection and maintenance.* It shall be the responsibility of the employer to maintain all forge shop equipment in a condition which will ensure continued safe operation. This responsibility includes:
 - (iii) Training personnel for the proper inspection and maintenance of forging machinery and equipment.

Subpart Q – Welding, Cutting, and Brazing

1910.252 General requirements

(a)(2)(xiii)(C) (a) Fire prevention and protection

(2) *Special precautions.* When the nature of the work to be performed falls within the scope of paragraph (a)(1)(ii) of this section certain additional precautions may be necessary:

(xiii) *Management.* Management shall recognize its responsibility for the safe usage of cutting and welding equipment on its property and:

(C) Insist that cutters or welders and their supervisors are suitably trained in the safe operation of their equipment and the safe use of the process.

1910.253 Oxygen-fuel gas welding and cutting

(a)(4) (a) General requirements

(4) *Personnel.* Workmen in charge of the oxygen or fuel-gas supply equipment, including generators, and oxygen or fuel-gas distribution piping systems shall be instructed and judged competent by their employers for this important work before being left in charge. Rules and instructions covering the operation and maintenance of oxygen or fuel-gas supply equipment including generators, and oxygen or fuel-gas distribution piping systems shall be readily available.

1910.254 Arc welding and cutting

(a)(3) (a) General

(3) *Instruction.* Workmen designated to operate arc welding equipment shall have been properly instructed and qualified to operate such equipment as specified in paragraph (d) of this section.

1910.255 Resistance welding

(a)(3) (a) General

(3) *Personnel.* Workers designated to operate resistance welding equipment shall have been properly instructed and judged competent to operate such equipment.

Subpart R – Special Industries

1910.261 Pulp, paper, and paperboard mills

(h)(3)(ii) **(h) Bleaching**

(3) *Liquid chlorine.*

- (ii) Gas masks capable of absorbing chlorine shall be supplied, conveniently placed, and regularly inspected, and workers who may be exposed to chlorine gas shall be instructed in their use.

1910.264 Laundry machinery and operating rules

(d)(1)(v) **(d) Operating rules**

(1) *General.*

- (v) *Instruction of employees.* Employees shall be properly instructed as to the hazards of their work and be instructed in safe practices, by bulletins, printed rules, and verbal instructions.

1910.266 Logging

(i)(1) through (10) **(i) Training**

- (1) The employer shall provide training for each employee, including supervisors, at no cost to the employee.
- (2) *Frequency.* Training shall be provided as follows:
 - (i) As soon as possible but not later than the effective date of this section for initial training for each current and new employee;
 - (ii) Prior to initial assignment for each new employee;
 - (iii) Whenever the employee is assigned new work tasks, tools, equipment, machines, or vehicles; and,
 - (iv) Whenever an employee demonstrates unsafe job performance.
- (3) *Content.* At a minimum, training shall consist of the following elements:
 - (i) Safe performance of assigned work tasks;
 - (ii) Safe use, operation, and maintenance of tools, machines, and vehicles the employee uses or operates, including emphasis on understanding and following the manufacturer's operating and maintenance instructions, warnings, and precautions;

- (iii) Recognition of safety and health hazards associated with the employee's specific work tasks, including the use of measures and work practices to prevent or control those hazards;
 - (iv) Recognition, prevention, and control of other safety and health hazards in the logging industry;
 - (v) Procedures, practices, and requirements of the employer's work site; and
 - (vi) The requirements of this standard.
- (4) Training of an employee due to unsafe job performance, or assignment of new work tasks, tools, equipment, machines, or vehicles may be limited to those elements in paragraph (i)(3) of this section which are relevant to the circumstances giving rise to the need for training.
- (5) *Portability of training.*
- (i) Each current employee who has received training in the particular elements specified in paragraph (i)(3) of this section shall not be required to be retrained in those elements.
 - (ii) Each new employee who has received training in the particular elements specified in paragraph (i)(3) of this section shall not be required to be retrained in those elements prior to initial assignment.
 - (iii) The employer shall train each current and new employee in those elements for which the employee has not received training.
 - (iv) The employer is responsible for ensuring that each current and new employee can properly and safely perform the work tasks and operate the tools, equipment, machines, and vehicles used in their job.
- (6) Each new employee and each employee who is required to be trained as specified in paragraph (i)(2) of this section, shall work under the close supervision of a designated person until the employee demonstrates to the employer the ability to safely perform the new duties independently.
- (7) *First-aid training.*
- (i) The employer shall assure that each employee, including supervisors, receives or has received first-aid and CPR training meeting at least the requirements specified in Appendix B.

- (ii) The employer shall assure that each employee receives first-aid training at least every three years and receives CPR training at least annually.
- (iii) The employer shall assure that each employee's first-aid and CPR training and/or certificate of training remain current.
- (8) All training shall be conducted by a designated person.
- (9) The employer shall assure that all training required by this section is presented in a manner that the employee is able to understand. The employer shall assure that all training materials used are appropriate in content and vocabulary to the educational level, literacy, and language skills of the employees being trained.
- (10) *Certification of training.*
 - (i) The employer shall verify compliance with paragraph (i) of this section by preparing a written certification record. The written certification record shall contain the name or other identity of the employee trained, the date(s) of the training, and the signature of the person who conducted the training or the signature of the employer. If the employer relies on training conducted prior to the employee's hiring or completed prior to the effective date of this section, the certification record shall indicate the date the employer determined the prior training was adequate.
 - (ii) The most recent training certification shall be maintained.

1910.268 Telecommunications

(b)(2)(i) and (c)
(1) through (3);
(j)(4)(iv)(D); (l)
(1); (o)(1)(ii)
and (3); (q)(1)
(ii), (q)(2)(ii)
and (iii)

(b) General

(2) Battery handling.

- (i) Eye protection devices which provide side as well as frontal eye protection for employees shall be provided when measuring storage battery specific gravity or handling electrolyte, and the employer shall ensure that such devices are used by the employees. The employer shall also ensure that acid resistant gloves and aprons shall be worn for protection against splattering. Facilities for quick drenching or flushing of the eyes and body shall be provided unless the storage batteries are of the enclosed type and equipped with explosion proof vents, in which case sealed water

rinse or neutralizing packs may be substituted for the quick drenching or flushing facilities. Employees assigned to work with storage batteries shall be instructed in emergency procedures such as dealing with accidental acid spills.

- (c) **Training.** Employers shall provide training in the various precautions and safe practices described in this section and shall insure that employees do not engage in the activities to which this section applies until such employees have received proper training in the various precautions and safe practices required by this section. However, where the employer can demonstrate that an employee is already trained in the precautions and safe practices required by this section prior to his employment, training need not be provided to that employee in accordance with this section. Where training is required, it shall consist of on-the-job training or classroom-type training or a combination of both. The employer shall certify that employees have been trained by preparing a certification record which includes the identity of the person trained, the signature of the employer or the person who conducted the training, and the date the training was completed. The certification record shall be prepared at the completion of training and shall be maintained on file for the duration of the employee's employment. The certification record shall be made available upon request to the Assistant Secretary for Occupational Safety and Health. Such training shall, where appropriate, include the following subjects:

- (1) Recognition and avoidance of dangers relating to encounters with harmful substances and animal, insect, or plant life;
- (2) Procedures to be followed in emergency situations; and,
- (3) First-aid training, including instruction in artificial respiration.

(j) **Vehicle-mounted material handling devices and other mechanical equipment**

- (4) *Derrick trucks and similar equipment.*
 - (iv) Derricks and the operation of derricks shall comply with the following requirements:
 - (D) Only persons trained in the operation of the derrick shall be permitted to operate the derrick.

(l) Cable fault locating and testing.

- (1) Employees involved in using high voltages to locate trouble or test cables shall be instructed in the precautions necessary for their own safety and the safety of other employees.

(o) Underground lines. The provisions of this paragraph apply to the guarding of manholes and street openings, and to the ventilation and testing for gas in manholes and unvented vaults, where telecommunications field work is performed on or with underground lines.

(1) *Guarding manholes and street openings.*

- (ii) While work is being performed in the manhole, a person with basic first aid training shall be immediately available to render assistance if there is cause for believing that a safety hazard exists, and if the requirements contained in paragraphs (d)(1) and (o)(1)(i) of this section do not adequately protect the employee(s). Examples of manhole worksite hazards which shall be considered to constitute a safety hazard include, but are not limited to:

- (A) Manhole worksites where safety hazards are created by traffic patterns that cannot be corrected by provisions of paragraph (d)(1) of this section.
- (B) Manhole worksites that are subject to unusual water hazards that cannot be abated by conventional means.
- (C) Manhole worksites that are occupied jointly with power utilities as described in paragraph (o)(3) of this section.

- (3) *Joint power and telecommunication manholes.* While work is being performed in a manhole occupied jointly by an electric utility and a telecommunication utility, an employee with basic first-aid training shall be available in the immediate vicinity to render emergency assistance as may be required. The employee whose presence is required in the immediate vicinity for the purposes of rendering emergency assistance is not to be precluded from occasionally entering a manhole to provide assistance other than in an emergency. The requirement of this paragraph (o)(3) does not preclude a qualified employee,

working alone, from entering for brief periods of time, a manhole where energized cables or equipment are in service, for the purpose of inspection, housekeeping, taking readings, or similar work if such work can be performed safely.

(q) Tree trimming — electrical hazards

(1) *General.*

(ii) Employees engaged in line clearing operations shall be instructed that:

- (A) A direct contact is made when any part of the body touches or contacts an energized conductor, or other energized electrical fixture or apparatus.
- (B) An indirect contact is made when any part of the body touches any object in contact with an energized electrical conductor, or other energized fixture or apparatus.
- (C) An indirect contact can be made through conductive tools, tree branches, trucks, equipment, or other objects, or as a result of communications wires, cables, fences, or guy wires being accidentally energized.
- (D) Electric shock will occur when an employee, by either direct or indirect contact with an energized conductor, energized tree limb, tool, equipment, or other object, provides a path for the flow of electricity to a grounded object or to the ground itself. Simultaneous contact with two energized conductors will also cause electric shock which may result in serious or fatal injury.

(2) *Working in proximity to electrical hazards.*

- (ii) Only qualified employees or trainees, familiar with the special techniques and hazards involved in line clearance, shall be permitted to perform the work if it is found that an electrical hazard exists.
- (iii) During all tree working operations aloft where an electrical hazard of more than 750V exists, there shall be a second employee or trainee qualified in line clearance tree trimming within normal voice communication.

1910.269 Electric power generation, transmission, and distribution

(a)(2); (b)(1); (a) **General**

(d)(2)(vi)
through (viii)

(2) *Training.*

- (i) Employees shall be trained in and familiar with the safety-related work practices, safety procedures, and other safety requirements in this section that pertain to their respective job assignments. Employees shall also be trained in and familiar with any other safety practices, including applicable emergency procedures (such as pole top and manhole rescue), that are not specifically addressed by this section but that are related to their work and are necessary for their safety.
- (ii) Qualified employees shall also be trained and competent in:
 - (A) The skills and techniques necessary to distinguish exposed live parts from other parts of electric equipment,
 - (B) The skills and techniques necessary to determine the nominal voltage of exposed live parts,
 - (C) The minimum approach distances specified in this section corresponding to the voltages to which the qualified employee will be exposed, and
 - (D) The proper use of the special precautionary techniques, personal protective equipment, insulating and shielding materials, and insulated tools for working on or near exposed energized parts of electric equipment.

Note: For the purposes of this section, a person must have this training in order to be considered a qualified person.
- (iii) The employer shall determine, through regular supervision and through inspections conducted on at least an annual basis, that each employee is complying with the safety-related work practices required by this section.
- (iv) An employee shall receive additional training (or retraining) under any of the following conditions:
 - (A) If the supervision and annual inspections required by paragraph (a)(2)(iii) of this section indicate that the employee is not complying with the safety-related work practices required by this section, or

- (B) If new technology, new types of equipment, or changes in procedures necessitate the use of safety-related work practices that are different from those which the employee would normally use, or
- (C) If he or she must employ safety-related work practices that are not normally used during his or her regular job duties.

Note: OSHA would consider tasks that are performed less often than once per year to necessitate retraining before the performance of the work practices involved.

- (v) The training required by paragraph (a)(2) of this section shall be of the classroom or on-the-job type.
- (vi) The training shall establish employee proficiency in the work practices required by this section and shall introduce the procedures necessary for compliance with this section.
- (vii) The employer shall certify that each employee has received the training required by paragraph (a)(2) of this section. This certification shall be made when the employee demonstrates proficiency in the work practices involved and shall be maintained for the duration of the employee's employment.

Note: Employment records that indicate that an employee has received the required training are an acceptable means of meeting this requirement.

(b) Medical services and first aid. The employer shall provide medical services and first aid as required in Section 1910.151 of this part. In addition to the requirements of Section 1910.151 of this part, the following requirements also apply:

- (1) *Cardiopulmonary resuscitation and first-aid training.* When employees are performing work on or associated with exposed lines or equipment energized at 50 volts or more, persons trained in first-aid including cardiopulmonary resuscitation (CPR) shall be available as follows:
 - (i) For field work involving two or more employees at a work location, at least two trained persons shall be available. However, only one trained person need be available if all new employees are trained in first aid, including CPR, within 3 months of their hiring dates.

- (ii) For fixed work locations such as generating stations, the number of trained persons available shall be sufficient to ensure that each employee exposed to electric shock can be reached within 4 minutes by a trained person. However, where the existing number of employees is insufficient to meet this requirement (at a remote substation, for example), all employees at the work location shall be trained.

(d) Hazardous energy control (lockout/tagout) procedures

(2) *General.*

- (vi) The employer shall provide training to ensure that the purpose and function of the energy control program are understood by employees and that the knowledge and skills required for the safe application, usage, and removal of energy controls are acquired by employees. The training shall include the following:
 - (A) Each authorized employee shall receive training in the recognition of applicable hazardous energy sources, the type and magnitude of energy available in the workplace, and in the methods and means necessary for energy isolation and control.
 - (B) Each affected employee shall be instructed in the purpose and use of the energy control procedure.
 - (C) All other employees whose work operations are or may be in an area where energy control procedures may be used shall be instructed about the procedures and about the prohibition relating to attempts to restart or reenergize machines or equipment that are locked out or tagged out.
- (vii) When tagout systems are used, employees shall also be trained in the limitation of tags.
- (viii) Retraining shall be provided by the employer as follows:
 - (A) Retraining shall be provided for all authorized and affected employees whenever there is a change in their job assignments, a change in machines, equipment, or processes that present a new hazard or whenever there is a change in the energy control procedures.

- (B) Retraining shall also be conducted whenever a periodic inspection under paragraph (d)(2)(v) of this section reveals, or whenever the employer has reason to believe, there are deviations from or inadequacies in an employee's knowledge or use of the energy control procedures.
- (C) The retraining shall reestablish employee proficiency and shall introduce new or revised control methods and procedures, as necessary.

1910.272 Grain handling facilities

(e)(1) and (2);
(g)(5); (h); (i)(2) **(e) Training**

- (1) The employer shall provide training to employees at least annually and when changes in job assignment will expose them to new hazards. Current employees, and new employees prior to starting work, shall be trained in at least the following:
 - (i) General safety precautions associated with the facility, including recognition and preventive measures for the hazards related to dust accumulations and common ignition sources such as smoking; and
 - (ii) Specific procedures and safety practices applicable to their job tasks including but not limited to, cleaning procedures for grinding equipment, clearing procedures for choked legs, housekeeping procedures, hot work procedures, preventive maintenance procedures and lock-out/tag-out procedures.
- (2) Employees assigned special tasks, such as bin entry and handling of flammable or toxic substances, shall be provided training to perform these tasks safely.

Note to paragraph (e)(2): Training for an employee who enters grain storage structures includes training about engulfment and mechanical hazards and how to avoid them.

(g) Entry into Bins, Silos, and Tanks

- (5) The employee acting as observer shall be trained in rescue procedures, including notification methods for obtaining additional assistance.

- (h) **Entry into flat storage structures.** For the purposes of this paragraph (h), the term “grain” means raw and processed grain and grain products in facilities within the scope of paragraph (b)(1) of this section.
- (i) **Contractors**
 - (2) The employer shall explain the applicable provisions of the emergency action plan to contractors.

Appendix A to 1910.272

3. Training

It is important that employees be trained in the recognition and prevention of hazards associated with grain facilities, especially those hazards associated with their own work tasks. Employees should understand the factors which are necessary to produce a fire or explosion, i.e., fuel (such as grain dust), oxygen, ignition source, and (in the case of explosions) confinement. Employees should be made aware that any efforts they make to keep these factors from occurring simultaneously will be an important step in reducing the potential for fires and explosions.

The standard provides flexibility for the employer to design a training program which fulfills the needs of a facility. The type, amount, and frequency of training will need to reflect the tasks that employees are expected to perform. Although training is to be provided to employees at least annually, it is recommended that safety meetings or discussions and drills be conducted at more frequent intervals.

The training program should include those topics applicable to the particular facility, as well as topics such as: Hot work procedures; lock-out/tag-out procedures; bin entry procedures; bin cleaning procedures; grain dust explosions; fire prevention; procedures for handling “hot grain”; housekeeping procedures, including methods and frequency of dust removal; pesticide and fumigant usage; proper use and maintenance of personal protective equipment; and, preventive maintenance. The types of work clothing should also be considered in the program at least to caution against using polyester clothing that easily melts and increases the severity of burns, as compared to wool or fire retardant cotton.

In implementing the training program, it is recommended that the employer utilize films, slide-tape presentations, pamphlets, and other information which can be obtained from such sources as the Grain Elevator and Processing Society, the Cooperative Extension Service of the U.S. Department of Agriculture, Kansas State University’s Extension Grain Science and Industry, and other state agriculture schools, industry associations, union organizations, and insurance groups.

Subpart S – Electrical Safety-Related Work Practices

1910.332 Training

- (a), (b) and (c) (a) **Scope.** The training requirements contained in this section apply to employees who face a risk of electric shock that is not reduced to a safe level by the electrical installation requirements of 1910.303 through 1910.308.

Note: Employees in occupations listed in Table S-4 face such a risk and are required to be trained. Other employees who also may reasonably be expected to face comparable risk of injury due to electric shock or other electrical hazards must also be trained.

(b) Content of training

- (1) *Practices addressed in this standard.* Employees shall be trained in and familiar with the safety-related work practices required by 1910.331 through 1910.335 that pertain to their respective job assignments.
- (2) *Additional requirements for unqualified persons.* Employees who are covered by paragraph (a) of this section but who are not qualified persons shall also be trained in and familiar with any electrically related safety practices not specifically addressed by 1910.331 through 1910.335 but which are necessary for their safety.
- (3) *Additional requirements for qualified persons.* Qualified persons (i.e., those permitted to work on or near exposed energized parts) shall, at a minimum, be trained in and familiar with the following:
 - (i) The skills and techniques necessary to distinguish exposed live parts from other parts of electric equipment.
 - (ii) The skills and techniques necessary to determine the nominal voltage of exposed live parts, and
 - (iii) The clearance distances specified in 1910.333(c) and the corresponding voltages to which the qualified person will be exposed.

Note 1: For the purposes of 1910.331 through 1910.335, a person must have the training required by paragraph (b)(3) of this section in order to be considered a qualified person.

Note 2: Qualified persons whose work on energized equipment involves either direct contact or contact by means of tools or materials must also have the training needed to meet 1910.333(C)(2).

- (c) **Type of training.** The training required by this section shall be of the classroom or on-the-job type. The degree of training provided shall be determined by the risk to the employee.

TABLE S-4 — Typical Occupational Categories of Employees

Facing a Higher Than Normal Risk of Electrical Accident

Occupation

Blue collar supervisors ¹	Material handling equipment operators ¹
Electrical and electronic engineers ¹	Mechanics and repairers ¹
Electrical and electronic equipment assemblers ¹	Painters ¹
Electrical and electronic technicians ¹	Riggers and roustabouts ¹
Electricians	Stationary engineers ¹
Industrial machine operators ¹	Welders

Footnote (1) Workers in these groups do not need to be trained if their work or the work of those they supervise does not bring them or the employees they supervise close enough to exposed parts of electric circuits operating at 50 volts or more to ground for a hazard to exist.

Subpart T – Commercial Diving Operations

1910.410 Qualifications of dive team

- (a)(1) **(a) Scope** through (4); (b)(1); (c)(2)
 - (1) Each dive team member shall have the experience or training necessary to perform assigned tasks in a safe and healthful manner.
 - (2) Each dive team member shall have experience or training in the following:
 - (i) The use of tools, equipment, and systems relevant to assigned tasks
 - (ii) Techniques of the assigned diving mode
 - (iii) Diving operations and emergency procedures

- (3) All dive team members shall be trained in cardiopulmonary resuscitation and first aid (American Red Cross standard course or equivalent).
- (4) Dive team members who are exposed to or control the exposure of others to hyperbaric conditions shall be trained in diving-related physics and physiology.

(b) Application in emergencies

- (1) Each dive team member shall be assigned tasks in accordance with the employee's experience or training, except that limited additional tasks may be assigned to an employee undergoing training provided that these tasks are performed under the direct supervision of an experienced dive team member.

(c) Employer obligation

- (2) The designated person-in-charge shall have experience and training in the conduct of the assigned diving operation.

Appendix C to Subpart T — Alternative conditions under 1910.401 for recreational diving instructors and diving guides (mandatory)

10. Diver Training

The employer must ensure that each diver receives training that enables the diver to perform work safely and effectively while using open-circuit SCUBAs or rebreathers supplied with nitrox breathing-gas mixtures. Accordingly, each diver must be able to demonstrate the ability to perform critical tasks safely and effectively, including, but not limited to: recognizing the effects of breathing excessive CO₂ and O₂; taking appropriate action after detecting excessive levels of CO₂ and O₂; and properly evaluating, operating, and maintaining their diving equipment under the diving conditions they encounter.

Subpart Z – Toxic and Hazardous Substances

1910.1001 Asbestos

(j)(7) and (m)(4) **(j) Communication of hazards to employees**

(7) *Employee information and training.*

- (i) The employer shall train each employee who is exposed to airborne concentrations of asbestos at or above the PEL and/or excursion limit in accordance with the requirements of this section. The employer shall institute a training program and ensure employee participation in the program.
- (ii) Training shall be provided prior to or at the time of initial assignment and at least annually thereafter.
- (iii) The training program shall be conducted in a manner which the employee is able to understand. The employer shall ensure that each employee is informed of the following:
 - (A) The health effects associated with asbestos exposure;
 - (B) The relationship between smoking and exposure;
 - (C) The quantity, location, manner of use, release, and storage of asbestos, and the specific nature of operations which could result in exposure to asbestos;
 - (D) The engineering controls and work practices associated with the employee's job assignment;
 - (E) The specific procedures implemented to protect employees from exposure to asbestos, such as appropriate work practices, emergency and clean-up procedures, and personal protective equipment to be used;
 - (F) The purpose, proper use, and limitations of respirators and protective clothing, if appropriate;
 - (G) The purpose and a description of the medical surveillance program required by paragraph (l) of this section
 - (H) The content of this standard, including appendices;
 - (I) The names, addresses and phone numbers of public health organizations which provide information, materials, and/or conduct programs concerning

smoking cessation. The employer may distribute the list of such organizations contained in Appendix I to this section, to comply with this requirement.

- (J) The requirements for posting signs and affixing labels and the meaning of the required legends for such signs and labels.
- (iv) The employer shall also provide, at no cost to employees who perform housekeeping operations in an area which contains ACM or PACM, an asbestos awareness training course, which shall at a minimum contain the following elements: health effects of asbestos, locations of ACM and PACM in the building/facility, recognition of ACM and PACM damage and deterioration, requirements in this standard relating to housekeeping, and proper response to fiber release episodes, to all employees who perform housekeeping work in areas where ACM and/or PACM is present. Each such employee shall be so trained at least once a year.
- (v) Access to information and training materials
 - (A) The employer shall make a copy of this standard and its appendices readily available without cost to all affected employees.
 - (B) The employer shall provide, upon request, all materials relating to the employee information and training program to the Assistant Secretary and the training program to the Assistant Secretary and the Director.
 - (C) The employer shall inform all employees concerning the availability of self-help smoking cessation program material. Upon employee request, the employer shall distribute such material, consisting of NIH Publication No. 89-1647, or equivalent self-help material, which is approved or published by a public health organization listed in Appendix I to this section.

(m) Recordkeeping

- (4) *Training.* The employer shall maintain all employee training records for (1) year beyond the last date of employment of that employee.

1910.1003 13 Carcinogens (4-Nitrobiphenyl, etc.)

(e)(4)(i) and (ii)

4-Nitrobiphenyl	1910.1003
Alpha-Naphthylamine	1910.1004
Methyl Chloromethyl Ether	1910.1006
3,3'-Dichlorobenzidine (and its salts)	1910.1007
Bis-Chloromethyl Ether	1910.1008
Beta-Naphthylamine	1910.1009
Benzidine	1910.1010
4-Aminodiphenyl	1910.1011
Ethyleneimine	1910.1012
Beta-Propiolactone	1910.1013
2-Acetylaminofluorene	1910.1014
4-Dimethylaminoazobenzene	1910.1015
N-Nitrosodimethylamine	1910.1016

(e) Communication of hazards

(4) *Training and indoctrination.*

- (i) Each employee prior to being authorized to enter a regulated area, shall receive a training and indoctrination program including, but not necessarily limited to:
 - (A) The nature of the carcinogenic hazards addressed by this section, including local and systemic toxicity;
 - (B) The specific nature of the operation involving a carcinogen addressed by this section that could result in exposure;
 - (C) The purpose for and application of the medical surveillance program, including, as appropriate, methods of self-examination;
 - (D) The purpose for and application of decontamination practices and purposes;
 - (E) The purpose for and significance of emergency practices and procedures;

- (F) The employee's specific role in emergency procedures;
 - (G) Specific information to aid the employee in recognition and evaluation of conditions and situations which may result in the release of a carcinogen addressed by this section;
 - (H) The purpose for and application of specific first-aid procedures and practices;
 - (I) A review of this section at the employee's first training and indoctrination program and annually thereafter.
- (ii) Specific emergency procedures shall be prescribed, and posted, and employees shall be familiarized with their terms, and rehearsed in their application.

1910.1017 Vinyl chloride

(j)(1)(i) through (ix) **(j) Training.** Each employee engaged in vinyl chloride or polyvinyl chloride operations shall be provided training in a program relating to the hazards of vinyl chloride and precautions for its safe use.

- (1) The program shall include:
- (i) The nature of the health hazard from chronic exposure to vinyl chloride including specifically the carcinogenic hazard;
 - (ii) The specific nature of operations which could result in exposure to vinyl chloride in excess of the permissible limit and necessary protective steps;
 - (iii) The purpose for, proper use, and limitations of respiratory protective devices;
 - (iv) The fire hazard and acute toxicity of vinyl chloride, and the necessary protective steps;
 - (v) The purpose for and a description of the monitoring program;
 - (vi) The purpose for, and a description of, the medical surveillance program;
 - (vii) Emergency procedures;
 - (viii) Specific information to aid the employee in recognition of conditions which may result in the release of vinyl chloride; and
 - (ix) A review of this standard at the employee's first training and indoctrination program, and annually thereafter.

1910.1018 Inorganic arsenic

(o)(1) and (2) (o) Employee information and training

(1) *Training program.*

- (i) The employer shall train each employee who is subject to exposure to inorganic arsenic above the action level without regard to respirator use, or for whom there is the possibility of skin or eye irritation from inorganic arsenic, in accordance with the requirements of this section. The employer shall institute a training program and ensure employee participation in the program.
- (ii) The training program shall be provided by October 1, 1978, for employees covered by this provision, at the time of initial assignment for those subsequently covered by this provision, and at least annually for other covered employees thereafter; and the employer shall assure that each employee is informed of the following:
 - (A) The information contained in Appendix A;
 - (B) The quantity, location, manner of use, storage, sources of exposure, and the specific nature of operations which could result in exposure to inorganic arsenic as well as any necessary protective steps;
 - (C) The purpose, proper use, and limitations of respirators;
 - (D) The purpose and a description of the medical surveillance program as required by paragraph (n) of this section;
 - (E) The engineering controls and work practices associated with the employee's job assignment; and
 - (F) A review of this standard.

(2) *Access to training materials.*

- (i) The employer shall make readily available to all affected employees a copy of this standard and its appendices.
- (ii) The employer shall provide, upon request, all materials relating to the employee information and training program to the Assistant Secretary and the Director.

Appendix A to 1910.1018 — Inorganic arsenic substance information sheet

IX – Training and Notification

Additional information on all of these items plus training as to hazards of exposure to inorganic arsenic and the engineering and work practice controls associated with your job will also be provided by your employer. If you are exposed over the permissible exposure limit, your employer must inform you of that fact and the actions he is taking to reduce your exposures.

1910.1025 Lead

(l)(1) and (2); **(l) Employee Information and Training**
Appendix B

(1) *Training Program.*

- (i) Each employer who has a workplace in which there is a potential exposure to airborne lead at any level shall inform employees of the content of Appendices A and B of this regulation.
- (ii) The employer shall train each employee who is subject to exposure to lead at or above the action level, or for whom the possibility of skin or eye irritation exists, in accordance with the requirements of this section. The employer shall institute a training program and ensure employee participation in the program.
- (iii) The employer shall provide initial training by 180 days from the effective date for those employees covered by paragraph (l)(1)(ii) on the standard's effective date and prior to the time of initial job assignment for those employees subsequently covered by this paragraph.
- (iv) The training program shall be repeated at least annually for each employee.
- (v) The employer shall assure that each employee is informed of the following:
 - (A) The content of this standard and its appendices;
 - (B) The specific nature of the operations which could result in exposure to lead above the action level;
 - (C) The purpose, proper selection, fitting, use, and limitations of respirators;

- (D) The purpose and a description of the medical surveillance program, and the medical removal protection program including information concerning the adverse health effects associated with excessive exposure to lead (with particular attention to the adverse reproductive effects on both males and females);
 - (E) The engineering controls and work practices associated with the employee's job assignment;
 - (F) The contents of any compliance plan in effect; and
 - (G) Instructions to employees that chelating agents should not routinely be used to remove lead from their bodies and should not be used at all except under the direction of a licensed physician.
- (2) *Access to information and training materials.*
- (i) The employer shall make readily available to all affected employees a copy of this standard and its appendices.
 - (ii) The employer shall provide, upon request, all materials relating to the employee information and training program to the Assistant Secretary and the Director.
 - (iii) In addition to the information required by paragraph (l)(1)(v), the employer shall include as part of the training program, and shall distribute to employees, any materials pertaining to the Occupational Safety and Health Act, the regulations issued pursuant to that Act, and this lead standard, which are made available to the employer by the Assistant Secretary.

Appendix A to 1910.1025 — Substance Data Sheet for occupational exposure to lead

X. EMPLOYEE INFORMATION AND TRAINING — PARAGRAPH (I)

Your employer is required to provide an information and training program for all employees exposed to lead above the action level or who may suffer skin or eye irritation from lead. This program must inform these employees of the specific hazards associated with their work environment, protective measures which can be taken, the danger of lead to their bodies (including their reproductive systems), and their rights under the standard. In addition your employer must make readily available to all employees,

including those exposed below the action level, a copy of the standard and its appendices and must distribute to all employees any materials provided to the employer by the Occupational Safety and Health Administration (OSHA).

Your employer is required to complete this training program for all employees by August 28, 1979. After this date, all new employees must be trained prior to initial assignment to areas where there is a possibility of exposure over the action level.

This training program must also be provided at least annually thereafter.

1910.1026 Chromium (VI)

(1)(1)(iii); (1) **Communication of chromium (VI) hazards to employees**
(2)(i) and (ii);
Appendix A

(1) *Hazard communication — general.*

(iii) Employers shall include chromium (VI) in the hazard communication program established to comply with the HCS (1910.1200). Employers shall ensure that each employee has access to labels on containers of chromium (VI) and to safety data sheets, and is trained in accordance with the requirements of HCS and paragraph (1)(2) of this section.

(2) *Employee information and training.*

(i) The employer shall ensure that each employee can demonstrate knowledge of at least the following:

- (A) The contents of this section; and
- (B) The purpose and a description of the medical surveillance program required by paragraph (k) of this section.

(ii) The employer shall make a copy of this section readily available without cost to all affected employees.

Appendix A to 1910.1026 — Chromium (VI)

5. Employee information and training. Company employees will be trained pursuant to the provisions of 29 CFR 1910.1026(l)(2). In addition, the Companies agree to train employees in the provisions of this Agreement within sixty (60) days of the Opt-In Date (defined in paragraph 7 of this Agreement). The training regarding this Agreement shall be provided in language the employees can understand.

1910.1027 Cadmium

(m)(4) (m) Communication of cadmium hazards to employees

(4) *Employee information and training.*

- (i) The employer shall train each employee who is potentially exposed to cadmium in accordance with the requirements of this section. The employer shall institute a training program, ensure employee participation in the program, and maintain a record of the contents of such program.
- (ii) Training shall be provided prior to or at the time of initial assignment to a job involving potential exposure to cadmium and at least annually thereafter.
- (iii) The employer shall make the training program understandable to the employee and shall assure that each employee is informed of the following:
 - (A) The health hazards associated with cadmium exposure, with special attention to the information incorporated in Appendix A to this section;
 - (B) The quantity, location, manner of use, release, and storage of cadmium in the workplace and the specific nature of operations that could result in exposure to cadmium, especially exposures above the PEL;
 - (C) The engineering controls and work practices associated with the employee's job assignment;
 - (D) The measures employees can take to protect themselves from exposure to cadmium, including modification of such habits as smoking and personal hygiene, and specific procedures the employer has implemented to protect employees from exposure to cadmium such as appropriate work practices, emergency procedures, and the provision of personal protective equipment;
 - (E) The purpose, proper selection, fitting, proper use, and limitations of respirators and protective clothing;

- (F) The purpose and a description of the medical surveillance program required by paragraph (l) of this standard;
 - (G) The contents of this section and its appendices; and
 - (H) The employee's rights of access to records under 1910.1020(e) and (g).
- (iv) Additional access to information and training program and materials.
- (A) The employer shall make a copy of this section and its appendices readily available without cost to all affected employees and shall provide a copy if requested.
 - (B) The employer shall provide to the Assistant Secretary or the Director, upon request, all materials relating to the employee information and the training program.

