

29 CFR 1926 – Construction

Note: NC State-Specific Standards that are relevant to Construction Industry are included at the end.

OSHA Standards With Special Requirements

These webpages are designed to assist employers in complying with standards that have "**special requirements**". For the purpose of this technical guidance, special requirements includes programs, plans, procedures, policies, inspections, certifications, competent persons, qualified persons, training, medical surveillance, exposure monitoring, signs, tags, markings, tests, records and recordkeeping requirements that are applicable in meeting the requirements of OSHA standards by industry. *If a standard or subpart are not listed, it did not have one of these types of special requirements.*

Note: *While all attempts have been made to ensure the accuracy of the content and completeness in the information provided, it may not include all the specific standards that have special requirements that may be required by an OSHA standard. To ensure completeness in meeting each standard's requirement, the specific standard should be referenced.*

To learn more about these special requirements, click on the tabs below.

Special Requirements

This webpage is to be used in conjunction with the [Which OSHA Standards Apply](#) webpages for [Construction Standards](#) (29 CFR Part 1926).

- Subpart C - [General Safety and Health Provisions](#)
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- Subpart E - [Personal Protective and Life Saving Equipment](#)
- Subpart F - [Fire Protection and Prevention](#)
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- Subpart P - [Excavations](#)
- Subpart Q - [Concrete and Masonry Construction](#)
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- Subpart Z - [Toxic and Hazardous Substances](#)
- Subpart AA - [Confined Spaces in Construction](#)
- Subpart CC - [Cranes and Derricks in Construction](#)
- [Additional Assistance for Construction](#)
- [Special Emphasis Programs](#)

Subpart C - [General Safety and Health Provisions](#)

[Subpart C](#) provides requirements for accident prevention responsibilities, employee safety training and education, first aid and medical attention, fire protection and prevention, housekeeping, illumination, sanitation, personal protective equipment, acceptable certifications, shipbuilding and ship repairing, access to employee exposure and medical records, means of egress, and employee emergency action plans.

[Construction work](#) means work for construction, alteration, and/or repair, including painting and decorating.

To learn if subpart C applies to you, go to [Does "Subpart C - General Safety and Health Provisions" Apply to You?](#)

Special Requirements

1926.20 - General Safety and Health Provisions

Scope: This [standard](#) provides general safety and health responsibilities.

Special Requirements: Responsibilities, personal protective equipment, programs, training, competent person, designated employees, locking/tagging, qualified employees, inspections, references other standards

[1926.20\(b\)](#) - *Accident prevention responsibilities.*

- [1926.20\(b\)\(1\)](#) - It shall be the *responsibility* of the employer to initiate and maintain such *programs* as may be necessary to comply with this [part \(1926\)](#).
- [1926.20\(b\)\(2\)](#) - Such *programs* shall provide for *frequent and regular inspections* of the job sites, materials, and equipment to be made by *competent persons designated by the employers*.
- [1926.20\(b\)\(3\)](#) -The use of any machinery, tool, material, or equipment which is not in compliance with any applicable requirement of this part is prohibited. Such machine, tool, material, or equipment shall either be identified as unsafe by *tagging or locking* the controls to render them inoperable or shall be physically removed from its place of operation.
- [1926.20\(b\)\(4\)](#) -The employer shall permit only those *employees qualified by training or experience* to operate equipment and machinery.

[1926.20\(f\)\(1\)](#) - *Personal protective equipment. Standards in this part* requiring the employer to provide *personal protective equipment (PPE), including respirators and other types of PPE*, because of hazards to employees impose a separate compliance duty with respect to each employee covered by the requirement. The employer must *provide PPE* to each employee *required to use the PPE*, and each failure to *provide PPE* to an employee may be considered a separate violation.

[1926.20\(f\)\(2\)](#) - *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.

[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.

Designated person means "authorized person" as defined in paragraph (d) of this section.

Authorized person means a person approved or assigned by the employer to perform a specific type of duty or duties or to be at a specific location or locations at the jobsite.

1926.21 - Safety Training and Education

Scope: This standard provides the basic training and education requirements for construction.

Special Requirements: Training, safety and health training programs, instruct, first aid procedures, personal protective measures, references other standards

1926.21(b) - Employer responsibility.

- 1926.21(b)(1) - The employer should avail himself of the *safety and health training programs* the Secretary provides. [Reference paragraph (a).]
- 1926.21(b)(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.
- 1926.21(b)(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.
- 1926.21(b)(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.
- 1926.21(b)(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 subpart D - occupational health and environmental controls, subpart F - fire protection and prevention, and other applicable subparts of this part 1926.

1926.23 - First Aid and Medical Attention

Scope: This standard provides general information for first aid and medical attention.

Special Requirements: First aid services, references other standards

First aid services and provisions for medical care shall be made available by the employer for every employee covered by these regulations. *Regulations* prescribing specific requirements for first aid, medical attention, and emergency facilities are contained in subpart D - occupational health and environmental controls of this part.

1926.24 - Fire Protection and Prevention

Scope: This [standard](#) provides general information on fire protection and prevention.

Special Requirements: Fire protection and prevention program, references other standards

The employer shall be responsible for the development and maintenance of an effective *fire protection and prevention program* at the job site throughout all phases of the construction, repair, alteration, or demolition work. The employer shall ensure the availability of the fire protection and suppression equipment required by [subpart F - fire protection and prevention](#) of this part.

1926.25 – Housekeeping

Scope: This [standard](#) provides general housekeeping requirements.

Special Requirements: Disposal intervals

[1926.25\(b\)](#) - Combustible scrap and debris shall be removed at *regular intervals* during the course of construction. Safe means shall be provided to facilitate such removal.

[1926.25\(c\)](#) - Containers shall be provided for the collection and separation of waste, trash, oily and used rags, and other refuse. Containers used for garbage and other oily, flammable, or hazardous wastes, such as caustics, acids, harmful dusts, etc. shall be equipped with covers. Garbage and other waste shall be *disposed of at frequent and regular intervals*.

1926.26 – Illumination

Scope: This [standard](#) provides general illumination requirements.

Special Requirements: References other standards

Construction areas, aisles, stairs, ramps, runways, corridors, offices, shops, and storage areas where work is in progress shall be lighted with either natural or artificial illumination. The minimum illumination requirements for work areas are contained in [subpart D - occupational health and environmental controls](#) of this part.

1926.27 – Sanitation

Scope: This [standard](#) provides general illumination requirements.

Special Requirements: References other standards

Health and sanitation requirements for drinking water are contained in [subpart D](#) - *occupational health and environmental controls* of this [part 1926](#).

1926.28 - Personal Protective Equipment

Scope: This [standard](#) provides general information on personal protective equipment.

Special Requirements: Personal protective equipment, references other standards

[1926.28\(a\)](#) - The employer is responsible for requiring the wearing of appropriate *personal protective equipment* in all operations where there is an exposure to hazardous conditions or where this [part 1926](#) indicates the need for using such equipment to reduce the hazards to the employees.

[1926.28\(b\)](#) - *Regulations* governing the use, selection, and maintenance of *personal protective and lifesaving equipment* are described under [subpart E](#) - *personal protective and life saving equipment* of this [part 1926](#).

1926.29 - Acceptable Certifications

Scope: This [standard](#) provides certifications that are acceptable under other rules.

Special Requirements: Certifications, inspections, tests, regulatory authority, references other standards

[1926.29\(a\)](#) - Pressure vessels. Current and *valid certification* by an *insurance company or regulatory authority* shall be deemed as acceptable evidence of safe installation, *inspection, and testing* of pressure vessels provided by the employer.

[1926.29\(b\)](#) - Boilers. Boilers provided by the employer shall be deemed to be in compliance with the requirements of this part when evidence of *current and valid certification* by an *insurance company or regulatory authority* attesting to the safe installation, *inspection, and testing* is presented.

[1926.29\(c\)](#) - Other requirements. Regulations prescribing specific requirements for other types of pressure vessels and similar equipment are contained in [subpart F](#) - *fire protection and prevention* and [subpart O](#) - *motor vehicles, mechanized equipment, and marine operations* of this part.

1926.30 - Shipbuilding and Ship Repairing

Scope: This [standard](#) provides general information for shipbuilding and repairing.

Special Requirements: References other standards

[1926.30\(b\)](#) - *Applicable safety and health standards. For the purpose of work carried out under this section, the safety and health regulations in [part 1915](#) of this title, Shipyard Employment, shall apply.*

1926.33 - Access to Employee Exposure and Medical Records

Scope: This [standard](#) provides general information for access to medical and exposure records.

Special Requirements: References other standards

Note: The requirements applicable to construction work under this section are identical to those set forth at [1910.1020](#) - *Access to employee exposure and medical records* of this chapter (29 CFR).

1926.34 - Means of Egress

Scope: This [standard](#) provides general information pertaining to means of egress.

Special Requirements: Markings, provisions, signs, supervisory personnel

[1926.34\(a\)](#) - *General. In every building or structure exits shall be so arranged and maintained as to provide free and unobstructed egress from all parts of the building or structure at all times when it is occupied. No lock or fastening to prevent free escape from the inside of any building shall be installed except in mental, penal, or corrective institutions where *supervisory personnel* is continually on duty and *effective provisions* are made to remove occupants in case of fire or other emergency.*

[1926.34\(b\)](#) - *Exit marking. Exits shall be *marked* by a *readily visible sign*. Access to exits shall be *marked* by *readily visible signs* in all cases where the exit or way to reach it is not immediately visible to the occupants.*

1926.35 - Employee Emergency Action Plans

Scope: This [standard](#) provides requirements for emergency action plans.

Special Requirements: Emergency action plan (written), procedures, designated actions, duties, assignments, names/titles, alarm system, communication, training, reporting, distinctive signal, plan review, fire brigade, references other standards

[1926.35\(a\)](#) - *Scope and application. This section applies to all *emergency action plans* required by a particular *OSHA standard*. The *emergency action plan* shall be in *writing* (except as provided in the last sentence of paragraph (e)(3) of this section) and*

shall cover those *designated actions* employers and employees must take to ensure employee safety from fire and other emergencies.

1926.35(b) - Elements. The following elements, at a minimum, shall be included in the *plan*:

- 1926.35(b)(1) - *Emergency escape procedures* and *emergency escape route assignments*;
- 1926.35(b)(2) - *Procedures* to be followed by employees who remain to operate critical plant operations before they evacuate;
- 1926.35(b)(3) - *Procedures* to account for all employees after emergency evacuation has been completed;
- 1926.35(b)(4) - *Rescue and medical duties* for those employees who are to perform them;
- 1926.35(b)(5) - The preferred means of *reporting* fires and other emergencies; and
- 1926.35(b)(6) - *Names or regular job titles* of persons or departments who can be contacted for further information or explanation of duties under the *plan*.

1926.35(c)(1) - The employer shall establish an *employee alarm system* which complies with 1926.159 [Standard removed].

1926.35(c)(2) - If the *employee alarm system* is used for alerting *fire brigade members*, or for other purposes, a *distinctive signal* for each purpose shall be used.

1926.35(d) - Evacuation. The employer shall establish in the *emergency action plan* the *types of evacuation* to be used in emergency circumstances.

1926.35(e)(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.

1926.35(e)(2) - The employer shall *review the plan* with each employee covered by the *plan* at the following times: [Reference paragraph (e)(2)(i) - (iii)].

1926.35(e)(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

Subpart D provides specific requirements for medical services and first aid; sanitation; occupational noise; ionizing and non-ionizing radiation; gases, vapors, fumes, dusts and mists; illumination; ventilation; hazard communication; methylenedianiline; retention of DOT markings, placards and labels; lead; process safety management of highly hazardous materials; hazardous waste operations and emergency response (HAZWOPER); and criteria for design and construction of spray booths.

To learn if subpart D applies to you, go to [Does "Subpart D - Occupational Health and Environmental Controls" Apply to You?](#)

Special Requirements

1926.50 - Medical Services and First Aid

Scope: This standard provides the requirements for medical services and first aid.

Special Requirements: Provisions, certificate, training, documented evidence, communication system, checks, posted numbers

1926.50(b) - *Provisions* shall be made prior to commencement of the project for prompt medical attention in case of serious injury.

1926.50(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.

1926.50(d)(2) - The contents of the first aid kit shall be placed in a weatherproof container with individual sealed packages for each type of item, and shall be *checked by the employer* before being sent out on each job and at *least weekly* on each job to ensure that the expended items are replaced.

1926.50(e) - Proper equipment for prompt transportation of the injured person to a physician or hospital, or a *communication system* for contacting necessary ambulance service, shall be provided.

[1926.50\(f\)\(1\)](#) - In areas where 911 emergency dispatch services are not available, the *telephone numbers* of the physicians, hospitals, or ambulances shall be conspicuously *posted*.

[1926.50\(f\)\(2\)](#) - In areas where 911 emergency dispatch services are available and an employer uses a *communication system* for contacting necessary emergency-medical service, the employer must:

- [1926.50\(f\)\(2\)\(i\)](#) - Ensure that the *communication system* is effective in contacting the emergency-medical service; and
- [1926.50\(f\)\(2\)\(ii\)\(A\)](#) - When using a *communication system* in an area that does not automatically supply the caller's latitude and longitude information to the 911 emergency dispatcher, the employer must *post* in a conspicuous location at the worksite either: [Reference [paragraph \(f\)\(2\)\(ii\)\(A\)\(1\) - \(2\)](#)].

1926.51 - Sanitation

Scope: This [standard](#) provides the sanitation requirements for construction.

Special Requirements: Markings, signs, extermination program, change rooms, references other standards

[1926.51\(a\)\(3\)](#) - Any container used to distribute drinking water shall be clearly *marked* as to the nature of its contents and not used for any other purpose.

[1926.51\(a\)\(6\)](#) - Potable water means water that meets the standards for drinking purposes of the *State or local authority having jurisdiction*, or water that meets the *quality standards* prescribed by the [U.S. Environmental Protection Agency's National Primary Drinking Water Regulations \(40 CFR part 141\)](#).

[1926.51\(b\)\(1\)](#) - Outlets for nonpotable water, such as water for industrial or firefighting purposes only, shall be identified by *signs* meeting the requirements of [subpart G - occupational health and environmental control of this part 1926](#), to indicate clearly that the water is unsafe and is not to be used for drinking, washing, or cooking purposes.

[1926.51\(d\)\(1\)](#) - All employees' food service facilities and operations shall meet the *applicable laws, ordinances, and regulations of the jurisdictions* in which they are located.

[1926.51\(h\)](#) - Vermin control. Every enclosed workplace shall be so constructed, equipped, and maintained, so far as reasonably practicable, as to prevent the entrance or harborage of rodents, insects, and other vermin. A continuing and effective *extermination program* shall be instituted where their presence is detected.

[1926.51\(i\)](#) - *Change rooms*. Whenever employees are *required by a particular standard to wear protective clothing* because of the possibility of contamination with toxic materials, change rooms equipped with storage facilities for street clothes and separate storage facilities for the protective clothing shall be provided.

1926.52 - Occupational Noise Exposure

Scope: This [standard](#) provides the requirements for noise exposure.

Special Requirements: Administrative controls, engineering controls, hearing conservation program, hearing protection, references other standards

[1926.52\(a\)](#) - *Protection* against the effects of noise exposure shall be provided when the sound levels exceed those shown in [Table D-2](#) of this section when measured on the A-scale of a standard sound level meter at slow response.

[1926.52\(b\)](#) - When employees are subjected to sound levels exceeding those listed in [Table D-2](#) of this section, feasible *administrative or engineering controls* shall be utilized. If such *controls* fail to reduce sound levels within the levels of the table, *personal protective equipment* as required in [subpart E - exit routes and emergency planning](#), shall be provided and used to reduce sound levels within the levels of the table.

[1926.52\(d\)\(1\)](#) - 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

Scope: This [standard](#) provides the requirements for ionizing radiation.

Special Requirements: Competent person, licensee, training, references other standards

[1926.53\(a\)](#) - In construction and related activities involving the use of sources of ionizing radiation, the pertinent provisions of the [Nuclear Regulatory Commission's Standards for Protection Against Radiation \(10 CFR part 20\)](#), relating to protection against occupational radiation exposure, shall apply.

[1926.53\(b\)](#) - 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.

Note: The requirements applicable to construction work under [paragraphs \(c\) through \(r\)](#) of this section are identical to those set forth at [paragraphs \(a\) through \(p\)](#) of [1910.1096](#) - ionizing radiation of this chapter.

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.

1926.54 - Nonionizing Radiation

Scope: This [standard](#) provides the requirements for nonionizing radiation.

Special Requirements: Qualified persons (proof), trained, warning placards (posted), references other standards

[1926.54\(a\)](#) - Only *qualified and trained employees* shall be assigned to install, adjust, and operate laser equipment.

[1926.54\(b\)](#) - *Proof of qualification* of the laser equipment operator shall be *available and in possession* of the operator at all times.

[1926.54\(c\)](#) - Employees, when working in areas in which a potential exposure to direct or reflected laser light greater than 0.005 watts (5 milliwatts) exists, shall be provided with antilaser eye protection devices as specified in [subpart E - personal protective and life saving equipment of this part 1926](#).

[1926.54\(d\)](#) - Areas in which lasers are used shall be *posted* with standard laser *warning placards*.

1926.55 - Gases, Vapors, Fumes, Dusts, and Mists

Scope: This [standard](#) provides the requirements for exposures to gases, vapors, fumes, dusts, and mists.

Special Requirements: Monitoring, assess, administrative controls, exposure monitoring, engineering controls, respirators, technical measures, competent industrial hygienist, protective measures, PPE, technically qualified person, references other standards

[1926.55\(a\)](#) - Employers must limit an *employee's exposure* to any substance listed in Table 1 or 2 of this section in accordance with the following:

- [1926.55\(a\)\(1\)](#) - Substances with limits preceded by (C)-Ceiling Values. An employee's exposure, as *determined from breathing-zone air samples*, to any

substance in [Table 1](#) of this section with a permissible exposure limit preceded by (C) must at no time exceed the exposure limit specified for that substance.

If *instantaneous monitoring* is not feasible, then the employer *must assess* the ceiling as a 15-minute time-weighted average exposure that the employer cannot exceed at any time during the working day.

- [1926.55\(a\)\(2\)](#) - Other substances - 8-hour Time Weighted Averages. An employee's exposure, as *determined from breathing-zone air samples*, to any substance in [Table 1 or 2](#) of this section with a permissible exposure limit not preceded by (C) must not exceed the limit specified for that substance measured as an 8-hour time-weighted average in any work shift.

[1926.55\(b\)](#) - 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](#) - *respiratory protection*.

[1926.55\(c\)](#) - [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 [1926.1101](#) - asbestos shall apply.

[1926.55\(d\)](#) - [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](#) - formaldehyde, of this title shall apply.

1926.56 – Illumination

Scope: This [standard](#) provides the requirements for illumination.

Special Requirements: References other standards

[1926.56\(b\)](#) - Other areas. For areas or operations not covered above by [Table D-3](#) - Minimum Illumination Intensities in Foot-Candles, refer to the *American National Standard A11.1-1965, R1970, Practice for Industrial Lighting*, for recommended values of illumination.

1926.57 – Ventilation

Scope: This [standard](#) provides the ventilation requirements as it relates to exposures to gases, vapors, mists, fumes and dusts.

Special Requirements: Engineering controls, ratings, marked (gauge, compartments), test data, tests, manual, inspections, checks, respiratory protection program, maintenance, approved, personal protective equipment, classifications, operational procedures, recorded (static pressure), instruction, first aid procedures, measured, corrective action, competent industrial hygienist, references other standards

[1926.57\(a\)](#) - General. Whenever hazardous substances such as dusts, fumes, mists, vapors, or gases exist or are produced in the course of construction work, their concentrations shall not exceed the limits specified in [1926.55\(a\)](#) - *gases, vapors, fumes, dusts, and mists*. When ventilation is used as an *engineering control method*, the system shall be installed and operated according to the requirements of this section.

[1926.57\(f\)](#) - Abrasive blasting

- [1926.57\(f\)\(2\)\(ii\)](#) - The concentration of respirable dust or fume in the breathing zone of the abrasive-blasting operator or any other worker shall be kept below the levels specified in [1926.55](#) - *gases, vapors, fumes, dusts, and mists*, or other pertinent sections of this [part 1926](#) - *construction standards*.
- [1926.57\(f\)\(2\)\(iii\)](#) - Organic abrasives which are combustible shall be used only in automatic systems. Where flammable or explosive dust mixtures may be present, the construction of the equipment, including the exhaust system and all electric wiring, shall conform to the requirements of *American National Standard Installation of Blower and Exhaust Systems for Dust, Stock, and Vapor Removal or Conveying, Z33.1-1961 (NFPA 91-1961)*, and [subpart S](#) - *underground construction, caissons, cofferdams, and compressed air*, of this [part 1926](#). The blast nozzle shall be bonded and grounded to prevent the build up of static charges. Where flammable or explosive dust mixtures may be present, the abrasive blasting enclosure, the ducts, and the dust collector shall be constructed with loose panels or explosion venting areas, located on sides away from any occupied area, to provide for pressure relief in case of explosion, following the principles set forth in the *National Fire Protection Association Explosion Venting Guide, NFPA 68-1954*.
- [1926.57\(f\)\(3\)\(i\)\(E\)](#) - Blast-cleaning enclosures. Slit abrasive-resistant baffles shall be installed in multiple sets at all small access openings where dust might escape, and shall be *inspected regularly* and replaced when needed.
- [1926.57\(f\)\(4\)\(i\)](#) - Exhaust ventilation systems. The construction, installation, *inspection, and maintenance* of exhaust systems shall conform to the principles and requirements set forth in *American National Standard Fundamentals Governing the Design and Operation of Local Exhaust Systems, Z9.2-1960, and ANSI Z33.1-1961*.
 - [1926.57\(f\)\(4\)\(i\)\(b\)](#) - The static pressure drop at the exhaust ducts leading from the equipment shall be *checked* when the installation is completed and periodically thereafter to assure continued satisfactory operation. Whenever an appreciable change in the pressure drop indicates a partial blockage, the system shall be *cleaned* and returned to normal operating condition.

- [1926.57\(f\)\(5\)\(i\)](#) - Employers must use only *respirators* approved by *NIOSH* under *42 CFR part 84* for protecting employees from dusts produced during abrasive-blasting operations.
- [1926.57\(f\)\(5\)\(ii\)\(C\)](#) - Where concentrations of toxic dust dispersed by the abrasive blasting may exceed the limits set in [1926.55\(a\)](#) - *gases, vapors, fumes, dusts, and mists*, or other pertinent sections of this [part 1926](#) and the nozzle and blast are not physically separated from the operator in an exhaust-ventilated enclosure.
- [1926.57\(f\)\(5\)\(iii\)](#) - Properly fitted particulate-filter *respirators*, commonly referred to as dust-filter respirators, may be used for short, intermittent, or occasional dust exposures such as cleanup, dumping of dust collectors, or unloading shipments of sand at a receiving point when it is not feasible to control the dust by enclosure, exhaust ventilation, or other means. The respirators used must be *approved by NIOSH* under *42 CFR part 84* for protection against the specific type of dust encountered.
- [1926.57\(f\)\(5\)\(iv\)](#) - A *respiratory protection program* as defined and described in [1926.103](#) - *respiratory protection*, shall be established wherever it is necessary to use respiratory protective equipment.
- [1926.57\(f\)\(5\)\(v\)](#) - Operators shall be equipped with heavy canvas or leather *gloves and aprons* or equivalent protection to protect them from the impact of abrasives. *Safety shoes* shall be worn to protect against foot injury where heavy pieces of work are handled.
- [1926.57\(f\)\(5\)\(v\)\(A\)](#) - *Safety shoes* shall conform to the requirements of *American National Standard for Men's Safety-Toe Footwear, Z41.1-1967*.
- [1926.57\(f\)\(5\)\(v\)\(B\)](#) - *Equipment for protection of the eyes and face* shall be supplied to the operator when the respirator design does not provide such protection and to any other personnel working in the vicinity of abrasive blasting operations. This *equipment* shall conform to the requirements of [1926.102](#) - *eye and face protection*.
- [1926.57\(f\)\(6\)](#) - Air supply and air compressors. Air for *abrasive-blasting respirators* must be free of harmful quantities of dusts, mists, or noxious gases, and must meet the requirements for supplied-air quality and use specified in [29 CFR 1910.134\(i\)](#) - *breathing air quality and use, respiratory protection*.
- [1926.57\(f\)\(7\)](#) - *Operational procedures* and general safety. Dust shall not be permitted to accumulate on the floor or on ledges outside of an abrasive-blasting enclosure, and dust spills shall be cleaned up promptly. Aisles and walkways shall be kept clear of steel shot or similar abrasive which may create a slipping hazard.