1910.1028 Benzene

(j)(3) (j) Communication of benzene hazards to employees

(3) *Information and training.*

- (i) The employer shall provide employees with information and training at the time of their initial assignment to a work area where benzene is present. If exposures are above the action level, employees shall be provided with information and training at least annually thereafter.
- (ii) The training program shall be in accordance with the requirements of 29 CFR 1910.1200(h)(1) and (2), and shall include specific information on benzene for each category of information included in that section.
- (iii) In addition to the information required under 29 CFR 1910.1200, the employer shall:
 - (A) Provide employees with an explanation of the contents of this section, including Appendices A and B, and indicate to them where the standard is available; and,
 - (B) Describe the medical surveillance program required under paragraph (i) of this section, and explain the information contained in Appendix C.

1910.1029 Coke oven emissions

(k) (1) and (2); (k) **Employee information and training**
Appendix A

(1) *Training program.*

- (i) The employer shall train each employee who is employed in a regulated area in accordance with the requirements of this section. The employer shall institute a training program and ensure employee participation in the program.
- (ii) The training program shall be provided as of January 27, 1977 for employees who are employed in the regulated area at that time or at the time of initial assignment to a regulated area.
- (iii) The training program shall be provided at least annually for all employees who are employed in the regulated area, except that training regarding the occupational safety and health hazards associated with exposure to coke oven emissions and the purpose, proper use, and limitations of respiratory protective devices shall be provided at least quarterly until January 20, 1978.
- (iv) The training program shall include informing each employee of:
 - (a) The information contained in the substance information sheet for coke oven emissions (Appendix A);
 - (b) The purpose, proper use, and limitations of respiratory protective devices required in accordance with paragraph (g) of this section;
 - (c) The purpose for and a description of the medical surveillance program required by paragraph (j) of this section including information on the occupational safety and health hazards associated with exposure to coke oven emissions;
 - (d) A review of all written procedures and schedules required under paragraph (f) of this section; and
 - (e) A review of this standard.

- (2) Access to training materials
 - (i) The employer shall make a copy of this standard and its appendices readily available to all employees who are employed in the regulated area.
 - (ii) The employer shall provide upon request all materials relating to the employee information and training program to the Secretary and the Director.

Appendix A – Coke Oven Emissions Substance Information Sheet

IX. TRAINING AND EDUCATION

Additional information on all of these items plus training as to hazards of coke oven emissions and the engineering and work practice controls associated with your job will also be provided by your employer.

1910.1030 Bloodborne pathogens

(g)(2); (h)(2) **(g) Communication of hazards to employees**
and (3)

- (2) *Information and Training.*
 - (i) The employer shall train each employee with occupational exposure in accordance with the requirements of this section. Such training must be provided at no cost to the employee and during working hours. The employer shall institute a training program and ensure employee participation in the program.
 - (ii) Training shall be provided as follows:
 - (A) At the time of initial assignment to tasks where occupational exposure may take place;
 - (B) At least annually thereafter.
 - (iii) reserved
 - (iv) Annual training for all employees shall be provided within one year of their previous training.
 - (v) Employers shall provide additional training when changes such as modification of tasks or procedures or institution of new tasks or procedures affect the employee's occupational exposure. The additional training may be limited to addressing the new exposures created.

- (vi) Material appropriate in content and vocabulary to educational level, literacy, and language of employees shall be used.
- (vii) The training program shall contain at a minimum the following elements:
 - (A) An accessible copy of the regulatory text of this standard and an explanation of its contents;
 - (B) A general explanation of the epidemiology and symptoms of bloodborne diseases;
 - (C) An explanation of the modes of transmission of bloodborne pathogens;
 - (D) An explanation of the employer's exposure control plan and the means by which the employee can obtain a copy of the written plan;
 - (E) An explanation of the appropriate methods for recognizing tasks and other activities that may involve exposure to blood and other potentially infectious materials;
 - (F) An explanation of the use and limitations of methods that will prevent or reduce exposure including appropriate engineering controls, work practices, and personal protective equipment;
 - (G) Information on the types, proper use, location, removal, handling, decontamination and disposal of personal protective equipment;
 - (H) An explanation of the basis for selection of personal protective equipment;
 - (I) Information on the hepatitis B vaccine, including information on its efficacy, safety, method of administration, the benefits of being vaccinated, and that the vaccine and vaccination will be offered free of charge;
 - (J) Information on the appropriate actions to take and persons to contact in an emergency involving blood or other potentially infectious materials;
 - (K) An explanation of the procedures to follow if an exposure incident occurs, including the method of reporting the incident and the medical follow-up that will be made available;

- (L) Information on the post exposure evaluation and follow-up that the employer is required to provide for the employee following an exposure incident;
 - (M) An explanation of the signs and labels and/or color coding required by paragraph (g)(1); and
 - (N) An opportunity for interactive questions and answers with the person conducting the training session.
- (viii) The person conducting the training shall be knowledgeable in the subject matter covered by the elements contained in the training program as it relates to the workplace that the training will address.
- (ix) Additional initial training for employees in HIV and HBV laboratories and production facilities. Employees in HIV or HBV research laboratories and HIV or HBV production facilities shall receive the following initial training in addition to the above training requirements:
- (A) The employer shall assure that employees demonstrate proficiency in standard microbiological practices and techniques and in the practices and operations specific to the facility before being allowed to work with HIV or HBV.
 - (B) The employer shall assure that employees have prior experience in the handling of human pathogens or tissue cultures before working with HIV or HBV.
 - (C) The employer shall provide a training program to employees who have no prior experience in handling human pathogens. Initial work activities shall not include the handling of infectious agents. A progression of work activities shall be assigned as techniques are learned and proficiency is developed. The employer shall assure that employees participate in work activities involving infectious agents only after proficiency has been demonstrated.

(h) Recordkeeping

(2) *Training records.*

- (i) Training records shall include the following information:
 - (A) The dates of the training sessions;
 - (B) The contents or a summary of the training sessions;

- (C) The names and qualifications of persons conducting the training; and
- (D) The names and job titles of all persons attending the training sessions.
- (ii) Training records shall be maintained for 3 years from the date on which the training occurred.
- (3) *Availability.*
 - (i) The employer shall ensure that all records required to be maintained by this section shall be made available upon request to the Assistant Secretary and the Director for examination and copying.
 - (ii) Employee training records required by this paragraph shall be provided upon request for examination and copying to employees, to employee representatives, to the Director, and to the Assistant Secretary.

1910.1043 Cotton dust

(i)(1) and (2) (i) Employee education and training

- (1) *Training program.*
 - (i) The employer shall train each employee exposed to cotton dust in accordance with the requirements of this section. The employer shall institute a training program and ensure employee participation in the program.
 - (A) The acute and long term health hazards associated with exposure to cotton dust;
 - (B) The names and descriptions of jobs and processes which could result in exposure to cotton dust at or above the permissible exposure levels;
 - (C) The measures, including work practices required by paragraph (g) of this section, necessary to protect the employee from exposures in excess of the permissible exposure limit;
 - (D) The purpose, proper use and limitations of respirators required by paragraph (f) of this section;

- (E) The purpose for and a description of the medical surveillance program required by paragraph (h) of this section and other information which will aid exposed employees in understanding the hazards of cotton dust exposure; and
- (F) The contents of the standard and its appendices.
- (ii) The training program shall be provided prior to initial assignment and shall be repeated annually for each employee exposed to cotton dust, when job assignments or work processes change, and when employee performance indicates a need for retraining.
- (2) *Access to training materials.*
 - (i) Each employer shall post a copy of this section with its appendices in a public location at the workplace, and shall, upon request, make copies available to employees.
 - (ii) The employer shall provide all materials relating to the employee training and information program to the Assistant Secretary and the Director upon request.

1910.1044 1,2-Dibromo-3-Chloropropane

(n)(1) and (2) (n) Employee information and training

- (1) *Training program.*
 - (i) The employer shall train each employee who may be exposed to DBCP in accordance with the requirements of this section. The employer shall institute a training program and ensure employee participation in the program.
 - (ii) The employer shall assure that each employee is informed of the following:
 - (a) The information contained in Appendix A;
 - (b) The quantity, location, manner of use, release or storage of DBCP and the specific nature of operations which could result in exposure to DBCP as well as any necessary protective steps;
 - (c) The purpose, proper use, and limitations of respirators;
 - (d) The purpose and description of the medical surveillance program required by paragraph (m) of this section; and
 - (e) A review of this standard, including appendices.

- (2) *Access to training materials.*
 - (i) The employer shall make a copy of this standard and its appendices readily available to all affected employees.
 - (ii) The employer shall provide, upon request, all materials relating to the employee information and training program to the Assistant Secretary and the Director.

1910.1045 Acrylonitrile (vinyl cyanide)

(o)(1) and (2) (o) Employee Information and Training

- (1) *Training program.*
 - (i) The employer shall train each employee exposed to AN above the action level, each employee whose exposures are maintained below the action level by engineering and work practice controls, and each employee subject to potential skin or eye contact with liquid AN in accordance with the requirements of this section. The employer shall institute a training program and ensure employee participation in the program.
 - (ii) Training shall be provided at the time of initial assignment, or upon institution of the training program, and at least annually thereafter, and the employer shall assure that each employee is informed of the following:
 - (A) The information contained in Appendices A and B;
 - (B) The quantity, location, manner of use, release, or storage of AN, and the specific nature of operations which could result in exposure to AN, as well as any necessary protective steps;
 - (C) The purpose, proper use, and limitations of respirators and protective clothing;
 - (D) The purpose and a description of the medical surveillance program required by paragraph (n) of this section;
 - (E) The emergency procedures developed, as required by paragraph (i) of this section;
 - (F) Engineering and work practice controls, their function, and the employee's relationship to these controls; and
 - (G) A review of this standard.

- (2) *Access to training materials.*
 - (i) The employer shall make a copy of this standard and its appendices readily available to all affected employees.
 - (ii) The employer shall provide, upon request, all materials relating to the employee information and training program to the Assistant Secretary and the Director.

1910.1047 Ethylene oxide

(j)(3) (j) **Communication of hazards**

- (3) *Information and training.*
 - (i) The employer shall provide employees who are potentially exposed to EtO at or above the action level or above the excursion limit with information and training on EtO at the time of initial assignment and at least annually thereafter.
 - (ii) Employees shall be informed of the following:
 - (A) The requirements of this section with an explanation of its contents, including Appendices A and B;
 - (B) Any operations in their work area where EtO is present;
 - (C) The location and availability of the written EtO final rule; and
 - (D) The medical surveillance program required by paragraph (i) of this section with an explanation of the information in Appendix C.
 - (iii) Employer training shall include at least:
 - (A) Methods and observations that may be used to detect the presence or release of EtO in the work area (such as monitoring conducted by the employer, continuous monitoring devices, etc.);
 - (B) The physical and health hazards of EtO;
 - (C) The measures employees can take to protect themselves from hazards associated with EtO exposure, including specific procedures the employer has implemented to protect employees from exposure to EtO, such as work practices, emergency procedures, and personal protective equipment to be used; and
 - (D) The details of the hazard communication program developed by the employer, including an explanation of the labeling system and how employees can obtain and use the appropriate hazard information.

1910.1048 Formaldehyde

(n)(1) through (4) (n) Employee Information and Training

- (1) *Participation.* The employer shall assure that all employees who are assigned to workplaces where there is exposure to formaldehyde participate in a training program, except where the employer can show, using objective data, that employees are not exposed to formaldehyde at or above 0.1 ppm, the employer is not required to provide training.
- (2) *Frequency.* Employers shall provide such information and training to employees at the time of initial assignment, and whenever a new exposure to formaldehyde is introduced into the work. The training shall be repeated at least annually.
- (3) *Training program.* The training program shall be conducted in a manner which the employee is able to understand and shall include:
 - (i) A discussion of the contents of this regulation and the contents of the Material Safety Data Sheet.
 - (ii) The purpose for and a description of the medical surveillance program required by this standard, including:
 - (A) A description of the potential health hazards associated with exposure to formaldehyde and a description of the signs and symptoms of exposure to formaldehyde.
 - (B) instructions to immediately report to the employer the development of any adverse signs or symptoms that the employee suspects is attributable to formaldehyde exposure.
 - (iii) Description of operations in the work area where formaldehyde is present and an explanation of the safe work practices appropriate for limiting exposure to formaldehyde in each job;
 - (iv) The purpose for, proper use of, and limitations of personal protective clothing and equipment;
 - (v) Instructions for the handling of spills, emergencies, and clean-up procedures;
 - (vi) An explanation of the importance of engineering and work practice controls for employee protection and any necessary instruction in the use of these controls; and

- (vii) A review of emergency procedures including the specific duties or assignments of each employee in the event of an emergency.
- (4) *Access to training materials.*
 - (i) The employer shall inform all affected employees of the location of written training materials and shall make these materials readily available, without cost, to the affected employees.
 - (ii) The employer shall provide, upon request, all training materials relating to the employee training program to the Assistant Secretary and the Director.

1910.1050 Methylenedianiline

(k)(3) and (4) (k) Communication of hazards

- (3) *Information and training.*
 - (i) The employer shall provide employees with information and training on MDA in accordance with 29 CFR 1910.1200(h) at the time of initial assignment and at least annually thereafter.
 - (ii) In addition to the information required under 29 CFR 1910.1200 the employer shall:
 - (A) Provide an explanation of the contents of this section, including Appendices A and B, and indicate to employees where a copy of the standard is available;
 - (B) Describe the medical surveillance program required under paragraph (m) of this section, and explain the information contained in Appendix C; and
 - (C) Describe the medical removal provision required under paragraph (m) of this section.
- (4) *Access to training materials.*
 - (i) The employer shall make readily available to all affected employees, without cost, all written materials relating to the employee training program, including a copy of this regulation.
 - (ii) The employer shall provide to the Assistant Secretary of Labor and the Director, upon request, all information and training materials relating to the employee information and training program.

1910.1051 1,3-Butadiene

(1)(2) and (3) **(1) Communication of BD hazards to employees**

(2) Employee information and training.

- (i) The employer shall provide all employees exposed to BD with information and training in accordance with the requirements of the Hazard Communication Standard, 29 CFR 1910.1200, 29 CFR 1915.1200, and 29 CFR 1926.59.
- (ii) The employer shall train each employee who is potentially exposed to BD at or above the action level or the STEL in accordance with the requirements of this section. The employer shall institute a training program, ensure employee participation in the program, and maintain a record of the contents of such program.
- (iii) Training shall be provided prior to or at the time of initial assignment to a job potentially involving exposure to BD at or above the action level or STEL and at least annually thereafter.
- (iv) The training program shall be conducted in a manner that the employee is able to understand. The employer shall ensure that each employee exposed to BD over the action level or STEL is informed of the following:
 - (A) The health hazards associated with BD exposure, and the purpose and a description of the medical screening and surveillance program required by this section;
 - (B) The quantity, location, manner of use, release, and storage of BD and the specific operations that could result in exposure to BD, especially exposures above the PEL or STEL;
 - (C) The engineering controls and work practices associated with the employee's job assignment, and emergency procedures and personal protective equipment;
 - (D) The measures employees can take to protect themselves from exposure to BD;
 - (E) The contents of this standard and its appendices; and
 - (F) The right of each employee exposed to BD at or above the action level or STEL to obtain:

- (1) medical examinations as required by paragraph (j) of this section at no cost to the employee;
 - (2) the employee's medical records required to be maintained by paragraph (m)(4) of this section; and
 - (3) all air monitoring results representing the employee's exposure to BD and required to be kept by paragraph (m)(2) of this section.
- (3) *Access to information and training materials.*
- (i) The employer shall make a copy of this standard and its appendices readily available without cost to all affected employees and their designated representatives and shall provide a copy if requested.
 - (ii) The employer shall provide to the Assistant Secretary or the Director, or the designated employee representatives, upon request, all materials relating to the employee information and the training program.

1910.1052 Methylene chloride

(1)(1) through (8) **(I) Employee information and training**

- (1) The employer shall provide information and training for each affected employee prior to or at the time of initial assignment to a job involving potential exposure to MC.
- (2) The employer shall ensure that information and training is presented in a manner that is understandable to the employees.
- (3) In addition to the information required under the Hazard Communication Standard at 29 CFR 1910.1200, 29 CFR 1915.1200, or 29 CFR 1926.59, as appropriate:
 - (i) The employer shall inform each affected employee of the requirements of this section and information available in its appendices, as well as how to access or obtain a copy of it in the workplace;
 - (ii) Wherever an employee's exposure to airborne concentrations of MC exceeds or can reasonably be expected to exceed the action level, the employer shall inform each affected employee of the quantity, location, manner of use, release, and storage of MC and the specific operations in the workplace that could result in exposure to MC, particularly noting where exposures may be above the 8-hour TWA PEL or STEL.

- (4) The employer shall train each affected employee as required under the Hazard Communication standard at 29 CFR 1910.1200, 29 CFR 1915.1200, or 29 CFR 1926.59, as appropriate.
- (5) The employer shall re-train each affected employee as necessary to ensure that each employee exposed above the action level or the STEL maintains the requisite understanding of the principles of safe use and handling of MC in the workplace.
- (6) Whenever there are workplace changes, such as modifications of tasks or procedures or the institution of new tasks or procedures, which increase employee exposure, and where those exposures exceed or can reasonably be expected to exceed the action level, the employer shall update the training as necessary to ensure that each affected employee has the requisite proficiency.
- (7) An employer whose employees are exposed to MC at a multi-employer worksite shall notify the other employers with work operations at that site in accordance with the requirements of the Hazard Communication Standard, 29 CFR 1910.1200, 29 CFR 1915.1200, or 29 CFR 1926.59, as appropriate.
- (8) The employer shall provide to the Assistant Secretary or the Director, upon request, all available materials relating to employee information and training.

1910.1096 Ionizing radiation

(f)(3)(viii); (f) **Immediate evacuation warning signal**
and (i)(2)

(3) *Testing.*

(viii) All employees whose work may necessitate their presence in an area covered by the signal shall be made familiar with the actual sound of the signal — preferably as it sounds at their work location. Before placing the system into operation, all employees normally working in the area shall be made acquainted with the signal by actual demonstration at their work locations.

(i) **Instruction of personnel, posting**

- (2) All individuals working in or frequenting any portion of a radiation area shall be informed of the occurrence of radioactive materials or of radiation in such portions of the radiation area; shall be instructed in the safety problems associated with exposure to such materials or radiation and in precautions or devices to minimize exposure; shall be instructed in the applicable provisions

of this section for the protection of employees from exposure to radiation or radioactive materials; and shall be advised of reports of radiation exposure which employees must request pursuant to the regulations in this section.

1910.1200 Hazard communication

(h)(1) through (3) **(h) Employee information and training**

- (1) Employers shall provide employees with effective information and training on hazardous chemicals in their work area at the time of their initial assignment, and whenever a new chemical hazard the employees have not previously been trained about is introduced into their work area. Information and training may be designed to cover categories of hazards (e.g., flammability, carcinogenicity) or specific chemicals. Chemical-specific information must always be available through labels and material safety data sheets.
- (2) *Information.* Employees shall be informed of:
 - (i) The requirements of this section;
 - (ii) Any operations in their work area where hazardous chemicals are present; and,
 - (iii) The location and availability of the written hazard communication program, including the required list(s) of hazardous chemicals, and material safety data sheets required by this section.
- (3) *Training.* Employee training shall include at least:
 - (i) Methods and observations that may be used to detect the presence or release of a hazardous chemical in the work area (such as monitoring conducted by the employer, continuous monitoring devices, visual appearance or odor of hazardous chemicals when being released, etc.);
 - (ii) The physical, health, simple asphyxiation, combustible dust, and pyrophoric gas hazards, as well as hazards not otherwise classified, of the chemicals in the work area;
 - (iii) The measures employees can take to protect themselves from these hazards, including specific procedures the employer has implemented to protect employees from exposure to hazardous chemicals, such as appropriate work practices, emergency procedures, and personal protective equipment to be used; and,

- (iv) The details of the hazard communication program developed by the employer, including an explanation of the labels received on shipped containers and the workplace labeling system used by their employer and the material safety data sheet, including the order of information and how employees can obtain and use the appropriate hazard information.

1910.1450 Occupational exposure to hazardous chemicals in laboratories

(f)(1) through (4) (f) Employee information and training

- (1) The employer shall provide employees with information and training to ensure that they are apprised of the hazards of chemicals present in their work area.
- (2) Such information shall be provided at the time of an employee's initial assignment to a work area where hazardous chemicals are present and prior to assignments involving new exposure situations. The frequency of refresher information and training shall be determined by the employer.
- (3) *Information.* Employees shall be informed of:
 - (i) The contents of this standard and its appendices which shall be made available to employees;
 - (ii) The location and availability of the employer's Chemical Hygiene Plan;
 - (iii) The permissible exposure limits for OSHA regulated substances or recommended exposure limits for other hazardous chemicals where there is no applicable OSHA standard;
 - (iv) Signs and symptoms associated with exposures to hazardous chemicals used in the laboratory; and
 - (v) The location and availability of known reference material on the hazards, safe handling, storage and disposal of hazardous chemicals found in the laboratory including, but not limited to, safety data sheets received from the chemical supplier.
- (4) *Training.*
 - (i) Employee training shall include:
 - (A) Methods and observations that may be used to detect the presence or release of a hazardous chemical (such as monitoring conducted by the employer, continuous monitoring devices, visual appearance or odor of hazardous chemicals when being released, etc.);

- (B) The physical and health hazards of chemicals in the work area; and
 - (C) The measures employees can take to protect themselves from these hazards, including specific procedures the employer has implemented to protect employees from exposure to hazardous chemicals, such as appropriate work practices, emergency procedures, and personal protective equipment to be used.
- (ii) The employee shall be trained on the applicable details of the employer's written Chemical Hygiene Plan.

Appendix A to 1910.1450 — National Research Council Recommendations Concerning Chemical Hygiene in Laboratories (Non-Mandatory)

Forward

As guidance for each employer's development of an appropriate laboratory Chemical Hygiene Plan, the following non-mandatory recommendations are provided. They were extracted from "Prudent Practices for Handling Hazardous Chemicals in Laboratories" (referred to below as "Prudent Practices"), which was published in 1981 by the National Research Council and is available from the National Academy Press, 2101 Constitution Ave., NW, Washington DC 20418.

(References to page numbers in "Prudent Practices" are given in parentheses).

Components of the Chemical Hygiene Plan — Information and Training Program (D)(10)

- (a) Aim: To assure that all individuals at risk are adequately informed about the work in the laboratory, its risks, and what to do if an accident occurs (5, 15).
- (b) Emergency and Personal Protection Training: Every laboratory worker should know the location and proper use of available protective apparel and equipment (154, 169).

Some of the full-time personnel of the laboratory should be trained in the proper use of emergency equipment and procedures (6). Such training as well as first aid instruction should be available to (154) and encouraged for (176) everyone who might need it.

- (c) Receiving and stockroom/storeroom personnel should know about hazards, handling equipment, protective apparel, and relevant regulations (217).
- (d) Frequency of Training: The training and education program should be a regular, continuing activity — not simply an annual presentation (15).
- (e) Literature/Consultation: Literature and consulting advice concerning chemical hygiene should be readily available to laboratory personnel, who should be encouraged to use these information resources (14).



Maritime

The following training requirements have been excerpted from ***Title 29 Code of Federal Regulations Parts 1915*** (Shipyard Employment), ***1917*** (Marine Terminals), and ***1918*** (Longshoring).*

29 CFR PART 1915 – SHIPYARD EMPLOYMENT

Subpart A – General Provisions

1915.6 Commercial diving operations

Commercial diving operations shall be subject to Subpart T of Part 1910, 1910.401-1910.441 of this chapter.

1915.7 Competent person

(b) and (c)

(b) Designation.

- (1) One or more competent persons shall be designated by the employer in accordance with the applicable requirements of this section, unless the requirements of subparts B, C, D, and H of this part are always carried out by a Marine Chemist. Exception: The employer may designate any person who meets the applicable

* Note that in addition to these requirements, Part 1910, relating to general industry, also contains applicable training standards.

portions of the criteria set forth in paragraph (c) of this section as a competent person who is limited to performing testing to the following situations:

- (i) Repair work on small craft in boatyards where only combustible gas indicator tests are required for fuel tank leaks or when using flammable paints below decks;
 - (ii) Building of wooden vessels where only knowledge of the precautions to be taken when using flammable paints is required;
 - (iii) The breaking of vessels where there is no fuel oil or other flammable hazard; and
 - (iv) Tests and inspections performed to comply with Section 1915.35(b)(8) and 1915.36(a)(5).
- (2) (i) The employer shall maintain either a roster of designated competent persons or a statement that a Marine Chemist will perform the tests or inspections which require a competent person.
- (ii) The employer shall make the roster of designated persons or the statement available to employees, the employee's representative, the Director or the Assistant Secretary upon request.
- (iii) The roster shall contain, at a minimum, the following:
- (A) The employer's name,
 - (B) The designated competent person's name(s), and
 - (C) The date the employee was trained as a competent person.
- (c) **Criteria.** The employer shall ensure that each designated competent person has the following skills and knowledge:
- (1) Ability to understand and carry out written or oral information or instructions left by Marine Chemist, Coast Guard authorized persons, and Certified Industrial Hygienists;
 - (2) Knowledge of subparts B, C, D, and H of this part;
 - (3) Knowledge of the structure, location, and designation of spaces where work is done;
 - (4) Ability to calibrate and use testing equipment including, but not limited to, oxygen indicators, combustible gas indicators, carbon monoxide indicators, and carbon dioxide indicators, and to interpret accurately the test results of that equipment;

- (5) Ability to perform all required tests and inspections which are or may be performed by a competent person as set forth in subparts B, C, D, and H of this part;
- (6) Ability to inspect, test and evaluate spaces to determine the need for further testing by a Marine Chemist or a Certified Industrial Hygienist; and
- (7) Ability to maintain records required by this section.

1915.9 Compliance duties owed to each employee

- (b) **Training.** Standards in this part requiring training on hazards and related matters, such as standards requiring that employees receive training or that the employer train employees, provide training to employees, or institute or implement a training program, impose a separate compliance duty with respect to each employee covered by the requirement. The employer must train each affected employee in the manner required by the standard, and each failure to train an employee may be considered a separate violation.

Subpart B – Confined and Enclosed Spaces and Other Dangerous Atmospheres in Shipyard Employment

1915.12 Precautions and the order of testing before entering confined and enclosed spaces and other dangerous atmospheres

(a)(1); (b)(1); (d)(1) through (5); (e)(1)(i)(ii) and (iv) and (e)(2)

(a) Oxygen content

- (1) The employer shall ensure that the following spaces are visually inspected and tested by a competent person to determine the atmosphere's oxygen content prior to initial entry into the space by an employee:
 - (i) Spaces that have been sealed, such as, but not limited to, spaces that have been coated and closed up, and non-ventilated spaces that have been freshly painted;
 - (ii) Spaces and adjacent spaces that contain or have contained combustible or flammable liquids or gases;
 - (iii) Spaces and adjacent spaces that contain or have contained liquids, gases, or solids that are toxic, corrosive, or irritant;
 - (iv) Spaces and adjacent spaces that have been fumigated; and

- (v) Spaces containing materials or residues of materials that create an oxygen-deficient atmosphere.

(b) Flammable atmospheres

- (1) The employer shall ensure that spaces and adjacent spaces that contain or have contained combustible or flammable liquids or gases are:
 - (i) Inspected visually by a competent person to determine the presence of combustible or flammable liquids; and,
 - (ii) Tested by a competent person prior to entry by an employee to determine the concentration of flammable vapors and gases within the space.

(d) Training of employees entering confined and enclosed spaces or other dangerous atmospheres

- (1) The employer shall ensure that each employee that enters a confined or enclosed space and other areas with dangerous atmospheres is trained to perform all required duties safely.
- (2) The employer shall ensure that each employee who enters a confined space, enclosed space, or other areas with dangerous atmospheres is trained to:
 - (i) Recognize the characteristics of the confined space;
 - (ii) Anticipate and be aware of the hazards that may be faced during entry;
 - (iii) Recognize the adverse health effects that may be caused by the exposure to a hazard;
 - (iv) Understand the physical signs and reactions related to exposures to such hazards;
 - (v) Know what personal protective equipment is needed for safe entry into and exit from the space;
 - (vi) Use personal protective equipment; and
 - (vii) Where necessary, be aware of the presence and proper use of barriers that may be needed to protect an entrant from hazards.
- (3) The employer shall ensure that each entrant into confined or enclosed spaces or other dangerous atmospheres is trained to exit the space or dangerous atmosphere whenever:
 - (i) The employer or a representative orders evacuation;
 - (ii) An evacuation signal such as an alarm is activated; or
 - (iii) The entrant perceives that he or she is in danger.

- (4) The employer shall provide each employee with training:
 - (i) Before the entrant begins work addressed by this section; and
 - (ii) Whenever there is a change in operations or in an employee's duties that present a hazard about which the employee has not previously been trained.
- (5) The employer shall certify that the training required by paragraphs (d)(1) through (d)(4) of this section has been accomplished.
 - (i) The certification shall contain the employee's name, the name of the certifier, and the date(s) of the certification.
 - (ii) The certification shall be available for inspection by the Assistant Secretary, the Director, employees, and their representatives.

(e) Rescue teams

- (1) The employer shall either establish a shipyard rescue team or arrange for an outside rescue team which will respond promptly to a request for rescue service.
 - (i) Each employee assigned to the shipyard team shall be provided with and trained to use the personal protective equipment he or she will need, including respirators and any rescue equipment necessary for making rescues from confined and enclosed spaces and other dangerous atmospheres.
 - (ii) Each employee assigned to the shipyard rescue team shall be trained to perform his or her rescue functions including confined and enclosed and other dangerous atmosphere entry.
 - (iv) At least one person on each rescue team shall maintain current certification in basic first aid which includes maintenance of an airway, control of bleeding, maintenance of circulation and cardiopulmonary resuscitation (CPR) skills.
- (2) The employer shall inform outside rescue teams of the hazards that the team may encounter when called to perform confined and enclosed space or other dangerous atmosphere rescue at the employer's facility so that the rescue team can be trained and equipped.

1915.13 Cleaning and other cold work

(b)(2) and (4)

(b) Requirements for performing cleaning or cold work

- (2) Testing shall be conducted by a competent person to determine the concentration of flammable, combustible, toxic, corrosive, or irritant vapors within the space prior to the beginning of cleaning or cold work.

- (4) Testing shall be conducted by a competent person as often as necessary during cleaning or cold work to assure that air concentrations are below 10 percent of the lower explosive limit and within the PELs and below IDLH levels. Factors such as, but not limited to, temperature, volatility of the residues, and other existing conditions in and about the spaces are to be considered in determining the frequency of testing necessary to assure a safe atmosphere.

1915.14 Hot work

(b)(1) (b) Hot work requiring testing by a competent person

- (1) Hot work is not permitted in or on the following spaces or adjacent spaces or other dangerous atmospheres until they have been tested by a competent person and determined to contain no concentrations of flammable vapors equal to or greater than 10 percent of the lower explosive limit:
 - (i) Dry cargo holds,
 - (ii) The bilges,
 - (iii) The engine room and boiler spaces for which a Marine Chemist or a Coast Guard authorized person certificate is not required under paragraph (a)(1)(i) of this section,
 - (iv) Vessels and vessel sections for which a Marine Chemist or Coast Guard authorized person certificate is not required under paragraph (a)(1)(i) of this section, and
 - (v) Land-side confined and enclosed spaces or other dangerous atmospheres not covered by paragraph (a)(1) of this section.

1915.15 Maintenance of safe conditions

- (c) **Tests to maintain the conditions of a Marine Chemist's or Coast Guard authorized person's certificates.** A competent person shall visually inspect and test each space certified as "Safe for Workers" or "Safe for Hot Work," as often as necessary to ensure that atmospheric conditions within that space is maintained within the conditions established by the certificate after the certificate has been issued.

Subpart C – Surface Preparation and Preservation

1915.35 Painting

- (b)(1) and (8) (b) **Paints and tank coatings dissolved in highly volatile, toxic and flammable solvents.** Several organic coatings, adhesives and resins are dissolved in highly toxic, flammable and explosive solvents with flash points below 80 degrees Fahrenheit. Work involving such materials shall be done only when all of the following special precautions have been taken:
- (1) Sufficient exhaust ventilation shall be provided to keep the concentration of solvent vapors below 10 percent of the lower explosive limit. Frequent tests shall be made by a competent person to ascertain the concentration.
 - (8) A competent person shall inspect all power lighting cables to ensure that the insulation is in excellent condition, free of all cracks and worn spots, that there are no connections within 50 feet (15.2 meters) of the operation, that lines are not overloaded, and that they are suspended with sufficient slack to prevent undue stress or chafing.

1915.36 Flammable liquids

- (a)(2) and (5) (a) In all cases when liquid solvents, paint and preservative removers, paints or vehicles, other than those covered by 1915.35(b), are capable of producing a flammable atmosphere under the conditions of use, the following precautions shall be taken:
- (2) Ventilation shall be provided in sufficient quantities to keep the concentration of vapors below 10 percent of their lower explosive limit. Frequent tests shall be made by a competent person to ascertain the concentration.
 - (5) A competent person shall inspect all power and lighting cables to ensure that the insulation is in excellent condition, free of all cracks and worn spots, that there are no connections within 50 feet (15.2 meters) of the operation, that lines are not overloaded, and that they are suspended with sufficient slack to prevent undue stress or chafing.