[1926.57\(g\)](#) - Grinding, polishing, and buffing operations

- [1926.57\(g\)\(4\)\(i\)](#) - Exhaust systems for grinding, polishing, and buffing operations should be designed in accordance with *American Standard Fundamentals Governing the Design and Operation of Local Exhaust Systems, Z9.2-1960*.

- [1926.57\(g\)\(4\)\(ii\)](#) - Exhaust systems for grinding, polishing, and buffing operations shall be tested in the manner described in *American Standard Fundamentals Governing the Design and Operation of Local Exhaust Systems, Z9.2-1960*.
- [1926.57\(g\)\(5\)\(i\)\(A\)](#) - It is the dual function of grinding and abrasive cutting-off wheel hoods to protect the operator from the hazards of bursting wheels as well as to provide a means for the removal of dust and dirt generated. All hoods shall be not less in structural strength than specified in the *American National Standard Safety Code for the Use, Care, and Protection of Abrasive Wheels, B7.1-1970*.

[1926.57\(h\)](#) - Spray finishing operations

- [1926.57\(h\)\(3\)\(i\)](#) - Spray booths shall be designed and constructed in accordance with [1926.66\(b\)\(1\) through \(4\)](#) and [\(6\) through \(10\)](#) - criteria for design and construction of spray booths, (see sections 301-304 and 306-310 of the *Standard for Spray Finishing Using Flammable and Combustible Materials, NFPA No. 33-1969*), for general construction specifications. For a more detailed discussion of fundamentals relating to this subject, see *ANSI Z9.2-1960*.
 - [1926.57\(h\)\(3\)\(i\)\(A\)](#) - Lights, motors, electrical equipment, and other sources of ignition shall conform to the requirements of [1926.66\(b\)\(10\) and \(c\)](#) - criteria for design and construction of spray booths. (See section 310 and chapter 4 of the *Standard for Spray Finishing Using Flammable and Combustible Materials NFPA No. 33-1969*.)
- [1926.57\(h\)\(3\)\(iii\)](#) - Baffles, distribution plates, and dry-type overspray collectors shall conform to the requirements of [1926.66\(b\)\(4\) and \(5\)](#) - criteria for design and construction of spray booths. (See sections 304 and 305 of the *Standard for Spray Finishing Using Flammable and Combustible Materials, NFPA No. 33-1969*.)
 - [1926.57\(h\)\(3\)\(iii\)\(A\)](#) - Overspray filters shall be installed and maintained in accordance with the requirements of [1926.66\(b\)\(5\)](#), (see section 305 of the *Standard for Spray Finishing Using Flammable and Combustible Materials, NFPA No. 33-1969*), and shall only be in a location easily accessible for inspection, cleaning, or replacement.
- [1926.57\(h\)\(5\)\(i\)](#) - Ventilation shall be provided in accordance with provisions of [1926.66\(d\)](#) - criteria for design and construction of spray booths, (see chapter 5 of the *Standard for Spray Finishing Using Flammable or Combustible Materials, NFPA No. 33-1969*), and in accordance with the following: [Reference [paragraph \(h\)\(5\)\(i\)\(A\) - \(B\)](#)].
- [1926.57\(h\)\(5\)\(iii\)\(B\)](#) - Exhaust ductwork shall be sized in accordance with good design practice which shall include consideration of fan capacity, length of duct, number of turns and elbows, variation in size, volume, and character of materials being exhausted. See *American National Standard Z9.2-1960* for further details and explanation concerning elements of design.
- [1926.57\(h\)\(5\)\(iii\)\(E\)](#) - Inspection or clean-out doors shall be provided for every 9 to 12 feet (2.736 to 3.648 m) of running length for ducts up to 12 inches (0.304 m) in diameter, but the distance between cleanout doors may be greater for larger pipes.

(See 8.3.21 of American National Standard Z9.1-1951.) A clean-out door or doors shall be provided for servicing the fan, and where necessary, a drain shall be provided.

- [1926.57\(h\)\(7\)\(iii\)\(B\)](#) - The *rating of filters* shall be governed by *test data* supplied by the manufacturer of the filter. A pressure gage shall be installed to show the pressure drop across the filters. This gage shall be *marked* to show the pressure drop at which the filters require cleaning or replacement. Filters shall be replaced or cleaned whenever the pressure drop across them becomes excessive or whenever the air flow through the face of the booth falls below that specified in [Table D-57.7](#).

[1926.57\(i\)](#) - Open surface tanks

- [1926.57\(i\)\(1\)\(ii\)](#) - Except where specific construction specifications are prescribed in this section, hoods, ducts, elbows, fans, blowers, and all other exhaust system parts, components, and supports thereof shall be so constructed as to meet conditions of service and to facilitate maintenance and shall conform in construction to the specifications contained in *American National Standard Fundamentals Governing the Design and Operation of Local Exhaust Systems, Z9.2-1960*.
- [1926.57\(i\)\(2\)\(i\)](#) - Open-surface tank operations shall be *classified into 16 classes, numbered A-1 to D-4, inclusive*.
- [1926.57\(i\)\(2\)\(ii\)](#) - *Determination of class*. Class is *determined* by two factors, hazard potential *designated by a letter from A to D, inclusive*, and rate of gas, vapor, or mist evolution *designated by a number from 1 to 4, inclusive* (for example, B.3).
- [1926.57\(i\)\(2\)\(iii\)](#) - Hazard potential is an index, on a *scale of from A to D, inclusive*, of the severity of the hazard associated with the substance contained in the tank because of the toxic, flammable, or explosive nature of the vapor, gas, or mist produced therefrom. The toxic hazard is determined from the concentration, measured in parts by volume of a gas or vapor, per million parts by volume of contaminated air (p.p.m.), or in milligrams of mist per cubic meter of air (mg./m.³), below which ill effects are unlikely to occur to the exposed worker. The concentrations shall be those in [1926.55](#) - *gases, vapors, fumes, dusts, and mists*, or other pertinent sections of this *part 1926*.
- [1926.57\(i\)\(2\)\(iv\)](#) - The relative fire or explosion hazard is measured in degrees Fahrenheit in terms of the closed-cup flash point of the substance in the tank. *Detailed information* on the prevention of fire hazards in dip tanks may be found in *Dip Tanks Containing Flammable or Combustible Liquids, NFPA No. 34-1966, National Fire Protection Association*. Where the tank contains a mixture of liquids, other than organic solvents, whose effects are additive, the *hygienic standard* of the most toxic component (for example, the one having the lowest p.p.m. or mg./m.³) shall be used, except where such substance constitutes an insignificantly small fraction of the mixture. For mixtures of organic solvents, their combined effect, rather than that of either individually, shall determine the hazard potential. In the absence of *information* to the contrary, the effects shall be

considered as additive. If the sum of the ratios of the airborne concentration of each contaminant to the toxic concentration of that contaminant exceeds unity, the toxic concentration shall be considered to have been exceeded. (See Note A to [paragraph \(i\)\(2\)\(v\)](#) of this section.)

- [1926.57\(i\)\(8\)\(iii\)](#) - A volume of outside air in the range of 90 percent to 110 percent of the exhaust volume shall be provided to each room having exhaust hoods. The outside air supply shall enter the workroom in such a manner as not to be detrimental to any exhaust hood. The airflow of the makeup air system shall be *measured* on installation. *Corrective action* shall be taken when the airflow is below that required. The makeup air shall be uncontaminated.
- [1926.57\(i\)\(3\)](#) - *Ventilation*. Where ventilation is used to control potential exposures to workers as defined in [paragraph \(i\)\(2\)\(iii\)](#) of this section, it shall be adequate to reduce the concentration of the air contaminant to the degree that a hazard to the worker does not exist. Methods of ventilation are discussed in *American National Standard Fundamentals Governing the Design and Operation of Local Exhaust Systems, Z9.2-1960*.
- [1926.57\(i\)\(7\)\(iv\)](#) - The exhaust system, consisting of hoods, ducts, air mover, and discharge outlet, shall be *designed* in accordance with *American National Standard Fundamentals Governing the Design and Operation of Local Exhaust Systems, Z9.2-1960*, or the manual, *Industrial Ventilation, published by the American Conference of Governmental Industrial Hygienists 1970*. Airflow and pressure loss *data* provided by the manufacturer of any air cleaning device shall be included in the *design calculations*.
- [1926.57\(i\)\(8\)\(i\)](#) - The required airflow shall be maintained at all times during which gas, mist, or vapor is emitted from the tank, and at all times the tank, the draining, or the drying area is in operation or use. When the system is first installed, the airflow from each hood shall be measured by means of a pitot traverse in the exhaust duct and corrective action taken if the flow is less than that required. When the proper flow is obtained, the hood static pressure shall be *measured and recorded*. At intervals of not more than *3 months* operation, or after a prolonged shutdown period, the hoods and duct system shall be inspected for evidence of corrosion or damage. In any case where the airflow is found to be less than required, it shall be increased to the required value. (Information on airflow and static pressure measurement and *calculations* may be found in *American National Standard Fundamental Governing the Design and Operation of Local Exhaust Systems, Z9.2-1960*, or in the manual, *Industrial Ventilation, published by the American Conference of Governmental Industrial Hygienists*.)
- [1926.57\(i\)\(9\)\(i\)](#) - 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.
- [1926.57\(i\)\(9\)\(v\)](#) - Whenever there is a danger of splashing, for example, when additions are made manually to the tanks, or when acids and chemicals are removed from the tanks, the employees so engaged shall be required to wear either

tight-fitting chemical goggles or an effective face shield. See [1926.102](#) - *eye and face protection*.

- [1926.57\(i\)\(9\)\(vi\)](#) - When, during the emergencies specified in [paragraph \(i\)\(11\)\(v\)](#) of this section, employees must be in areas where concentrations of air contaminants are greater than the limits set by [paragraph \(i\)\(2\)\(iii\)](#) of this section or oxygen concentrations are less than 19.5 percent, they must use respirators that reduce their exposure to a level below these limits or that provide adequate oxygen. Such respirators must also be provided in *marked*, quickly-accessible storage compartments built for this purpose when the possibility exists of accidental release of hazardous concentrations of air contaminants. Respirators must be approved by NIOSH under 42 CFR part 84, selected by a *competent industrial hygienist or other technically-qualified source*, and used in accordance with 29 CFR [1926.103](#) - *respiratory protection*.

1926.59 - Hazard Communication

Scope: This [standard](#) (Refers to [1910.1200](#) - Hazard Communication) provides the requirements for communicating hazards and protective measures related to chemicals for employees that may be exposed under normal conditions or in foreseeable emergencies. **Note:** Reference [paragraph \(b\)\(5\)\(i\) - \(vi\)](#) for labeling exemptions. and [paragraph \(b\)\(6\)\(i\) - \(xii\)](#) for substances not covered by this standard.

[Foreseeable emergency](#) means any potential occurrence such as, but not limited to, equipment failure, rupture of containers, or failure of control equipment which could result in an uncontrolled release of a hazardous chemical into the workplace.

[Safety data sheet \(SDS\)](#) means written or printed material concerning a hazardous chemical that is prepared in accordance with [paragraph \(g\)](#) of this section.

Special Requirements: Engineering control measures, respirator program (written), procedures, respirators, training, fit testing, medical evaluations, program administrator, hazard evaluations, inspections, NIOSH-certified respirators, affected employees, change schedules, employer demonstrates, medical questionnaire, tests, certification, records, recordkeeping, assigned protection factors, tags, recommendations (written), PLHCP, references other standards

[1910.134\(a\)\(1\)](#) - In the control of those occupational diseases caused by breathing air contaminated with harmful dusts, fogs, fumes, mists, gases, smokes, sprays, or vapors, the primary objective shall be to prevent atmospheric contamination. This shall be accomplished as far as feasible by *accepted engineering control measures* (for example, enclosure or confinement of the operation, general and local ventilation, and substitution of

less toxic materials). When effective *engineering controls* are not feasible, or while they are being instituted, appropriate *respirators* shall be used pursuant to this section.

[1910.134\(a\)\(2\)](#) - 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*.

[1910.134\(c\)\(1\)](#) - 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:

- [1910.134\(c\)\(1\)\(i\)](#) - *Procedures for selecting respirators for use in the workplace;*
- [1910.134\(c\)\(1\)\(ii\)](#) - *Medical evaluations of employees required to use respirators;*
- [1910.134\(c\)\(1\)\(iii\)](#) - *Fit testing procedures for tight-fitting respirators;*
- [1910.134\(c\)\(1\)\(iv\)](#) - *Procedures for proper use of respirators in routine and reasonably foreseeable emergency situations;*
- [1910.134\(c\)\(1\)\(v\)](#) - *Procedures and schedules for cleaning, disinfecting, storing, inspecting, repairing, discarding, and otherwise maintaining respirators;*
- [1910.134\(c\)\(1\)\(vi\)](#) - *Procedures to ensure adequate air quality, quantity, and flow of breathing air for atmosphere-supplying respirators;*
- [1910.134\(c\)\(1\)\(vii\)](#) - *Training of employees in the respiratory hazards to which they are potentially exposed during routine and emergency situations;*
- [1910.134\(c\)\(1\)\(viii\)](#) - *Training of employees in the proper use of respirators, including putting on and removing them, any limitations on their use, and their maintenance;* and
- [1910.134\(c\)\(1\)\(ix\)](#) - *Procedures for regularly evaluating the effectiveness of the program.*

[1910.134\(c\)\(2\)](#) - Where *respirator* use is not required:

- [1910.134\(c\)\(2\)\(i\)](#) - An employer may provide *respirators* at the *request of employees* or permit employees to use their own *respirators*, if the *employer determines* that such *respirator* use will not in itself create a hazard. If the *employer determines* that any *voluntary respirator* use is permissible, the employer shall provide the *respirator* users with the *information* contained in [appendix D](#) to this section ("Information for Employees Using Respirators When Not Required Under the Standard" - Mandatory); and
- [1910.134\(c\)\(2\)\(ii\)](#) - In addition, the employer must *establish* and implement those elements of a *written respiratory protection program* necessary to ensure that any employee using a *respirator* voluntarily is *medically able* to use that respirator, and that the respirator is cleaned, stored, and maintained so that its use does not present a health hazard to the user. *Exception:* Employers are not required to include in a *written respiratory protection program* those employees whose only use of *respirators* involves the voluntary use of *filtering facepieces (dust masks)*.

[1910.134\(c\)\(3\)](#) - 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*.

[1910.134\(c\)\(4\)](#) - The employer shall provide *respirators, training, and medical evaluations* at no cost to the employee.

[1910.134\(d\)](#) - Selection of *respirators*. This paragraph requires the employer to *evaluate respiratory hazard(s)* in the workplace, identify relevant workplace and user factors, and base *respirator selection* on these factors. The paragraph also specifies appropriately protective *respirators* for use in IDLH atmospheres, and limits the selection and use of *air-purifying respirators*.

- [1910.134\(d\)\(1\)\(ii\)](#) - The employer shall select a *NIOSH-certified respirator*. The respirator shall be used in compliance with the conditions of its *certification*.
- [1910.134\(d\)\(1\)\(iii\)](#) - The employer shall *identify and evaluate* the *respiratory hazard(s)* in the workplace; this *evaluation* shall include a reasonable estimate of employee exposures to respiratory hazard(s) and an identification of the contaminant's chemical state and physical form. Where the employer cannot identify or reasonably estimate the employee exposure, the employer shall consider the atmosphere to be IDLH.

[1910.134\(d\)\(2\)\(i\)](#) - The employer shall provide the following *respirators* for employee use in IDLH atmospheres:

- [1910.134\(d\)\(2\)\(i\)\(A\)](#) - A full facepiece pressure demand SCBA *certified by NIOSH* for a minimum service life of thirty minutes, or

[1910.134\(d\)\(2\)\(ii\)](#) - *Respirators* provided only for escape from IDLH atmospheres shall be *NIOSH-certified* for escape from the atmosphere in which they will be used.

[1910.134\(d\)\(2\)\(iii\)](#) - All oxygen-deficient atmospheres shall be considered IDLH. *Exception:* If the employer *demonstrates* that, under all foreseeable conditions, the oxygen concentration can be maintained within the ranges specified in [Table II](#) of this section (i.e., for the altitudes set out in the table), then any *atmosphere-supplying respirator* may be used.

[1910.134\(d\)\(3\)\(i\)\(A\)](#) - *Assigned Protection Factors (APFs)*. Employers must use the *assigned protection factors* listed in [Table 1](#) to select a respirator that meets or exceeds the required level of employee protection. When using a combination *respirator* (e.g., airline respirators with an air-purifying filter), employers must ensure that the *assigned protection factor* is appropriate to the mode of operation in which the *respirator* is being used.

[1910.134\(d\)\(3\)\(iii\)\(B\)](#) - For protection against gases and vapors, the employer shall provide, an *air-purifying respirator*, provided that:

- [1910.134\(d\)\(3\)\(iii\)\(B\)\(1\)](#) - The *respirator* is equipped with an *end-of-service-life indicator (ESLI)* *certified by NIOSH* for the contaminant; or
- [1910.134\(d\)\(3\)\(iii\)\(B\)\(2\)](#) - If there is no ESLI appropriate for conditions in the employer's workplace, the employer implements a *change schedule* for canisters and cartridges that is based on *objective information or data* that will ensure that canisters and cartridges are changed before the end of their service life. The employer shall describe in the *respirator program* the *information and data* relied upon and the basis for the *canister and cartridge change schedule* and the basis for reliance on the *data*.

[1910.134\(e\)](#) - *Medical evaluation*. Using a respirator may place a physiological burden on employees that varies with the type of *respirator* worn, the job and workplace conditions in which the *respirator* is used, and the medical status of the employee. Accordingly, this paragraph specifies the minimum requirements for *medical evaluation* that employers must implement to determine the employee's ability to use a respirator.

[1910.134\(e\)\(1\)](#) - General. The employer shall provide a *medical evaluation* to determine the employee's ability to use a respirator, before the employee is *fit tested* or required to use the respirator in the workplace. The employer may discontinue an employee's *medical evaluations* when the employee is no longer required to use a *respirator*.

[1910.134\(e\)\(2\)\(i\)](#) - *Medical evaluation procedures.* The employer shall identify a *physician or other licensed health care professional (PLHCP)* to perform *medical evaluations* using a *medical questionnaire* or an initial medical examination that obtains the same information as the *medical questionnaire*.

[1910.134\(e\)\(2\)\(ii\)](#) - The *medical evaluation* shall obtain the *information requested* by the *questionnaire* in Sections 1 and 2, part A of [appendix C](#) (mandatory) of this section.

[1910.134\(e\)\(3\)\(i\)](#) - *Follow-up medical examination.* The employer shall ensure that a follow-up medical examination is provided for an employee who gives a *positive response to any question* among *questions 1 through 8* in Section 2, part A of [appendix C](#) (mandatory) or whose initial medical examination demonstrates the need for a follow-up medical examination.

[1910.134\(e\)\(4\)\(i\)](#) - Administration of the *medical questionnaire* and examinations. The *medical questionnaire* and examinations shall be *administered confidentially* during the employee's normal working hours or at a time and place convenient to the employee. The *medical questionnaire* shall be administered in a manner that ensures that the employee understands its content.

[1910.134\(e\)\(4\)\(ii\)](#) - The employer shall provide the employee with an opportunity to *discuss the questionnaire* and *examination results with the PLHCP*.

[1910.134\(e\)\(5\)\(i\)](#) - Supplemental *information* for the *PLHCP*. The following *information* must be provided to the *PLHCP* before the *PLHCP* makes a *recommendation* concerning an employee's ability to use a *respirator* [Reference [paragraph \(e\)\(5\)\(i\)\(A\) - \(E\)](#)].

[1910.134\(e\)\(5\)\(iii\)](#) - Supplemental *information* for the *PLHCP*. The employer shall provide the *PLHCP* with a *copy of the written respiratory protection program* and a *copy* of this section.

[1910.134\(e\)\(6\)](#) - Medical determination. In determining the employee's ability to use a *respirator*, the employer shall:

- [1910.134\(e\)\(6\)\(i\)](#) - *Obtain a written recommendation* regarding the employee's ability to use the *respirator* from the *PLHCP*. The *recommendation* shall provide only the following *information* [Reference [paragraph \(e\)\(6\)\(i\)\(A\) - \(C\)](#)].

[1910.134\(e\)\(7\)](#) - Additional medical evaluations. At a minimum, the employer shall provide additional *medical evaluations* that comply with the requirements of this section if:

- [1910.134\(e\)\(7\)\(i\)](#) - *An employee reports* medical signs or symptoms that are related to ability to use a *respirator*;

- [1910.134\(e\)\(7\)\(ii\)](#) - A *PLHCP, supervisor, or the respirator program administrator* informs the employer that an employee needs to be reevaluated;
- [1910.134\(e\)\(7\)\(iii\)](#) - *Information from the respiratory protection program, including observations made during fit testing and program evaluation, indicates a need for employee reevaluation.*

[1910.134\(f\)](#) - *Fit testing.* This paragraph requires that, before an employee may be required to use any *respirator* with a negative or positive pressure tight-fitting facepiece, the employee must be *fit tested* with the same make, model, style, and size of *respirator* that will be used. This paragraph specifies the kinds of *fit tests* allowed, the *procedures* for conducting them, and how the results of the *fit tests* must be used.

[1910.134\(f\)\(1\)](#) - The employer shall ensure that employees using a tight-fitting *facepiece respirator* pass an appropriate *qualitative fit test (QLFT)* or *quantitative fit test (QNFT)* as stated in this paragraph.

[1910.134\(f\)\(2\)](#) - The employer shall ensure that an employee using a tight-fitting *facepiece respirator* is *fit tested prior to initial use* of the *respirator*, whenever a different *respirator facepiece* (size, style, model or make) is used, and *at least annually* thereafter.

[1910.134\(f\)\(3\)](#) - The employer shall *conduct an additional fit test* whenever the *employee reports*, or the *employer, PLHCP, supervisor, or program administrator makes visual observations* of, changes in the employee's physical condition that could affect respirator fit. Such conditions include, but are not limited to, facial scarring, dental changes, cosmetic surgery, or an obvious change in body weight.

[1910.134\(f\)\(4\)](#) - If after passing a QLFT or QNFT, the *employee subsequently notifies* the *employer, program administrator, supervisor, or PLHCP* that the fit of the respirator is unacceptable, the employee shall be given a reasonable opportunity to select a different *respirator facepiece* and to be *retested*.

[1910.134\(f\)\(5\)](#) - The *fit test* shall be administered using an *OSHA-accepted QLFT or QNFT protocol*. The *OSHA-accepted QLFT and QNFT protocols and procedures* are contained in [appendix A](#) - *fit testing procedures (mandatory)*, of this section.

[1910.134\(f\)\(8\)](#) - *Fit testing* of tight-fitting atmosphere-supplying *respirators* and tight-fitting powered air-purifying *respirators* shall be accomplished by *performing quantitative or qualitative fit testing* in the negative pressure mode, regardless of the mode of operation (negative or positive pressure) that is used for respiratory protection.

- [1910.134\(f\)\(8\)\(i\)](#) - *Qualitative fit testing* of these *respirators* shall be accomplished by temporarily converting the *respirator user's actual facepiece* into a negative

pressure *respirator* with appropriate filters, or by using an identical negative pressure air-purifying *respirator* facepiece with the same sealing surfaces as a surrogate for the atmosphere-supplying or powered air-purifying *respirator* facepiece.

- [1910.134\(f\)\(8\)\(ii\)](#) - *Quantitative fit testing* of these *respirators* shall be accomplished by modifying the facepiece to allow sampling inside the facepiece in the breathing zone of the user, midway between the nose and mouth. This requirement shall be accomplished by installing a permanent sampling probe onto a surrogate facepiece, or by using a sampling adapter *designed* to temporarily provide a means of sampling air from inside the facepiece.

[1910.134\(g\)](#) - Use of *respirators*. This paragraph requires employers to *establish and implement procedures* for the proper use of *respirators*. These requirements include prohibiting conditions that may result in facepiece seal leakage, preventing employees from removing *respirators* in hazardous environments, taking actions to ensure continued effective *respirator* operation throughout the work shift, and *establishing procedures* for the use of *respirators* in IDLH atmospheres or in interior structural firefighting situations.