Subpart D – Welding, Cutting and Heating

1915.53 Welding, cutting and heating in way of preservative coatings

- (b), (e)(1), (f)
- (b) Before welding, cutting or heating is commenced on any surface covered by a preservative coating whose flammability is not known, a test shall be made by a competent person to determine its flammability. Preservative coatings shall be considered to be highly flammable when scrapings burn with extreme rapidity.
 - (e) Before welding, cutting or heating is commenced in enclosed spaces on metals covered by soft and greasy preservatives, the following precautions shall be taken:
 - (1) A competent person shall test the atmosphere in the space to ensure that it does not contain explosive vapors, since there is a possibility that some soft and greasy preservatives may have flash points below temperatures which may be expected to occur naturally. If such vapors are determined to be present, no hot work shall be commenced until such precautions have been taken as will ensure that the welding, cutting or heating can be performed in safety.
 - (f) Immediately after welding, cutting or heating is commenced in enclosed spaces on metal covered by soft and greasy preservatives, and at frequent intervals thereafter, a competent person shall make tests to ensure that no flammable vapors are being produced by the coatings. If such vapors are determined to be present, the operation shall be stopped immediately and shall not be resumed until such additional precautions have been taken as are necessary to ensure that the operation can be resumed safely.

1915.54 Welding, cutting and heating of hollow metal containers and structures not covered by 1915.12

- (c) Before welding, cutting, heating or brazing is begun on structural voids such as skegs, bilge keels, fair waters, masts, booms, support stanchions, pipe stanchions or railings, a competent person shall inspect the object and, if necessary, test it for the presence of flammable liquids or vapors. If flammable liquids or vapors are present, the objects shall be made safe.

1915.55 Gas welding and cutting

(d)(1)
through (6)

- (d) Use of fuel gas.** The employer shall thoroughly instruct employees in the safe use of fuel gas, as follows:
- (1) Before connecting a regulator to a cylinder valve, the valve shall be opened slightly and closed immediately. (This action is generally termed “cracking” and is intended to clear the valve of dust or dirt that might otherwise enter the regulator.) The person cracking the valve shall stand to one side of the outlet, not in front of it. The valve of a fuel gas cylinder shall not be cracked where the gas would reach welding work, sparks, flame or other possible sources of ignition.
 - (2) The cylinder valve shall always be opened slowly to prevent damage to the regulator. To permit quick closing, valves on fuel gas cylinders shall not be opened more than 1-1/2 turns. When a special wrench is required, it shall be left in position on the stem of the valve while the cylinder is in use so that the fuel gas flow can be shut off quickly in case of an emergency. In the case of manifolded or coupled cylinders, at least one such wrench shall always be available for immediate use. Nothing shall be placed on top of a fuel gas cylinder, when in use, which may damage the safety device or interfere with the quick closing of the valve.
 - (3) Fuel gas shall not be used from cylinders through torches or other devices which are equipped with shutoff valves without reducing the pressure through a suitable regulator attached to the cylinder valve or manifold.
 - (4) Before a regulator is removed from a cylinder valve, the cylinder valve shall always be closed and the gas released from the regulator.
 - (5) If, when the valve on a fuel gas cylinder is opened, there is found to be a leak around the valve stem, the valve shall be closed and the gland nut tightened. If this action does not stop the leak, the use of the cylinder shall be discontinued, and it shall be properly tagged and removed from the vessel. In the event that fuel gas should leak from the cylinder valve rather than from the valve stem and the gas cannot be shut off, the cylinder shall be properly tagged and removed from the vessel. If a regulator attached to a cylinder valve will effectively stop a leak through the valve seal, the cylinder need not be removed from the vessel.
 - (6) If a leak should develop at a fuse plug or other safety device, the cylinder shall be removed from the vessel.

1915.56 Arc welding and cutting

(d)(1)
through (4)

- (d) Operating instructions.** Employers shall instruct employees in the safe means of arc welding and cutting as follows:
- (1) When electrode holders are to be left unattended, the electrodes shall be removed and the holders shall be so placed or protected so that they cannot make electrical contact with employees or conducting objects.
 - (2) Hot electrode holders shall not be dipped in water, since to do so may expose the arc welder or cutter to electric shock.
 - (3) When the arc welder or cutter has occasion to leave his work or to stop work for any appreciable length of time, or when the arc welding or cutting machine is to be moved, the power supply switch to the equipment shall be opened.
 - (4) Any faulty or defective equipment shall be reported to the supervisor.

1915.57 Uses of fissionable material

- (b) Any activity which involves the use of radioactive material, whether or not under license from the Nuclear Regulatory Commission, shall be performed by competent persons specially trained in the proper and safe operation of such equipment. In the case of materials used under Commission license, only persons actually licensed, or competent persons under direction and supervision of the licensee, shall perform such work.

Subpart E – Scaffolds, Ladders and Other Working Surfaces

1915.71 Scaffolds or staging

(b) General requirements

- (7) No scaffold shall be erected, moved, dismantled or altered except under the supervision of competent persons.

Subpart F – General Working Conditions

1915.89 Control of hazardous energy (lockout/tags-plus)

(o)(1) through
(7); (r)(1)

(o) Information and training

- (1) *Initial training.* The employer shall train each employee in the applicable requirements of this section no later than October 31, 2011.
- (2) *General training content.* The employer shall train each employee who is, or may be, in an area where lockout/tags-plus systems are being used so they know:
 - (i) The purpose and function of the employer's lockout/tags-plus program and procedures;
 - (ii) The unique identity of the locks and tags to be used in the lockout/tags-plus system, as well as the standardized color, shape or size of these devices;
 - (iii) The basic components of the tags-plus system: an energy-isolating device with a tag affixed to it and an additional safety measure;
 - (iv) The prohibition against tampering with or removing any lockout/tags-plus system; and
 - (v) The prohibition against restarting or reenergizing any machinery, equipment, or system being serviced under a lockout/tags-plus system.
- (3) *Additional training requirements for affected employees.* In addition to training affected employees in the requirements in paragraph (o)(2) of this section, the employer also shall train each affected employee so he/she knows:
 - (i) The use of the employer's lockout/tags-plus program and procedures;
 - (ii) That affected employees are not to apply or remove any lockout/tags-plus system; and
 - (iii) That affected employees are not to bypass, ignore, or otherwise defeat any lockout/tags-plus system.

- (4) *Additional training requirements for authorized employees.* In addition to training authorized employees in the requirements in paragraphs (o)(2) and (o)(3) of this section, the employer also shall train each authorized employee so he/she knows:
- (i) The steps necessary for the safe application, use, and removal of lockout/tags-plus systems to prevent energization or startup or the release of hazardous energy during servicing of machinery, equipment, or systems;
 - (ii) The type of energy sources and the magnitude of the energy available at the worksite;
 - (iii) The means and methods necessary for effective isolation and control of hazardous energy;
 - (iv) The means for determining the safe exposure status of other employees in a group when the authorized employee is working as a group's primary authorized employee;
 - (v) The requirement for tags to be written so they are legible and understandable to all employees;
 - (vi) The requirement that tags and their means of attachment be made of materials that will withstand the environmental conditions encountered in the workplace;
 - (vii) The requirement that tags be securely attached to energy-isolating devices so they cannot be accidentally removed while servicing machinery, equipment, or systems;
 - (viii) That tags are warning devices, and alone do not provide physical barriers against energization or startup, or the release of hazardous energy, provided by locks, and energy-isolating devices; and
 - (ix) That tags must be used in conjunction with an energy-isolating device to prevent energization or startup or the release of hazardous energy.
- (5) *Additional training for lockout/tags-plus coordinator.* In addition to training lockout/tags-plus coordinators in the requirements in paragraphs (o)(2), (o)(3), and (o)(4) of this section, the employer shall train each lockout/tags-plus coordinator so he/she knows:
- (i) How to identify and isolate any machinery, equipment, or system that is being serviced; and
 - (ii) How to accurately document lockout/tags-plus systems and maintain the lockout/tags-plus log.

- (6) *Employee retraining.*
 - (i) The employer shall retrain each employee, as applicable, whenever
 - (A) There is a change in his/her job assignment that presents new hazards or requires a greater degree of knowledge about the employer's lockout/tags-plus program or procedures;
 - (B) There is a change in machinery, equipment, or systems to be serviced that presents a new energy-control hazard;
 - (C) There is a change in the employer's lockout/tags-plus program or procedures; or
 - (D) It is necessary to maintain the employee's proficiency
 - (ii) The employer also shall retrain each employee, as applicable, whenever an incident investigation or program audit indicates that there are:
 - (A) Deviations from, or deficiencies in, the employer's lockout/tags-plus program or procedures; or
 - (B) Inadequacies in an employee's knowledge or use of the lockout/tags-plus program or procedures.
 - (iii) The employer shall ensure that retraining establishes the required employee knowledge and proficiency in the employer's lockout/tags-plus program and procedures and in any new or revised energy-control procedures
- (7) Upon completion of employee training, the employer shall keep a record that the employee accomplished the training, and that this training is current. The training record shall contain at least the employee's name, date of training, and the subject of the training.

(r) Recordkeeping

- (1) Table to paragraph (r)(1) of this section specifies what records the employer must retain and how long the employer must retain them:

**Table to Paragraph (r)(1) of This Section—
Retention of Records Required by 1915.89**

The employer must keep the following records . . .	For at least . . .
(i) Current lockout/tags-plus program and procedures	Until replaced by updated program and procedures.
(ii) Training records	Until replaced by updated records for each type of training.
(iii) Incident investigation reports	Until the next program audit is completed.
(iv) Program audit report	12 months after being replaced by the next audit report.

- (2) The employer shall make all records required by this section available to employees, their representatives, and the Assistant Secretary in accordance with the procedures and time periods specified in 29 CFR 1910.1020(e)(1) and (e)(3).

Subpart G – Gear and Equipment for Rigging and Materials Handling

1915.112 Ropes, chains and slings

(c) Chain and chain slings

- (5) All repairs to chains shall be made under qualified supervision. Links or portions of the chain found to be defective as described in paragraph (c)(4) of this section shall be replaced by links having proper dimensions and made of material similar to that of the chain. Before repaired chains are returned to service, they shall be proof tested to the proof test load recommended by the manufacturer.

1915.116 Use of gear

- (l) An individual who is familiar with the signal code in use shall be assigned to act as a signalman when the hoist operator cannot see the load being handled. Communications shall be made by means of clear and distinct visual or auditory signals except that verbal signals shall not be permitted.

1915.117 Qualifications of operators

Paragraphs (a) and (d) of this section shall apply to ship repairing and shipbuilding only. Paragraphs (b) and (c) of this section shall apply to ship repairing, shipbuilding and shipbreaking.

- (a) When ship's gear is used to hoist materials aboard, a competent person shall determine that the gear is properly rigged, that it is in safe condition, and that it will not be overloaded by the size and weight of the lift.
- (b) Only those employees who understand the signs, notices, and operating instructions, and are familiar with the signal code in use, shall be permitted to operate a crane, winch, or other power operated hoisting apparatus.

Subpart H – Tools and Related Equipment

1915.135 Powder actuated fastening tools

- (a) and (c)(1) through (6) (a) This section shall apply to ship repairing and shipbuilding only.
- (c) *Instruction of operators.* Before employees are permitted to use powder actuated tools, they shall have been thoroughly instructed by a competent person with respect to the requirements of paragraph (b) of this section and the safe use of such tools as follows:
 - (1) Before using a tool, the operator shall inspect it to determine that it is clean, that all moving parts operate freely and that the barrel is free from obstructions.
 - (2) When a tool develops a defect during use, the operator shall immediately cease to use it and shall notify his supervisor.
 - (3) Tools shall not be loaded until just prior to the intended firing time and the tool shall not be left unattended while loaded.
 - (4) The tool, whether loaded or empty, shall not be pointed at any person, and hands shall be kept clear of the open barrel end.
 - (5) In case of a misfire, the operator shall hold the tool in the operating position for at least 15 seconds and shall continue to hold the muzzle against the work surface during disassembly or opening of the tool and removal of the powder load.
 - (6) Neither tools nor powder charges shall be left unattended in places where they would be available to unauthorized persons.

1915.136 Internal combustion engines, other than ships' equipment

- (c) When internal combustion engines on vehicles, such as forklifts and mobile cranes, or on portable equipment such as fans, generators, and pumps, exhaust into the atmosphere below decks, the competent person shall make tests of the carbon monoxide content of the atmosphere as frequently as conditions require to ensure that dangerous concentrations do not develop. Employees shall be removed from the compartment involved when the carbon monoxide concentration exceeds 50 parts per million (0.005%). The employer shall use blowers sufficient in size and number and so arranged as to maintain the concentration below this allowable limit before work is resumed.

Subpart I – Personal Protective Equipment (PPE)

1915.152 General requirements

(e)(1) through (3) (e) Training

- (1) The employer shall provide training to each employee who is required by this section to use PPE (Exception: Training in the use of personal fall arrest systems and positioning device systems is covered in Sections 1915.159 and 1915.160). Each employee shall be trained to understand at least the following:
 - (i) When PPE is necessary;
 - (ii) What PPE is necessary;
 - (iii) How to properly don, doff, adjust, and wear PPE;
 - (iv) The limitations of the PPE; and
 - (v) The proper care, maintenance, useful life, and disposal of the PPE.
- (2) The employer shall ensure that each affected employee demonstrates the ability to use PPE properly before being allowed to perform work requiring the use of PPE.
- (3) The employer shall retrain any employee who does not understand or display the skills required by paragraph (e)(2) of this section. Circumstances where retraining is required include, but are not limited to, situations where:

- (i) Changes in occupation or work render previous training obsolete; or
- (ii) Changes in the types of PPE to be used render previous training obsolete; or
- (iii) Inadequacies in an affected employee's knowledge or use of assigned PPE indicate that the employee has not retained the requisite understanding or skill.

1915.154 Respiratory protection

Respiratory protection for shipyard employment is covered by 29 CFR 1910.134.

1915.159 Personal fall arrest systems (PFAS)

- (d) **Training.** Before using personal fall arrest equipment, each affected employee shall be trained to understand the application limits of the equipment and proper hook-up, anchoring, and tie-off techniques. Affected employees shall also be trained so that they can demonstrate the proper use, inspection, and storage of their equipment.

1915.160 Positioning device systems

- (d) **Training.** Before using a positioning device system, employees shall be trained in the application limits, proper hook-up, anchoring and tie-off techniques, methods of use, inspection, and storage of positioning device systems.

Subpart K – Portable, Unfired Pressure Vessels, Drums and Containers, Other Than Ship's Equipment

1915.172 Portable air receivers and other unfired pressure vessels

- (b) Portable, unfired pressure vessels, not built to the code requirements of paragraph (a) of this section, and built prior to the effective date of this regulation, shall be examined quarterly by a competent person. They shall be subjected yearly to a hydrostatic pressure test of one and one-half times the working pressure of the vessels.

Subpart P – Fire Protection in Shipyard Employment

1915.508 Training

- (a) **The employer must train employees in the applicable requirements of this section:**
 - (1) Within 90 days of December 14, 2004, for employees currently working;
 - (2) Upon initial assignment for new employees; and
 - (3) When necessary to maintain proficiency for employees previously trained.
- (b) **Employee training.** The employer must ensure that all employees are trained on:
 - (1) The emergency alarm signals, including system discharge alarms and employee evacuation alarms; and
 - (2) The primary and secondary evacuation routes that employees must use in the event of a fire in the workplace. While all vessels and vessel sections must have a primary evacuation route, a secondary evacuation route is not required when impracticable.
- (c) **Additional training requirements for employees expected to fight incipient stage fires.** The employer must ensure that employees expected to fight incipient stage fires are trained on the following:
 - (1) The general principles of using fire extinguishers or hose lines, the hazards involved with incipient firefighting, and the procedures used to reduce these hazards;
 - (2) The hazards associated with fixed and portable fire protection systems that employees may use or to which they may be exposed during discharge of those systems; and
 - (3) The activation and operation of fixed and portable fire protection systems that the employer expects employees to use in the workplace.
- (d) **Additional training requirements for shipyard employees designated for fire response.** The employer must:
 - (1) Have a written training policy stating that fire response employees must be trained and capable of carrying out their duties and responsibilities at all times;
 - (2) Keep written standard operating procedures that address anticipated emergency operations and update these procedures as necessary;

- (3) Review fire response employee training programs and hands-on sessions before they are used in fire response training to make sure that fire response employees are protected from hazards associated with fire response training;
 - (4) Provide training for fire response employees that ensures they are capable of carrying out their duties and responsibilities under the employer's standard operating procedures;
 - (5) Train new fire response employees before they engage in emergency operations;
 - (6) At least quarterly, provide training on the written operating procedures to fire response employees who are expected to fight fires;
 - (7) Use qualified instructors to conduct the training;
 - (8) Conduct any training that involves live fire response exercises in accordance with NFPA 1403-2002 Standard on Live Fire Training Evolutions (incorporated by reference, see 1915.5);
 - (9) Conduct semi-annual drills according to the employer's written procedures for fire response employees that cover site-specific operations, occupancies, buildings, vessels and vessel sections, and fire-related hazards; and
 - (10) Prohibit the use of smoke generating devices that create a dangerous atmosphere in training exercises.
- (e) Additional training requirements for fire watch duty.**
- (1) The employer must ensure that each fire watch is trained by an instructor with adequate fire watch knowledge and experience to cover the items as follows:
 - (i) Before being assigned to fire watch duty;
 - (ii) Whenever there is a change in operations that presents a new or different hazard;
 - (iii) Whenever the employer has reason to believe that the fire watch's knowledge, skills, or understanding of the training previously provided is inadequate; and
 - (iv) Annually.
 - (2) The employer must ensure that each employee who stands fire watch duty is trained in:

- (i) The basics of fire behavior, the different classes of fire and of extinguishing agents, the stages of fire, and methods for extinguishing fires;
 - (ii) Extinguishing live fire scenarios whenever allowed by local and federal law;
 - (iii) The recognition of the adverse health effects that may be caused by exposure to fire;
 - (iv) The physical characteristics of the hot work area;
 - (v) The hazards associated with fire watch duties;
 - (vi) The personal protective equipment (PPE) needed to perform fire watch duties safely;
 - (vii) The use of PPE;
 - (viii) The selection and use of any fire extinguishers and fire hoses likely to be used by a fire watch in the work area;
 - (ix) The location and use of barriers;
 - (x) The means of communication designated by the employer for fire watches;
 - (xi) When and how to start fire alarm procedures; and
 - (xii) The employer's evacuation plan.
- (3) The employer must ensure that each fire watch is trained to alert others to exit the space whenever:
- (i) The fire watch perceives an unsafe condition;
 - (ii) The fire watch perceives that a worker performing hot work is in danger;
 - (iii) The employer or a representative of the employer orders an evacuation; or
 - (iv) An evacuation signal, such as an alarm, is activated.
- (f) **Records.** The employer must keep records that demonstrate that employees have been trained as required by paragraphs (a) through (e) of this section.
- (1) The employer must ensure that the records include the employee's name; the trainer's name; the type of training; and the date(s) on which the training took place.
 - (2) The employer must keep each training record for one year from the time it was made or until it is replaced with a new training record, whichever is shorter, and make it available for inspection and copying by OSHA on request.

Subpart Z – Toxic and Hazardous Substances

1915.1001 Asbestos

(k)(9) and (10); **(k) Communication of hazards**

(o)(1) and (4);
Appendix L

(9) *Employee information and training.*

- (i) The employer shall train each employee who is likely to be exposed in excess of a PEL and each employee who performs Class I through IV asbestos operations in accordance with the requirements of this section. Training shall be provided at no cost to the employee. The employer shall institute a training program and ensure employee participation in the program.
- (ii) Training shall be provided prior to or at the time of initial assignment and at least annually thereafter.
- (iii) Training for Class I operations and for Class II operations that require the use of critical barriers (or equivalent isolation methods) and/or negative pressure enclosures under this section shall be the equivalent in curriculum, training method and length to the EPA Model Accreditation Plan (MAP) asbestos abatement workers training (40 CFR part 763, subpart E, appendix C).
- (iv) *Training for other Class II work.*
 - (A) For work with asbestos containing roofing materials, flooring materials, siding materials, ceiling tiles, or transite panels, training shall include at a minimum all the elements included in paragraph (k)(9)(viii) of this section and in addition, the specific work practices and engineering controls set forth in paragraph (g) of this section which specifically relate to that category. Such course shall include “hands-on” training and shall take at least 8 hours.
 - (B) An employee who works with more than one of the categories of material specified in paragraph (k)(9)(iv) (A) of this section shall receive training in the work practices applicable to each category of material that the employee removes and each removal method that the employee uses.

- (C) For Class II operations not involving the categories of material specified in paragraph (k)(9)(iv)(A) of this section, training shall be provided which shall include at a minimum all the elements included in paragraph (k)(9)(viii) of this section and in addition, the specific work practices and engineering controls set forth in paragraph (g) of this section which specifically relate to the category of material being removed, and shall include “hands-on” training in the work practices applicable to each category of material that the employee removes and each removal method that the employee uses.
- (v) Training for Class III employees shall be consistent with EPA requirements for training of local education agency maintenance and custodial staff as set forth at 40 CFR 763.92(a)(2). Such a course shall also include “hands-on” training and shall take at least 16 hours. Exception: For Class III operations for which the competent person determines that the EPA curriculum does not adequately cover the training needed to perform that activity, training shall include as a minimum all the elements included in paragraph (k)(9)(viii) of this section and in addition, the specific work practices and engineering controls set forth in paragraph (g) of this section which specifically relate to that activity, and shall include “hands-on” training in the work practices applicable to each category of material that the employee disturbs.
- (vi) Training for employees performing Class IV operations shall be consistent with EPA requirements for training of local education agency maintenance and custodial staff as set forth at 40 CFR 763.92(a)(1). Such a course shall include available information concerning the locations of thermal system insulation and surfacing ACM/PACM, and asbestos-containing flooring material, or flooring material where the absence of asbestos has not yet been certified; and instruction in the recognition of damage, deterioration, and delamination of asbestos containing building materials. Such a course shall take at least 2 hours.
- (vii) Training for employees who are likely to be exposed in excess of the PEL and who are not otherwise required to be trained under paragraph (k)(9) (iii) through (vi) of this section, shall meet the requirements of paragraph (k)(9)(viii) of this section.

- (viii) The training program shall be conducted in a manner that the employee is able to understand. In addition to the content required by the provisions in paragraphs (k)(9)(iii) through (vi) of this section, the employer shall ensure that each such employee is informed of the following:
- (A) Methods of recognizing asbestos, including the requirement in paragraph (k)(1) of this section to presume that certain building materials contain asbestos;
 - (B) The health effects associated with asbestos exposure;
 - (C) The relationship between smoking and asbestos in producing lung cancer;
 - (D) The nature of operations that could result in exposure to asbestos, the importance of necessary protective controls to minimize exposure including, as applicable, engineering controls, work practices, respirators, housekeeping procedures, hygiene facilities, protective clothing, decontamination procedures, emergency procedures, and waste disposal procedures, and any necessary instruction in the use of these controls and procedures; where Class III and IV work will be or is performed, the contents of EPA 20T-2003, "Managing Asbestos In-Place" July 1990 or its equivalent in content;
 - (E) The purpose, proper use, fitting instructions, and limitations of respirators as required by 29 CFR 1910.134;
 - (F) The appropriate work practices for performing the asbestos job;
 - (G) Medical surveillance program requirements;
 - (H) The content of this standard including appendices;
 - (I) The names, addresses and phone numbers of public health organizations which provide information, materials and/or conduct programs concerning smoking cessation. The employer may distribute the list of such organizations contained in Appendix J to this section, to comply with this requirement; and
 - (J) The requirements for posting signs and affixing labels and the meaning of the required legends for such signs and labels.

(10) *Access to training materials.*

- (i) The employer shall make readily available to affected employees without cost, written materials relating to the employee training program, including a copy of this regulation.
- (ii) The employer shall provide to the Assistant Secretary and the Director, upon request, all information and training materials relating to the employee information and training program.
- (iii) The employer shall inform all employees concerning the availability of self-help smoking cessation program material. Upon employee request, the employer shall distribute such material, consisting of NIH Publication No. 89-1647, or equivalent self-help material, which is approved or published by a public health organization listed in Appendix J to this section.

(n) Recordkeeping

- (4) *Training records.* The employer shall maintain all employee training records for one (1) year beyond the last date of employment by that employer.

(o) Qualified person

- (1) *General.* On all shipyard worksites covered by this standard, the employer shall designate a qualified person having the qualifications and authority for ensuring worker safety and health required by Subpart C, General Safety and Health Provisions for Construction (29 CFR 1926.20 through 1926.31).
- (4) *Training for the competent person.*
 - (i) For Class I and II asbestos work the qualified person shall be trained in all aspects of asbestos removal and handling, including: Abatement, installation, removal and handling; the contents of this standard; the identification of asbestos; removal procedures, where appropriate; and other practices for reducing the hazard. Such training shall be obtained in a comprehensive course for supervisors, that meets the criteria of EPA's Model Accredited Plan (40 CFR part 763, subpart E, Appendix C), such as a course conducted by an EPA-approved or state-approved training provider, certified by EPA or a state, or a course equivalent in stringency, content, and length.
 - (ii) For Class III and IV asbestos work, the qualified person shall be trained in aspects of asbestos handling appropriate

for the nature of the work, to include procedures for setting up glove bags and mini-enclosures, practices for reducing asbestos exposures, use of wet methods, the contents of this standard, and the identification of asbestos. Such training shall include successful completion of a course that is consistent with EPA requirements for training of local education agency maintenance and custodial staff as set forth at 40 CFR 763.92(a)(2), or its equivalent in stringency, content, and length. Qualified persons for Class III and Class IV work may also be trained pursuant to the requirements of paragraph (o)(4)(i) of this section.

Appendix L — Work Practices and Engineering Controls for Automotive Brake and Clutch Inspection, Disassembly, Repair and Assembly — Mandatory

This mandatory appendix specifies engineering controls and work practices that must be implemented by the employer during automotive brake and clutch inspection, disassembly, repair, and assembly operations. Proper use of these engineering controls and work practices by trained employees will reduce employees' asbestos exposure below the permissible exposure level during clutch and brake inspection, disassembly, repair, and assembly operations. The employer shall institute engineering controls and work practices using either the method set forth in paragraph [A] or paragraph [B] of this appendix, or any other method which the employer can demonstrate to be equivalent in terms of reducing employee exposure to asbestos as defined and which meets the requirements described in paragraph [C] of this appendix, for those facilities in which no more than 5 pairs of brakes or 5 clutches are inspected, disassembled, reassembled and/or repaired per week, the method set forth in paragraph [D] of this appendix may be used:

1915.1003 13 carcinogens (4-Nitrobiphenyl, etc.)

Note: The requirements applicable to shipyard employment under this section are identical to those set forth in 29 CFR 1910.1003.

1915.1017 Vinyl chloride

Note: The requirements applicable to shipyard employment under this section are identical to those set forth in 29 CFR 1910.1017.

1915.1018 Inorganic arsenic

Note: The requirements applicable to shipyard employment under this section are identical to those set forth in 29 CFR 1910.1018.

1915.1025 Lead

Note: The requirements applicable to shipyard employment under this section are identical to those set forth in 29 CFR 1910.1025.

1915.1027 Cadmium

Note: The requirements applicable to shipyard employment under this section are identical to those set forth in 29 CFR 1910.1027.

1915.1028 Benzene

Note: The requirements applicable to shipyard employment under this section are identical to those set forth in 29 CFR 1910.1028.

1915.1030 Bloodborne pathogens

Note: The requirements applicable to shipyard employment under this section are identical to those set forth in 29 CFR 1910.1030.

1915.1044 1,2-Dibromo-3-Chloropropane

Note: The requirements applicable to shipyard employment under this section are identical to those set forth in 29 CFR 1910.1044.

1915.1045 Acrylonitrile

Note: The requirements applicable to shipyard employment under this section are identical to those set forth in 29 CFR 1910.1045.

1915.1047 Ethylene oxide

Note: The requirements applicable to shipyard employment under this section are identical to those set forth in 29 CFR 1910.1047.

1915.1048 Formaldehyde

Note: The requirements applicable to shipyard employment under this section are identical to those set forth in 29 CFR 1910.1048.

1915.1050 Methylenedianiline

Note: The requirements applicable to shipyard employment under this section are identical to those set forth in 29 CFR 1910.1050.

1915.1200 Hazard communication

Note: The requirements applicable to shipyard employment under this section are identical to those set forth in 29 CFR 1910.1200.

1915.1450 Occupational exposure to hazardous chemicals in laboratories

Note: The requirements applicable to shipyard employment under this section are identical to those set forth in 29 CFR 1910.1450.

29 CFR PART 1917 – MARINE TERMINALS

Subpart A – General Provisions

1917.1 Scope and applicability**(a)(2)**

(iii) Commercial diving operations

Note: The requirements applicable to Marine Terminals under this section are identical to those set forth in 29 CFR 1910.410(a)(1); (2)(i) through (iii); (3) and (4).

(iv) Electrical (safety-related work practices)

Note: The requirements applicable to Marine Terminals under this section are identical to those set forth in 29 CFR 1910.332(b)(1).

(v) Grain handling facilities

Note: The requirements applicable to Marine Terminals under this section are identical to those set forth in 29 CFR 1910.272(e)(1)(i) and (ii) and (2).

(vi) Hazard communication

Note: The requirements applicable to Marine Terminals under this section are identical to those set forth in 29 CFR 1910.1200(h)(1) and (3)(i) through (iv).

(vii) Ionizing radiation

Note: The requirements applicable to Marine Terminals under this section are identical to those set forth in 29 CFR 1910.1096(i)(2).

(viii) Noise (hearing protection)

Note: The requirement applicable to Marine Terminals under this section are identical to those set forth in 29 CFR 1910.95(i)(4).

(x) Respiratory protection

Note: The requirements applicable to Marine Terminals under this section are identical to those set forth in 29 CFR 1910.134(k)(3)

(xii) Servicing multi-piece and single-piece rim wheels

Note: The requirement applicable to Marine Terminals under this section are identical to those set forth in 29 CFR 1910.177(c)(1)(i) through (iii); (2)(i) through (viii) and (3) including single piece wheels per Federal Register of February 3, 1984 (pp. 4338-4352) but not automobile or truck tires marked “LT.”

(xiii) Toxic and hazardous substances

Note: The requirements applicable to Marine Terminals under this section are identical to those set forth in 29 CFR 1910 Subpart Z.

Subpart B – Marine Terminal Operations

1917.23 Hazardous atmospheres and substances

(b)(1) and (d)(3) **Note:** The requirements applicable to Marine Terminals under this section are identical to those set forth in 29 CFR 1910 Subpart Z.

(b) Determination of hazard

(1) When the employer is aware that a room, building, vehicle, railcar, or other space contains or has contained a hazardous atmosphere, a designated and appropriately equipped person shall test the atmosphere before employee entry to determine whether a hazardous atmosphere exists.

(d) Entry into hazardous atmospheres. Only designated persons shall enter hazardous atmospheres, in which case the following provisions shall apply:

(3) Except for emergency or rescue operations, employees shall not enter into any atmosphere which has been identified as flammable or oxygen deficient (less than 19.5 percent oxygen). Persons who may be required to enter flammable or oxygen deficient atmospheres in emergency operations shall be instructed in the dangers attendant to those atmospheres and instructed in the use of self-contained breathing apparatus, which shall be utilized.

1917.25 Fumigants, pesticides, insecticides, and hazardous preservatives

(e) Only designated persons shall enter hazardous atmospheres, in which place the following provisions apply.

(2) Persons entering a space containing a hazardous atmosphere shall be instructed in the nature of the hazard, precautions to be taken, and the use of protective and emergency equipment. Standby observers, similarly equipped and instructed, shall continuously monitor the activity of employees within such a space.

1917.27 Personnel

(a)(1) and
(b)(1) and (2)

(a) Qualifications of machinery operators.

- (1) Only those employees determined by the employer to be competent by reason of training or experience, and who understand the signs, notices and operating instructions and are familiar with the signal code in use shall be permitted to operate a crane, winch or other power operated cargo handling apparatus, or any power operated vehicle, or give signals to the operator of any hoisting apparatus. Exception: Employees being trained and supervised by a designated person may operate such machinery and give signals to operators during training.

(b) Supervisory accident prevention proficiency

- (1) After October 3, 1985 immediate supervisors of cargo-handling operations of more than five (5) persons shall satisfactorily complete a course in accident prevention. Employees newly assigned to supervisory duties after that date shall be required to meet the provisions of this paragraph within 90 days of such assignment.
- (2) The course shall consist of instruction suited to the particular operations involved.*

*The following are recommended topics: (i) Safety responsibility and authority; (ii) elements of accident prevention; (iii) attitudes, leadership and motivation; (iv) hazards of longshoring, including peculiar local circumstances; (v) hazard identification and elimination; (vi) applicable regulations; and (vii) accident investigations.

1917.28 Hazard communication

Note: The requirements applicable to Marine Terminals under this section are identical to those set forth in 29 CFR 1910.1200(h)(1) and (3)(i) through (iv).

1917.30 Emergency action plans

(a)(5)(i)
through (iii)

(a) Emergency action plans

- (5) *Training.*
 - (i) Before implementing the emergency action plan, the employer shall designate and train a sufficient number of persons to assist in the safe and orderly emergency evacuation of employees.
 - (ii) The employer shall review the plan with each employee covered by the plan at the following times:
 - (A) Initially when the plan is developed;

- (B) Whenever the employee's responsibilities or designated actions under the plan change; and,
- (C) Whenever the plan is changed.
- (iii) The employer shall review with each employee upon initial assignment those parts of the plan that the employee must know to protect the employee in the event of an emergency. The written plan shall be kept at the workplace and be made available for employee review.

Subpart C – Cargo Handling Gear and Equipment

1917.44 General rules applicable to vehicles

- (a), (i), and (o)(3)
 - (a) The requirements of this section apply to general vehicle use within marine terminals. Exception: The provisions of paragraphs (c) and (1) of this section do not apply when preempted by applicable regulation of the Department of Transportation.
 - (i) A distance of not less than 20 feet (6.1 meters) shall be maintained between the first two vehicles in a check-in, check-out, roadability, or vessel loading/discharging line. The distance shall be maintained between any subsequent vehicles behind which employees are required to work.
 - (o) *Servicing multi-piece and single piece rim wheels.* Servicing of multi-piece and single piece rim wheels is covered by 1910.177.
 - (3) *Employee training.*
 - (i) Only employees trained in the procedures required in paragraph (o)(4) of this section and who have demonstrated their ability to service multi-piece rim wheels shall be assigned to such duties.
 - (ii) Employees assigned such duties shall have demonstrated their ability by the safe performance of the following tasks:
 - (A) Tire demounting (including deflation);
 - (B) Inspection of wheel components;
 - (C) Mounting of tires;

- (D) Inflation of tires, including use of a restraining device;
- (E) Handling of wheels;
- (F) Inflation of tires when a wheel is mounted on the vehicle; and
- (G) Installation and removal of wheels.

Subpart D – Specialized Terminals

1917.73 Terminal facilities handling menhaden and similar species of fish

- (d) The plant superintendent and foremen shall be trained and be knowledgeable about the hazards of hydrogen sulfide and oxygen deficiency. They shall be trained in the use of appropriate respiratory and other protective equipment, and in rescue procedures. Other supervisory plant personnel shall be informed of these hazards and instructed in the necessary safety measures, including use of respiratory and rescue equipment.

Subpart G – Related Terminal Operations and Equipment

1917.152 Welding, cutting and heating (hot work)

- (c) **Fire protection**
 - (4) When the hot work operation is such that normal fire prevention precautions are not sufficient, additional personnel shall be assigned to guard against fire during hot work and for a sufficient time after completion of the work to ensure that no fire hazard remains. The employer shall instruct all employees involved in hot work operations as to potential fire hazards and the use of firefighting equipment.

29 CFR PART 1918 – SAFETY AND HEALTH REGULATIONS FOR LONGSHORING

Subpart A – Scope and Definitions

1918.1 Scope and application

(b) **Part 1910 of this chapter does not apply to longshoring except for the following provisions:**

(2) *Commercial diving operations.*

Note: The requirements applicable to Longshoring under this section are identical to those set forth in 29 CFR 1910.410(a)(1); (2)(i) through (iii); (3) and (4).

(3) *Electrical safety-related work practices.*

Note: The requirements applicable to Longshoring under this section are identical to those set forth in 29 CFR 1910.332(b)(1).

(4) *Hazard communication.*

Note: The requirements applicable to Longshoring under this section are identical to those set forth in 29 CFR 1910.1200(h)(1) and (3)(i) and (iv).

(5) *Ionizing radiation.*

Note: The requirements applicable to Longshoring under this section are identical to those set forth in 29 CFR 1910.1096(i)(2).

(6) *Noise (hearing protection).*

Note: The requirements applicable to Longshoring under this section are identical to those set forth in 29 CFR 1910.95(i)(4).

(8) *Respiratory protection.*

Note: The requirements applicable to Longshoring under this section are identical to those set forth in 29 CFR 1910.134(k)(3).

(9) *Toxic and Hazardous Substances.*

Note: The requirements applicable to Longshoring under this section are identical to those set forth in 29 CFR 1910, Subpart Z.

Subpart H – Handling Cargo

1918.85 Containerized cargo operations

(k) Fall Protection Systems

- (12) Before using any fall protection system, the employee shall be trained in the use and application limits of the equipment, proper hook-up, anchoring and tie-off techniques, methods of use, and proper methods of equipment inspection and storage.

Subpart I – General Working Conditions

1918.93 Hazardous atmospheres and substances

(d) Entry into hazardous atmospheres

- (3) Except in emergency or rescue operations, employees shall not enter any atmosphere identified as flammable or oxygen-deficient (less than 19.5 percent oxygen). Persons who may be required to enter flammable or oxygen-deficient atmospheres in emergency operations shall be instructed in the dangers attendant to those atmospheres and be instructed in the use of self-contained breathing apparatus which shall be used for entry.

1918.94 Ventilation and atmospheric conditions

(b) Fumigated grains

- (3) A test of the fumigant concentration in the atmosphere of the compartment shall be made after loading begins and before employees enter the compartment. Additional tests shall be made as often as necessary to ensure that hazardous concentrations do not develop.
- (v) One or more employees on duty shall be equipped and trained to provide any specific emergency medical treatment stipulated for the particular fumigant.

1918.97 First aid and lifesaving facilities

(b) **First Aid.** A first-aid kit shall be available at or near each vessel being worked. At least one person holding a valid first-aid certificate, such as is issued by the Red Cross or other equivalent organization, shall be available to render first aid when work is in progress.

1918.98 Qualifications of machinery operators and supervisory training

(a) **Qualification of machinery operators**

(1) Only an employee determined by the employer to be competent by reason of training or experience, and who understands the signs, notices, and operating instructions and is familiar with the signal code in use, shall be permitted to operate a crane, winch, or other power-operated cargo handling apparatus, or any power-operated vehicle, or give signals to the operator of any hoisting apparatus. However, an employee being trained and supervised by a designated person may operate such machinery and give signals to operators during training.



Photo: Dona File, Philadelphia, PA

Construction

The following standards have been excerpted from ***Title 29, Code of Federal Regulations Part 1926***. They contain training requirements with which employers must comply. Note that in addition to these ***Part 1926*** standards, ***Part 1910, Occupational Safety and Health Standards***, also contain training standards applicable to construction work.

29 CFR 1910

Subpart B – Adoption and Extension of Established Federal Standards

1910.12 Construction Work

- (a) **Standards.** The standards prescribed in part 1926 of this chapter are adopted as occupational safety and health standards under section 6 of the Act [OSH Act] and shall apply, according to the provisions thereof, to every employment and place of employment of every employee engaged in construction work. Each employer shall protect the employment and places of employment of each of his employees engaged in construction work by complying with the appropriate standards prescribed in this paragraph.

- (b) **Definition.** For the purposes of this section, Construction work means work for construction, alteration, and/or repair, including painting and decorating. See discussion of these terms in 1926.13 of this title.
- (c) **Construction Safety Act Distinguished.** This section adopts as occupational safety and health standards under section 6 of the Act the standards which are prescribed in part 1926 of this chapter. Thus, the standards (substantive rules) published in subpart C and following subparts of part 1926 of this chapter are applied. This section does not incorporate subparts A and B of part 1926 of this chapter. Subparts A and B have pertinence only to the application of section 107 of the Contract Work Hours and Safety Standards Act (Construction Safety Act).

29 CFR 1926

Subpart C – General Safety and Health Provisions

1926.20 General Safety and Health Provisions

(b)(1), (2)
and (4); (f)(2)

(b) Accident prevention responsibilities

- (1) It shall be the responsibility of the employer to initiate and maintain such programs as may be necessary to comply with this part.
- (2) Such programs [as may be necessary to comply with this part] shall provide for frequent and regular inspections of the job sites, materials, and equipment to be made by competent persons [capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who have authorization to take prompt corrective measures to eliminate them] designated by the employers.
- (4) The employer shall permit only those employees qualified [one who, by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training, and experience, has successfully demonstrated his ability to solve or resolve problems relating to the subject matter, the work, or the project] by training or experience to operate equipment and machinery.

(f) Compliance duties owed to each employee

- (2) *Training.* Standards in this part requiring training on hazards and related matters, such as standards requiring that employees receive training or that the employer train employees, provide training to employees, or institute or implement a training program, impose a separate compliance duty with respect to each employee covered by the requirement. The employer must train each affected employee in the manner required by the standard, and each failure to train an employee may be considered a separate violation.

1926.21 Safety training and education

- (a) and (b)
- (a) General requirements.** The Secretary shall, pursuant to section 107(f) of the Act, establish and supervise programs for the education and training of employers and employees in the recognition, avoidance and prevention of unsafe conditions in employments covered by the act.
 - (b) Employer responsibility.**
 - (1) The employer should avail himself of the safety and health training programs the Secretary provides.
 - (2) The employer shall instruct each employee in the recognition and avoidance of unsafe conditions and the regulations applicable to his work environment to control or eliminate any hazards or other exposure to illness or injury.
 - (3) Employees required to handle or use poisons, caustics, and other harmful substances shall be instructed regarding the safe handling and use, and be made aware of the potential hazards, personal hygiene, and personal protective measures required.
 - (4) In job site areas where harmful plants or animals are present, employees who may be exposed shall be instructed regarding the potential hazards, and how to avoid injury, and the first aid procedures to be used in the event of injury.
 - (5) Employees required to handle or use flammable liquids, gases, or toxic materials shall be instructed in the safe handling and use of these materials and made aware of the specific requirements contained in subparts D, F, and other applicable subparts of this part.
 - (6) (i) All employees required to enter into confined or enclosed spaces shall be instructed as to the nature of the hazards involved, the necessary precautions to be taken, and in the use of protective and emergency equipment required. The employer shall comply with any specific regulations that apply to work in dangerous or potentially dangerous areas.

- (ii) For purposes of paragraph (b)(6)(i) of this section, *confined or enclosed space* means any space having a limited means of egress, which is subject to the accumulation of toxic or flammable contaminants or has an oxygen deficient atmosphere. Confined or enclosed spaces include, but are not limited to, storage tanks, process vessels, bins, boilers, ventilation or exhaust ducts, sewers, underground utility vaults, tunnels, pipelines, and open top spaces more than 4 feet in depth such as pits, tubs, vaults, and vessels.

1926.32 Definitions

- (f) “Competent person” means one who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.
- (m) “Qualified” means one who, by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training, and experience, has successfully demonstrated his ability to solve or resolve problems relating to the subject matter, the work, or the project.

1926.35 Employee emergency action plans

(e)(1)
through (3)

(e) Training.

- (1) Before implementing the emergency action plan, the employer shall designate and train a sufficient number of persons to assist in the safe and orderly emergency evacuation of employees.
- (2) The employer shall review the plan with each employee covered by the plan at the following times:
 - (i) Initially when the plan is developed,
 - (ii) Whenever the employee’s responsibilities or designated actions under the plan change, and
 - (iii) Whenever the plan is changed.
- (3) The employer shall review with each employee upon initial assignment those parts of the plan which the employee must know to protect the employee in the event of an emergency. The written plan shall be kept at the workplace and made available for employee review. For those employers with 10 or fewer employees the plan may be communicated orally to employees and the employer need not maintain a written plan.

Subpart D – Occupational Health and Environmental Controls

1926.50 Medical services and first aid

- (c) In the absence of an infirmary, clinic, hospital, or physician, that is reasonably accessible in terms of time and distance to the worksite, which is available for the treatment of injured employees, a person who has a valid certificate in first-aid training from the U.S. Bureau of Mines, the American Red Cross, or equivalent training that can be verified by documentary evidence, shall be available at the worksite to render first aid.

1926.52 Occupational noise exposure

- (d) (1) In all cases where the sound levels exceed the values shown herein, a continuing, effective hearing conservation program shall be administered.

1926.53 Ionizing radiation

- (b) Any activity which involves the use of radioactive materials or X-rays, whether or not under license from the Nuclear Regulatory Commission, shall be performed by competent persons specially trained in the proper and safe operation of such equipment. In the case of materials used under Commission license, only persons actually licensed, or competent persons under direction and supervision of the licensee, shall perform such work.

1926.54 Nonionizing radiation

- (a) Only qualified and trained employees shall be assigned to install, adjust, and operate laser equipment.
- (b) Proof of qualification of the laser equipment operator shall be available and in possession of the operator at all times.

1926.55 Gases, vapors, fumes, dusts, and mists

- (a) Exposure of employees to inhalation, ingestion, skin absorption, or contact with any material or substance at a concentration above those specified in the “Threshold Limit Values of Airborne Contaminants for 1970” of the American Conference of Governmental Industrial Hygienists, shall be avoided. See Appendix A to this section.

- (b) To achieve compliance with paragraph (a) of this section, administrative or engineering controls must first be implemented whenever feasible. When such controls are not feasible to achieve full compliance, protective equipment or other protective measures shall be used to keep the exposure of employees to air contaminants within the limits prescribed in this section. Any equipment and technical measures used for this purpose must first be approved for each particular use by a competent industrial hygienist or other technically qualified person. Whenever respirators are used, their use shall comply with 1926.103.
- (c) Paragraphs (a) and (b) of this section do not apply to the exposure of employees to airborne asbestos, tremolite, anthophyllite, or actinolite dust. Whenever any employee is exposed to airborne asbestos, tremolite, anthophyllite, or actinolite dust, the requirements of 1910.1101 or 1926.58 of this title shall apply.
- (d) Paragraphs (a) and (b) of this section do not apply to the exposure of employees to formaldehyde. Whenever any employee is exposed to formaldehyde, the requirements of 1910.1048 of this title shall apply.

1926.57 Ventilation

(i)(9)(i) and
(i)(11)(v)

(i) Open surface tanks

(9) Personal protection.

- (i) All employees working in and around open-surface tank operations must be instructed as to the hazards of their respective jobs, and in the personal protection and first aid procedures applicable to these hazards.

(11) Inspection, maintenance and installation.

- (v) If, in emergencies, such as rescue work, it is necessary to enter a tank which may contain a hazardous atmosphere, suitable respirators, such as self-contained breathing apparatus; hose mask with blower, if there is a possibility of oxygen deficiency; or a gas mask, selected and operated in accordance with paragraph (i)(9)(vi) of this section, shall be used. If a contaminant in the tank can cause dermatitis, or be absorbed through the skin, the employee entering the tank shall also wear protective clothing. At least one trained standby employee, with suitable respirator, shall be present in the nearest uncontaminated area. The standby employee must be able to communicate with the employee in the tank and be able to haul him out of the tank with a lifeline if necessary.

1926.59 Hazard communication

[**Note:** The requirements applicable to construction work under this section are identical to those set forth at 1910.1200 Hazard Communication of this chapter.]

1910.1200 Hazard communication

(a) Purpose.

- (1) The purpose of this section is to ensure that the hazards of all chemicals produced or imported are classified, and that information concerning the classified hazards is transmitted to employers and employees. The requirements of this section are intended to be consistent with the provisions of the United Nations Globally Harmonized System of Classification and Labelling of Chemicals (GHS), Revision 3. The transmittal of information is to be accomplished by means of comprehensive hazard communication programs, which are to include container labeling and other forms of warning, safety data sheets and employee training. [See standard for specific requirements.]

1926.60 Methylenedianiline

(l)(3) and (4),
and (o)(6)

(l) Communication of hazards to employees

(3) *Information and training.*

- (i) The employer shall provide employees with information and training on MDA, in accordance with 29 CFR 1910.1200(h), at the time of initial assignment and at least annually thereafter.
- (ii) In addition to the information required under 29 CFR 1910.1200, the employer shall:
 - (A) Provide an explanation of the contents of this section, including appendices A and B of this section, and indicate to employees where a copy of the standard is available;
 - (B) Describe the medical surveillance program required under paragraph (n) of this section, and explain the information contained in Appendix C of this section; and
 - (C) Describe the medical removal provision required under paragraph (n) of this section.

- (4) *Access to training materials.*
 - (i) The employer shall make readily available to all affected employees, without cost, all written materials relating to the employee training program, including a copy of this regulation.
 - (ii) The employer shall provide to the Assistant Secretary and the Director, upon request, all information and training materials relating to the employee information and training program.

(o) Recordkeeping

- (6) *Training records.* The employer shall maintain all employee training records for one (1) year beyond the last date of employment.

1926.61 Retention of DOT markings, placards and labels

[**Note:** The requirements applicable to construction work under this section are identical to those set forth at 1910.1201 of this chapter.]

1910.1201(d) For non-bulk packages which will not be reshipped, the provisions of this section are met if a label or other acceptable marking is affixed in accordance with the Hazard Communication Standard (29 CFR 1910.1200). [See 1910.1200(h) for required employee information and training, including explanations of labels.]

1926.62 Lead in Construction

(l)(1) through (3);
and Appendix B (X)

(l) Communication of hazards

- (1) *General*
 - (i) *Hazard communication.* The employer shall include lead in the program established to comply with the Hazard Communication Standard (HCS) (1910.1200). The employer shall ensure that each employee has access to labels on containers of lead and safety data sheets, and is trained in accordance with the provisions of HCS and paragraph (l) of this section. The employer shall ensure that at least the following hazards are addressed:
 - (A) Reproductive/developmental toxicity;
 - (B) Central nervous system effects;
 - (C) Kidney effects;
 - (D) Blood effects; and
 - (E) Acute toxicity effects.

- (ii) The employer shall train each employee who is subject to exposure to lead at or above the action level on any day, or who is subject to exposure to lead compounds which may cause skin or eye irritation (e.g., lead arsenate, lead azide), in accordance with the requirements of this section. The employer shall institute a training program and ensure employee participation in the program.
 - (iii) The employer shall provide the training program as initial training prior to the time of job assignment or prior to the start up date for this requirement, whichever comes last.
 - (iv) The employer shall also provide the training program at least annually for each employee who is subject to lead exposure at or above the action level on any day.
- (2) *Training program.* The employer shall assure that each employee is trained in the following:
- (i) The content of this standard and its appendices;
 - (ii) The specific nature of the operations which could result in exposure to lead above the action level;
 - (iii) The purpose, proper selection, fitting, use, and limitations of respirators;
 - (iv) The purpose and a description of the medical surveillance program, and the medical removal protection program including information concerning the adverse health effects associated with excessive exposure to lead (with particular attention to the adverse reproductive effects on both males and females and hazards to the fetus and additional precautions for employees who are pregnant);
 - (v) The engineering controls and work practices associated with the employee's job assignment including training of employees to follow relevant good work practices described in Appendix B of this section;
 - (vi) The contents of any compliance plan in effect;
 - (vii) Instructions to employees that chelating agents should not routinely be used to remove lead from their bodies and should not be used at all except under the direction of a licensed physician; and
 - (viii) The employee's right of access to records under 29 CFR 1910.20.

- (3) *Access to information and training materials.*
 - (i) The employer shall make readily available to all affected employees a copy of this standard and its appendices.
 - (ii) The employer shall provide, upon request, all materials relating to the employee information and training program to affected employees and their designated representatives, and to the Assistant Secretary and the Director.

Appendix B to 1926.62 — Employee Standard Summary

X. Employee Information and Training — Paragraph (L)

Your employer is required to provide an information and training program for all employees exposed to lead above the action level or who may suffer skin or eye irritation from lead compounds such as lead arsenate or lead azide. The program must train these employees regarding the specific hazards associated with their work environment, protective measures which can be taken, including the contents of any compliance plan in effect, the danger of lead to their bodies (including their reproductive systems), and their rights under the standard. All employees must be trained prior to initial assignment to areas where there is a possibility of exposure over the action level.

This training program must also be provided at least annually thereafter unless further exposure above the action level will not occur.

1926.64 Process safety management of highly hazardous chemicals

(g)(1) through (3); (h)(3)(i) through (iii); (i)(2)(iv); (j)(3); (l)(3); and all Appendix C except (1), (7) and (10)

(g) Training

- (1) *Initial training*
 - (i) Each employee presently involved in operating a process, and each employee before being involved in operating a newly assigned process, shall be trained in an overview of the process and in the operating procedures as specified in paragraph (f) of this section. The training shall include emphasis on the specific safety and health hazards, emergency operations including shutdown, and safe work practices applicable to the employee's job tasks.
 - (ii) In lieu of initial training for those employees already involved in operating a process on May 26, 1992, an employer may certify in writing that the employee has the required knowledge, skills, and abilities to safely carry out the duties and responsibilities as specified in the operating procedures.

- (2) *Refresher training.* Refresher training shall be provided at least every three years, and more often if necessary, to each employee involved in operating a process to assure that the employee understands and adheres to the current operating procedures of the process. The employer, in consultation with the employees involved in operating the process, shall determine the appropriate frequency of refresher training.
- (3) *Training documentation.* The employer shall ascertain that each employee involved in operating a process has received and understood the training required by this paragraph. The employer shall prepare a record which contains the identity of the employee, the date of training, and the means used to verify that the employee understood the training.

(h) Contractors

- (3) *Contract employer responsibilities*
 - (i) The contract employer shall assure that each contract employee is trained in the work practices necessary to safely perform his/her job.
 - (ii) The contract employer shall assure that each contract employee is instructed in the known potential fire, explosion, or toxic release hazards related to his/her job and the process, and the applicable provisions of the emergency action plan.
 - (iii) The contract employer shall document that each contract employee has received and understood the training required by this paragraph. The contract employer shall prepare a record which contains the identity of the contract employee, the date of training, and the means used to verify that the employee understood the training.

(i) Pre-startup safety review

- (2) The pre-startup safety review shall confirm that prior to the introduction of highly hazardous chemicals to a process:
 - (iv) Training of each employee involved in operating a process has been completed.

(j) Mechanical integrity

- (3) *Training for process maintenance activities.* The employer shall train each employee involved in maintaining the on-going integrity of process equipment in an overview of that process and its hazards and in the procedures applicable to the employee's job tasks to assure that the employee can perform the job tasks in a safe manner.

(l) **Management of change**

- (3) Employees involved in operating a process and maintenance and contract employees whose job tasks will be affected by a change in the process shall be informed of, and trained in, the change prior to start-up of the process or affected part of the process.

Appendix C to 1926.64 — Compliance Guidelines and Recommendations for Process Safety Management (Nonmandatory)

This appendix serves as a nonmandatory guideline to assist employers and employees in complying with the requirements of this section, as well as provides other helpful recommendations and information. Examples presented in this appendix are not the only means of achieving the performance goals in the standard. This appendix neither adds nor detracts from the requirements of the standard.

- 2. Employee Involvement in Process Safety Management.** Section 304 of the Clean Air Act Amendments states that employers are to consult with their employees and their representatives regarding the employers' efforts in the development and implementation of the process safety management program elements and hazard assessments. Section 304 also requires employers to train and educate their employees and to inform affected employees of the findings from incident investigations required by the process safety management program. Many employers, under their safety and health programs, have already established means and methods to keep employees and their representatives informed about relevant safety and health issues and employers may be able to adapt these practices and procedures to meet their obligations under this standard. Employers who have not implemented an occupational safety and health program may wish to form a safety and health committee of employees and management representatives to help the employer meet the obligations specified by this standard. These committees can become a significant ally in helping the employer to implement and maintain an effective process safety management program for all employees.
- 3. Process Safety Information.** Complete and accurate written information concerning process chemicals, process technology, and process equipment is essential to an effective process safety management program and to a process hazards analysis. The compiled information will be a necessary resource to a variety of users including the team that will perform the process hazards analysis as required under paragraph (e); those developing the training programs and the operating procedures; contractors whose employees will be working with the process; those conducting the pre-startup reviews; local emergency preparedness planners; and insurance and enforcement officials.

5. Operating Procedures and Practices

...Operating procedures and instructions are important for training operating personnel. The operating procedures are often viewed as the standard operating practices (SOPs) for operations. Control room personnel and operating staff, in general, need to have a full understanding of operating procedures. If workers are not fluent in English then procedures and instructions need to be prepared in a second language understood by the workers. In addition, operating procedures need to be changed when there is a change in the process as a result of the management of change procedures. The consequences of operating procedure changes need to be fully evaluated and the information conveyed to the personnel. For example, mechanical changes to the process made by the maintenance department (like changing a valve from steel to brass or other subtle changes) need to be evaluated to determine if operating procedures and practices also need to be changed. All management of change actions must be coordinated and integrated with current operating procedures and operating personnel must be oriented to the changes in procedures before the change is made. When the process is shut down in order to make a change, then the operating procedures must be updated before startup of the process.

Training in how to handle upset conditions must be accomplished as well as what operating personnel are to do in emergencies such as when a pump seal fails or a pipeline ruptures. Communication between operating personnel and workers performing work within the process area, such as nonroutine tasks, also must be maintained. The hazards of the tasks are to be conveyed to operating personnel in accordance with established procedures and to those performing the actual tasks. When the work is completed, operating personnel should be informed to provide closure on the job.

- 6. Employee Training.** All employees, including maintenance and contractor employees, involved with highly hazardous chemicals need to fully understand the safety and health hazards of the chemicals and processes they work with for the protection of themselves, their fellow employees and the citizens of nearby communities. Training conducted in compliance with 1926.59, the Hazard Communication standard, will help employees to be more knowledgeable about the chemicals they work with as well as familiarize them with reading and understanding MSDS. However, additional training in subjects such as operating procedures and safety work practices, emergency evacuation and response, safety procedures, routine and nonroutine work authorization activities, and other areas pertinent to process safety and health will need to be covered by an employer's training program.

In establishing their training programs, employers must clearly define the employees to be trained and what subjects are to be covered in their training. Employers in setting up their training program will need to clearly establish the goals and objectives they wish to achieve with the training that they provide to their employees. The learning goals or objectives should be written in clear measurable terms before the training begins. These goals and objectives need to be tailored to each of the specific training modules or segments. Employers should describe the important actions and conditions under which the employee will demonstrate competence or knowledge as well as what is acceptable performance.

Hands-on-training where employees are able to use their senses beyond listening, will enhance learning. For example, operating personnel, who will work in a control room or at control panels, would benefit by being trained at a simulated control panel or panels. Upset conditions of various types could be displayed on the simulator, and then the employee could go through the proper operating procedures to bring the simulator panel back to the normal operating parameters. A training environment could be created to help the trainee feel the full reality of the situation but, of course, under controlled conditions. This realistic type of training can be very effective in teaching employees correct procedures while allowing them to also see the consequences of what might happen if they do not follow established operating procedures. Other training techniques using videos or on-the-job training can also be very effective for teaching other job tasks, duties, or other important information. An effective training program will allow the employee to fully participate in the training process and to practice their skill or knowledge.

Employers need to periodically evaluate their training programs to see if the necessary skills, knowledge, and routines are being properly understood and implemented by their trained employees. The means or methods for evaluating the training should be developed along with the training program goals and objectives. Training program evaluation will help employers to determine the amount of training their employees understood, and whether the desired results were obtained. If, after the evaluation, it appears that the trained employees are not at the level of knowledge and skill that was expected, the employer will need to revise the training program, provide retraining, or provide more frequent refresher training sessions until the deficiency is resolved. Those who conducted the training and those who received the training should also be consulted as to how best to improve the training process. If there is a language barrier, the language known to the trainees should be used to reinforce the training messages and information.

Careful consideration must be given to assure that employees including maintenance and contract employees receive current and updated training. For example, if changes are made to a process, impacted employees must be trained

in the changes and understand the effects of the changes on their job tasks (e.g., any new operating procedures pertinent to their tasks). Additionally, as already discussed the evaluation of the employee's absorption of training will certainly influence the need for training.

8. Pre-Startup Safety

...For existing processes that have been shut down for turnaround, or modification, etc., the employer must assure that any changes other than “replacement in kind” made to the process during shutdown go through the management of change procedures. P&IDs will need to be updated as necessary, as well as operating procedures and instructions. If the changes made to the process during shutdown are significant and impact the training program, then operating personnel as well as employees engaged in routine and nonroutine work in the process area may need some refresher or additional training in light of the changes. Any incident investigation recommendations, compliance audits or PHA recommendations need to be reviewed as well to see what impacts they may have on the process before beginning the startup.

9. **Mechanical Integrity.** Employers will need to review their maintenance programs and schedules to see if there are areas where “breakdown” maintenance is used rather than an on-going mechanical integrity program. Equipment used to process, store, or handle highly hazardous chemicals needs to be designed, constructed, installed and maintained to minimize the risk of releases of such chemicals. This requires that a mechanical integrity program be in place to assure the continued integrity of process equipment. Elements of a mechanical integrity program include the identification and categorization of equipment and instrumentation, inspections and tests, testing and inspection frequencies, development of maintenance procedures, training of maintenance personnel, the establishment of criteria for acceptable test results, documentation of test and inspection results, and documentation of manufacturer recommendations as to meantime to failure for equipment and instrumentation.

... Appropriate training is to be provided to maintenance personnel to ensure that they understand the preventive maintenance program procedures, safe practices, and the proper use and application of special equipment or unique tools that may be required. This training is part of the overall training program called for in the standard.

11. Managing Change

... Employers may wish to develop a form or clearance sheet to facilitate the processing of changes through the management of change procedures. A typical change form may include a description and the purpose of the change, the technical basis for the change, safety and health considerations, documentation of changes for the operating procedures, maintenance procedures, inspection and testing, P&IDs, electrical classification, training and communications, pre-startup inspection, duration if a temporary change, approvals and authorization...

12. Investigation of Incidents. Incident investigation is the process of identifying the underlying causes of incidents and implementing steps to prevent similar events from occurring. The intent of an incident investigation is for employers to learn from past experiences and thus avoid repeating past mistakes. The incidents for which OSHA expects employers to become aware and to investigate are the types of events which result in or could reasonably have resulted in a catastrophic release. Some of the events are sometimes referred to as “near misses,” meaning that a serious consequence did not occur, but could have.

Employers need to develop in-house capability to investigate incidents that occur in their facilities. A team needs to be assembled by the employer and trained in the techniques of investigation including how to conduct interviews of witnesses, needed documentation and report writing. A multi-disciplinary team is better able to gather the facts of the event and to analyze them and develop plausible scenarios as to what happened, and why. Team members should be selected on the basis of their training, knowledge and ability to contribute to a team effort to fully investigate the incident.

13. Emergency Preparedness. Each employer must address what actions employees are to take when there is an unwanted release of highly hazardous chemicals. Emergency preparedness or the employer’s tertiary (third) lines of defense are those that will be relied on along with the secondary lines of defense when the primary lines of defense which are used to prevent an unwanted release fail to stop the release. Employers will need to decide if they want employees to handle and stop small or minor incidental releases. Whether they wish to mobilize the available resources at the plant and have them brought to bear on a more significant release. Or whether employers want their employees to evacuate the danger area and promptly escape to a preplanned safe zone area, and allow the local community emergency response organizations to handle the release. Or whether the employer wants to use some combination of these actions. Employers will need to select how

many different emergency preparedness or tertiary lines of defense they plan to have and then develop the necessary plans and procedures, and appropriately train employees in their emergency duties and responsibilities and then implement these lines of defense...

... If the employer wants specific employees in the release area to control or stop the minor emergency or incidental release, these actions must be planned for in advance and procedures developed and implemented. Preplanning for handling incidental releases for minor emergencies in the process area needs to be done, appropriate equipment for the hazards must be provided, and training conducted for those employees who will perform the emergency work before they respond to handle an actual release. The employer's training program, including the Hazard Communication standard training is to address the training needs for employees who are expected to handle incidental or minor releases...

... Responders may be working under very hazardous conditions and therefore the objective is to have them competently led by an on-scene incident commander and the commander's staff, properly equipped to do their assigned work safely, and fully trained to carry out their duties safely before they respond to an emergency. Drills, training exercises, or simulations with the local community emergency response planners and responder organizations is one means to obtain better preparedness. This close cooperation and coordination between plant and local community emergency preparedness managers will also aid the employer in complying with the Environmental Protection Agency's Risk Management Plan criteria...

14. Compliance Audits. Employers need to select a trained individual or assemble a trained team of people to audit the process safety management system and program. A small process or plant may need only one knowledgeable person to conduct an audit. The audit is to include an evaluation of the design and effectiveness of the process safety management system and a field inspection of the safety and health conditions and practices to verify that the employer's systems are effectively implemented. The audit should be conducted or led by a person knowledgeable in audit techniques and who is impartial towards the facility or area being audited. The essential elements of an audit program include planning, staffing, conducting the audit, evaluation and corrective action, follow-up and documentation...

... The selection of effective audit team members is critical to the success of the program. Team members should be chosen for their experience, knowledge, and training and should be familiar with the processes and with auditing techniques, practices and procedures...

An effective audit includes a review of the relevant documentation and process safety information, inspection of the physical facilities, and interviews with all levels of plant personnel. Utilizing the audit procedure and checklist developed in the preplanning stage, the audit team can systematically analyze compliance with the provisions of the standard and any other corporate policies that are relevant. For example, the audit team will review all aspects of the training program as part of the overall audit. The team will review the written training program for adequacy of content, frequency of training, effectiveness of training in terms of its goals and objectives as well as to how it fits into meeting the standard's requirements, documentation, etc. Through interviews, the team can determine the employee's knowledge and awareness of the safety procedures, duties, rules, emergency response assignments, etc. During the inspection, the team can observe actual practices such as safety and health policies, procedures, and work authorization practices. This approach enables the team to identify deficiencies and determine where corrective actions or improvements are necessary.

1926.65 Hazardous waste operations and emergency response

(a)(3); (b)(1)(i) and (ii)(D); (b)(3)(iv); (b)(4)(i), (ii)(B) and (C), and (iii); (c)(5)(iv), (c)(7)(i) and (c)(8); (e)(1) through (9); (g)(5)(vi); (i); (j)(1)(vi); (k)(2)(i); (l)(3)(iv); (p)(7); (p)(8)(iii); and (iv)(C); (q)(5) through (8) and (10), (11); Appendix C (1), (2) and (9); Appendix—
Training Curriculum
Guidelines

(a) Definitions

- (3) *Qualified person* means a person with specific training, knowledge and experience in the area for which the person has the responsibility and the authority to control.