- [1910.134\(g\)\(1\)\(iii\)](#) - For all tight-fitting *respirators*, the employer shall ensure that employees *perform a user seal check each time* they put on the *respirator* using the *procedures* in [appendix B-1](#) - user seal checks, or *procedures* recommended by the *respirator* manufacturer that the *employer demonstrates* are as effective as those in [appendix B-1](#) of this section.
- [1910.134\(g\)\(2\)\(i\)](#) - Continuing *respirator* effectiveness. Appropriate *surveillance* shall be maintained of work area conditions and degree of employee exposure or stress. When there is a change in work area conditions or degree of employee exposure or stress that may affect *respirator* effectiveness, the employer shall *reevaluate* the continued effectiveness of the *respirator*.

[1910.134\(g\)\(3\)](#) - *Procedures for IDLH atmospheres*. For all IDLH atmospheres, the employer shall ensure that [Reference [paragraphs \(g\)\(3\)\(i\) - \(g\)\(3\)\(vi\)](#)].

[1910.134\(g\)\(4\)](#) - *Procedures for interior structural firefighting*. In addition to the requirements set forth under [paragraph \(g\)\(3\)](#), in interior structural fires, the employer shall ensure that: [Reference [paragraphs \(g\)\(4\)\(i\) - \(g\)\(4\)\(iii\)](#)].

[1910.134\(h\)](#) - Maintenance and care of *respirators*. This paragraph requires the employer to provide for the cleaning and disinfecting, storage, *inspection*, and repair of *respirators* used by employees.

[1910.134\(h\)\(1\)](#) - Cleaning and disinfecting. The employer shall provide each *respirator* user with a *respirator* that is clean, sanitary, and in good working order. The employer shall ensure that *respirators* are cleaned and disinfected using the *procedures* in [appendix B-2](#) - *respirator* cleaning procedures (mandatory), of this section, or *procedures* recommended by the *respirator manufacturer*, provided that such *procedures* are of equivalent effectiveness. The *respirators* shall be cleaned and disinfected at the following intervals: [Reference [paragraphs \(h\)\(1\)\(i\) - \(h\)\(1\)\(iv\)](#)].

[1910.134\(h\)\(2\)](#) - Storage. The employer shall ensure that *respirators* are stored as follows:

- [1910.134\(h\)\(2\)\(ii\)\(C\)](#) - *Stored* in accordance with any applicable *manufacturer instructions*.

[1910.134\(h\)\(3\)\(i\)](#) - The employer shall ensure that *respirators* are *inspected* as follows:

- [1910.134\(h\)\(3\)\(i\)\(A\)](#) - All *respirators* used in routine situations shall be *inspected before each use and during cleaning*;
- [1910.134\(h\)\(3\)\(i\)\(B\)](#) - All *respirators* maintained for use in *emergency situations* shall be *inspected at least monthly* and in accordance with the *manufacturer's recommendations*, and shall be *checked for proper function* before and after each use; and
- [1910.134\(h\)\(3\)\(i\)\(C\)](#) - *Emergency escape-only respirators* shall be *inspected before being carried into the workplace* for use.

[1910.134\(h\)\(3\)\(ii\)](#) - The employer shall ensure that *respirator inspections* include the following: [Reference [paragraph \(h\)\(3\)\(ii\)\(A\) - \(h\)\(3\)\(ii\)\(B\)](#)].

[1910.134\(h\)\(3\)\(iii\)](#) - In addition to the requirements of [paragraphs \(h\)\(3\)\(i\) and \(ii\)](#) of this section, self-contained breathing apparatus shall be *inspected monthly*. Air and oxygen cylinders shall be maintained in a fully charged state and shall be recharged when the pressure falls to 90% of the *manufacturer's recommended* pressure level. The employer shall determine that the regulator and warning devices function properly.

[1910.134\(h\)\(3\)\(iv\)](#) - For *respirators* maintained for *emergency use*, the employer shall:

- [1910.134\(h\)\(3\)\(iv\)\(A\)](#) - *Certify the respirator* by *documenting* the date the inspection was performed, the name (or signature) of the person who made the *inspection*, the findings, required remedial action, and a serial number or other means of identifying the *inspected respirator*; and
- [1910.134\(h\)\(3\)\(iv\)\(B\)](#) - Provide this *information on a tag or label* that is attached to the storage compartment for the respirator, is kept with the respirator, or is included

in *inspection reports* stored as paper or electronic files. This *information shall be maintained* until replaced following a *subsequent certification*.

[1910.134\(h\)\(4\)](#) - Repairs. The employer shall ensure that *respirators* that fail an *inspection* or are otherwise found to be defective are removed from service, and are discarded or repaired or adjusted in accordance with the *following procedures*:

- [1910.134\(h\)\(4\)\(i\)](#) - Repairs or adjustments to *respirators* are to be made only by *persons appropriately trained* to perform such operations and shall use only the *respirator manufacturer's NIOSH-approved parts* designed for the *respirator*;
- [1910.134\(h\)\(4\)\(ii\)](#) - Repairs shall be made according to the *manufacturer's recommendations and specifications* for the type and extent of repairs to be performed; and
- [1910.134\(h\)\(4\)\(iii\)](#) - Reducing and admission valves, regulators, and alarms shall be adjusted or repaired only by the manufacturer or a *technician trained* by the manufacturer.

[1910.134\(i\)\(4\)](#) - The employer shall ensure that cylinders used to supply breathing air to *respirators* meet the following requirements:

- [1910.134\(i\)\(4\)\(i\)](#) - Cylinders are *tested and maintained* as prescribed in the *Shipping Container Specification Regulations of the Department of Transportation (49 CFR part 180)*;
- [1910.134\(i\)\(4\)\(ii\)](#) - Cylinders of purchased breathing air have a *certificate of analysis* from the supplier that the breathing air meets the requirements for Grade D breathing air.

[1910.134\(i\)\(5\)\(iv\)](#) - Have a *tag* containing the most recent *change date and the signature* of the *person authorized* by the employer to perform the change. The *tag* shall be *maintained* at the compressor.

[1910.134\(i\)\(9\)](#) - The employer shall use only the *respirator manufacturer's NIOSH-approved* breathing-gas containers, *marked and maintained* in accordance with the *Quality Assurance provisions of the NIOSH approval* for the SCBA as issued in accordance with the *NIOSH respirator-certification standard* at [42 CFR part 84](#).

[1910.134\(j\)](#) - *Identification of filters, cartridges, and canisters*. The employer shall ensure that all filters, cartridges and canisters used in the workplace are *labeled and color coded* with the *NIOSH approval label* and that the *label is not removed* and remains legible.

[1910.134\(k\)](#) - *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](#) - (mandatory) Information for employees using respirators when not required under the standard, of this section to employees who wear *respirators* when not required by this section or by the employer to do so.

- [1910.134\(k\)\(1\)](#) - The employer shall ensure that each employee can *demonstrate knowledge* of at least the following: [Reference [paragraph \(k\)\(1\)\(i\) - \(k\)\(1\)\(vii\)](#)].

[1910.134\(k\)\(2\)](#) - The *training* shall be conducted in a manner that is understandable to the employee.

[1910.134\(k\)\(3\)](#) - The employer shall provide the *training prior to requiring* the employee to use a *respirator* in the workplace.

[1910.134\(k\)\(4\)](#) - 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*.

[1910.134\(k\)\(5\)](#) - *Retraining* shall be administered *annually*, and when the following situations occur: [Reference [paragraph \(k\)\(5\)\(i\) - \(k\)\(5\)\(iii\)](#)].

[1910.134\(k\)\(6\)](#) - 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.

[1910.134\(l\)](#) - *Program evaluation*. This section requires the employer to *conduct evaluations* of the workplace to ensure that the *written respiratory protection program* is being properly implemented, and to *consult employees* to ensure that they are using the *respirators* properly.

[1910.134\(l\)\(1\)](#) - The employer shall *conduct evaluations* of the workplace as necessary to ensure that the provisions of the current *written program* are being effectively implemented and that it continues to be effective.

[1910.134\(l\)\(2\)](#) - The employer shall regularly *consult employees* required to use *respirators* to assess the employees' views on *program effectiveness* and to identify any problems. Any problems that are identified during this *assessment* shall be corrected.

Factors to be assessed include, but are not limited to: [Reference [paragraph \(l\)\(2\)\(i\) - \(l\)\(2\)\(iv\)](#)].

[1910.134\(m\)](#) - *Recordkeeping*. This section requires the employer to establish and *retain written information* regarding *medical evaluations, fit testing, and the respirator program*. This *information* will facilitate employee involvement in the *respirator program*, assist the employer in *auditing* the adequacy of the *program*, and provide a *record* for compliance determinations by OSHA.

[1910.134\(m\)\(1\)](#) - *Medical evaluation*. *Records of medical evaluations* required by this section must be *retained* and made available in accordance with [1910.1020](#) - access to employee exposure and medical records.

[1910.134\(m\)\(2\)\(i\)](#) - *Fit testing*. The employer shall establish a *record* of the *qualitative and quantitative fit tests* administered to an employee including [Reference [paragraph \(m\)\(2\)\(i\)\(A\) - \(E\)](#)]:

[1910.134\(m\)\(2\)\(ii\)](#) - *Fit test records* shall be *retained* for *respirator users until the next fit test* is administered.

[1910.134\(m\)\(3\)](#) - A *written copy* of the current *respirator program* shall be *retained* by the employer.

[1910.134\(m\)\(4\)](#) - *Written materials* required to be *retained* under this paragraph shall be made available upon request to *affected employees* and to the Assistant Secretary or designee for examination and *copying*.

1926.60 – Methylenedianiline

Scope: This [standard](#) provides the requirements for exposures to methylenedianiline (MDA). **Note:** Reference [paragraph \(a\)\(1\)\(i\) - \(iv\)](#) for applicability and [paragraph \(a\)\(2\) - \(a\)\(7\)](#) and exceptions.

[4,4'Methylenedianiline or MDA](#) means the chemical; 4,4'-diaminodiphenylmethane, Chemical Abstract Service Registry number 101-77-9, in the form of a vapor, liquid, or solid. The definition also includes the salts of MDA.

Special Requirements: Inform, determinations, emergency (action) plan (written), fire prevention plan, alerting employees, procedures, job classification, exposure monitoring (document, records), demonstrate, regulated areas, decontamination areas, change areas, authorized persons, demarcation, posting results, written notification, inspections, work practices, corrective action (records), engineering controls, hazard communication program (written), work practices, labels, examine, compliance program (written), inform,

training (records), respiratory protection program (written), signs (posted), inspections, (leak detection) program, medical surveillance program (records), employee information and training program (written materials), copy of standard, licensed physician, records, physician's opinion (written), employer-funded compensation program, objective testing data (records), PPE, monitoring data (records), safety and health procedures, competent organizations, observation procedures, references other standards

[1926.60\(d\)](#) - *Communication among employers*. On multi-employer worksites, an employer performing work involving the application of MDA or materials containing MDA for which establishment of one or more regulated areas is required shall *inform other employers* on the site of the nature of the employer's work with MDA and of the existence of, and requirements pertaining to, regulated areas.

[1926.60\(e\)\(1\)\(i\)](#) - A *written plan for emergency situations* shall be developed for each construction operation where there is a possibility of an emergency. The *plan* shall include *procedures* where the employer *identifies emergency escape routes* for his employees at each construction site before the construction operation begins. Appropriate portions of the *plan* shall be implemented in the event of an emergency.

[1926.60\(e\)\(1\)\(ii\)](#) - The *plan* shall specifically provide that employees engaged in correcting emergency conditions shall be equipped with the appropriate *personal protective equipment* and clothing as required in [paragraphs \(i\)](#) - respiratory protection, and [\(j\)](#) - protective work clothing and equipment, of this section until the emergency is abated.

[1926.60\(e\)\(1\)\(iii\)](#) - The *plan* shall specifically include provisions for alerting and evacuating affected employees as well as the applicable elements prescribed in [29 CFR 1910.38](#) and [29 CFR 1910.39](#), "*Emergency action plans*" and "*Fire prevention plans*," respectively.

[1926.60\(e\)\(2\)](#) - *Alerting employees*. Where there is the possibility of employee exposure to MDA due to an emergency, *means* shall be developed to promptly *alert employees* who have the potential to be directly exposed. Affected employees not engaged in correcting emergency conditions shall be evacuated immediately in the event that an emergency occurs. *Means* shall also be developed for *alerting other employees* who may be exposed as a result of the emergency.

[1926.60\(f\)\(1\)\(i\)](#) - *Determinations* of employee exposure shall be made from breathing zone air samples that are representative of each employee's exposure to airborne MDA over an *eight (8) hour period*. *Determination of employee exposure* to the STEL shall be made from breathing zone air samples collected over a *15 minute sampling period*.