(b) Safety and health program

Note to (b): Safety and health programs developed and implemented to meet other Federal, state, or local regulations are considered acceptable in meeting this requirement if they cover or are modified to cover the topics required in this paragraph. An additional or separate safety and health program is not required by this paragraph.

- (1) *General.*
- (i) Employers shall develop and implement a written safety and health program for their employees involved in hazardous waste operations. The program shall be designed to identify, evaluate, and control safety and health hazards, and provide for emergency response for hazardous waste operations.
 - (ii) The written safety and health program shall incorporate the following:
 - (D) The safety and health training program [described in detail in Appendix C of 1926.65]

- (3) *Comprehensive workplan part of the site program.* The comprehensive workplan part of the program shall address the tasks and objectives of the site operations and the logistics and resources required to reach those tasks and objectives.
 - (iv) The comprehensive workplan shall provide for the implementation of the training required in paragraph (e) of this section.
 - (4) *Site-specific safety and health plan part of the program.*
 - (i) *General.* The site safety and health plan, which must be kept on site, shall address the safety and health hazards of each phase of site operation and include the requirements and procedures for employee protection.
 - (ii) *Elements.* The site safety and health plan, as a minimum, shall address the following:
 - (B) Employee training assignments to assure compliance with paragraph (e) of this section
 - (C) Personal protective equipment to be used by employees for each of the site tasks and operations being conducted as required by the personal protective equipment program in paragraph (g)(5) of this section.
 - (iii) *Pre-entry briefing.* The site specific safety and health plan shall provide for pre-entry briefings to be held prior to initiating any site activity, and at such other times as necessary to ensure that employees are apprised of the site safety and health plan and that this plan is being followed. The information and data obtained from site characterization and analysis work required in paragraph (c) of this section shall be used to prepare and update the site safety and health plan.
- (c) Site characterization and analysis**
- (5) *Personal protective equipment.* Personal protective equipment (PPE) shall be provided and used during initial site entry in accordance with the following requirements:
 - (iv) Once the hazards of the site have been identified, the appropriate PPE shall be selected and used in accordance with paragraph (g) of this section. [See paragraph (g)(5)(vi) PPE training and proper fitting.]

(7) *Risk identification.*

- (i) Once the presence and concentrations of specific hazardous substances and health hazards have been established, the risks associated with these substances shall be identified. Employees who will be working on the site shall be informed of any risks that have been identified. In situations covered by the Hazard Communication Standard, 29 CFR 1926.59, training required by that standard need not be duplicated.

Note to (c)(7). Risks to consider include, but are not limited to:

- (c)(7)(i)(a) Exposures exceeding the permissible exposure limits and published exposure levels.
- (c)(7)(i)(b) IDLH concentrations.
- (c)(7)(i)(c) Potential skin absorption and irritation sources.
- (c)(7)(i)(d) Potential eye irritation sources.
- (c)(7)(i)(e) Explosion sensitivity and flammability ranges.
- (c)(7)(i)(f) Oxygen deficiency.

(c) Site characterization and analysis

- (8) *Employee notification.* Any information concerning the chemical, physical, and toxicologic properties of each substance known or expected to be present on site that is available to the employer and relevant to the duties an employee is expected to perform shall be made available to the affected employees prior to the commencement of their work activities. The employer may utilize information developed for the hazard communication standard for this purpose. [See 1910.1200 for training requirements.]

(e) Training

- (1) *General.*
 - (i) All employees working on site (such as but not limited to equipment operators, general laborers and others) exposed to hazardous substances, health hazards, or safety hazards and their supervisors and management responsible for the site shall receive training meeting the requirements of this paragraph before they are permitted to engage in hazardous waste operations that could expose them to hazardous substances, safety, or health hazards, and they shall receive review training as specified in this paragraph.

- (ii) Employees shall not be permitted to participate in or supervise field activities until they have been trained to a level required by their job function and responsibility.
- (2) *Elements to be covered.* The training shall thoroughly cover the following:
 - (i) Names of personnel and alternates responsible for site safety and health;
 - (ii) Safety, health and other hazards present on the site;
 - (iii) Use of personal protective equipment;
 - (iv) Work practices by which the employee can minimize risks from hazards;
 - (v) Safe use of engineering controls and equipment on the site;
 - (vi) Medical surveillance requirements, including recognition of symptoms and signs which might indicate overexposure to hazards; and
 - (vii) The contents of paragraphs (G) through (J) of the site safety and health plan set forth in paragraph (b)(4)(ii) of this section.
- (3) *Initial training.*
 - (i) General site workers (such as equipment operators, general laborers and supervisory personnel) engaged in hazardous substance removal or other activities which expose or potentially expose workers to hazardous substances and health hazards shall receive a minimum of 40 hours of instruction off the site, and a minimum of three days actual field experience under the direct supervision of a trained, experienced supervisor.
 - (ii) Workers on site only occasionally for a specific limited task (such as, but not limited to, ground water monitoring, land surveying, or geo-physical surveying) and who are unlikely to be exposed over permissible exposure limits and published exposure limits shall receive a minimum of 24 hours of instruction off the site, and the minimum of one day actual field experience under the direct supervision of a trained, experienced supervisor.
 - (iii) Workers regularly on site who work in areas which have been monitored and fully characterized indicating that exposures are under permissible exposure limits and published exposure limits where respirators are not necessary, and the

characterization indicates that there are no health hazards or the possibility of an emergency developing, shall receive a minimum of 24 hours of instruction off the site and the minimum of one day actual field experience under the direct supervision of a trained, experienced supervisor.

- (iv) Workers with 24 hours of training who are covered by paragraphs (e)(3)(ii) and (e)(3)(iii) of this section, and who become general site workers or who are required to wear respirators, shall have the additional 16 hours and two days of training necessary to total the training specified in paragraph (e)(3)(i).
- (4) *Management and supervisor training.* On-site management and supervisors directly responsible for, or who supervise employees engaged in, hazardous waste operations shall receive 40 hours initial training, and three days of supervised field experience (the training may be reduced to 24 hours and one day if the only area of their responsibility is employees covered by paragraphs (e)(3)(ii) and (e)(3)(iii)) and at least eight additional hours of specialized training at the time of job assignment on such topics as, but not limited to, the employer's safety and health program and the associated employee training program, personal protective equipment program, spill containment program, and health hazard monitoring procedure and techniques.
- (5) *Qualifications for trainers.* Trainers shall be qualified to instruct employees about the subject matter that is being presented in training. Such trainers shall have satisfactorily completed a training program for teaching the subjects they are expected to teach, or they shall have the academic credentials and instructional experience necessary for teaching the subjects. Instructors shall demonstrate competent instructional skills and knowledge of the applicable subject matter.
- (6) *Training certification.* Employees and supervisors that have received and successfully completed the training and field experience specified in paragraphs (e)(1) through (e)(4) of this section shall be certified by their instructor or the head instructor and trained supervisor as having successfully completed the necessary training. A written certificate shall be given to each person so certified. Any person who has not been so certified or who does not meet the requirements of paragraph (e)(9) of this section shall be prohibited from engaging in hazardous waste operations.

- (7) *Emergency response.* Employees who are engaged in responding to hazardous emergency situations at hazardous waste clean-up sites that may expose them to hazardous substances shall be trained in how to respond to such expected emergencies.
 - (8) *Refresher training.* Employees specified in paragraph (e)(1) of this section, and managers and supervisors specified in paragraph (e)(4) of this section, shall receive eight hours of refresher training annually on the items specified in paragraph (e)(2) and/or (e)(4) of this section, any critique of incidents that have occurred in the past year that can serve as training examples of related work, and other relevant topics.
 - (9) *Equivalent training.* Employers who can show by documentation or certification that an employee's work experience and/or training has resulted in training equivalent to that training required in paragraphs (e)(1) through (e)(4) of this section shall not be required to provide the initial training requirements of those paragraphs to such employees and shall provide a copy of the certification or documentation to the employee upon request. However, certified employees or employees with equivalent training new to a site shall receive appropriate, site specific training before site entry and have appropriate supervised field experience at the new site. Equivalent training includes any academic training or the training that existing employees might have already received from actual hazardous waste site work experience.
- (g) Engineering controls, work practices, and personal protective equipment for employee protection.**
- (5) *Personal protective equipment (PPE) program.* A written personal protective equipment program, which is part of the employer's safety and health program required in paragraph (b) of this section or required in paragraph (p)(1) of this section and which is also a part of the site-specific safety and health plan shall be established. The PPE program shall address the elements listed below. When elements, such as donning and doffing procedures, are provided by the manufacturer of a piece of equipment and are attached to the plan, they need not be rewritten into the plan as long as they adequately address the procedure or element.
 - (vi) PPE training and proper fitting
 - (i) **Informational programs.** Employers shall develop and implement a program, which is part of the employer's safety and health program required in paragraph (b) of this section, to inform employees,

contractors, and subcontractors (or their representative) actually engaged in hazardous waste operations of the nature, level and degree of exposure likely as a result of participation in such hazardous waste operations. Employees, contractors and subcontractors working outside of the operations part of a site are not covered by this standard.

(j) Handling drums and containers

(1) *General.*

- (vi) Prior to movement of drums or containers, all employees exposed to the transfer operation shall be warned of the potential hazards associated with the contents of the drums or containers.

(k) Decontamination

(2) *Decontamination procedures.*

- (i) A decontamination procedure shall be developed, communicated to employees and implemented before any employees or equipment may enter areas on site where potential for exposure to hazardous substances exists.

(l) Emergency response by employees at uncontrolled hazardous waste sites

(3) *Procedures for handling emergency incidents.*

- (iv) The emergency response plan shall be rehearsed regularly as part of the overall training program for site operations.

(p) Certain operations conducted under the Resource Conservation and Recovery Act of 1976 (RCRA)

(7) *Training program.*

- (i) *New employees.* The employer shall develop and implement a training program, which is part of the employer's safety and health program, for employees exposed to health hazards or hazardous substances at TSD operations to enable the employees to perform their assigned duties and functions in a safe and healthful manner so as not endanger themselves or other employees. The initial training shall be for 24 hours and refresher training shall be for eight hours annually. Employees who have received the initial training required by this paragraph shall be given a written certificate attesting that they have successfully completed the necessary training.

- (ii) *Current employees.* Employers who can show by an employee's previous work experience and/or training that the employee has had training equivalent to the initial training required by this paragraph, shall be considered as meeting the initial training requirements of this paragraph as to that employee. Equivalent training includes the training that existing employees might have already received from actual site work experience. Current employees shall receive eight hours of refresher training annually.
 - (iii) *Trainers.* Trainers who teach initial training shall have satisfactorily completed a training course for teaching the subjects they are expected to teach or they shall have the academic credentials and instruction experience necessary to demonstrate a good command of the subject matter of the courses and competent instructional skills.
- (8) *Emergency response program.*
- (iii) Training
 - (A) Training for emergency response employees shall be completed before they are called upon to perform in real emergencies. Such training shall include the elements of the emergency response plan, standard operating procedures the employer has established for the job, the personal protective equipment to be worn and procedures for handling emergency incidents.

Exception #1: An employer need not train all employees to the degree specified if the employer divides the work force in a manner such that a sufficient number of employees who have responsibility to control emergencies have the training specified, and all other employees, who may first respond to an emergency incident, have sufficient awareness training to recognize that an emergency response situation exists and that they are instructed in that case to summon the fully trained employees and not attempt control activities for which they are not trained.

Exception #2: An employer need not train all employees to the degree specified if arrangements have been made in advance for an outside fully-trained emergency response team to respond in a reasonable period and all employees, who may come

to the incident first, have sufficient awareness training to recognize that an emergency response situation exists and they have been instructed to call the designated outside fully-trained emergency response team for assistance.

- (B) Employee members of TSD facility emergency response organizations shall be trained to a level of competence in the recognition of health and safety hazards to protect themselves and other employees. This would include training in the methods used to minimize the risk from safety and health hazards; in the safe use of control equipment; in the selection and use of appropriate personal protective equipment; in the safe operating procedures to be used at the incident scene; in the techniques of coordination with other employees to minimize risks; in the appropriate response to over exposure from health hazards or injury to themselves and other employees; and in the recognition of subsequent symptoms which may result from over exposures.
- (C) The employer shall certify that each covered employee has attended and successfully completed the training required in paragraph (p)(8)(iii) of this section, or shall certify the employee's competency at least yearly. The method used to demonstrate competency for certification of training shall be recorded and maintained by the employer.

(iv) *Procedures for handling emergency incidents.*

- (C) The emergency response plan shall be rehearsed regularly as part of the overall training program for site operations.

(q) Emergency response to hazardous substance releases. This paragraph covers employers whose employees are engaged in emergency response no matter where it occurs except that it does not cover employees engaged in operations specified in paragraphs (a)(1)(i) through (a)(1)(iv) of this section. Those emergency response organizations who have developed and implemented programs equivalent to this paragraph for handling releases of hazardous

substances pursuant to section 303 of the Superfund Amendments and Reauthorization Act of 1986 (Emergency Planning and Community Right-to-Know Act of 1986, 42 U.S.C. 11003) shall be deemed to have met the requirements of this paragraph

- (5) *Specialist employees.* Employees who, in the course of their regular job duties, work with and are trained in the hazards of specific hazardous substances, and who will be called upon to provide technical advice or assistance at a hazardous substance release incident to the individual in charge, shall receive training or demonstrate competency in the area of their specialization annually.
- (6) *Training.* Training shall be based on the duties and function to be performed by each responder of an emergency response organization. The skill and knowledge levels required for all new responders, those hired after the effective date of this standard, shall be conveyed to them through training before they are permitted to take part in actual emergency operations on an incident. Employees who participate, or are expected to participate, in emergency response, shall be given training in accordance with the following paragraphs:
 - (i) *First responder awareness level.* First responders at the awareness level are individuals who are likely to witness or discover a hazardous substance release and who have been trained to initiate an emergency response sequence by notifying the proper authorities of the release. They would take no further action beyond notifying the authorities of the release. First responders at the awareness level shall have sufficient training or have had sufficient experience to objectively demonstrate competency in the following areas:
 - (A) An understanding of what hazardous substances are, and the risks associated with them in an incident.
 - (B) An understanding of the potential outcomes associated with an emergency created when hazardous substances are present.
 - (C) The ability to recognize the presence of hazardous substances in an emergency.
 - (D) The ability to identify the hazardous substances, if possible.

- (E) An understanding of the role of the first responder awareness individual in the employer's emergency response plan including site security and control and the U.S. Department of Transportation's Emergency Response Guidebook.
 - (F) The ability to realize the need for additional resources, and to make appropriate notifications to the communication center.
- (ii) *First responder operations level.* First responders at the operations level are individuals who respond to releases or potential releases of hazardous substances as part of the initial response to the site for the purpose of protecting nearby persons, property, or the environment from the effects of the release. They are trained to respond in a defensive fashion without actually trying to stop the release. Their function is to contain the release from a safe distance, keep it from spreading, and prevent exposures. First responders at the operational level shall have received at least eight hours of training or have had sufficient experience to objectively demonstrate competency in the following areas in addition to those listed for the awareness level and the employer shall so certify:
- (A) Knowledge of the basic hazard and risk assessment techniques.
 - (B) Know how to select and use proper personal protective equipment provided to the first responder operational level.
 - (C) An understanding of basic hazardous materials terms.
 - (D) Know how to perform basic control, containment and/or confinement operations within the capabilities of the resources and personal protective equipment available with their unit.
 - (E) Know how to implement basic decontamination procedures.
 - (F) An understanding of the relevant standard operating procedures and termination procedures.
- (iii) *Hazardous materials technician.* Hazardous materials technicians are individuals who respond to releases or potential releases for the purpose of stopping the release.

They assume a more aggressive role than a first responder at the operations level in that they will approach the point of release in order to plug, patch or otherwise stop the release of a hazardous substance. Hazardous materials technicians shall have received at least 24 hours of training equal to the first responder operations level and in addition have competency in the following areas and the employer shall so certify:

- (A) Know how to implement the employer's emergency response plan.
 - (B) Know the classification, identification and verification of known and unknown materials by using field survey instruments and equipment.
 - (C) Be able to function within an assigned role in the Incident Command System.
 - (D) Know how to select and use proper specialized chemical personal protective equipment provided to the hazardous materials technician.
 - (E) Understand hazard and risk assessment techniques.
 - (F) Be able to perform advance control, containment, and/or confinement operations within the capabilities of the resources and personal protective equipment available with the unit.
 - (G) Understand and implement decontamination procedures.
 - (H) Understand termination procedures.
 - (I) Understand basic chemical and toxicological terminology and behavior.
- (iv) *Hazardous materials specialist.* Hazardous materials specialists are individuals who respond with and provide support to hazardous materials technicians. Their duties parallel those of the hazardous materials technician, however, those duties require a more directed or specific knowledge of the various substances they may be called upon to contain. The hazardous materials specialist would also act as the site liaison with Federal, state, local and other government authorities in regards to site activities. Hazardous materials specialists shall have received at least

24 hours of training equal to the technician level and in addition have competency in the following areas and the employer shall so certify:

- (A) Know how to implement the local emergency response plan.
 - (B) Understand classification, identification and verification of known and unknown materials by using advanced survey instruments and equipment.
 - (C) Know of the state emergency response plan.
 - (D) Be able to select and use proper specialized chemical personal protective equipment provided to the hazardous materials specialist.
 - (E) Understand in-depth hazard and risk techniques.
 - (F) Be able to perform specialized control, containment, and/or confinement operations within the capabilities of the resources and personal protective equipment available.
 - (G) Be able to determine and implement decontamination procedures.
 - (H) Have the ability to develop a site safety and control plan.
 - (I) Understand chemical, radiological and toxicological terminology and behavior.
- (v) *On scene incident commander.* Incident commanders, who will assume control of the incident scene beyond the first responder awareness level, shall receive at least 24 hours of training equal to the first responder operations level and in addition have competency in the following areas and the employer shall so certify:
- (A) Know and be able to implement the employer's incident command system.
 - (B) Know how to implement the employer's emergency response plan.
 - (C) Know and understand the hazards and risks associated with employees working in chemical protective clothing.
 - (D) Know how to implement the local emergency response plan.

- (E) Know of the state emergency response plan and of the Federal Regional Response Team.
 - (F) Know and understand the importance of decontamination procedures.
- (7) Trainers who teach any of the above training subjects shall have satisfactorily completed a training course for teaching the subjects they are expected to teach, such as the courses offered by the U.S. National Fire Academy, or they shall have the training and/or academic credentials and instructional experience necessary to demonstrate competent instructional skills and a good command of the subject matter of the courses they are to teach.
- (8) *Refresher training.*
- (i) Those employees who are trained in accordance with paragraph (q)(6) of this section shall receive annual refresher training of sufficient content and duration to maintain their competencies, or shall demonstrate competency in those areas at least yearly.
 - (ii) A statement shall be made of the training or competency, and if a statement of competency is made, the employer shall keep a record of the methodology used to demonstrate competency.
- (10) *Chemical protective clothing.* Chemical protective clothing and equipment to be used by organized and designated HAZMAT team members, or to be used by hazardous materials specialists, shall meet the requirements of paragraphs (g)(3) through (5) of this section. [SEE: 1926.65(g)(5)(vi) for PPE training and fitting.]
- (11) *Post-emergency response operations.* Upon completion of the emergency response, if it is determined that it is necessary to remove hazardous substances, health hazards, and materials contaminated with them (such as contaminated soil or other elements of the natural environment) from the site of the incident, the employer conducting the clean-up shall comply with one of the following:
- (i) Meet all of the requirements of paragraphs (b) through (o) of this section; or
 - (ii) Where the clean-up is done on plant property using plant or workplace employees, such employees shall have completed the training requirements of the following: 29 CFR 1926.35, 1926.59, and 1926.103, and other appropriate safety and health training made necessary by the tasks that they are expected

to be performed such as personal protective equipment and decontamination procedures. All equipment to be used in the performance of the clean-up work shall be in serviceable condition and shall have been inspected prior to use.

Appendix C to 1926.65—Compliance Guidelines

1. Occupational Safety and Health Program. Each hazardous waste site clean-up effort will require an occupational safety and health program headed by the site coordinator or the employer's representative. The purpose of the program will be the protection of employees at the site and will be an extension of the employer's overall safety and health program. The program will need to be developed before work begins on the site and implemented as work proceeds as stated in paragraph (b). The program is to facilitate coordination and communication of safety and health issues among personnel responsible for the various activities which will take place at the site. It will provide the overall means for planning and implementing the needed safety and health training and job orientation of employees who will be working at the site. The program will provide the means for identifying and controlling worksite hazards and the means for monitoring program effectiveness. The program will need to cover the responsibilities and authority of the site coordinator or the employer's manager on the site for the safety and health of employees at the site, and the relationships with contractors or support services as to what each employer's safety and health responsibilities are for their employees on the site. Each contractor on the site needs to have its own safety and health program so structured that it will smoothly interface with the program of the site coordinator or principal contractor.

Also those employers involved with treating, storing or disposal of hazardous waste as covered in paragraph (p) must have implemented a safety and health program for their employees. This program is to include the hazard communication program required in paragraph (p)(1) and the training required in paragraphs (p)(7) and (p)(8) as parts of the employer's comprehensive overall safety and health program. This program is to be in writing.

Each site or workplace safety and health program will need to include the following: (1) Policy statements of the line of authority and accountability for implementing the program, the objectives of the program and the role of the site safety and health supervisor or manager and staff; (2) means or methods for the development of procedures for identifying and controlling workplace hazards at the site; (3) means or methods for the development and communication to employees of the various plans,

work rules, standard operating procedures and practices that pertain to individual employees and supervisors; (4) means for the training of supervisors and employees to develop the needed skills and knowledge to perform their work in a safe and healthful manner; (5) means to anticipate and prepare for emergency situations; and (6) means for obtaining information feedback to aid in evaluating the program and for improving the effectiveness of the program. The management and employees should be trying continually to improve the effectiveness of the program thereby enhancing the protection being afforded those working on the site.

Accidents on the site or workplace should be investigated to provide information on how such occurrences can be avoided in the future. When injuries or illnesses occur on the site or workplace, they will need to be investigated to determine what needs to be done to prevent this incident from occurring again. Such information will need to be used as feedback on the effectiveness of the program and the information turned into positive steps to prevent any recurrence. Receipt of employee suggestions or complaints relating to safety and health issues involved with site or workplace activities is also a feedback mechanism that can be used effectively to improve the program and may serve in part as an evaluative tool(s).

For the development and implementation of the program to be the most effective, professional safety and health personnel should be used. Certified Safety Professionals, Board Certified Industrial Hygienists or Registered Professional Safety Engineers are good examples of professional stature for safety and health managers who will administer the employer's program.

- 2. Training.** The training programs for employees subject to the requirements of paragraph (e) of this standard should address: the safety and health hazards employees should expect to find on hazardous waste clean-up sites; what control measures or techniques are effective for those hazards; what monitoring procedures are effective in characterizing exposure levels; what makes an effective employer's safety and health program; what a site safety and health plan should include; hands on training with personal protective equipment and clothing they may be expected to use; the contents of the OSHA standard relevant to the employee's duties and function; and, employee's responsibilities under OSHA and other regulations. Supervisors will need training in their responsibilities under the safety and health program and its subject areas such as the spill containment program, the personal protective equipment program, the medical surveillance program, the emergency response plan and other areas.

The training programs for employees subject to the requirements of paragraph (p) of this standard should address: the employer's safety and health program elements impacting employees; the hazard communication program; the medical surveillance program; the hazards and the controls for such hazards that employees need to know for their job duties and functions. All require annual refresher training.

The training programs for employees covered by the requirements of paragraph (q) of this standard should address those competencies required for the various levels of response such as: the hazards associated with hazardous substances; hazard identification and awareness; notification of appropriate persons; the need for and use of personal protective equipment including respirators; the decontamination procedures to be used; preplanning activities for hazardous substance incidents including the emergency response plan; company standard operating procedures for hazardous substance emergency responses; the use of the incident command system and other subjects. Hands-on training should be stressed whenever possible. Critiques done after an incident which include an evaluation of what worked and what did not and how could the incident be better handled the next time may be counted as training time.

For hazardous materials specialists (usually members of hazardous materials teams), the training should address the care, use and/or testing of chemical protective clothing including totally encapsulating suits, the medical surveillance program, the standard operating procedures for the hazardous materials team including the use of plugging and patching equipment and other subject areas.

Officers and leaders who may be expected to be in charge at an incident should be fully knowledgeable of their company's incident command system. They should know where and how to obtain additional assistance and be familiar with the local district's emergency response plan and the state emergency response plan.

Specialist employees such as technical experts, medical experts or environmental experts that work with hazardous materials in their regular jobs, who may be sent to the incident scene by the shipper, manufacturer or governmental agency to advise and assist the person in charge of the incident should have training on an annual basis. Their training should include the care and use of personal protective equipment including respirators; knowledge of the incident command system and how they are to relate to it; and those areas needed to keep them current in their respective field as it relates to safety and health involving specific hazardous substances.

Those skilled support personnel, such as employees who work for public works departments or equipment operators who operate bulldozers, sand trucks, backhoes, etc., who may be called to the incident scene to provide emergency support

assistance, should have at least a safety and health briefing before entering the area of potential or actual exposure. These skilled support personnel, who have not been a part of the emergency response plan and do not meet the training requirements, should be made aware of the hazards they face and should be provided all necessary protective clothing and equipment required for their tasks.

There are two National Fire Protection Association standards, NFPA 472—“Standard for Professional Competence of Responders to Hazardous Material Incidents” and NFPA 471—“Recommended Practice for Responding to Hazardous Material Incidents,” which are excellent resource documents to aid fire departments and other emergency response organizations in developing their training program materials. NFPA 472 provides guidance on the skills and knowledge needed for first responder awareness level, first responder operations level, hazmat technicians, and hazmat specialist. It also offers guidance for the officer corp that will be in charge of hazardous substance incidents.

9. New Technology and Spill Containment Programs.

...All workers performing hazardous substance spill control work are expected to wear the proper protective clothing and equipment for the materials present and to follow the employer’s established standard operating procedures for spill control. All involved workers need to be trained in the established operating procedures; in the use and care of spill control equipment; and in the associated hazards and control of such hazards of spill containment work.

Appendix [E] to 1926.65 — Training Curriculum Guidelines

The following *non-mandatory* general criteria may be used for assistance in developing site-specific training curriculum used to meet the training requirements of 29 CFR 1926.65(e); 29 CFR 1926.65(p)(7), (p)(8)(iii); and 29 CFR 1926.65(q)(6), (q)(7), and (q)(8). These are generic guidelines and they are not presented as a complete training curriculum for any specific employer. Site-specific training programs must be developed on the basis of a needs assessment of the hazardous waste site, RCRA/TSD, or emergency response operation in accordance with 29 CFR 1926.65.

It is noted that the legal requirements are set forth in the regulatory text of 1926.65. The guidance set forth here presents a highly effective program that in the areas covered would meet or exceed the regulatory requirements. In addition, other approaches could meet the regulatory requirements.

Suggested General Criteria

Definitions:

Competent means possessing the skills, knowledge, experience, and judgment to perform assigned tasks or activities satisfactorily as determined by the employer.

Demonstration means the showing by actual use of equipment or procedures.

Hands-on training means training in a simulated work environment that permits each student to have experience performing tasks, making decisions, or using equipment appropriate to the job assignment for which the training is being conducted.

Initial training means training required prior to beginning work.

Lecture means an interactive discourse with a class lead by an instructor.

Proficient means meeting a stated level of achievement.

Site-specific means individual training directed to the operations of a specific job site.

Training hours means the number of hours devoted to lecture, learning activities, small group work sessions, demonstration, evaluations, or hands-on experience.

Suggested Core Criteria:

1. *Training facility.* The training facility should have available sufficient resources, equipment, and site locations to perform didactic and hands-on training when appropriate. Training facilities should have sufficient organization, support staff, and services to conduct training in each of the courses offered.
2. *Training Director.* Each training program should be under the direction of a training director who is responsible for the program. The Training Director should have a minimum of two years of employee education experience.
3. *Instructors.* Instructors should be deemed competent on the basis of previous documented experience in their area of instruction, successful completion of a “train-the-trainer” program specific to the topics they will teach, and an evaluation of instructional competence by the Training Director.

Instructors should be required to maintain professional competency by participating in continuing education or professional development programs or by completing successfully an annual refresher course and having an annual review by the Training Director.

The annual review by the Training Director should include observation of an instructor’s delivery, a review of those observations with the trainer, and an analysis of any instructor or class evaluations completed by the students during the previous year.

4. *Course materials.* The Training Director should approve all course materials to be used by the training provider. Course materials should be reviewed and updated at least annually. Materials and equipment should be in good working order and maintained properly.

All written and audio-visual materials in training curricula should be peer reviewed by technically competent outside reviewers or by a standing advisory committee.

Reviews should possess expertise in the following disciplines were applicable: occupational health, industrial hygiene and safety, chemical/environmental engineering, employee education, or emergency response. One or more of the peer reviewers should be a employee experienced in the work activities to which the training is directed.

5. *Students.* The program for accepting students should include:
 - a. Assurance that the student is or will be involved in work where chemical exposures are likely and that the student possesses the skills necessary to perform the work.
 - b. A policy on the necessary medical clearance.
6. *Ratios.* Student-instructor ratios should not exceed 30 students per instructor. Hands-on activity requiring the use of personal protective equipment should have the following student-instructor ratios. For Level C or Level D personal protective equipment the ratio should be 10 students per instructor. For Level A or Level B personal protective equipment the ratio should be 5 students per instructor.
7. *Proficiency assessment.* Proficiency should be evaluated and documented by the use of a written assessment and a skill demonstration selected and developed by the Training Director and training staff. The assessment and demonstration should evaluate the knowledge and individual skills developed in the course of training. The level of minimum achievement necessary for proficiency shall be specified in writing by the Training Director.

If a written test is used, there should be a minimum of 50 questions. If a written test is used in combination with a skills demonstration, a minimum of 25 questions should be used. If a skills demonstration is used, the tasks chosen and the means to rate successful completion should be fully documented by the Training Director.

The content of the written test or of the skill demonstration shall be relevant to the objectives of the course. The written test and skill demonstration should be updated as necessary to reflect changes in the curriculum and any update should be approved by the Training Director.

The proficiency assessment methods, regardless of the approach or combination of approaches used, should be justified, document and approved by the Training Director.

The proficiency of those taking the additional courses for supervisors should be evaluated and documented by using proficiency assessment methods acceptable to the Training Director. These proficiency assessment methods must reflect the additional responsibilities borne by supervisory personnel in hazardous waste operations or emergency response.

8. *Course certificate.* Written documentation should be provided to each student who satisfactorily completes the training course. The documentation should include:
 - a. Student's name.
 - b. Course title.
 - c. Course date.
 - d. Statement that the student has successfully completed the course.
 - e. Name and address of the training provider.
 - f. An individual identification number for the certificate.
 - g. List of the levels of personal protective equipment used by the student to complete the course.

This documentation may include a certificate and an appropriate wallet-sized laminated card with a photograph of the student and the above information. When such course certificate cards are used, the individual identification number for the training certificate should be shown on the card.

9. *Recordkeeping.* Training providers should maintain records listing the dates courses were presented, the names of the individual course attenders, the names of those students successfully completing each course, and the number of training certificates issued to each successful student. These records should be maintained for a minimum of five years after the date an individual participated in a training program offered by the training provider. These records should be available and provided upon the student's request or as mandated by law.
10. *Program quality control.* The Training Director should conduct or direct an annual written audit of the training program. Program modifications to address deficiencies, if any, should be documented, approved, and implemented by the training provider. The audit and the program modification documents should be maintained at the training facility.

Suggested Program Quality Control Criteria

Factors listed here are suggested criteria for determining the quality and appropriateness of employee health and safety training for hazardous waste operations and emergency response.

A. Training Plan

Adequacy and appropriateness of the training program's curriculum development, instructor training, distribution of course materials, and direct student training should be considered, including:

1. The duration of training, course content, and course schedules/agendas;
2. The different training requirements of the various target populations, as specified in the appropriate generic training curriculum;
3. The process for the development of curriculum, which includes appropriate technical input, outside review, evaluation, program pretesting;
4. The adequate and appropriate inclusion of hands-on, demonstration, and instruction methods;
5. Adequate monitoring of student safety, progress, and performance during the training.

B. Program management, Training Director, staff, and consultants

Adequacy and appropriateness of staff performance and delivering an effective training program should be considered, including:

1. Demonstration of the training director's leadership in assuring quality of health and safety training.
2. Demonstration of the competency of the staff to meet the demands of delivering high quality hazardous waste employee health and safety training.
3. Organization charts establishing clear lines of authority.
4. Clearly defined staff duties including the relationship of the training staff to the overall program.
5. Evidence that the training organizational structure suits the needs of the training program.
6. Appropriateness and adequacy of the training methods used by the instructors.
7. Sufficiency of the time committed by the training director and staff to the training program.
8. Adequacy of the ratio of training staff to students.

9. Availability and commitment of the training program of adequate human and equipment resources in the areas of —
 - a. Health effects
 - b. Safety
 - c. Personal protective equipment (PPE)
 - d. Operational procedures
 - e. Employee protection practices/procedures
10. Appropriateness of management controls.
11. Adequacy of the organization and appropriate resources assigned to assure appropriate training.
12. In the case of multiple-site training programs, adequacy of satellite centers management.

C. Training facilities and resources

Adequacy and appropriateness of the facilities and resources for supporting the training program should be considered, including:

1. Space and equipment to conduct the training.
2. Facilities for representative hands-on training.
3. In the case of multiple-site programs, equipment and facilities at the satellite centers.
4. Adequacy and appropriateness of the quality control and evaluations program to account for instructor performance.
5. Adequacy and appropriateness of the quality control and evaluation program to ensure appropriate course evaluation, feedback, updating, and corrective action.
6. Adequacy and appropriateness of disciplines and expertise being used within the quality control and evaluation program.
7. Adequacy and appropriateness of the role of student evaluations to provide feedback for training program improvement.