[1926.60\(f\)\(1\)\(ii\)](#) - Representative employee exposure shall be determined on the basis of *one or more samples* representing *full shift exposure for each shift* for each *job classification* in each work area where exposure to MDA may occur.

[1926.60\(f\)\(1\)\(iii\)](#) - Where the employer can *document* that *exposure levels* are equivalent for similar operations in different work shifts, the employer shall only be required to determine representative employee exposure for that operation *during one shift*.

[1926.60\(f\)\(2\)](#) - *Initial monitoring*. Each employer who has a workplace or work operation covered by this standard shall perform *initial monitoring* to determine accurately the airborne concentrations of MDA to which employees may be exposed unless: [Reference [paragraph \(f\)\(2\)\(i\) - \(ii\)](#)].

[1926.60\(f\)\(3\)](#) - *Periodic monitoring and monitoring frequency*. [Reference [paragraph \(f\)\(3\)\(i\) - \(iv\)](#)].

[1926.60\(f\)\(4\)](#) - *Termination of monitoring*. [Reference [paragraph \(f\)\(4\)\(i\) - \(ii\)](#)].

[1926.60\(f\)\(5\)](#) - *Additional monitoring*. The employer shall institute the *exposure monitoring* required under [paragraphs \(f\)\(2\)](#) and [\(f\)\(3\)](#) of this section when there has been a change in production process, chemicals present, control equipment, personnel, or *work practices* which may result in new or additional exposures to MDA, or when the employer has any reason to suspect a change which may result in new or additional exposures.

[1926.60\(f\)\(6\)](#) - *Accuracy of monitoring*. *Monitoring* shall be accurate, to a confidence level of 95 percent, to within plus or minus 25 percent for airborne concentrations of MDA.

[1926.60\(f\)\(7\)](#) - *Employee notification of monitoring results*. [Reference [paragraph \(f\)\(7\)\(i\) - \(ii\)](#)].

[1926.60\(f\)\(8\)](#) - *Visual monitoring*. The employer shall make *routine inspections* of employee hands, face and forearms potentially exposed to MDA. Other potential dermal exposures reported by the employee must be referred to the appropriate medical personnel for observation. If the *employer determines* that the employee has been exposed to MDA the employer shall: [Reference [paragraph \(f\)\(8\)\(i\) - \(iii\)](#)].

[1926.60\(g\)\(1\)\(i\)](#) - Airborne exposures. The employer shall establish *regulated areas* where airborne concentrations of MDA exceed or can reasonably be expected to exceed, the permissible exposure limits.

[1926.60\(g\)\(1\)\(ii\)](#) - Dermal exposures. Where employees are subject to "dermal exposure to MDA" the employer shall establish those work areas as *regulated areas*.

[1926.60\(g\)\(2\)](#) - *Demarcation*. *Regulated areas* shall be *demarcated* from the rest of the workplace in a manner that minimizes the number of persons potentially exposed.

[1926.60\(g\)\(3\)](#) - Access. Access to *regulated areas* shall be limited to *authorized persons*.

[1926.60\(g\)\(4\)](#) - *Personal protective equipment and clothing*. Each person entering a *regulated area* shall be supplied with, and required to use, the appropriate *personal protective clothing and equipment* in accordance with [paragraphs \(i\)](#) - respiratory protection, and [\(j\)](#) - protective work clothing and equipment of this section.

[1926.60\(g\)\(5\)](#) - Prohibited activities. The employer shall ensure that employees do not eat, drink, smoke, chew tobacco or gum, or apply cosmetics in *regulated areas*.

[1926.60\(h\)\(1\)](#) - *Engineering controls and work practices and respirators*.
[Reference [paragraph \(h\)\(1\)\(i\) - \(ii\)](#)].

[1926.60\(h\)\(2\)](#) - Special Provisions. For workers engaged in spray application methods, respiratory protection must be used in addition to feasible *engineering controls and work practices* to reduce employee exposure to or below the PELs.

[1926.60\(h\)\(5\)\(i\)](#) - *Compliance program*. The employer shall establish and implement a *written program* to reduce employee exposure to or below the PELs by means of *engineering and work practice controls*, as required by [paragraph \(h\)\(1\)](#) of this section, and by use of respiratory protection where permitted under this section.

[1926.60\(h\)\(5\)\(ii\)](#) - Upon request this *written program* shall be furnished for *examination and copying* to the Assistant Secretary, the Director, affected employees and designated employee representatives. The employer shall review and, as necessary, update such *plans at least once every 12 months* to make certain they reflect the current status of the *program*.

[1926.60\(i\)\(2\)](#) - *Respirator program*. The employer must implement a *respiratory protection program* in accordance with [1910.134\(b\) through \(d\)](#) [except [\(d\)\(1\)\(iii\)](#)], and [\(f\) through \(m\)](#), which covers each employee required by this section to use a respirator.

[1926.60\(i\)\(3\)\(i\)](#) - Employers must:

- [1926.60\(i\)\(3\)\(i\)\(A\)](#) - Select, and provide to employees, the appropriate respirators specified in [paragraph \(d\)\(3\)\(i\)\(A\) of 29 CFR 1910.134](#) - *respiratory protection*.

[1926.60\(j\)\(1\)](#) - Provision and use. Where employees are subject to dermal exposure to MDA, where liquids containing MDA can be splashed into the eyes, or where airborne concentrations of MDA are in excess of the PEL, the employer shall provide, at no cost to the employee, and ensure that the employee uses, appropriate protective work clothing and equipment which prevent contact with MDA such as, but not limited to:
[Reference [paragraph \(j\)\(1\)\(i\) - \(iv\)](#)].

- [1926.60\(j\)\(1\)\(iv\)](#) - Other appropriate protective equipment which comply with [29 CFR 1910.133](#) - eye and face protection

[1926.60\(j\)\(2\)\(iii\)](#) - The employer shall ensure that no employee takes MDA-contaminated work clothing or equipment out of the decontamination areas, except those *employees authorized* to do so for the purpose of laundering, maintenance, or disposal.

[1926.60\(j\)\(2\)\(v\)](#) - Containers of MDA-contaminated protective work clothing or equipment which are to be taken out of decontamination areas or the workplace for cleaning, maintenance, or disposal, shall bear *labels warning* of the hazards of MDA.

[1926.60\(j\)\(3\)\(iv\)](#) - Any employer who gives MDA-contaminated clothing to another person for laundering shall *inform* such person of the requirement to prevent the release of MDA.

[1926.60\(j\)\(3\)\(v\)](#) - The employer shall *inform* any person who launders or cleans protective clothing or equipment contaminated with MDA of the potentially harmful effects of exposure.

[1926.60\(j\)\(4\)\(i\)](#) - *Visual examination.* The employer shall ensure that employees' work clothing is *examined periodically* for rips or tears that may occur during performance of work.

[1926.60\(k\)\(1\)\(i\)](#) - The employer shall provide *decontamination areas* for employees required to work in *regulated areas* or required by [paragraph \(j\)\(1\)](#) of this section to wear protective clothing. Exception: In lieu of the decontamination area requirement specified in [paragraph \(k\)\(1\)\(i\)](#) of this section, the employer may permit employees engaged in small scale, short duration operations, to clean their protective clothing or dispose of the protective clothing before such employees leave the area where the work was performed.

[1926.60\(k\)\(1\)\(ii\)](#) - *Change areas.* The employer shall ensure that *change areas* are equipped with separate storage facilities for protective clothing and street clothing, in accordance with [29 CFR 1910.141\(e\)](#) - *sanitation*.

[1926.60\(k\)\(1\)\(iii\)](#) - Equipment area. The equipment area shall be supplied with impermeable, *labeled bags and containers* for the containment and disposal of contaminated protective clothing and equipment.

[1926.60\(k\)\(2\)\(i\)](#) - Where feasible, shower facilities shall be provided which comply with [29 CFR 1910.141\(d\)\(3\)](#) - *sanitation*, wherever the possibility of employee exposure to airborne levels of MDA in excess of the permissible exposure limit exists.

[1926.60\(l\)\(1\)](#) - Hazard communication. The employer shall include Methylene dianiline (MDA) 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 MDA and *safety data sheets*, and is *trained* in accordance with the *provisions of HCS* and [paragraph \(l\)\(3\)](#) of this section. The employer shall ensure that at least the following hazards are addressed: Cancer; liver effects; and skin sensitization.

[1926.60\(l\)\(2\)\(i\)\(A\)](#) - The employer shall *post* and maintain legible *signs demarcating regulated areas* and entrances or access-ways to regulated areas that bear the following legend: [Reference [paragraph \(l\)\(2\)\(i\)\(A\) - \(B\)](#)].

[1926.60\(l\)\(2\)\(ii\)\(A\)](#) - The employer shall ensure that *labels* or other appropriate *forms of warning* are provided for containers of MDA within the workplace. The *labels* shall comply with the requirements of [1910.1200\(f\)](#) - *labels and other forms of warning*, and shall include at least the following *information* for pure MDA and mixtures containing MDA: [Reference [paragraph \(l\)\(2\)\(ii\)\(A\) - \(B\)](#)].

[1926.60\(l\)\(3\)\(i\)](#) - The employer shall provide employees with *information and training* on MDA, in accordance with [29 CFR 1910.1200\(h\)](#) - *employee information and training*, at the time of *initial assignment and at least annually* thereafter.

[1926.60\(l\)\(3\)\(ii\)](#) - In addition to the *information* required under [29 CFR 1910.1200](#) - *hazard communication*, the employer shall: [Reference [paragraph \(l\)\(3\)\(ii\)\(A\) - \(C\)](#)].

[1926.60\(l\)\(4\)\(i\)](#) - 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*.

[1926.60\(l\)\(4\)\(ii\)](#) - 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*.

[1926.60\(m\)\(2\)](#) - The employer shall institute a *program for detecting MDA leaks, spills, and discharges*, including *regular visual inspections* of operations involving liquid or solid MDA.

[1926.60\(n\)\(1\)\(i\)](#) - The employer shall make available a *medical surveillance program* for employees exposed to MDA under the following circumstances: [Reference [paragraph \(n\)\(1\) - \(6\)](#)].

[1926.60\(n\)\(7\)\(i\)](#) - The employer shall provide the following *information* to the examining physician (i.e., *copy of regulation, job description*): [Reference [paragraph \(n\)\(7\)\(i\) - \(ii\)](#)].

[1926.60\(n\)\(8\)](#) - *Physician's written opinion*. [Reference [paragraph \(n\)\(8\)\(i\) - \(ii\)](#)].

[1926.60\(n\)\(9\)](#) - Medical removal (i.e., *medical determination results, opinion, employer-funded compensation program*). [Reference [paragraph \(n\)\(9\)\(i\) - \(vi\)](#)].

[1926.60\(o\)\(1\)\(i\)](#) - Where the employer has relied on *objective data* that demonstrate that products made from or containing MDA are not capable of releasing MDA or do not present a dermal exposure problem under the expected conditions of processing, use, or handling to exempt such operations from the initial monitoring requirements under [paragraph](#)

[\(f\)\(2\)](#) of this section, the employer shall establish and maintain an accurate *record of objective data* reasonably relied upon in support of the exemption.

[1926.60\(o\)\(1\)\(ii\)](#) - The *record* shall include at least the following *information*:
[Reference [paragraph \(o\)\(1\)\(ii\)\(A\) - \(E\)](#)].

[1926.60\(o\)\(1\)\(iii\)](#) - The employer shall *maintain this record* for the duration of the employer's reliance upon such *objective data*.

[1926.60\(o\)\(2\)\(i\)](#) - Where the employer has relied on *historical monitoring data* that demonstrate that exposures on a particular job will be below the action level to exempt such operations from the *initial monitoring* requirements under [paragraph \(f\)\(2\)](#) of this section, the employer shall establish and maintain an *accurate record of historical monitoring data* reasonably relied upon in support of the exception.

[1926.60\(o\)\(2\)\(ii\)](#) - The *record* shall include information that reflect the following conditions:
[Reference [paragraph \(o\)\(2\)\(ii\)\(A\) - \(E\)](#)].

[1926.60\(o\)\(2\)\(iii\)](#) - The employer shall maintain this *record* for the duration of the employer's reliance upon such *historical monitoring data*.

[1926.60\(o\)\(3\)](#) - The employer may utilize the services of *competent organizations* such as industry trade associations and employee associations to maintain the *records* required by this section.