D. Quality control and evaluation

Adequacy and appropriateness of quality control and evaluation plans for training programs should be considered, including:

1. A balanced advisory committee and/or competent outside reviewers to give overall policy guidance;
2. Clear and adequate definition of the composition and active programmatic role of the advisory committee or outside reviewers.
3. Adequacy of the minutes or reports of the advisory committee or outside reviewers' meetings or written communication.

4. Adequacy and appropriateness of the quality control and evaluations program to account for instructor performance.
5. Adequacy and appropriateness of the quality control and evaluation program to ensure appropriate course evaluation, feedback, updating, and corrective action.
6. Adequacy and appropriateness of disciplines and expertise being used within the quality control and evaluation program.
7. Adequacy and appropriateness of the role of student evaluations to provide feedback for training program improvement.

E. Students

Adequacy and appropriateness of the program for accepting students should be considered, including:

1. Assurance that the student already possesses the necessary skills for their job, including necessary documentation.
2. Appropriateness of methods the program uses to ensure that recruits are capable of satisfactorily completing training.
3. Review and compliance with any medical clearance policy.

F. Institutional Environment and Administrative Support

The adequacy and appropriateness of the institutional environment and administrative support system for the training program should be considered, including

1. Adequacy of the institutional commitment to the employee training program.
2. Adequacy and appropriateness of the administrative structure and administrative support.

G. Summary of Evaluation Questions

Key questions for evaluating the quality and appropriateness of an overall training program should include the following:

1. Are the program objectives clearly stated?
2. Is the program accomplishing its objectives?
3. Are appropriate facilities and staff available?
4. Is there an appropriate mix of classroom, demonstration, and hands-on training?
5. Is the program providing quality employee health and safety training that fully meets the intent of regulatory requirements?
6. What are the program's main strengths?
7. What are the program's main weaknesses?

8. What is recommended to improve the program?
9. Are instructors instructing according to their training outlines?
10. Is the evaluation tool current and appropriate for the program content?
11. Is the course material current and relevant to the target group?

Suggested Training Curriculum Guidelines

The following training curriculum guidelines are for those operations specifically identified in 29 CFR 1926.65 as requiring training. Issues such as qualifications of instructors, training certification, and similar criteria appropriate to all categories of operations addressed in 1926.65 have been covered in the preceding section and are not re-addressed in each of the generic guidelines. Basic core requirements for training programs that are addressed include:

1. General Hazardous Waste Operations
2. RCRA operations—Treatment, storage, and disposal facilities
3. Emergency Response

A. General Hazardous Waste Operations and Site-specific Training

1. Off-site training

Minimum training course content for hazardous waste operations, required by 29 CFR 1926.65(e), should include the following topics or procedures:

- a. Regulatory knowledge*
 - (1) A review of 29 CFR 1926.65 and the core elements of an occupational safety and health program.
 - (2) The content of a medical surveillance program as outlined in 29 CFR 1926.65(f).
 - (3) The content of an effective site safety and health plan consistent with the requirements of 29 CFR 1926.65(b)(4)(ii).
 - (4) Emergency response plan and procedures as outlined in 29 CFR 1910.38 and 29 CFR 1926.65(l).
 - (5) Adequate illumination.
 - (6) Sanitation recommendation and equipment.
 - (7) Review and explanation of OSHA's hazard-communication standard (29 CFR 1910.1200) and lock-out-tag-out standard (29 CFR 1910.147).
 - (8) Review of other applicable standards including but not limited to those in the construction standards (29 CFR part 1926).
 - (9) Rights and responsibilities of employers and employees under applicable OSHA and EPA laws.

b. Technical knowledge

- (1) Type of potential exposures to chemical, biological, and radiological hazards; types of human responses to these hazards and recognition of those responses; principles of toxicology and information about acute and chronic hazards; health and safety considerations of new technology.
- (2) Fundamentals of chemical hazards including but not limited to vapor pressure, boiling points, flash points, ph, other physical and chemical properties.
- (3) Fire and explosion hazards of chemicals.
- (4) General safety hazards such as but not limited to electrical hazards, powered equipment hazards, motor vehicle hazards, walking-working surface hazards, excavation hazards, and hazards associated with working in hot and cold temperature extremes.
- (5) Review and knowledge of confined space entry procedures in 29 CFR 1910.146.
- (6) Work practices to minimize employee risk from site hazards.
- (7) Safe use of engineering controls, equipment, and any new relevant safety technology or safety procedures.
- (8) Review and demonstration of competency with air sampling and monitoring equipment that may be used in a site monitoring program.
- (9) Container sampling procedures and safeguarding; general drum and container handling procedures including special requirement for laboratory waste packs, shock-sensitive wastes, and radioactive wastes.
- (10) The elements of a spill control program.
- (11) Proper use and limitations of material handling equipment.
- (12) Procedures for safe and healthful preparation of containers for shipping and transport.
- (13) Methods of communication including those used while wearing respiratory protection.

c. Technical skills

- (1) Selection, use maintenance, and limitations of personal protective equipment including the components and procedures for carrying out a respirator program to comply with 29 CFR 1910.134.
- (2) Instruction in decontamination programs including personnel, equipment, and hardware; hands-on training including level A, B, and C ensembles and appropriate decontamination lines; field activities

including the donning and doffing of protective equipment to a level commensurate with the employee's anticipated job function and responsibility and to the degree required by potential hazards.

- (3) Sources for additional hazard information; exercises using relevant manuals and hazard coding systems.

d. Additional suggested items

- (1) A laminated, dated card or certificate with photo, denoting limitations and level of protection for which the employee is trained should be issued to those students successfully completing a course.
- (2) Attendance should be required at all training modules, with successful completion of exercises and a final written or oral examination with at least 50 questions.
- (3) A minimum of one-third of the program should be devoted to hands-on exercises.
- (4) A curriculum should be established for the 8-hour refresher training required by 29 CFR 1926.65(e)(8), with delivery of such courses directed toward those areas of previous training that need improvement or reemphasis.
- (5) A curriculum should be established for the required 8-hour training for supervisors. Demonstrated competency in the skills and knowledge provided in a 40-hour course should be a prerequisite for supervisor training.

2. Refresher training. The 8-hour annual refresher training required in 29 CFR 1926.65(e)(8) should be conducted by qualified training providers. Refresher training should include at a minimum the following topics and procedures:

- (a) Review of and retraining on relevant topics covered in the 40-hour program, as appropriate, using reports by the students on their work experiences.
- (b) Update on developments with respect to material covered in the 40-hour course.
- (c) Review of changes to pertinent provisions of EPA or OSHA standards or laws.
- (d) Introduction of additional subject areas as appropriate.
- (e) Hands-on review of new or altered PPE or decontamination equipment or procedures. Review of new developments in personal protective equipment.
- (f) Review of newly developed air and contaminant monitoring equipment.

3. *On-site training*

- a. The employer should provide employees engaged in hazardous waste site activities with information and training prior to initial assignment into their work area, as follows:
 - (1) The requirements of the hazard communication program including the location and availability of the written program, required lists of hazardous chemicals, and material safety data sheets.
 - (2) Activities and locations in their work area where hazardous substance may be present.
 - (3) Methods and observations that may be used to detect the presence or release of a hazardous chemical in the work area (such as monitoring conducted by the employer, continuous monitoring devices, visual appearances, or other evidence (sight, sound or smell) of hazardous chemicals being released, and applicable alarms from monitoring devices that record chemical releases).
 - (4) The physical and health hazards of substances known or potentially present in the work area.
 - (5) The measures employees can take to help protect themselves from work-site hazards, including specific procedures the employer has implemented.
 - (6) An explanation of the labeling system and material safety data sheets and how employees can obtain and use appropriate hazard information.
 - (7) The elements of the confined space program including special PPE, permits, monitoring requirements, communication procedures, emergency response, and applicable lock-out procedures.
- b. The employer should provide hazardous waste employees information and training and should provide a review and access to the site safety and plan as follows:
 - (1) Names of personnel and alternate responsible for site safety and health.
 - (2) Safety and health hazards present on the site.
 - (3) Selection, use, maintenance, and limitations of personal protective equipment specific to the site.
 - (4) Work practices by which the employee can minimize risks from hazards.
 - (5) Safe use of engineering controls and equipment available on site.

- (6) Safe decontamination procedures established to minimize employee contact with hazardous substances, including:
 - (A) Employee decontamination,
 - (B) Clothing decontamination, and
 - (C) Equipment decontamination.
- (7) Elements of the site emergency response plan, including:
 - (A) Pre-emergency planning.
 - (B) Personnel roles and lines of authority and communication.
 - (C) Emergency recognition and prevention.
 - (D) Safe distances and places of refuge.
 - (E) Site security and control.
 - (F) Evacuation routes and procedures.
 - (G) Decontamination procedures not covered by the site safety and health plan.
 - (H) Emergency medical treatment and first aid.
 - (I) Emergency equipment and procedures for handling emergency incidents.
- c. The employer should provide hazardous waste employees information and training on personal protective equipment used at the site, such as the following:
 - (1) PPE to be used based upon known or anticipated site hazards.
 - (2) PPE limitations of materials and construction; limitations during temperature extremes, heat stress, and other appropriate medical considerations; use and limitations of respirator equipment as well as documentation procedures as outlined in 29 CFR 1910.134.
 - (3) PPE inspection procedures prior to, during, and after use.
 - (4) PPE donning and doffing procedures.
 - (5) PPE decontamination and disposal procedures.
 - (6) PPE maintenance and storage.
 - (7) Task duration as related to PPE limitations.
- d. The employer should instruct the employee about the site medical surveillance program relative to the particular site, including:
 - (1) Specific medical surveillance programs that have been adapted for the site.

- (2) Specific signs and symptoms related to exposure to hazardous materials on the site.
 - (3) The frequency and extent of periodic medical examinations that will be used on the site.
 - (4) Maintenance and availability of records.
 - (5) Personnel to be contacted and procedures to be followed when signs and symptoms of exposures are recognized.
- e. The employees will review and discuss the site safety plan as part of the training program. The location of the site safety plan and all written programs should be discussed with employees including a discussion of the mechanisms for access, review, and references described.

B. RCRA Operations Training for Treatment, Storage and Disposal Facilities

1. As a minimum, the training course required in 29 CFR 1926.65 (p) should include the following topics:
 - (a) Review of the applicable paragraphs of 29 CFR 1926.65 and the elements of the employer's occupational safety and health plan.
 - (b) Review of relevant hazards such as, but not limited to, chemical, biological, and radiological exposures; fire and explosion hazards; thermal extremes; and physical hazards.
 - (c) General safety hazards including those associated with electrical hazards, powered equipment hazards, lockout/tagout procedures, motor vehicle hazards and walking-working surface hazards.
 - (d) Confined-space hazards and procedures.
 - (e) Work practices to minimize employee risk from workplace hazards.
 - (f) Emergency response plan and procedures including first aid meeting the requirements of paragraph (p)(8).
 - (g) A review of procedures to minimize exposure to hazardous waste and various type of waste streams, including the materials handling program and spill containment program.
 - (h) A review of hazard communication programs meeting the requirements of 29 CFR 1910.1200.
 - (i) A review of medical surveillance programs meeting the requirements of 29 CFR 1926.65(p)(3) including the recognition of signs and symptoms of overexposure to hazardous substance including known synergistic interactions.

- (j) A review of decontamination programs and procedures meeting the requirements of 29 CFR 1926.65(p)(4).
 - (k) A review of an employer's requirements to implement a training program and its elements.
 - (l) A review of the criteria and programs for proper selection and use of personal protective equipment, including respirators.
 - (m) A review of the applicable appendices to 29 CFR 1926.65.
 - (n) Principles of toxicology and biological monitoring as they pertain to occupational health.
 - (o) Rights and responsibilities of employees and employers under applicable OSHA and EPA laws.
 - (p) Hands-on exercises and demonstrations of competency with equipment to illustrate the basic equipment principles that may be used during the performance of work duties, including the donning and doffing of PPE.
 - (q) Sources of reference, efficient use of relevant manuals, and knowledge of hazard coding systems to include information contained in hazardous waste manifests.
 - (r) At least 8 hours of hands-on training.
 - (s) Training in the job skills required for an employee's job function and responsibility before they are permitted to participate in or supervise field activities.
2. The individual employer should provide hazardous waste employees with information and training prior to an employee's initial assignment into a work area. The training and information should cover the following topics:
- (a) The Emergency response plan and procedures including first aid.
 - (b) A review of the employer's hazardous waste handling procedures including the materials handling program and elements of the spill containment program, location of spill response kits or equipment, and the names of those trained to respond to releases.
 - (c) The hazardous communication program meeting the requirements of 29 CFR 1910.1200.
 - (d) A review of the employer's medical surveillance program including the recognition of signs and symptoms of exposure to relevant hazardous substances including known synergistic interactions.
 - (e) A review of the employer's decontamination program and procedures.
 - (f) A review of the employer's training program and the parties responsible for that program.

- (g) A review of the employer's personal protective equipment program including the proper selection and use of PPE based upon specific site hazards.
- (h) All relevant site-specific procedures addressing potential safety and health hazards. This may include, as appropriate, biological and radiological exposures, fire and explosion hazards, thermal hazards, and physical hazards such as electrical hazards, powered equipment hazards, lockout/tagout hazards, motor vehicle hazards, and walking-working surface hazards.
- (i) Safe use engineering controls and equipment on site.
- (j) Names of personnel and alternates responsible for safety and health.

C. Emergency response training

Federal OSHA standards in 29 CFR 1926.65(q) are directed toward private sector emergency responders. Therefore, the guidelines provided in this portion of the appendix are directed toward that employee population. However, they also impact indirectly through State OSHA or USEPA regulations some public sector emergency responders. Therefore, the guidelines provided in this portion of the appendix may be applied to both employee populations.

States with OSHA state plans must cover their employees with regulations at least as effective as the Federal OSHA standards. Public employees in states without approved state OSHA programs covering hazardous waste operations and emergency response are covered by the U.S. EPA under 40 CFR 311, a regulation virtually identical to 1926.65.

Since this is a non-mandatory appendix and therefore not an enforceable standard, OSHA recommends that those employers, employees or volunteers in public sector emergency response organizations outside Federal OSHA jurisdiction consider the following criteria in developing their own training programs. A unified approach to training at the community level between emergency response organizations covered by Federal OSHA and those not covered directly by Federal OSHA can help ensure an effective community response to the release or potential release of hazardous substances in the community.

a. General considerations

Emergency response organizations are required to consider the topics listed in 1926.65(q)(6). Emergency response organizations may use some or all of the following topics to supplement those mandatory topics when developing their response training programs. Many of the topics would require an interaction between the response provider and the individuals responsible for the site where the response would be expected.

- (1) Hazard recognition, including:
 - (A) Nature of hazardous substances present,
 - (B) Practical applications of hazard recognition, including presentations on biology, chemistry, and physics.
- (2) Principles of toxicology, biological monitoring, and risk assessment.
- (3) Safe work practices and general site safety.
- (4) Engineering controls and hazardous waste operations.
- (5) Site safety plans and standard operating procedures.
- (6) Decontamination procedures and practices.
- (7) Emergency procedures, first aid, and self-rescue.
- (8) Safe use of field equipment.
- (9) Storage, handling, use and transportation of hazardous substances.
- (10) Use, care, and limitations of personal protective equipment.
- (11) Safe sampling techniques.
- (12) Rights and responsibilities of employees under OSHA and other related laws concerning right-to-know, safety and health, compensations and liability.
- (13) Medical monitoring requirements.
- (14) Community relations.

b. *Suggested criteria for specific courses*

- (1) *First responder awareness level.*
 - (A) Review of and demonstration of competency in performing the applicable skills of 29 CFR 1926.65(q).
 - (B) Hands-on experience with the U.S. Department of Transportation's *Emergency Response Guidebook* (ERG) and familiarization with OSHA standard 29 CFR 1926.60.
 - (C) Review of the principles and practices for analyzing an incident to determine both the hazardous substances present and the basic hazard and response information for each hazardous substance present.
 - (D) Review of procedures for implementing actions consistent with the local emergency response plan, the organization's standard operating procedures, and the current edition of DOT's ERG including emergency notification procedures and follow-up communications.

- (E) Review of the expected hazards including fire and explosions hazards, confined space hazards, electrical hazards, powered equipment hazards, motor vehicle hazards, and walking-working surface hazards.
 - (F) Awareness and knowledge of the competencies for the First Responder at the Awareness Level covered in the National Fire Protection Association's Standard No. 472, *Professional Competence of Responders to Hazardous Materials Incidents*.
- (2) *First responder operations level.*
- (A) Review of and demonstration of competency in performing the applicable skills of 29 CFR 1926.65(q).
 - (B) Hands-on experience with the U.S. Department of Transportation's *Emergency Response Guidebook* (ERG), manufacturer material safety data sheets, CHEMTREC/CANUTEC, shipper or manufacturer contacts and other relevant sources of information addressing hazardous substance releases. Familiarization with OSHA standard 29 CFR 1926.60.
 - (C) Review of the principles and practices for analyzing an incident to determine the hazardous substances present, the likely behavior of the hazardous substance and its container, the types of hazardous substance transportation containers and vehicles, the types and selection of the appropriate defensive strategy for containing the release.
 - (D) Review of procedures for implementing continuing response actions consistent with the local emergency response plan, the organization's standard operating procedures, and the current edition of DOT's ERG including extended emergency notification procedures and follow-up communications.
 - (E) Review of the principles and practice for proper selection and use of personal protective equipment.
 - (F) Review of the principles and practice of personnel and equipment decontamination.
 - (G) Review of the expected hazards including fire and explosions hazards, confined space hazards, electrical hazards, powered equipment hazards, motor vehicle hazards, and walking-working surface hazards.
 - (H) Awareness and knowledge of the competencies for the First Responder at the Operations Level covered in the National Fire Protection Association's Standard No. 472, *Professional Competence of Responders to Hazardous Materials Incidents*.

- (3) *Hazardous materials technician.*
 - (A) Review of and demonstration of competency in performing the applicable skills of 29 CFR 1926.65(q).
 - (B) Hands-on experience with written and electronic information relative to response decision making including but not limited to the U.S. Department of Transportation's *Emergency Response Guidebook* (ERG), manufacturer material safety data sheets, CHEMTREC/CANUTEC, shipper or manufacturer contacts, computer data bases and response models, and other relevant sources of information addressing hazardous substance releases. Familiarization with 29 CFR 1926.60.
 - (C) Review of the principles and practices for analyzing an incident to determine the hazardous substances present, their physical and chemical properties, the likely behavior of the hazardous substance and its container, the types of hazardous substance transportation containers and vehicles involved in the release, the appropriate strategy for approaching release sites and containing the release.
 - (D) Review of procedures for implementing continuing response actions consistent with the local emergency response plan, the organization's standard operating procedures, and the current edition of DOT's ERG including extended emergency notification procedures and follow-up communications.
 - (E) Review of the principles and practice for proper selection and use of personal protective equipment.
 - (F) Review of the principles and practices of establishing exposure zones, proper decontamination and medical surveillance stations and procedures.
 - (G) Review of the expected hazards including fire and explosions hazards, confined space hazards, electrical hazards, powered equipment hazards, motor vehicle hazards, and walking-working surface hazards.
 - (H) Awareness and knowledge of the competencies for the Hazardous Materials Technician covered in the National Fire Protection Association's Standard No. 472, *Professional Competence of Responders to Hazardous Materials Incidents*.
- (4) *Hazardous materials specialist.*
 - (A) Review of and demonstration of competency in performing the applicable skills of 29 CFR 1926.65(q).

- (B) Hands-on experience with retrieval and use of written and electronic information relative to response decision making including but not limited to the U.S. Department of Transportation's *Emergency Response Guidebook* (ERG), manufacturer material safety data sheets, CHEMTREC/CANUTEC, shipper or manufacturer contacts, computer data bases and response models, and other relevant sources of information addressing hazardous substance releases. Familiarization with 29 CFR 1926.60.
- (C) Review of the principles and practices for analyzing an incident to determine the hazardous substances present, their physical and chemical properties, and the likely behavior of the hazardous substance and its container, vessel, or vehicle.
- (D) Review of the principles and practices for identification of the types of hazardous substance transportation containers, vessels and vehicles involved in the release; selecting and using the various types of equipment available for plugging or patching transportation containers, vessels or vehicles; organizing and directing the use of multiple teams of hazardous material technicians and selecting the appropriate strategy for approaching release sites and containing or stopping the release.
- (E) Review of procedures for implementing continuing response actions consistent with the local emergency response plan, the organization's standard operating procedures, including knowledge of the available public and private response resources, establishment of an incident command post, direction of hazardous material technician teams, and extended emergency notification procedures and follow-up communications.
- (F) Review of the principles and practice for proper selection and use of personal protective equipment.
- (G) Review of the principles and practices of establishing exposure zones and proper decontamination, monitoring and medical surveillance stations and procedures.
- (H) Review of the expected hazards including fire and explosions hazards, confined space hazards, electrical hazards, powered equipment hazards, motor vehicle hazards, and walking-working surface hazards.
- (I) Awareness and knowledge of the competencies for the Off-site Specialist Employee covered in the National Fire Protection Association's Standard No. 472, *Professional Competence of Responders to Hazardous Materials Incidents*.

- (5) *Incident commander.* The incident commander is the individual who, at any one time, is responsible for and in control of the response effort. This individual is the person responsible for the direction and coordination of the response effort. An incident commander's position should be occupied by the most senior, appropriately trained individual present at the response site. Yet, as necessary and appropriate by the level of response provided, the position may be occupied by many individuals during a particular response as the need for greater authority, responsibility, or training increases. It is possible for the first responder at the awareness level to assume the duties of incident commander until a more senior and appropriately trained individual arrives at the response site.

Therefore, any emergency responder expected to perform as an incident commander should be trained to fulfill the obligations of the position at the level of response they will be providing including the following:

- (A) Ability to analyze a hazardous substance incident to determine the magnitude of the response problem.
- (B) Ability to plan and implement an appropriate response plan within the capabilities of available personnel and equipment.
- (C) Ability to implement a response to favorably change the outcome of the incident in a manner consistent with the local emergency response plan and the organization's standard operating procedures.
- (D) Ability to evaluate the progress of the emergency response to ensure that the response objectives are being met safely, effectively, and efficiently.
- (E) Ability to adjust the response plan to the conditions of the response and to notify higher levels of response when required by the changes to the response plan.

Subpart E – Personal Protective and Life Saving Equipment

1926.102 Eye and Face Protection

(a) General

- (2) Eye and face protection equipment required by this Part shall meet the requirements specified in American National Standards Institute, Z87.1-1968, Practice for Occupational and Educational Eye and Face Protection. [SEE: ANSI Z87.1 – 1968 Section 4.9 “When limitations or precautions are indicated by the manufacturer, they shall be transmitted to the user and care taken to see that such limitations and precautions are strictly observed.”]

1926.103 Respiratory protection

[**Note:** The requirements applicable to construction work under this section are identical to those set forth at 29 CFR 1910.134 of this chapter.]

1910.134 Respiratory protection

(a) Permissible Practice

- (2) A respirator shall be provided to each employee when such equipment is necessary to protect the health of such employee. The employer shall provide the respirators which are applicable and suitable for the purpose intended. The employer shall be responsible for the establishment and maintenance of a respiratory protection program, which shall include the requirements outlined in paragraph (c) of this section. The program shall cover each employee required by this section to use a respirator.
- (c) **Respiratory protection program.** This paragraph requires the employer to develop and implement a written respiratory protection program with required worksite-specific procedures and elements for required respirator use. The program must be administered by a suitably trained program administrator. In addition, certain program elements may be required for voluntary use to prevent potential hazards associated with the use of the respirator. The Small Entity Compliance Guide contains criteria for the selection of a program administrator and a sample program that meets the requirements of this paragraph. Copies of the Small Entity Compliance Guide will be available on or about April 8, 1998 from the Occupational Safety and Health Administration’s Office of Publications, Room N 3101, 200 Constitution Avenue, NW, Washington, DC, 20210 (202-219-4667).

- (1) In any workplace where respirators are necessary to protect the health of the employee or whenever respirators are required by the employer, the employer shall establish and implement a written respiratory protection program with worksite-specific procedures. The program shall be updated as necessary to reflect those changes in workplace conditions that affect respirator use. The employer shall include in the program the following provisions of this section, as applicable:
 - (vii) Training of employees in the respiratory hazards to which they are potentially exposed during routine and emergency situations;
 - (viii) Training of employees in the proper use of respirators, including putting on and removing them, any limitations on their use, and their maintenance; and
- (3) The employer shall designate a program administrator who is qualified by appropriate training or experience that is commensurate with the complexity of the program to administer or oversee the respiratory protection program and conduct the required evaluations of program effectiveness.
- (4) The employer shall provide respirators, training, and medical evaluations at no cost to the employee.
- (k) Training and information.** This paragraph requires the employer to provide effective training to employees who are required to use respirators. The training must be comprehensive, understandable, and recur annually, and more often if necessary. This paragraph also requires the employer to provide the basic information on respirators in Appendix D of this section to employees who wear respirators when not required by this section or by the employer to do so.
 - (1) The employer shall ensure that each employee can demonstrate knowledge of at least the following:
 - (i) Why the respirator is necessary and how improper fit, usage, or maintenance can compromise the protective effect of the respirator;
 - (ii) What the limitations and capabilities of the respirator are;
 - (iii) How to use the respirator effectively in emergency situations, including situations in which the respirator malfunctions;

- (iv) How to inspect, put on and remove, use, and check the seals of the respirator;
 - (v) What the procedures are for maintenance and storage of the respirator;
 - (vi) How to recognize medical signs and symptoms that may limit or prevent the effective use of respirators; and
 - (vii) The general requirements of this section.
- (2) The training shall be conducted in a manner that is understandable to the employee.
 - (3) The employer shall provide the training prior to requiring the employee to use a respirator in the workplace.
 - (4) An employer who is able to demonstrate that a new employee has received training within the last 12 months that addresses the elements specified in paragraph (k)(1)(i) through (vii) is not required to repeat such training provided that, as required by paragraph (k)(1), the employee can demonstrate knowledge of those element(s). Previous training not repeated initially by the employer must be provided no later than 12 months from the date of the previous training.
 - (5) Retraining shall be administered annually, and when the following situations occur:
 - (i) Changes in the workplace or the type of respirator render previous training obsolete;
 - (ii) Inadequacies in the employee's knowledge or use of the respirator indicate that the employee has not retained the requisite understanding or skill; or
 - (iii) Any other situation arises in which retraining appears necessary to ensure safe respirator use.
 - (6) The basic advisory information on respirators, as presented in Appendix D of this section, shall be provided by the employer in any written or oral format, to employees who wear respirators when such use is not required by this section or by the employer.

Subpart F – Fire Protection and Prevention

1926.150 Fire protection

(a) General requirements.

- (1) The employer shall be responsible for the development of a fire protection program to be followed throughout all phases of the construction and demolition work, and he shall provide for the firefighting equipment as specified in this subpart. As fire hazards occur, there shall be no delay in providing the necessary equipment.
- (5) As warranted by the project, the employer shall provide a trained and equipped firefighting organization (Fire Brigade) to assure adequate protection to life.

1926.155 Definitions applicable to this subpart

- (e) *Fire brigade* means an organized group of employees that are knowledgeable, trained, and skilled in the safe evacuation of employees during emergency situations and in assisting in fire fighting operations.

Subpart G – Signs, Signals, and Barricades

1926.200 Accident prevention signs and tags

(g) Traffic signs

- (1) Construction areas shall be posted with legible traffic signs at points of hazard.
- (2) All traffic controls signs or devices used for protection of construction workers shall conform to Part VI of the Manual of Uniform Traffic Control Devices (MUTCD), 1988 Edition, Revision 3, September 3, 1993, FHWA-SA-94-027 or Part VI of the Manual on Uniform Traffic Control Devices, Millennium Edition, December 2000, FHWA, which are incorporated by reference... [SEE: the edition being used for guidance about training workers, flaggers, and others in the temporary traffic control and work zones.]

1926.201 Signaling

- (a) **Flaggers.** Signaling by flaggers and the use of flaggers, including warning garments worn by flaggers shall conform to Part VI of the Manual on Uniform Traffic Control Devices, (1988 Edition, Revision 3 or the Millennium Edition), which are incorporated by reference in 1926.200(g)(2).
- (b) **Crane and hoist signals.** Regulations for hoist signaling will be found in applicable American National Standards Institute standards. [NOTE: As of Nov. 8, 2010, crane/derrick signaling comes under the final rule for cranes and derricks in construction, 29 CFR 1926 Subpart CC. The rule requires specific training for signal persons (at 1926.1430(b) — based on signal person qualification requirements in 1926.1428c)].

1926.202 Barricades

Barricades for protection of employees shall conform to Part VI of the Manual on Uniform Traffic Control Devices (1988 Edition, Revision 3 or Millennium Edition), which are incorporated by reference in 1926.200(g)(2). [SEE: the edition being used for information about training workers, flaggers, and others in the temporary traffic control and work zones.]

Subpart I – Tools – Hand and Power

1926.300 General requirements

- (c) **Personal protective equipment.** Employees using hand and power tools and exposed to the hazard of falling, flying, abrasive, and splashing objects, or exposed to harmful dusts, fumes, mists, vapors, or gases shall be provided with the particular personal protective equipment necessary to protect them from the hazard. All personal protective equipment shall meet the requirements and be maintained according to Subparts D and E of this part. [SEE 29 CFR 1926 Subpart E for training requirements.]

1926.302 Power-operated hand tools

- (e) **Powder-actuated tools**
 - (1) Only employees who have been trained in the operation of the particular tool in use shall be allowed to operate a powder-actuated tool.

Subpart J – Welding and Cutting

1926.350 Gas welding and cutting

(a) **Transporting, moving and storing compressed gas cylinders**

- (12) The in-plant handling, storage, and utilization of all compressed gases in cylinders, portable tanks, rail tank cars, or motor vehicle cargo tanks shall be in accordance with Compressed Gas Association Pamphlet P-1-1965. [SEE the pamphlet for training/information requirements.]

1926.351 Arc welding and cutting

(d) **Operating instructions.** Employers shall instruct employees in the safe means of arc welding and cutting as follows:

- (1) When electrode holders are to be left unattended, the electrodes shall be removed and the holders shall be so placed or protected that they cannot make electrical contact with employees or conducting objects.
- (2) Hot electrode holders shall not be dipped in water; to do so may expose the arc welder or cutter to electric shock.
- (3) When the arc welder or cutter has occasion to leave his work or to stop work for any appreciable length of time, or when the arc welding or cutting machine is to be moved, the power supply switch to the equipment shall be opened.
- (4) Any faulty or defective equipment shall be reported to the supervisor.
- (5) See 1926.406(c) for additional requirements.

1926.352 Fire prevention

- (e) When the welding, cutting, or heating operation is such that normal fire prevention precautions are not sufficient, additional personnel shall be assigned to guard against fire while the actual welding, cutting, or heating operation is being performed, and for a sufficient period of time after completion of the work to ensure that no possibility of fire exists. Such personnel shall be instructed as to the specific anticipated fire hazards and how the firefighting equipment provided is to be used.
- (f) When welding, cutting, or heating is performed on walls, floors, and ceilings, since direct penetration of sparks or heat transfer may introduce a fire hazard to an adjacent area, the same precautions shall be taken on the opposite side as are taken on the side on which the welding is being performed. [SEE 29 CFR 1926.352(e) for instruction requirements.]

Subpart K – Electrical

1926.416 General requirements

(a) Protection of employees

- (3) Before work is begun the employer shall ascertain by inquiry or direct observation, or by instruments, whether any part of an energized electric power circuit, exposed or concealed, is so located that the performance of the work may bring any person, tool, or machine into physical or electrical contact with the electric power circuit. The employer shall post and maintain proper warning signs where such a circuit exists. The employer shall advise employees of the location of such lines, the hazards involved, and the protective measures to be taken.

Subpart L – Scaffolds

1926.450 Scope, application and definitions applicable to this subpart

- (a) **Definitions.** *Qualified* means one who, by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training, and experience, has successfully demonstrated his/her ability to solve or resolve problems related to the subject matter, the work, or the project.

1926.451 General requirements

(f) Use

- (7) Scaffolds shall be erected, moved, dismantled, or altered only under the supervision and direction of a competent person qualified in scaffold erection, moving, dismantling or alteration. Such activities shall be performed only by experienced and trained employees selected for such work by the competent person.

1926.454 Training requirements

- (a), (b) and (c) *This section supplements and clarifies the requirements of 1926.21(b)(2) as these relate to the hazards of work on scaffolds.*

- (a) The employer shall have each employee who performs work while on a scaffold trained by a person qualified in the subject matter to

recognize the hazards associated with the type of scaffold being used and to understand the procedures to control or minimize those hazards. The training shall include the following areas, as applicable:

- (1) The nature of any electrical hazards, fall hazards and falling object hazards in the work area;
 - (2) The correct procedures for dealing with electrical hazards and for erecting, maintaining, and disassembling the fall protection systems and falling object protection systems being used;
 - (3) The proper use of the scaffold, and the proper handling of materials on the scaffold;
 - (4) The maximum intended load and the load-carrying capacities of the scaffolds used; and
 - (5) Any other pertinent requirements of this subpart.
- (b) The employer shall have each employee who is involved in erecting, disassembling, moving, operating, repairing, maintaining, or inspecting a scaffold trained by a competent person to recognize any hazards associated with the work in question. The training shall include the following topics, as applicable:
- (1) The nature of scaffold hazards;
 - (2) The correct procedures for erecting, disassembling, moving, operating, repairing, inspecting, and maintaining the type of scaffold in question;
 - (3) The design criteria, maximum intended load-carrying capacity and intended use of the scaffold;
 - (4) Any other pertinent requirements of this subpart.
- (c) When the employer has reason to believe that an employee lacks the skill or understanding needed for safe work involving the erection, use or dismantling of scaffolds, the employer shall retrain each such employee so that the requisite proficiency is regained. Retraining is required in at least the following situations:
- (1) Where changes at the worksite present a hazard about which an employee has not been previously trained; or
 - (2) Where changes in the types of scaffolds, fall protection, falling object protection, or other equipment present a hazard about which an employee has not been previously trained; or
 - (3) Where inadequacies in an affected employee's work involving scaffolds indicate that the employee has not retained the requisite proficiency.

(Non-mandatory) Appendix D to Subpart L of Part 1926—List of Training Topics for Scaffold Erectors and Dismantlers

This appendix D is provided to serve as a guide to assist employers when evaluating the training needs of employees erecting or dismantling supported scaffolds.

The Agency believes that employees erecting or dismantling scaffolds should be trained in the following topics:

General Overview of Scaffolding

- regulations and standards
- erection/dismantling planning
- PPE and proper procedures
- fall protection
- materials handling
- access
- working platforms
- foundations
- guys, ties and braces

Tubular Welded Frame Scaffolds

- specific regulations and standards
- components
- parts inspection
- erection/dismantling planning
- guys, ties and braces
- fall protection
- general safety
- access and platforms
- erection/dismantling procedures
- rolling scaffold assembly
- putlogs

Tube and Clamp Scaffolds

- specific regulations and standards
- components
- parts inspection
- erection/dismantling planning
- guys, ties and braces
- fall protection
- general safety
- access and platforms
- erection/dismantling procedures
- buttresses, cantilevers, & bridges

System Scaffolds

- specific regulations and standards
- components
- parts inspection
- erection/dismantling planning
- guys, ties and braces
- fall protection
- general safety
- access and platforms
- erection/dismantling procedures
- buttresses, cantilevers, & bridges

Scaffold erectors and dismantlers should all receive the general overview, and, in addition, specific training for the type of supported scaffold being erected or dismantled.

Subpart M – Fall Protection

1926.503 Training requirements

The following training provisions supplement and clarify the requirements of 1926.21 regarding the hazards addressed in subpart M of this part.

(a) Training Program.

- (1) The employer shall provide a training program for each employee who might be exposed to fall hazards. The program shall enable each employee to recognize the hazards of falling and shall train each employee in the procedures to be followed in order to minimize these hazards.
- (2) The employer shall assure that each employee has been trained, as necessary, by a competent person qualified in the following areas:
 - (i) The nature of fall hazards in the work area;
 - (ii) The correct procedures for erecting, maintaining, disassembling, and inspecting the fall protection systems to be used;
 - (iii) The use and operation of guardrail systems, personal fall arrest systems, safety net systems, warning line systems, safety monitoring systems, controlled access zones, and other protection to be used;
 - (iv) The role of each employee in the safety monitoring system when this system is used;
 - (v) The limitations on the use of mechanical equipment during the performance of roofing work on low-sloped roofs;
 - (vi) The correct procedures for the handling and storage of equipment and materials and the erection of overhead protection; and
 - (vii) The role of employees in fall protection plans;
 - (viii) The standards contained in this subpart.

(b) Certification of training

(1) The employer shall verify compliance with paragraph (a) of this section by preparing a written certification record. The written certification record shall contain the name or other identity of the employee trained, the date(s) of the training, and the signature of the person who conducted the training or the signature of the employer. If the employer relies on training conducted by another employer or completed prior to the effective date of this section, the certification record shall indicate the date the employer determined the prior training was adequate rather than the date of actual training.

(2) The latest training certification shall be maintained.

(c) 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 by paragraph (a) of this section, the employer shall retrain each such employee. Circumstances where retraining is required include, but are not limited to, situations where:

- (1) Changes in the workplace render previous training obsolete; or
- (2) Changes in the types of fall protection systems or equipment to be used render previous training obsolete; or
- (3) Inadequacies in an affected employee's knowledge or use of fall protection systems or equipment indicate that the employee has not retained the requisite understanding or skill.

Appendix E to Subpart M of Part 1926 — Sample Fall Protection Plan**Non-Mandatory Guidelines for Complying with 1926.502(k)**

Note: Part VII (Changes to Plan) of this Appendix contains a non-mandatory Sample Fall Protection Plan for Residential Construction employers; the sample plan has references to trained employees.

Subpart O – Motor Vehicles, Mechanized Equipment, and Marine Operations

1926.602 Material handling equipment

(d) Powered industrial truck operator training

Note: The requirements applicable to construction work under this paragraph are identical to those set forth at 1910.178(l) of this chapter.

1910.178 Powered industrial trucks

(l) Operator training

(1) *Safe operation.*

- (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).
- (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).

(2) *Training program implementation.*

- (i) Trainees may operate a powered industrial truck only:
 - (A) Under the direct supervision of persons who have the knowledge, training, and experience to train operators and evaluate their competence; and
 - (B) Where such operation does not endanger the trainee or other employees.
- (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.
- (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.

- (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.
- (i) Truck-related topics:
- (A) Operating instructions, warnings, and precautions for the types of truck the operator will be authorized to operate;
 - (B) Differences between the truck and the automobile;
 - (C) Truck controls and instrumentation: where they are located, what they do, and how they work;
 - (D) Engine or motor operation;
 - (E) Steering and maneuvering;
 - (F) Visibility (including restrictions due to loading);
 - (G) Fork and attachment adaptation, operation, and use limitations;
 - (H) Vehicle capacity;
 - (I) Vehicle stability;
 - (J) Any vehicle inspection and maintenance that the operator will be required to perform;
 - (K) Refueling and/or charging and recharging of batteries;
 - (L) Operating limitations;
 - (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.
- (ii) Workplace-related topics:
- (A) Surface conditions where the vehicle will be operated;
 - (B) Composition of loads to be carried and load stability;
 - (C) Load manipulation, stacking, and unstacking;
 - (D) Pedestrian traffic in areas where the vehicle will be operated;
 - (E) Narrow aisles and other restricted places where the vehicle will be operated;
 - (F) Hazardous (classified) locations where the vehicle will be operated;

- (G) Ramps and other sloped surfaces that could affect the vehicle's stability;
 - (H) Closed environments and other areas where insufficient ventilation or poor vehicle maintenance could cause a buildup of carbon monoxide or diesel exhaust;
 - (I) Other unique or potentially hazardous environmental conditions in the workplace that could affect safe operation.
- (iii) The requirements of this section
- (4) *Refresher training and evaluation.*
- (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.
 - (ii) Refresher training in relevant topics shall be provided to the operator when:
 - (A) The operator has been observed to operate the vehicle in an unsafe manner;
 - (B) The operator has been involved in an accident or near-miss incident;
 - (C) The operator has received an evaluation that reveals that the operator is not operating the truck safely;
 - (D) The operator is assigned to drive a different type of truck; or
 - (E) A condition in the workplace changes in a manner that could affect safe operation of the truck.
 - (iii) An evaluation of each powered industrial truck operator's performance shall be conducted at least once every three years.
- (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.

- (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.
- (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 employee 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

- (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.

Subpart R – Steel Erection

1926.760 Fall Protection

- (c) **Controlled Decking Zone (CDZ).** A controlled decking zone may be established in that area of the structure over 15 and up to 30 feet above a lower level where metal decking is initially being installed and forms the leading edge of a work area. In each CDZ, the following shall apply:
 - (4) Each employee working in a CDZ shall have completed CDZ training in accordance with 1926.761.

1926.761 Training

The following provisions supplement the requirements of 1926.21 regarding the hazards addressed in this subpart.

- (a) **Training personnel.** Training required by this section shall be provided by a qualified person(s).
- (b) **Fall hazard training.** The employer shall train each employee exposed to a fall hazard in accordance with the requirements of this section. The employer shall institute a training program and ensure employee participation in the program.

- (c) **Special training programs.** In addition to the training required in paragraphs (a) and (b) of this section, the employer shall provide special training to employees engaged in the following activities.
- (1) *Multiple lift rigging procedure.* The employer shall ensure that each employee who performs multiple lift rigging has been provided training in the following areas:
 - (i) The nature of the hazards associated with multiple lifts; and
 - (ii) The proper procedures and equipment to perform multiple lifts required by 1926.753(e).
 - (2) *Connector procedures.* The employer shall ensure that each connector has been provided training in the following areas:
 - (i) The nature of the hazards associated with connecting; and
 - (ii) The establishment, access, proper connecting techniques and work practices required by 1926.756(c) and 1926.760(b).
 - (3) *Controlled Decking Zone Procedures.* Where CDZs are being used, the employer shall assure that each employee has been provided training in the following areas:
 - (i) The nature of the hazards associated with work within a controlled decking zone; and
 - (ii) The establishment, access, proper installation techniques and work practices required by 1926.760(c) and 1926.754(e).

Appendix A to Subpart R of Part 1926 — Guidelines for Establishing the components of a Site-specific Erection Plan: Non-mandatory Guidelines for Complying with 1926.752(e)

- (a) *General.* This appendix serves as a guideline to assist employers who elect to develop a site-specific erection plan in accordance with 1926.752(e) with alternate means and methods to provide employee protection in accordance with 1926.752(e), 1926.753(c)(5), 1926.757(a)(4) and 1926.757(e)(4).
- (c) *Components of a site-specific erection plan.* In developing a site-specific erection plan, a steel erector considers the following elements:
 - (7) A certification for each employee who has received training for performing steel erection operations as required by 1926.761.

Appendix E to Subpart R of Part 1926 — Training: Non-mandatory Guidelines for Complying with 1926.761

The training requirements of 1926.761 will be deemed to have been met if employees have completed a training course on steel erection, including instruction in the provisions of this standard, that has been approved by the U.S. Department of Labor Bureau of Apprenticeship.

Subpart S – Underground Construction, Caissons, Cofferdams and Compressed Air

1926.800 Underground construction

(d)(1) through
(10), and (g)(5)(iv)

(d) Safety instruction. All employees shall be instructed in the recognition and avoidance of hazards associated with underground construction activities including, where appropriate, the following subjects:

- (1) Air monitoring;
- (2) Ventilation;
- (3) Illumination;
- (4) Communications;
- (5) Flood control;
- (6) Mechanical equipment;
- (7) Personal protective equipment;
- (8) Explosives;
- (9) Fire prevention and protection; and
- (10) Emergency procedures, including evacuation plans and check-in/check-out systems.

(g) Emergency provisions

- (5) *Rescue teams.*
 - (iv) On jobsites where flammable or noxious gases are encountered or anticipated in hazardous quantities, rescue team members shall practice donning and using self-contained breathing apparatus monthly.

1926.803 Compressed air

(a) General provisions

- (2) Every employee shall be instructed in the rules and regulations which concern his safety or the safety of others.

(e) Compression

- (1) Every employee going under air pressure for the first time shall be instructed on how to avoid excessive discomfort.

Subpart U – Blasting and the Use of Explosives

1926.901 Blaster qualifications

- (c) A blaster shall be qualified, by reason of training, knowledge, or experience, in the field of transporting, storing, handling, and use of explosives, and have a working knowledge of State and local laws and regulations which pertain to explosives.

Subpart V – Power Transmission and Distribution

1926.955 Overhead lines

- (e)(1) and (4) **(e) Live-line bare-hand work.** In addition to any other applicable standards contained elsewhere in this subpart all live-line bare-hand work shall be performed in accordance with the following requirements:
- (1) Employees shall be instructed and trained in the live-line bare-hand technique and the safety requirements pertinent thereto before being permitted to use the technique on energized circuits.
 - (4) All work shall be personally supervised by a person trained and qualified to perform live-line bare-hand work.

Subpart X – Stairways and Ladders

1926.1060 Training requirements

(a)(1)(i) through (v), and (b) (2), regarding the hazards addressed in subpart X. The following training provisions clarify the requirements of 1926.21(b) (2), regarding the hazards addressed in subpart X.

- (a) The employer shall provide a training program for each employee using ladders and stairways, as necessary. The program shall enable each employee to recognize hazards related to ladders and stairways, and shall train each employee in the procedures to be followed to minimize these hazards.
 - (1) The employer shall ensure that each employee has been trained by a competent person in the following areas, as applicable:
 - (i) The nature of fall hazards in the work area;
 - (ii) The correct procedures for erecting, maintaining, and disassembling the fall protection systems to be used;
 - (iii) The proper construction, use, placement, and care in handling of all stairways and ladders;
 - (iv) The maximum intended load-carrying capacities of ladders used; and
 - (v) The standards contained in this subpart.
 - (b) Retraining shall be provided for each employee as necessary so that the employee maintains the understanding and knowledge acquired through compliance with this section.

Subpart Y – Diving

1926.1076 Qualifications of dive team

1910.410 (a)(1), (2), (3) and (4); (b) (1); (c)(1) and (2) **Note:** The requirements applicable to construction work under this section are identical to those set forth at 1910.410 of this chapter.

(a) General

- (1) Each dive team member shall have the experience or training necessary to perform assigned tasks in a safe and healthful manner.

- (2) Each dive team member shall have experience or training in the following:
 - (i) The use of tools, equipment and systems relevant to assigned tasks;
 - (ii) Techniques of the assigned diving mode; and
 - (iii) Diving operations and emergency procedures.
- (3) All dive team members shall be trained in cardiopulmonary resuscitation and first aid (American Red Cross standard course or equivalent).
- (4) Dive team members who are exposed to or control the exposure of others to hyperbaric conditions shall be trained in diving-related physics and physiology.

(b) Assignments

- (1) Each dive team member shall be assigned tasks in accordance with the employee's experience or training, except that limited additional tasks may be assigned to an employee undergoing training provided that these tasks are performed under the direct supervision of an experienced dive team member.

(c) Designated person-in-charge

- (1) The employer or an employee designated by the employer shall be at the dive location in charge of all aspects of the diving operation affecting the safety and health of dive team members.
- (2) The designated person-in-charge shall have experience and training in the conduct of the assigned diving operation.

Subpart Z – Toxic and Hazardous Substances

1926.1101 Asbestos

- (b); (g)(8)(vi)(B) and (11)(i) and (ii); (k)(6), (8)(i) and (vii); (9)(i) through (viii), and (10)(i) through (iii); (m)(1)(ii)(B); (n)(4); (o)(4)(i) and (ii); Appendix H (V)(A)
- (b) Definitions.**

Competent person means, in addition to the definition in 29 CFR 1926.32 (f), one who is capable of identifying existing asbestos hazards in the workplace and selecting the appropriate control strategy for asbestos exposure, who has the authority to take prompt corrective measures to eliminate them, as specified in 29 CFR 1926.32(f); in addition, for Class I and Class II work who is specially trained in a training course which meets the criteria of EPA's Model Accreditation

Plan (40 CFR part 763) for supervisor, or its equivalent and, for Class III and Class IV work, who is trained in a manner consistent with EPA requirements for training of local education agency maintenance and custodial staff as set forth at 40 CFR 763.92 (a)(2).

Industrial hygienist means a professional qualified by education, training, and experience to anticipate, recognize, evaluate and develop controls for occupational health hazards.

Project Designer means a person who has successfully completed the training requirements for an abatement project designer established by 40 U.S.C. 763.90(g).

(g) Methods of compliance

(8) *Additional Controls for Class II work.*

(vi) Alternative Work Practices and Controls

- (B) A competent person shall evaluate the work area, the projected work practices and the engineering controls, and shall certify in writing, that the different or modified controls are adequate to reduce direct and indirect employee exposure to below the PELs under all expected conditions of use and that the method meets the requirements of this standard. The evaluation shall include and be based on data representing employee exposure during the use of such method under conditions which closely resemble the conditions under which the method is to be used for the current job, and by employees whose training and experience are equivalent to employees who are to perform the current job.

(11) *Alternative methods of compliance for installation, removal, repair, and maintenance of certain roofing and pipeline coating materials.*

- (i) Before work begins and as needed during the job, a competent person who is capable of identifying asbestos hazards in the workplace and selecting the appropriate control strategy for asbestos exposure, and who has the authority to take prompt corrective measures to eliminate such hazards, shall conduct an inspection of the worksite and determine that the roofing material is intact and will likely remain intact.
- (ii) All employees performing work covered by this paragraph (g)(11) shall be trained in a training program that meets the requirements of paragraph (k)(9)(viii) of this section.

(k) Communication of hazards

(6) At the entrance to mechanical rooms/areas in which employees reasonably can be expected to enter and which contain ACM and/or PACM, the building owner shall post signs which identify the material which is present, its location, and appropriate work practices which, if followed, will ensure that ACM and/or PACM will not be disturbed. The employer shall ensure, to the extent feasible, that employees who come in contact with these signs can comprehend them. Means to ensure employee comprehension may include the use of foreign languages, pictographs, graphics, and awareness training.

(8) *Labels.*

(i) Labels shall be affixed to all products containing asbestos and to all containers containing such products, including waste containers. Where feasible, installed asbestos products shall contain a visible label.

(vii) When a building owner or employer identifies previously installed PACM and/or ACM, labels or signs shall be affixed or posted so that employees will be notified of what materials contain PACM and/or ACM. The employer shall attach such labels in areas where they will clearly be noticed by employees who are likely to be exposed, such as at the entrance to mechanical room/areas. Signs required by paragraph (k)(6) of this section may be posted in lieu of labels so long as they contain information required for labelling. The employer shall ensure, to the extent feasible, that employees who come in contact with these signs or labels can comprehend them. Means to ensure employee comprehension may include the use of foreign languages, pictographs, graphics, and awareness training.

(9) *Employee Information and Training.*

(i) The employer shall train each employee who is likely to be exposed in excess of a PEL, and each employee who performs Class I through IV asbestos operations, in accordance with the requirements of this section. Such training shall be conducted at no cost to the employee. The employer shall institute a training program and ensure employee participation in the program.

- (ii) Training shall be provided prior to or at the time of initial assignment and at least annually thereafter.
- (iii) Training for Class I operations and for Class II operations that require the use of critical barriers (or equivalent isolation methods) and/or negative pressure enclosures under this section shall be the equivalent in curriculum, training method and length to the EPA Model Accreditation Plan (MAP) asbestos abatement workers training (40 CFR part 763, subpart E, appendix C).
- (iv) Training for other Class II work.
 - (A) For work with asbestos containing roofing materials, flooring materials, siding materials, ceiling tiles, or transite panels, training shall include at a minimum all the elements included in paragraph (k)(9)(viii) of this section and in addition, the specific work practices and engineering controls set forth in paragraph (g) of this section which specifically relate to that category. Such course shall include “hands-on” training and shall take at least 8 hours.
 - (B) An employee who works with more than one of the categories of material specified in paragraph (k)(9)(iv)(A) of this section shall receive training in the work practices applicable to each category of material that the employee removes and each removal method that the employee uses.
 - (C) For Class II operations not involving the categories of material specified in paragraph (k)(9)(iv)(A) of this section, training shall be provided which shall include at a minimum all the elements included in paragraph (k)(9)(viii) of this section and in addition, the specific work practices and engineering controls set forth in paragraph (g) of this section which specifically relate to the category of material being removed, and shall include “hands-on” training in the work practices applicable to each category of material that the employee removes and each removal method that the employee uses.
- (v) Training for Class III employees shall be consistent with EPA requirements for training of local education agency maintenance and custodial staff as set forth at 40 CFR

763.92(a)(2). Such a course shall also include “hands-on” training and shall take at least 16 hours. Exception: For Class III operations for which the competent person determines that the EPA curriculum does not adequately cover the training needed to perform that activity, training shall include as a minimum all the elements included in paragraph (k)(9)(viii) of this section and in addition, the specific work practices and engineering controls set forth in paragraph (g) of this section which specifically relate to that activity, and shall include “hands-on” training in the work practices applicable to each category of material that the employee disturbs.

- (vi) Training for employees performing Class IV operations shall be consistent with EPA requirements for training of local education agency maintenance and custodial staff as set forth at 40 CFR 763.92(a)(1). Such a course shall include available information concerning the locations of thermal system insulation and surfacing ACM/PACM, and asbestos-containing flooring material, or flooring material where the absence of asbestos has not yet been certified; and instruction in recognition of damage, deterioration, and delamination of asbestos-containing building materials. Such course shall take at least 2 hours.
- (vii) Training for employees who are likely to be exposed in excess of the PEL and who are not otherwise required to be trained under paragraph (k)(9)(iii) through (vi) of this section, shall meet the requirements of paragraph (k)(9)(viii) of this section.
- (viii) The training program shall be conducted in a manner that the employee is able to understand. In addition to the content required by provisions in paragraphs (k)(9)(iii) through (vi) of this section, the employer shall ensure that each such employee is informed of the following:
 - (A) Methods of recognizing asbestos, including the requirement in paragraph (k)(1) of this section to presume that certain building materials contain asbestos;
 - (B) The health effects associated with asbestos exposure;

- (C) The relationship between smoking and asbestos in producing lung cancer;
 - (D) The nature of operations that could result in exposure to asbestos, the importance of necessary protective controls to minimize exposure including, as applicable, engineering controls, work practices, respirators, housekeeping procedures, hygiene facilities, protective clothing, decontamination procedures, emergency procedures, and waste disposal procedures, and any necessary instruction in the use of these controls and procedures; where Class III and IV work will be or is performed, the contents of EPA 20T-2003, “Managing Asbestos In-Place” July 1990 or its equivalent in content;
 - (E) The purpose, proper use, fitting instructions, and limitations of respirators as required by 29 CFR 1910.134;
 - (F) The appropriate work practices for performing the asbestos job;
 - (G) Medical surveillance program requirements;
 - (H) The content of this standard including appendices;
 - (I) The names, addresses and phone numbers of public health organizations which provide information, materials and/or conduct programs concerning smoking cessation. The employer may distribute the list of such organizations contained in Appendix J to this section, to comply with this requirement; and
 - (J) The requirements for posting signs and affixing labels and the meaning of the required legends for such signs and labels.
- (10) *Access to training materials.*
- (i) The employer shall make readily available to affected employees without cost, written materials relating to the employee training program, including a copy of this regulation.
 - (ii) The employer shall provide to the Assistant Secretary and the Director, upon request, all information and training materials relating to the employee information and training program.

- (iii) The employer shall inform all employees concerning the availability of self-help smoking cessation program material. Upon employee request, the employer shall distribute such material, consisting of NIH Publication No. 89-1647, or equivalent self-help material, which is approved or published by a public health organization listed in Appendix J to this section.

(m) Medical surveillance

- (1) *General.*
 - (ii) Examination
 - (B) Persons other than such licensed physicians who administer the pulmonary function testing required by this section shall complete a training course in spirometry sponsored by an appropriate academic or professional institution.

(n) Recordkeeping

- (4) *Training records.* The employer shall maintain all employee training records for one (1) year beyond the last date of employment by that employer.

(o) Competent person

- (4) *Training for the competent person.*
 - (i) For Class I and II asbestos work the competent person shall be trained in all aspects of asbestos removal and handling, including: abatement, installation, removal and handling; the contents of this standard; the identification of asbestos; removal procedures, where appropriate; and other practices for reducing the hazard. Such training shall be obtained in a comprehensive course for supervisors that meets the criteria of EPA's Model Accreditation Plan (40 CFR part 763, subpart E, appendix C), such as a course conducted by an EPA-approved or state-approved training provider, certified by EPA or a state, or a course equivalent in stringency, content, and length.
 - (ii) For Class III and IV asbestos work, the competent person shall be trained in aspects of asbestos handling appropriate for the nature of the work, to include procedures for setting up glove bags and mini-enclosures, practices for reducing asbestos exposures, use of wet methods, the contents of

this standard, and the identification of asbestos. Such training shall include successful completion of a course that is consistent with EPA requirements for training of local education agency maintenance and custodial staff as set forth at 40 CFR 763.92(a)(2), or its equivalent in stringency, content and length. Competent persons for Class III and IV work may also be trained pursuant to the requirements of paragraph (o)(4)(i) of this section.

Appendix H to 1926.1101 — Substance Technical Information for Asbestos — Non-Mandatory

(Note: Part V of this Appendix provides a non-mandatory statement of workers' rights to Access to Information about their exposure to asbestos on worksites, including a reference to instruction in proper work practices to avoid unhealthful exposure to asbestos.)

V. Access to Information

- A. Each year, your employer is required to inform you of the information contained in this standard and appendices for asbestos. In addition, your employer must instruct you in the proper work practices for handling asbestos-containing materials, and the correct use of protective equipment.

1926.1126 Chromium (VI)

(j)(1) and (2) (j) Communication of chromium (VI) hazards to employees

- (1) *Hazard communication.* The employer shall include chromium (VI) in the program established to comply with the Hazard Communication Standard (HCS) (1910.1200). The employer shall ensure that each employee has access to labels on containers of chromium and safety data sheets, and is trained in accordance with the provisions of 1910.1200 and paragraph (j)(2) of this section. The employer shall provide information on at least the following hazards: Cancer; eye irritation; and skin sensitization.
- (2) *Employee information and training.*
 - (i) The employer shall ensure that each employee can demonstrate knowledge of at least the following:
 - (A) The contents of this section; and
 - (B) The purpose and a description of the medical surveillance program required by paragraph (i) of this section.
 - (ii) The employer shall make a copy of this section readily available without cost to all affected employees.

1926.1127 Cadmium

- (b) (“Competent person”); and (m) (1) and (4)
- (b) Definitions.** *Competent person*, in accordance with 29 CFR 1926.32(f), means a person designated by the employer to act on the employer’s behalf who is capable of identifying existing and potential cadmium hazards in the workplace and the proper methods to control them in order to protect workers, and has the authority necessary to take prompt corrective measures to eliminate or control such hazards. The duties of a competent person include at least the following: Determining prior to the performance of work whether cadmium is present in the workplace; establishing, where necessary, regulated areas and assuring that access to and from those areas is limited to authorized employees; assuring the adequacy of any employee exposure monitoring required by this standard; assuring that all employees exposed to air cadmium levels above the PEL wear appropriate personal protective equipment and are trained in the use of appropriate methods of exposure control; assuring that proper hygiene facilities are provided and that workers are trained to use those facilities; and assuring that the engineering controls required by this standard are implemented, maintained in proper operating condition, and functioning properly.
- (m) Communication of cadmium hazards to employees**
- (1) *Hazard communication.* The employer shall include cadmium in the program established to comply with the Hazard Communication Standard (HCS) (1910.1200). The employer shall ensure that each employee has access to labels on containers of cadmium and safety data sheets, and is trained in accordance with the provisions of HCS and paragraph (m)(4) of this section. The employer shall provide information on at least the following hazards: cancer; lung effects; kidney effects; and acute toxicity effects.
- (4) *Employee information and training.*
- (i) The employer shall train each employee who is potentially exposed to cadmium in accordance with the requirements of this section. The employer shall institute a training program, ensure employee participation in the program, and maintain a record of the contents of the training program.
- (ii) Training shall be provided prior to or at the time of initial assignment to a job involving potential exposure to cadmium and at least annually thereafter.

- (iii) The employer shall make the training program understandable to the employee and shall assure that each employee is informed of the following:
 - (A) The health hazards associated with cadmium exposure, with special attention to the information incorporated in Appendix A to this section;
 - (B) The quantity, location, manner of use, release, and storage of cadmium in the workplace and the specific nature of operations that could result in exposure to cadmium, especially exposures above the PEL;
 - (C) The engineering controls and work practices associated with the employee's job assignment;
 - (D) The measures employees can take to protect themselves from exposure to cadmium, including modification of such habits as smoking and personal hygiene, and specific procedures the employer has implemented to protect employees from exposure to cadmium such as appropriate work practices, emergency procedures, and the provision of personal protective equipment;
 - (E) The purpose, proper selection, fitting, proper use, and limitations of respirators and protective clothing;
 - (F) The purpose and a description of the medical surveillance program required by paragraph (l) of this section;
 - (G) The contents of this section and its appendices, and,
 - (H) The employee's rights of access to records under 1926.33(g)(1) and (2).
- (iv) Additional access to information and training program and materials.
 - (A) The employer shall make a copy of this section and its appendices readily available to all affected employees and shall provide a copy without cost if requested.
 - (B) Upon request, the employer shall provide to the Assistant Secretary or the Director all materials relating to the employee information and the training program.

Subpart AA – Confined Spaces in Construction

1926.1207 Training

- (a) The employer must provide training to each employee whose work is regulated by this standard, at no cost to the employee, and ensure that the employee possesses the understanding, knowledge, and skills necessary for the safe performance of the duties assigned under this standard. This training must result in an understanding of the hazards in the permit space and the methods used to isolate, control or in other ways protect employees from these hazards, and for those employees not authorized to perform entry rescues, in the dangers of attempting such rescues.
- (b) Training required by this section must be provided to each affected employee:
 - (1) In both a language and vocabulary that the employee can understand;
 - (2) Before the employee is first assigned duties under this standard;
 - (3) Before there is a change in assigned duties;
 - (4) Whenever there is a change in permit space entry operations that presents a hazard about which an employee has not previously been trained; and
 - (5) Whenever there is any evidence of a deviation from the permit space entry procedures required by paragraph 1926.1204(c) of this standard or there are inadequacies in the employee's knowledge or use of these procedures.
- (c) The training must establish employee proficiency in the duties required by this standard and must introduce new or revised procedures, as necessary, for compliance with this standard.
- (d) The employer must maintain training records to show that the training required by paragraphs 1926.1207(a) through (c) of this standard has been accomplished. The training records must contain each employee's name, the name of the trainers, and the dates of training. The documentation must be available for inspection by employees and their authorized representatives, for the period of time the employee is employed by that employer.

1926.1211 Rescue and emergency services.

- (b) An employer whose employees have been designated to provide permit space rescue and/or emergency services must take the following measures and provide all equipment and training at no cost to those employees:
- (1) Provide each affected employee with the personal protective equipment (PPE) needed to conduct permit space rescues safely and train each affected employee so the employee is proficient in the use of that PPE;
 - (2) Train each affected employee to perform assigned rescue duties. The employer must ensure that such employees successfully complete the training required and establish proficiency as authorized entrants, as provided by 1926.1207 and 1926.1208 of this standard;
 - (3) Train each affected employee in basic first aid and cardiopulmonary resuscitation (CPR). The employer must ensure that at least one member of the rescue team or service holding a current certification in basic first aid and CPR is available; and
 - (4) Ensure that affected employees practice making permit space rescues before attempting an actual rescue, and at least once every 12 months, by means of simulated rescue operations in which they remove dummies, manikins, or actual persons from the actual permit spaces or from representative permit spaces, except practice rescue is not required where the affected employees properly performed a rescue operation during the last 12 months in the same permit space the authorized entrant will enter, or in a similar permit space. Representative permit spaces must, with respect to opening size, configuration, and accessibility, simulate the types of permit spaces from which rescue is to be performed.

Subpart CC – Cranes and Derricks in Construction

1926.1401 Definitions

Assembly/Disassembly means the assembly and/or disassembly of equipment covered under this standard. With regard to tower cranes, “erecting and climbing” replaces the term “assembly,” and “dismantling” replaces the term “disassembly.” Regardless of whether the crane is initially erected to its full height or is climbed in stages, the process of increasing the height of the crane is an erection process.

A/D director (Assembly/Disassembly director) means an individual who meets this subpart’s requirements for an A/D director, irrespective of the person’s formal job title or whether the person is non-management or management personnel.

Fall zone means the area (including but not limited to the area directly beneath the load) in which it is reasonably foreseeable that partially or completely suspended materials could fall in the event of an accident.

Qualified person means a person who, by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training and experience, successfully demonstrated the ability to solve/resolve problems relating to the subject matter, the work, or the project.

Qualified rigger is a rigger who meets the criteria for a qualified person.

1926.1404 Assembly/Disassembly — general requirements

(a), (b), (c) and **(applies to all assembly and disassembly operations)**

(d); and (r)(1)

(a) Supervision — competent-qualified person

- (1) Assembly/disassembly must be directed by a person who meets the criteria for both a competent person and a qualified person, or by a competent person who is assisted by one or more qualified persons (“A/D director”).
- (2) Where the assembly/disassembly is being performed by only one person, that person must meet the criteria for both a competent person and a qualified person. For purposes of this standard, that person is considered the A/D director.

(b) Knowledge of procedures. The A/D director must understand the applicable assembly/disassembly procedures.

- (c) **Review of procedures.** The A/D director must review the applicable assembly/disassembly procedures immediately prior to the commencement of assembly/disassembly unless the A/D director understands the procedures and has applied them to the same type and configuration of equipment (including accessories, if any).
- (d) **Crew instructions**
- (1) Before commencing assembly/disassembly operations, the A/D director must ensure that the crew members understand all of the following:
 - (i) Their tasks.
 - (ii) The hazards associated with their tasks.
 - (iii) The hazardous positions/locations that they need to avoid.
 - (2) During assembly/disassembly operations, before a crew member takes on a different task, or when adding new personnel during the operations, the requirements in paragraphs (d)(1)(i) through (d)(1)(iii) of this section must be met.
- (r) **Rigging.** In addition to following the requirements in 29 CFR 1926.251 and other requirements in this and other standards applicable to rigging, when rigging is used for assembly/disassembly, the employer must ensure that:
- (1) The rigging work is done by a qualified rigger.

1926.1408 Power line safety (up to 350 kV) — equipment operations

- (b)(1); (g)(1), (2) and (3) (b) **Preventing encroachment/electrocution**
- (1) Conduct a planning meeting with the operator and the other workers who will be in the area of the equipment or load to review the location of the power line(s), and the steps that will be implemented to prevent encroachment/electrocution.
- (g) **Training**
- (1) The employer must train each operator and crew member assigned to work with the equipment on all of the following:
 - (i) The procedures to be followed in the event of electrical contact with a power line. Such training must include:
 - (A) Information regarding the danger of electrocution from the operator simultaneously touching the equipment and the ground.