[1926.60\(o\)\(4\)\(i\)](#) - The employer shall keep an accurate *record of all measurements* taken to monitor employee exposure to MDA.

[1926.60\(o\)\(4\)\(ii\)](#) - This *record* shall include at least the following *information*: [Reference [paragraph \(o\)\(4\)\(ii\)\(A\) - \(F\)](#)].

[1926.60\(o\)\(4\)\(iii\)](#) - The employer shall maintain this *record for at least thirty (30) years*, in accordance with [29 CFR 1926.33 - access to employee exposure and medical records](#).
Refers to 1910.1020 - access to employee exposure and medical records.

[1926.60\(o\)\(5\)\(i\)](#) - The employer shall establish and maintain an accurate *record for each employee* subject to medical surveillance by [paragraph \(n\)](#) of this section, in accordance with [29 CFR 1926.33 - access to employee exposure and medical records](#). *Refers to 1910.1020 - access to employee exposure and medical records.*

[1926.60\(o\)\(5\)\(ii\)](#) - The *record* shall include at least the following *information*: [Reference [paragraph \(o\)\(5\)\(ii\)\(A\) - \(E\)](#)].

[1926.60\(o\)\(5\)\(iii\)](#) - The employer shall ensure that this *record* is maintained for the *duration of employment plus thirty (30) years*, in accordance with [29 CFR 1926.33](#) - *access to employee exposure and medical records*. Refers to [1910.1020](#) - *access to employee exposure and medical records*.

[1926.60\(o\)\(5\)\(iv\)](#) - A *copy of the employee's medical removal and return to work status*.

[1926.60\(o\)\(6\)](#) - *Training records*. The employer shall maintain all employee *training records for one (1) year* beyond the last date of employment.

[1926.60\(o\)\(7\)\(i\)](#) - The employer, upon *written request*, shall make all *records* required to be maintained by this section available to the Assistant Secretary and the Director for examination and *copying*.

[1926.60\(o\)\(7\)\(ii\)](#) - The employer, upon request, shall make any *exposure records* required by [paragraphs \(f\)](#) and [\(n\)](#) of this section available for examination and *copying* to affected employees, former employees, designated representatives, and the Assistant Secretary, in accordance with [29 CFR 1926.33\(a\)-\(e\) and \(g\)-\(i\)](#) - *access to employee exposure and medical records* (Refers to [1910.1020](#) - *access to employee exposure and medical records*).

[1926.60\(o\)\(7\)\(iii\)](#) - The employer, upon request, shall make employee *medical records* required by [paragraphs \(n\)](#) and [\(o\)](#) of this section available for examination and copying to the subject employee, anyone having the specific *written consent* of the subject employee, and the Assistant Secretary, in accordance with [29 CFR 1926.33](#) - *access to employee exposure and medical records* (Refers to [1910.1020](#) - *access to employee exposure and medical records*).

[1926.60\(o\)\(8\)](#) - *Transfer of records*. The employer shall comply with the requirements concerning *transfer of records* set forth in [29 CFR 1910.1020\(h\)](#) - *transfer of records*.

[1926.60\(p\)\(1\)](#) - Employee observation. The employer shall provide affected employees, or their designated representatives, an opportunity to *observe the measuring or monitoring of employee exposure* to MDA conducted pursuant to [paragraph \(f\)](#) of this section.

[1926.60\(p\)\(2\)](#) - *Observation procedures*. When observation of the measuring or monitoring of employee exposure to MDA requires entry into areas where the use of *protective clothing and equipment or respirators* is required, the employer shall provide the observer with *personal protective clothing and equipment or respirators* required to be worn by employees working in the area, assure the *use of such clothing and equipment or respirators*, and require the observer to comply with all other applicable *safety and health procedures*.

1926.61 - Retention of DOT Markings, Placards, and Labels

Scope: This [standard](#) (Refers to [1910.1201](#) - Retention of DOT Markings, Placards, and Labels) provides the requirements for retaining DOT markings, placards and labels.

Special Requirements: Markings, placards, labels, references other standards

[1910.1201\(a\)](#) - Any employer who receives a package of hazardous material which is required to be *marked, labeled or placarded* in accordance with the *U. S. Department of Transportation's Hazardous Materials Regulations (49 CFR Parts 171 through 180)* shall retain those *markings, labels and placards* on the package until the packaging is sufficiently cleaned of residue and purged of vapors to remove any potential hazards.

[1910.1201\(b\)](#) - Any employer who receives a freight container, rail freight car, motor vehicle, or transport vehicle that is required to be *marked or placarded* in accordance with the *Hazardous Materials Regulations* shall retain those *markings and placards* on the freight container, rail freight car, motor vehicle or transport vehicle until the hazardous materials which require the *marking or placarding* are sufficiently removed to prevent any potential hazards.

[1910.1201\(c\)](#) - *Markings, placards and labels* shall be maintained in a manner that ensures that they are readily visible.

[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)*.

[1910.1201\(e\)](#) - For the purposes of this section, the term "hazardous material" and any other terms not defined in this section have the same definition as in the *Hazardous Materials Regulations (49 CFR Parts 171 through 180)*.

1926.62 – Lead

Scope: This [standard](#) provides the requirements for lead exposures in construction work.

[Lead](#) means metallic lead, all inorganic lead compounds, and organic lead soaps. Excluded from this definition are all other organic lead compounds.

Special Requirements: Exposure assessment (document), exposure monitoring, biological monitoring, hazard communication training, safety training and education, employer determination (written records), job classification, employee protective measures, administrative controls, objective data (records), lead results (written statement), engineering controls, work practice controls, administrative controls, affected employees, exposure assessment, work practice program, compliance program (written), updated, inspections, administrative control schedule, respiratory protection program, labels, medical examination, inform launderer (written), change areas, medical

surveillance program, job rotation schedule, description, report, licensed physician, employee notification, results, receipt, medical examinations, hazard communication program, safety data sheets, post, warning signs, statement, training program, training, record, description, copy, data, observation, procedures, medical removal protection, hygiene facilities and practices (i.e., eating areas, change rooms, showers), housekeeping, PPE, reference other standards

[1926.62\(d\)\(1\)\(i\)](#) - *Exposure assessment*. Each employer who has a workplace or operation covered by this standard shall initially *determine* if any employee may be exposed to lead at or above the action level.

[1926.62\(d\)\(1\)\(iii\)](#) - With the exception of monitoring under [paragraph \(d\)\(3\)](#), where *monitoring* is required under this section, the employer shall collect personal samples representative of a *full shift* including at least one sample for each *job classification* in each work area either for *each shift* or for *the shift* with the highest exposure level.

[1926.62\(d\)\(2\)\(i\)](#) - With respect to the lead related tasks listed in [paragraph \(d\)\(2\)\(i\)](#) of this section, where lead is present, until the employer performs an *employee exposure assessment* as required in [paragraph \(d\)](#) - exposure assessment, of this section and *documents* that the employee performing any of the listed tasks is not exposed above the PEL, the employer shall treat the employee as if the employee were exposed above the PEL, and not in excess of ten (10) times the PEL, and shall implement *employee protective measures* prescribed in [paragraph \(d\)\(2\)\(v\)](#) of this section. The tasks covered by this requirement are: [Reference [paragraph \(d\)\(2\)\(i\)\(A\) - \(B\)](#)].

[1926.62\(d\)\(2\)\(ii\)](#) - In addition, with regard to tasks not listed in [paragraph \(d\)\(2\)\(i\)](#), where the employee has any reason to believe that an employee performing the task may be exposed to lead in excess of the PEL, until the employer performs an *employee exposure assessment* as required by [paragraph \(d\)](#) of this section and *documents* that the employee's lead exposure is not above the PEL the employer shall treat the employee as if the employee were exposed above the PEL and shall implement *employee protective measures* as prescribed in [paragraph \(d\)\(2\)\(v\)](#) of this section.

[1926.62\(d\)\(2\)\(iii\)](#) - With respect to the tasks listed in this [paragraph \(d\)\(2\)\(iii\)](#) of this section, where lead is present, until the employer performs an employee exposure assessment as required in this [paragraph \(d\)](#), and documents that the employee performing any of the listed tasks is not exposed in excess of 500 µg/m³, the employer shall treat the employee as

if the employee were exposed to lead in excess of 500 $\mu\text{g}/\text{m}^3$ and shall implement *employee protective measures* as prescribed in [paragraph \(d\)\(2\)\(v\)](#) of this section. Where the employer does establish that the employee is exposed to levels of lead below 500 $\mu\text{g}/\text{m}^3$, the employer may provide the exposed employee with the appropriate respirator prescribed for such use at such lower exposures, in accordance with [paragraph \(f\)](#) of this section. The tasks covered by this requirement are: [Reference [paragraph \(d\)\(2\)\(iii\)\(A\) - \(B\)](#)].

[1926.62\(d\)\(2\)\(iv\)](#) - With respect to the tasks listed in this [paragraph \(d\)\(2\)\(iv\)](#), where lead is present, until the employer performs an *employee exposure assessment* as required in this [paragraph \(d\)](#) and documents that the employee performing any of the listed tasks is not exposed to lead in excess of 2,500 $\mu\text{g}/\text{m}^3$ (50 \times PEL), the employer shall treat the employee as if the employee were exposed to lead in excess of 2,500 $\mu\text{g}/\text{m}^3$ and shall implement *employee protective measures* as prescribed in [paragraph \(d\)\(2\)\(v\)](#) of this section. Where the employer does establish that the employee is exposed to levels of lead below 2,500 $\mu\text{g}/\text{m}^3$, the employer may provide the exposed employee with the appropriate *respirator* prescribed for use at such lower exposures, in accordance with [paragraph \(f\)](#) of this section. Interim protection as described in this paragraph is required where lead containing coatings or paint are present on structures when performing:

- (A) Abrasive blasting,
- (B) Welding,
- (C) Cutting, and
- (D) Torch burning.

[1926.62\(d\)\(2\)\(v\)](#) - Until the employer performs an *employee exposure assessment* as required under [paragraph \(d\)](#) of this section and determines actual employee exposure, the employer shall provide to employees performing the tasks described in [paragraphs \(d\)\(2\)\(i\), \(d\)\(2\)\(ii\), \(d\)\(2\)\(iii\)](#) and [\(d\)\(2\)\(iv\)](#) of this section with interim protection as follows: [Reference [paragraph \(d\)\(2\)\(v\)\(A\) - \(F\)](#)].

- [1926.62\(d\)\(2\)\(v\)\(F\)](#) - *Training* as required under [paragraph \(l\)\(1\)\(i\)](#) of this section regarding [29 CFR 1926.59](#), Hazard Communication (refers to [1910.1200](#)); *training* as required under [paragraph \(1\)\(2\)\(iii\)](#) of this section, regarding use of respirators; and *training* in accordance with [29 CFR 1926.21](#), *Safety training and education*.

[1926.62\(d\)\(3\)\(i\)](#) - Except as provided under [paragraphs \(d\)\(3\)\(iii\)](#) and [\(d\)\(3\)\(iv\)](#) of this section the employer shall *monitor employee exposures* and shall base initial determinations on

the *employee exposure monitoring results* and any of the following, relevant considerations: [Reference [paragraph \(d\)\(3\)\(i\)\(A\) - \(C\)](#)].

[1926.62\(d\)\(4\)](#) - *Positive initial determination and initial monitoring*. [Reference [paragraph \(d\)\(4\)\(i\) - \(ii\)](#)].

[1926.62\(d\)\(5\)](#) - *Negative initial determination*. Where a *determination*, conducted under [paragraphs \(d\)\(1\), \(2\), and \(3\)](#) of this section is made that no employee is exposed to airborne concentrations of lead at or above the action level the employer shall make a *written record of such determination*. The *record* shall include at least the information specified in [paragraph \(d\)\(3\)\(i\)](#) of this section and shall also include the date of determination, location within the worksite, and the name of each employee monitored.

[1926.62\(d\)\(6\)](#) - *Frequency. Exposure monitoring*. [Reference [paragraph \(d\)\(6\)\(i\) - \(iii\)](#)].

[1926.62\(d\)\(7\)](#) - *Additional exposure assessments*. Whenever there has been a change of equipment, process, control, personnel or a new task has been initiated that may result in additional employees being exposed to lead at or above the action level or may result in employees already exposed at or above the action level being exposed above the PEL, the employer shall conduct *additional monitoring* in accordance with this paragraph.