- (B) The importance to the operator's safety of remaining inside the cab except where there is an imminent danger of fire, explosion, or other emergency that necessitates leaving the cab.
- (C) The safest means of evacuating from equipment that may be energized.
- (D) The danger of the potentially energized zone around the equipment (step potential).
- (E) The need for crew in the area to avoid approaching or touching the equipment and the load.
- (F) Safe clearance distance from power lines.
- (ii) Power lines are presumed to be energized unless the utility owner/operator confirms that the power line has been and continues to be deenergized and visibly grounded at the worksite.
- (iii) Power lines are presumed to be uninsulated unless the utility owner/operator or a registered engineer who is a qualified person with respect to electrical power transmission and distribution confirms that a line is insulated.
- (iv) The limitations of an insulating link/device, proximity alarm, and range control (and similar) device, if used.
- (v) The procedures to be followed to properly ground equipment and the limitations of grounding.
- (2) Employees working as dedicated spotters must be trained to enable them to effectively perform their task, including training on the applicable requirements of this section.
- (3) Training under this section must be administered in accordance with 1926.1430(g).

1926.1419 Signals — general requirements

(c) Non-standard hand signals.

- (2) When using non-standard hand signals, the signal person, operator, and lift director (where there is one) must contact each other prior to the operation and agree on the non-standard hand signals that will be used.

1926.1423 Fall protection

- (k) **Training.** The employer must train each employee who may be exposed to fall hazards while on, or hoisted by, equipment covered by this subpart on all of the following:
- (1) the requirements in this subpart that address fall protection.
 - (2) the applicable requirements in 1926.500 and 1926.502

1926.1424 Work area control

(a) **Swing radius hazards**

- (2) To prevent employees from entering these hazard areas, the employer must:
 - (i) Train each employee assigned to work on or near the equipment (“authorized personnel”) in how to recognize struck-by and pinch/crush hazard areas posed by the rotating superstructure.
 - (ii) Erect and maintain control lines, warning lines, railings or similar barriers to mark the boundaries of the hazard areas.
Exception: When the employer can demonstrate that it is neither feasible to erect such barriers on the ground nor on the equipment, the hazard areas must be clearly marked by a combination of warning signs (such as “Danger—Swing/Crush Zone”) and high visibility markings on the equipment that identify the hazard areas. In addition, the employer must train each employee to understand what these markings signify.
- (3) *Protecting employees in the hazard area.*
 - (i) Before an employee goes to a location in the hazard area that is out of view of the operator, the employee (or someone instructed by the employee) must ensure that the operator is informed that he/she is going to that location.
 - (ii) Where the operator knows that an employee went to a location covered by paragraph (a)(1) of this section, the operator must not rotate the superstructure until the operator is informed in accordance with a pre-arranged system of communication that the employee is in a safe position.

- (b) Where any part of a crane/derrick is within the working radius of another crane/derrick, the controlling entity must institute a system to coordinate operations. If there is no controlling entity, the employer (if there is only one employer operating the multiple pieces of equipment), or employers, must institute such a system.

1926.1425 Keeping clear of the load

- (c) When employees are engaged in hooking, unhooking, or guiding the load, or in the initial connection of a load to a component or structure and are within the fall zone, all of the following criteria must be met:
 - (1) The materials being hoisted must be rigged to prevent unintentional displacement.
 - (2) Hooks with self-closing latches or their equivalent must be used. *Exception:* “J” hooks are permitted to be used for setting wooden trusses.
 - (3) The materials must be rigged by a *qualified rigger*.

1926.1427 Operator qualification and certification

- (f) and (g) **(f) Pre-qualification/certification training period.** An employee who is not qualified or certified under this section is permitted to operate equipment only as an operator-in-training and only where the requirements of this paragraph are met.
 - (1) The employer must provide each operator-in-training with sufficient training prior to operating the equipment to enable the operator-in-training to operate the equipment safely under limitations established by this section (including continuous monitoring) and any additional limitations established by the employer.
 - (2) The tasks performed by the operator-in-training while operating the equipment must be within the operator-in-training’s ability.
 - (3) *Trainer.* While operating the equipment, the operator-in-training must be continuously monitored by an individual (“operator’s trainer”) who meets all of the following requirements:
 - (i) The operator’s trainer is an employee or agent of the operator-in-training’s employer.
 - (ii) The operator’s trainer is either a certified operator under this section, or has passed the written portion of a certification test under one of the options in paragraphs (b) through (e) of this section, and is familiar with the proper use of the equipment’s controls.

- (iii) While monitoring the operator-in-training, the operator's trainer performs no tasks that detract from the trainer's ability to monitor the operator-in-training.
 - (iv) For equipment other than tower cranes: The operator's trainer and the operator-in-training must be in direct line of sight of each other. In addition, they must communicate verbally or by hand signals. For tower cranes: The operator's trainer and the operator-in-training must be in direct communication with each other.
- (4) *Continuous monitoring.* The operator-in-training must be monitored by the operator's trainer at all times, except for short breaks where all of the following are met:
- (i) The break lasts no longer than 15 minutes and there is no more than one break per hour.
 - (ii) Immediately prior to the break the operator's trainer informs the operator-in-training of the specific tasks that the operator-in-training is to perform and limitations to which he/she must adhere during the operator trainer's break.
 - (iii) The specific tasks that the operator-in-training will perform during the operator trainer's break are within the operator-in-training's abilities.
- (5) The operator-in-training must not operate the equipment in any of the following circumstances unless the exception stated in paragraph (f)(5)(v) of this section is applicable:
- (i) If any part of the equipment, load line or load (including rigging and lifting accessories), if operated up to the equipment's maximum working radius in the work zone (*see* 1926.1408(a)(1)), could get within 20 feet of a power line that is up to 350 kV, or within 50 feet of a power line that is over 350 kV.
 - (ii) If the equipment is used to hoist personnel.
 - (iii) In multiple-equipment lifts.
 - (iv) If the equipment is used over a shaft, cofferdam, or in a tank farm.
 - (v) In multiple-lift rigging operations, except where the operator's trainer determines that the operator-in-training skills are sufficient for this high-skill work.

- (g) Under this section, a testing entity is permitted to provide training as well as testing services as long as the criteria of the applicable accrediting agency (in the option selected) for an organization providing both services are met.

1926.1428 Signal Person Qualifications

- (c) **Qualification Requirements.** Each signal person must:
 - (1) Know and understand the type of signals used. If hand signals are used, the signal person must know and understand the Standard Method for hand signals.
 - (2) Be competent in the application of the type of signals used.
 - (3) Have a basic understanding of equipment operation and limitations, including the crane dynamics involved in swinging and stopping loads and boom deflection from hoisting loads.
 - (4) Know and understand the relevant requirements of 1926.1419 through 1926.1422 and 1926.1428.
 - (5) Demonstrate that he/she meets the requirements in paragraphs (c)(1) through (4) of this section through an oral or written test, and through a practical test.

1926.1430 Training

- (a) through (g) The employer must provide training as follows:
 - (a) **Overhead power lines.** The employer must train each employee specified in 1926.1408(g) and 1926.1410(m) in the topics listed in 1926.1408(g).
 - (b) **Signal persons.** The employer must train each employee who will be assigned to work as a signal person who does not meet the requirements of 1926.1428(c) in the areas addressed in that paragraph.
 - (c) **Operators**
 - (1) *Operators-in-Training for equipment where certification or qualification is required by this subpart.* The employer must train each operator-in-training in the areas addressed in 1926.1427(j). The employer must provide re-training if the operator-in-training does not pass a qualification or certification test.
 - (2) *Transitional Period.* During the four-year phase-in period for operator certification or qualification, as provided in 1926.1427(k), employers must train each operator who has not yet been certified or qualified in the areas addressed in 1926.1427(j).

- (3) *Operators excepted from the requirements of 1926.1427.* The employer must train each operator excepted under 1926.1427(a) from the requirements of 1926.1427 on the safe operation of the equipment the operator will be using.
- (4) The employer must train each operator of the equipment covered by this subpart in the following practices:
 - (i) On friction equipment, whenever moving a boom off a support, first raise the boom a short distance (sufficient to take the load of the boom) to determine if the boom hoist brake needs to be adjusted. On other types of equipment with a boom, the same practice is applicable, except that typically there is no means of adjusting the brake; if the brake does not hold, a repair is necessary. *See* 1926.1417(f) and (j) for additional requirements.
 - (ii) Where available, the manufacturer's emergency procedures for halting unintended equipment movement.
- (d) Competent persons and qualified persons.** The employer must train each competent person and each qualified person regarding the requirements of this subpart applicable to their respective roles.
- (e) Crush/pinch points.** The employer must train each employee who works with the equipment to keep clear of holes, and crush/pinch points and the hazards addressed in 1926.1424 (Work area control).
- (f) Tag-out.** The employer must train each operator and each additional employee authorized to start/energize equipment or operate equipment controls (such as maintenance and repair employees), in the tag-out and start-up procedures in 1926.1417(f) and (g).
- (g) Training administration**
 - (1) The employer must evaluate each employee required to be trained under this subpart to confirm that the employee understands the information provided in the training.
 - (2) The employer must provide refresher training in relevant topics for each employee when, based on the conduct of the employee or an evaluation of the employee's knowledge, there is an indication that retraining is necessary.
 - (3) Whenever training is required under subpart CC, the employer must provide the training at no cost to the employee.

1926.1436 Derricks

- (q) **Qualification and Training.** The employer must train each operator of a derrick on the safe operation of equipment the individual will operate. Section 1926.1427 of this subpart (Operator qualification and certification) does not apply.

1926.1438 Overhead & gantry cranes

- (a) **Permanently installed overhead and gantry cranes.** The requirements of 1910.179, except for 1910.179(b)(1), and not the requirements of this subpart CC, apply to the following equipment when used in construction and permanently installed in a facility: overhead and gantry cranes, including semigantry, cantilever gantry, wall cranes, storage bridge cranes, and others having the same fundamental characteristics.
- (b) **Overhead and gantry cranes that are not permanently installed in a facility.**
 - (2) The following requirements apply to equipment identified in paragraph (b)(1) of this section:
 - (i) Sections 1926.1400 through 1926.1414; 1926.1417 through 1926.1425; 1926.1426(d); 1926.1427 through 1926.1434; 1926.1437, 1926.1439, and 1926.1441. [NOTE: This includes training at 1926.1404 assembly-disassembly, 1926.1419 Signals-general requirements, 1926.1423 Fall protection, 1926.1408(g) for power line safety (up to 350kV) — equipment operations.]

1926.1441 Equipment with a rated hoisting/lifting capacity of 2,000 pounds or less

The following paragraphs of this section specify requirements for employers using equipment with a maximum rated hoisting/lifting capacity of 2,000 pounds or less.

- (a) The employer using this equipment must comply with the following provisions of this subpart:
- ... 1926.1407 through 1926.1411 (Power line safety)... [which directs employers to training requirements at 1926.1408(g)], sections 1926.1419 through 1926.1422 (Signals) [including 1419(c)(2) Non-standard hand signals. When using non-standard hand signal, the signal person, operator, and lift director (where there is one) must contact each other prior to the operation and agree on the non-standard hand signals that will be used.],
 - section 1926.1423 (Fall protection) [Including 1423(k) Training],
 - section 1926.1432 (Multiple-crane/derrick lifts-supplemental requirements) [including 1432(b)(2) The lift director must review the plan in a meeting with all workers who will be involved with the operation.],
 - section 1926.1437 (Floating cranes/derricks and land cranes/derricks on barges) [including 1437(c)(2)(ii) Clearly mark the hazard areas by a combination of warning signs (such as, “Danger-Swing/Crush Zone”) and high visibility markings on the equipment that identify the hazard areas. In addition, the employer must train each employee to understand what these markings signify.],
 - and section 1926.1438 (Overhead & gantry cranes) [NOTE: See 1438 above for requirements].
- (e) *Operator qualifications.* The employer must train each operator, prior to operating the equipment, on the safe operation of the type of equipment the operator will be using.
- (f) *Signal person qualifications.* The employer must train each signal person in the proper use of signals applicable to the use of the equipment.

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Agricultural

The following training requirements have been excerpted from ***Title 29, Code of Federal Regulations Part 1928***. Note that in addition to these requirements, ***Part 1910***, relating to general industry, also contains applicable training standards.

29 CFR 1928

Subpart C – Roll-Over Protective Structures

1928.51 Roll-Over Protective Structures (ROPS) for Tractors Used in Agricultural Operations

(d) **Operating instructions.** Every employee who operates an agricultural tractor shall be informed of the operating practices contained in Appendix A of this part and of any other practices dictated by the work environment. Such information shall be provided at the time of initial assignment and at least annually thereafter.

Appendix A to Subpart C of Part 1928 — Employee Operating Instructions

1. Securely fasten your seat belt if the tractor has a ROPS.
2. Where possible, avoid operating the tractor near ditches, embankments, and holes.
3. Reduce speed when turning, crossing slopes, and on rough, slick, or muddy surfaces.
4. Stay off slopes too steep for safe operation.
5. Watch where you are going, especially at row ends, on roads, and around trees.
6. Do not permit others to ride.
7. Operate the tractor smoothly — no jerky turns, starts, or stops.
8. Hitch only to the drawbar and hitch points recommended by tractor manufacturers.
9. When tractor is stopped, set brakes securely and use park lock if available.

1928.57 Guarding of Farm Field Equipment, Farmstead Equipment, and Cotton Gins

(a)(6)(i) through
(v); and (d)(1)(viii)

(a) General —

- (6) *Operating instructions.* At the time of initial assignment and at least annually thereafter, the employer shall instruct every employee in the safe operation and servicing of all covered equipment with which he is or will be involved, including at least the following safe operating practices:
- (i) Keep all guards in place when the machine is in operation;
 - (ii) Permit no riders on farm field equipment other than persons required for instruction or assistance in machine operation;
 - (iii) Stop engine, disconnect the power source, and wait for all machine movement to stop before servicing, adjusting, cleaning, or unclogging the equipment, except where the machine must be running to be properly serviced or maintained, in which case the employer shall instruct employees as to all steps and procedures which are necessary to safely service or maintain the equipment;
 - (iv) Make sure everyone is clear of machinery before starting the engine, engaging power, or operating the machine;
 - (v) Lock out electrical power before performing maintenance or service on farmstead equipment.

(d) Cotton ginning equipment

- (1) *Power transmission components.*
- (viii) In power plants and power development rooms where access is limited to authorized personnel, guard railings may be used in place of guards or guarding by location. Authorized employees having access to power plants and power development rooms shall be instructed in the safe operation and maintenance of the equipment in accordance with paragraph (a)(6) of this section.

Subpart M – Occupational Health

1928.1027 Cadmium

Note: The requirements applicable to agricultural training requirements under this section are identical to those set forth in 29 CFR 1910.1027.



Photo: Caycee Cook

Federal Employee Programs

The following training requirements have been excerpted from ***Title 29, Code of Federal Regulations Part 1960***. Note that in addition to these requirements, ***Part 1910***, relating to general industry, also contains applicable training standards.

29 CFR 1960

Subpart B – Administration

1960.7 Financial Management

- (c) Appropriate resources for an agency’s occupational safety and health program shall include, but not be limited to:
 - (1) Sufficient personnel to implement and administer the program at all levels, including necessary administrative costs such as training, travel, and personal protective equipment.

Subpart D – Inspection and Abatement

1960.25 Qualifications of Safety and Health Inspectors and Agency Inspections

- (a) Executive Order 12196 requires that each agency utilize as inspectors “personnel with equipment and competence to recognize hazards.” Inspections shall be conducted by inspectors qualified to recognize

and evaluate hazards of the working environment and to suggest general abatement procedures. Safety and health specialists as defined in 29 CFR 1960.2(s), with experience and/or up-to-date training in occupational safety and health hazard recognition and evaluation are considered as meeting the qualifications of safety and health inspectors. For those working environments where there are less complex hazards, such safety and health specializations as cited above may not be required, but inspectors in such environments shall have sufficient documented training and/or experience in the safety and health hazards of the workplace involved to recognize and evaluate those particular hazards and to suggest general abatement procedures. All inspection personnel must be provided the equipment necessary to conduct a thorough inspection of the workplace involved.

Subpart E – General Services Administration and Other Federal Agencies

1960.34 General Provisions

- (e) **Safety and health services.** The General Services Administration (GSA) will operate and maintain for user agencies the following services:
 - (1) Listings in the “Federal Supply Schedule” of safety and health services and equipment which are approved for use by agencies when needed. Examples of such services are: workplace inspections, training, industrial hygiene surveys, asbestos bulk sampling, and mobile health testing. Examples of such equipment are: personal protective equipment and apparel, safety devices, and environmental monitoring equipment.

Subpart F – Occupational Safety and Health Committees

1960.39 Agency Responsibilities

- (b) Agencies shall provide all committee members appropriate training as required by subpart H of this part.

Subpart H – Training

1960.54 Training of Top Management Officials

Each agency shall provide top management officials with orientation and other learning experiences which will enable them to manage the occupational safety and health programs of their agencies. Such orientation should include coverage of section 19 of the Act, Executive Order 12196, the requirements of this part, and the agency safety and health program.

1960.55 Training of Supervisors

- (a) Each agency shall provide occupational safety and health training for supervisory employees that includes: supervisory responsibility for providing and maintaining safe and healthful working conditions for employees; the agency occupational safety and health program; section 19 of the Act; Executive Order 12196; this part; occupational safety and health standards applicable to the assigned workplaces; agency procedures for reporting hazards; agency procedures for reporting and investigating allegations of reprisal; and agency procedures for the abatement of hazards, as well as other appropriate rules and regulations.
- (b) This supervisory training should include introductory and specialized courses and materials which will enable supervisors to recognize and eliminate, or reduce, occupational safety and health hazards in their working units. Such training shall also include the development of requisite skills in managing the agency's safety and health program within the work unit, including the training and motivation of subordinates toward assuring safe and healthful work practices.

1960.56 Training of Safety and Health Specialists

- (a) Each agency shall provide occupational safety and health training for safety and health specialists through courses, laboratory experiences, field study, and other formal learning experiences to prepare them to perform the necessary technical monitoring, consulting, testing, inspecting, designing, and other tasks related to program development and implementation, as well as hazard recognition, evaluation and control, equipment and facility design, standards, analysis of accident, injury, and illness data, and other related tasks.

- (b) Each agency shall implement career development programs for their occupational safety and health specialists to enable the staff to meet present and future program needs of the agency.

1960.57 Training of Safety and Health Inspectors

Each agency shall provide training for safety and health inspectors with respect to appropriate standards, and the use of appropriate equipment and testing procedures necessary to identify and evaluate hazards and suggest general abatement procedures during or following their assigned inspections, as well as preparation of reports and other documentation to support the inspection findings.

Subpart K – Field Federal Safety and Health Councils

1960.85 Role of the Secretary

- (a) The Secretary shall maintain liaison with agency heads to ensure that they encourage their field activities to participate actively in field council programs. To ensure maximum participation, the field councils' annual reports to the Secretary shall provide descriptions of the degree of management and employee participation by the defined Federal field activities. The Secretary shall annually furnish each agency head with a report consolidating the information received as to the participation of the agency's several field installations in field council activities.
- (b) The Secretary shall provide leadership and guidance and make available necessary equipment, supplies, and staff services to the Field Federal Safety and Health Councils to assist them in carrying out their responsibilities. The Secretary shall also provide consultative and technical services to field councils. These services shall involve aid in any phase of developing and planning programs; and in sponsoring, conducting or supporting safety and health training courses.

Appendix A – Multilingual Resources

Below are resources to use when looking for (mostly) Spanish language safety and health material. Remember that simply translating English safety and health materials into Spanish or another language is not necessarily adequate for your target population to understand the material. There are many different terms and dialects in Spanish (and other languages) and you need to ensure that you are using the correct ones. Also, using the correct literacy level is just as important in other languages as it is in English. It is best to test the translated materials using a focus group made up of a subset of your target population.

OSHA Publications

OSHA Dictionaries (English and Spanish)

- Frequently Used Construction Industry Terms
- Frequently Used General Industry Terms
- General OSH Terms

OSHA Publications in Spanish and Other Languages

Many OSHA publications are available in both English and **Spanish**, as well as Portuguese, Russian and **other languages**. To order multiple copies of these resources, call OSHA's Publications Office at (202) 693-1888 or visit OSHA's Publications page at www.osha.gov/publications.

Adobe Reader is required to view PDF files.

OSHA Mobile-Friendly e-Books

Select OSHA publications are available in e-Book format. OSHA e-Books are designed to increase readability on smartphones, tablets and other mobile devices. For access, go to www.osha.gov/ebooks.

Susan Harwood Training Grant Products

This web site features training materials such as PowerPoint™ presentations, instructor and student manuals, and test questions developed by Susan Harwood grantees. These **resources** are available in multiple languages.

OSHA Safety Campaigns

OSHA's Campaign to Prevent Heat Illness in Outdoor Workers

OSHA's nationwide Heat Illness Prevention Campaign aims to raise awareness and teach workers and employers about the dangers of working in hot weather and provide valuable resources to address these concerns. Begun in 2011, the Heat Illness Prevention Campaign has reached more than 10 million people and distributed close to half a million fact sheets, posters, QuickCards™, training guides and wallet cards. OSHA, together with other federal and state agencies and non-governmental organizations, spreads the word about preventing heat illness. For example, OSHA collaborates with the National Oceanic and Atmospheric Administration's (NOAA) National Weather Service to include worker safety precautions in **Excessive Heat Watch, Warning, and Advisory Products**.

Available on this web page are numerous resources that can be used to prevent heat illnesses:

- The **Educational Resources** section links to information about heat illnesses and how to prevent them. Many of these resources target vulnerable workers with limited English proficiency and/or low literacy.
- The **Using the Heat Index** section provides guidance to help employers develop a heat illness prevention plan.
- The **Training** section includes a guide to help employers and others to teach workers about heat illness. There are links to more resources in other languages.
- The **Online Toolkit** section includes news releases, public service announcements, drop-in articles about heat illness prevention that you can customize to share, and campaign artwork.
- The **Fatality Map** is an interactive infographic representing many of the heat-related fatalities that occurred outdoors between 2008 and 2014. The map provides a geographic reminder that *Water.Rest.Shade.* is vital to providing a safe and healthful environment when working outdoors in the heat.

The Heat Illness web page and many resources are available **en español**.

OSHA's Fall Prevention Campaign

This campaign is part of OSHA's nationwide effort to raise awareness among workers and employers about the hazards of falls from ladders, scaffolds and roofs. The educational resources page gives workers and employers information about falls and how to prevent them. There are also training tools for employers to use and posters to display at their worksites. Many of the new resources target vulnerable workers with limited English proficiency.

The Fall Prevention web page and many resources are available [en español](#).

Fall Prevention Videos (v-Tools)

Videos are an effective educational tool. Several workplace training videos, based on true stories, examine how falls lead to death and how these fatal falls could have been prevented.

These training tools (v-Tools) explain why using the right type of fall protection equipment allows workers to return home the same way they go to work each day.

You can download the following videos in English and Spanish, read the transcripts or watch the videos on YouTube:

Falls in Construction

- Floor Openings
- Fixed Scaffolds
- Bridge Decking
- Reroofing
- Leading Edge Work

V-Tools on other [construction hazards](#) are also available.



OSHA State Plan Foreign Language Safety and Health Resources

State Plan Spanish language resource page

This page lists examples of Spanish language resources from OSHA state plan states. This listing also includes selected Spanish language resources from state agencies in states under Federal OSHA jurisdiction.

Other Foreign Language Safety and Health Resources

National Institute for Occupational Safety and Health

This site includes links to NIOSH publications in Spanish on a variety of construction topics, and also provides links to other agencies and organizations that have Spanish language resources.

Electronic Library of Construction Occupational Safety and Health (eLCOSH)

This electronic library was developed and is maintained by CPWR — The Center for Construction Research and Training — and provides a wide range of materials on construction safety and health. The goal is to improve safety and health for construction workers by making such information more accessible.

Information is available [here](#) in English, Spanish, and other languages.

Georgia Tech Spanish Language Construction Training Website

This site provides training guides in Spanish on several construction safety and health topics — scaffolding, fall protection, electricity, handling of objects/materials, and trenches and excavations. For each topic, there are educational materials various formats, including posters, pamphlets, tailgate session guides, and formal presentations.

Labor Occupational Health Program, UC Berkeley

This site provides training guides in English, Spanish, Chinese, Korean, and Vietnamese to assist trainers in homecare, restaurant safety, janitorial safety, agriculture and other industries.

LOHP Multilingual Resource Guide

This guide contains an extensive collection of links to worker safety and health training materials (such as fact sheets, curricula, and checklists) that are available from many sources online in languages other than English.

Occupational Health Branch, California Department of Health Services

BuildSafe produced a safety and health tailgate training kit in English and Spanish. The kit consists of Safety Break cards that cover 23 general construction safety topics and are linked to information in the *Cal/OSHA Pocket Guide for the Construction Industry*. These cards are simple to use and designed to improve the quality of tailgates.

Mi Trabajo Seguro (My Safe Job)

This Spanish language web site provides safety and health information for construction workers. Developed in collaboration with the hit *telenovela* “Pecados Ajenos” (“Sins of Others”), this site introduces helpful construction safety information that follows a construction safety storyline on the show.

Appendix B – References

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- *Evaluation of the Limited English Proficiency and Hispanic Worker Initiative*, U.S. Department of Labor, Employment and Training Administration, Prepared by Coffey Consulting, December 2009.
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- Robson L., Stephenson C., Schulte P., Amick B., Chan S., Bielecky A., Wang A., Heidotting T., Irvin E., Eggerth D., Peters R., Clarke J., Cullen K., Boldt L., Grubb P., A systematic review of the effectiveness of training & education for the protection of workers. Toronto: Institute for Work & Health, 2010; Cincinnati, OH: National Institute for Occupational Safety and Health, DHHS (NIOSH) Publication No. 2010-127.

- Szudy, Elizabeth and Gonzalez Arroyo, Michele, *The Right to Understand: Linking Literacy to Health and Safety Training, Labor Occupational Health Program*, University of California at Berkeley, 1994.
- Wallerstein, N. and Rubenstein, H., *Teaching about Job Hazards, A Guide for Workers and Their Health Providers*, American Public Health Association, 1993.

Appendix C – States with Approved OSHA Plans

Private Sector Workers

OSHA covers most private sector employers and workers in all 50 states, the District of Columbia, and other U.S., jurisdictions either directly through Federal OSHA or through an OSHA-approved state plan.

State plans are OSHA-approved job safety and health programs operated by individual states instead of Federal OSHA. The OSH Act encourages states to develop and operate their own job safety and health programs and precludes state enforcement of OSHA standards unless the state has an approved program. OSHA approves and monitors all state plans and provides as much as fifty percent of the funding for each program. State-run safety and health programs must be at least as effective as the Federal OSHA program. To find the contact information for the OSHA Federal or state plan office nearest you, call 1-800-321-OSHA (6742) or go to www.osha.gov.

The following 22 states or territories have OSHA-approved state programs:

- Alaska
- Arizona
- California
- Hawaii
- Indiana
- Iowa
- Kentucky
- Maryland
- Michigan
- Minnesota
- Nevada
- New Mexico
- North Carolina
- Oregon
- Puerto Rico
- South Carolina
- Tennessee
- Utah
- Vermont
- Virginia
- Washington
- Wyoming

Federal OSHA provides coverage to certain workers specifically excluded from a state's plan — for example, those in some states who work in maritime industries or on military bases.

State and Local Government Workers

Workers at state and local government agencies are not covered by Federal OSHA, but have OSH Act protections if they work in those states that have an OSHA-approved state program.

OSHA rules also permit states and territories to develop plans that cover only public sector (state and local government) workers. In these cases, private sector workers and employers remain under Federal OSHA jurisdiction. Four additional states and one U.S. territory have OSHA-approved state plans that cover public sector workers only:

- *Connecticut*
- *Illinois*
- *New Jersey*
- *New York*
- *Virgin Islands*

Federal Government Workers

OSHA's protection applies to all federal agencies. Section 19 of the OSH Act makes federal agency heads responsible for providing safe and healthful working conditions for their workers. Although OSHA does not fine federal agencies, it does monitor these agencies and conducts federal workplace inspections in response to workers' reports of hazards.

Federal agencies must have a safety and health program that meets the same standards as private employers. Under a 1998 amendment, the OSH Act covers the U.S. Postal Service the same as any private sector employer.

Not Covered under the OSH Act

- The self-employed;
- Immediate family members of farm employers; and
- Workplace hazards regulated by another federal agency (for example, the Mine Safety and Health Administration, the Department of Energy, or Coast Guard).

Appendix D – Free On-site Safety and Health Consultation Services for Small Business

OSHA's On-site Consultation Program offers free and confidential advice to small and medium-sized businesses in all states across the country, with priority given to high-hazard worksites. Each year, responding to requests from small-business owners looking to create or improve their safety and health management programs, OSHA's On-site Consultation Program conducts over 29,000 visits to small business worksites covering over 1.5 million workers across the nation.

On-site consultation services are separate from enforcement and do not result in penalties or citations. Consultants from state agencies or universities work with employers to identify workplace hazards, provide advice on compliance with OSHA standards, and assist in establishing safety and health management programs.

For more information, to find the local On-site Consultation office in your state, or to request a brochure on Consultation Services, visit www.osha.gov/consultation, or call 1-800-321-OSHA (6742).

Under the consultation program, certain exemplary employers may request participation in OSHA's **Safety and Health Achievement Recognition Program (SHARP)**. Eligibility for participation includes, but is not limited to, receiving a full-service, comprehensive consultation visit, correcting all identified hazards and developing an effective safety and health management program. Worksites that receive SHARP recognition are exempt from programmed inspections during the period that the SHARP certification is valid.

Appendix E – NIOSH Health Hazard Evaluation Program

Getting Help with Health Hazards

The National Institute for Occupational Safety and Health (NIOSH) is a federal agency that conducts scientific and medical research on workers' safety and health. At no cost to employers or workers, NIOSH can help identify health hazards and recommend ways to reduce or eliminate those hazards in the workplace through its Health Hazard Evaluation (HHE) Program.

Workers, union representatives and employers can request a NIOSH HHE. An HHE is often requested when there is a higher-than-expected rate of a disease or injury in a group of workers. These situations may be the result of an unknown cause, a new hazard, or a mixture of sources. To request a NIOSH Health Hazard Evaluation go to www.cdc.gov/niosh/hhe/request.html. To find out more, in English or Spanish, about the Health Hazard Evaluation Program:

E-mail HHERequestHelp@cdc.gov or call 800-CDC-INFO (800-232-4636).

Appendix F – OSHA Regional Offices

Region I

Boston Regional Office
(CT*, ME, MA, NH, RI, VT*)
JFK Federal Building, Room E340
Boston, MA 02203
(617) 565-9860 (617) 565-9827 Fax

Region II

New York Regional Office
(NJ*, NY*, PR*, VI*)
201 Varick Street, Room 670
New York, NY 10014
(212) 337-2378 (212) 337-2371 Fax

Region III

Philadelphia Regional Office
(DE, DC, MD*, PA, VA*, WV)
The Curtis Center
170 S. Independence Mall West
Suite 740 West
Philadelphia, PA 19106-3309
(215) 861-4900 (215) 861-4904 Fax

Region IV

Atlanta Regional Office
(AL, FL, GA, KY*, MS, NC*, SC*, TN*)
61 Forsyth Street, SW, Room 6T50
Atlanta, GA 30303
(678) 237-0400 (678) 237-0447 Fax

Region V

Chicago Regional Office
(IL*, IN*, MI*, MN*, OH, WI)
230 South Dearborn Street, Room 3244
Chicago, IL 60604
(312) 353-2220 (312) 353-7774 Fax

Region VI

Dallas Regional Office
(AR, LA, NM*, OK, TX)
525 Griffin Street, Room 602
Dallas, TX 75202
(972) 850-4145 (972) 850-4149 Fax
(972) 850-4150 FSO Fax

Region VII

Kansas City Regional Office
(IA*, KS, MO, NE)
Two Pershing Square Building
2300 Main Street, Suite 1010
Kansas City, MO 64108-2416
(816) 283-8745 (816) 283-0547 Fax

Region VIII

Denver Regional Office
(CO, MT, ND, SD, UT*, WY*)
Cesar Chavez Memorial Building
1244 Speer Blvd., Suite 551
Denver, CO 80204
(720) 264-6550 (720) 264-6585 Fax

Region IX

San Francisco Regional Office
(AZ*, CA*, HI*, NV*, and American Samoa,
Guam and the Northern Mariana Islands)
90 7th Street, Suite 18100
San Francisco, CA 94103
(415) 625-2547 (415) 625-2534 Fax

Region X

Seattle Regional Office
(AK*, ID, OR*, WA*)
300 Fifth Avenue, Suite 1280
Seattle, WA 98104
(206) 757-6700 (206) 757-6705 Fax

*These states and territories operate their own OSHA-approved job safety and health plans and cover state and local government employees as well as private-sector employees. The Connecticut, Illinois, New Jersey, New York and Virgin Islands programs cover public employees only. (Private-sector workers in these states are covered by Federal OSHA). States with approved programs must have standards that are identical to, or at least as effective as, the Federal OSHA standards.

Note: To get contact information for OSHA area offices, OSHA-approved state plans and OSHA consultation projects, please visit us online at www.osha.gov or call us at 1-800-321-OSHA (6742).

How to Contact OSHA

For questions or to get information or advice, to report an emergency, fatality, hospitalization, amputation, or loss of an eye, or to file a confidential complaint, contact your nearest OSHA office, visit www.osha.gov or call OSHA at 1-800-321-OSHA (6742), TTY 1-877-889-5627.

**For assistance, contact us.
We are OSHA. We can help.**



U.S. Department of Labor

For more information:



www.osha.gov (800) 321-OSHA (6742)