[1926.62\(d\)\(8\)](#) - *Employee notification (posting results, written statement)*. [Reference [paragraph \(d\)\(8\)\(i\) - \(ii\)](#)].

[1926.62\(e\)\(1\)](#) - *Engineering and work practice controls*. The employer shall implement *engineering and work practice controls*, including *administrative controls*, to reduce and maintain employee exposure to lead to or below the *permissible exposure limit* to the extent that such controls are feasible. Wherever all feasible *engineering and work practices controls* that can be instituted are not sufficient to reduce employee exposure to or below the *permissible exposure limit* prescribed in [paragraph \(c\)](#) of this section, the employer shall nonetheless use them to reduce employee exposure to the lowest feasible level and shall supplement them by the use of respiratory protection that complies with the requirements of [paragraph \(f\)](#) of this section.

[1926.62\(e\)\(2\)](#) - *Compliance program*. [Reference [paragraph \(e\)\(2\)\(i\) - \(v\)](#)].

- [1926.62\(e\)\(2\)\(i\)](#) - Prior to commencement of the job each employer shall establish and implement a *written compliance program* to achieve compliance with [paragraph \(c\)](#) of this section.
- [1926.62\(e\)\(2\)\(ii\)](#) - *Written plans for these compliance programs* shall include at least the following: [Reference [paragraph \(e\)\(2\)\(ii\)\(A\) - \(I\)](#)].

1926.62(e)(4) - *Administrative controls*. If *administrative controls* are used as a means of reducing employees TWA exposure to lead, the employer shall establish and implement a *job rotation schedule* which includes: [Reference paragraph (e)(4)(i) - (iii)].

1926.62(e)(5) - The employer shall ensure that, to the extent relevant, employees follow *good work practices* such as described in appendix B - employee standard summary, of this section.

1926.62(f) - *Respiratory protection*. [Reference paragraph (f)(1) - (3)].

- 1926.62(f)(2) - *Respirator program*.
 - 1926.62(f)(2)(i) - The employer must implement a *respiratory protection program* in accordance with §1910.134(b) through (d) [except (d)(1)(iii)], and (f) through (m), which covers each employee required by this section to use a respirator.
 - 1926.62(f)(2)(ii) - If an employee has breathing difficulty during fit testing or respirator use, the employer must provide the employee with a *medical examination* in accordance with paragraph (j)(3)(i)(B) of this section to determine whether or not the employee can use a respirator while performing the required duty.
- 1926.62(f)(3)(i)(A) - Select, and provide to employees, the appropriate respirators specified in paragraph (d)(3)(i)(A) of 29 CFR 1910.134.

1926.62(g) - *Protective work clothing and equipment*.

- 1926.62(g)(1) - *Provision and use*. Where an employee is exposed to lead above the PEL without regard to the use of respirators, where employees are exposed to lead compounds which may cause skin or eye irritation (e.g. lead arsenate, lead azide), and as interim protection for employees performing tasks as specified in paragraph (d)(2) of this section, the employer shall provide at no cost to the employee and assure that the employee uses appropriate *protective work clothing and equipment* that prevents contamination of the employee and the employee's garments such as, but not limited to: [Reference paragraph (g)(1)(i) - (iii)].
- 1926.62(g)(2) - *Cleaning and replacement*. [Reference paragraph (g)(2)(i) - (viii)].
 - 1926.62(g)(2)(vi) - The employer shall *inform in writing* any person who cleans or *launders protective clothing or equipment* of the potentially harmful effects of exposure to lead.
 - 1926.62(g)(2)(vii)(A) - The employer shall ensure that the containers of contaminated *protective clothing and equipment* required by paragraph (g)(2)(v) of this section are *labeled* as follows:
DANGER: CLOTHING AND EQUIPMENT CONTAMINATED WITH LEAD. MAY DAMAGE FERTILITY OR THE UNBORN CHILD. CAUSES DAMAGE TO THE CENTRAL NERVOUS SYSTEM. DO NOT EAT, DRINK OR SMOKE WHEN HANDLING. DO NOT REMOVE DUST BY BLOWING OR

SHAKING. DISPOSE OF LEAD CONTAMINATED WASH WATER IN ACCORDANCE WITH APPLICABLE LOCAL, STATE, OR FEDERAL REGULATIONS.

1926.62(h) - *Housekeeping*. [Reference paragraph (h)(1) - (5)].

1926.62(i) - *Hygiene facilities and practices*. [Reference paragraph (i)(1) - (5)].

1926.62(j) - *Medical surveillance*. [Reference paragraph (j)(1) - (4)].

- 1926.62(j)(1)(ii) - The employer shall institute a *medical surveillance program* in accordance with paragraphs (j)(2) and (j)(3) of this section for all employees who are or may be exposed by the employer at or above the *action level* for more than 30 days in any consecutive 12 months;
- 1926.62(j)(2)(iv) - *Employee notification*. [Reference paragraph (j)(2)(iv)(A) - (B)].
- 1926.62(j)(3) - *Medical examinations and consultations*. [Reference paragraph (j)(3)(i) - (vi)].

1926.62(k) - *Medical removal protection*. [Reference paragraph (k)(1) - (2)].

1926.62(l) - *Communication of hazards*. [Reference paragraph (l)(1) - (3)].

- 1926.62(l)(1)(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: [Reference paragraph (l)(1)(i)(A) - (E)].
- 1926.62(l)(1)(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*. [Reference paragraph (l)(1)(ii) - (iv)].
- 1926.62(l)(2) - *Training program*. The employer shall assure that each employee is trained in the following: [Reference paragraph (l)(2)(i) - (viii)].
- 1926.62(l)(3) - *Access to information and training materials*. [Reference paragraph (l)(3)(i) - (ii)].

1926.62(m) - *Signs*. [Reference paragraph (m)(1) - (v)].

- 1926.62(m)(1)(i) - The employer shall *post* the following *warning signs* in each work area where an employee's exposure to lead is above the PEL.

[1926.62\(n\)](#) - *Recordkeeping*. [Reference [paragraph \(n\)\(1\) - \(6\)](#)].

- [1926.62\(n\)\(1\)](#) - *Exposure assessment*. [Reference [paragraph \(n\)\(1\)\(i\) - \(iii\)](#)].
 - [1926.62\(n\)\(1\)\(iii\)](#) - The employer shall maintain monitoring and other exposure assessment records in accordance with the provisions of [29 CFR 1910.33](#) (*sic - 1926.33 - refers to 1910.1020*) - *access to employee exposure and medical records*.
- [1926.62\(n\)\(2\)](#) - *Medical surveillance*. [Reference [paragraph \(n\)\(2\)\(i\) - \(iv\)](#)].
- [1926.62\(n\)\(3\)](#) - *Medical removals*. [Reference [paragraph \(n\)\(3\)\(i\) - \(iii\)](#)].
- [1926.62\(n\)\(4\)](#) - *Objective data* for exemption from requirement for initial monitoring. [Reference [paragraph \(n\)\(4\)\(i\) - \(ii\)](#)].
- [1926.62\(n\)\(6\)\(ii\)](#) - The employer shall also comply with any additional requirements involving the transfer of records set forth in [29 CFR 1910.1020\(h\)](#) - *access to employee exposure and medical records*.

[1926.62\(o\)](#) - *Observation of monitoring*. [Reference [paragraph \(o\)\(1\) - \(2\)](#)].

- [1926.62\(o\)\(2\)\(i\)](#) - Whenever *observation of the monitoring* of employee exposure to lead requires entry into an area where the use of *respirators, protective clothing or equipment* is required, the employer shall provide the observer with and assure the use of such respirators, clothing and equipment, and shall require the observer to comply with all other applicable *safety and health procedures*.

1926.64 - Process Safety Management of Highly Hazardous Materials

Scope: This [standard](#) provides the requirements for preventing or minimizing the consequences of catastrophic releases of toxic, reactive, flammable, or explosive chemicals. These releases may result in toxic, fire or explosion hazards. **Note:** This standard refers to [1910.119](#) as being identical for construction.

Special Requirements: Information (written), safety performance and programs, team, recommendations, emergency action plan (written), training (document), evaluations, work practices, documentation, safety rules, inform, explain, instructions, records, procedures (written), inspections (document), safe work practices, advise, reviews, process hazard analysis (written), information, methodologies, schedules, permits (document), updates, incident reports, reviews, audits, communicate, engineering controls, administrative controls, personal protective equipment, consultation, determine, operating procedures (written), agreements, evaluate, prepare, certify, references other standards

[1910.119\(c\)\(1\)](#) - Employers shall develop a *written plan of action* regarding the implementation of the employee participation required by this paragraph.

[1910.119\(c\)\(2\)](#) - Employers shall *consult with employees* and their representatives on the conduct and *development of process hazards analyses* and on the *development of the other elements of process safety management* in this standard.

[1910.119\(c\)\(3\)](#) - Employers shall provide to employees and their representatives access to *process hazard analyses* and to all other *information* required to be developed under this standard.

[1910.119\(d\)](#) - *Process safety information*. In accordance with the schedule set forth in [paragraph \(e\)\(1\)](#) of this section, the employer shall complete a compilation of *written process safety information* before conducting any process hazard analysis required by the standard. The compilation of *written process safety information* is to enable the employer and the employees involved in operating the process to identify and understand the hazards posed by those processes involving highly hazardous chemicals. This *process safety information* shall include information pertaining to the hazards of the highly hazardous chemicals used or produced by the process, information pertaining to the technology of the process, and information pertaining to the equipment in the process.

[1910.119\(d\)\(1\)](#) - *Information* pertaining to the hazards of the highly hazardous chemicals in the process. This *information* shall consist of at least the following: [Reference [paragraph \(d\)\(1\)\(i\) - \(vii\)](#)].

[1910.119\(d\)\(2\)](#) - *Information pertaining to the technology of the process*. [Reference [paragraph \(d\)\(2\)\(i\) - \(ii\)](#)].

[1910.119\(d\)\(3\)\(i\)](#) - *Information pertaining to the equipment* in the process shall include: [Reference [paragraph \(d\)\(3\)\(i\)\(A\) - \(H\)](#)].

[1910.119\(e\)\(1\)](#) - The employer shall *perform an initial process hazard analysis* (hazard evaluation) on processes covered by this standard. The *process hazard analysis* shall be appropriate to the complexity of the process and shall identify, evaluate, and control the hazards involved in the process. Employers shall *determine and document* the priority order for conducting *process hazard analyses* based on a rationale which includes such considerations as extent of the process hazards, number of potentially affected employees, age of the process, and operating history of the process. The *process hazard analysis* shall be conducted as soon as possible, but not later than the following *schedule*: [Reference [paragraph \(e\)\(1\)\(i\) - \(v\)](#)].

[1910.119\(e\)\(2\)](#) - The employer shall use one or more of the following *methodologies* that are appropriate to determine and *evaluate the hazards* of the process being analyzed. [Reference [paragraph \(e\)\(2\)\(i\) - \(vii\)](#)].

[1910.119\(e\)\(3\)](#) - The *process hazard analysis* shall address: [Reference [paragraph \(e\)\(3\)\(i\) - \(vii\)](#)].

[1910.119\(e\)\(4\)](#) - The *process hazard analysis* shall be performed by a *team with expertise in engineering and process operations*, and the team shall include at least *one employee who has experience and knowledge specific to the process* being evaluated. Also, one member of the team must be *knowledgeable in the specific process hazard analysis methodology* being used.

[1910.119\(e\)\(5\)](#) - The employer shall establish a *system* to promptly address the *team's findings and recommendations*; assure that the recommendations are resolved in a timely manner and that the *resolution is documented*; *document* what actions are to be taken; complete actions as soon as possible; develop a written schedule of when these actions are to be *completed*; *communicate* the actions to operating, *maintenance* and other employees whose work assignments are in the process and who may be affected by the *recommendations or actions*.

[1910.119\(e\)\(6\)](#) - At least every *five (5) years* after the completion of the *initial process hazard analysis*, the *process hazard analysis* shall be *updated and revalidated by a team* meeting the requirements in [paragraph \(e\)\(4\)](#) of this section, to assure that the process hazard analysis is consistent with the current process.

[1910.119\(e\)\(7\)](#) - Employers shall *retain process hazards analyses and updates or revalidations* for each process covered by this section, as well as the *documented resolution of recommendations* described in [paragraph \(e\)\(5\)](#) of this section for the life of the process.

[1910.119\(f\)\(1\)](#) - The employer shall *develop and implement written operating procedures* that provide *clear instructions* for safely conducting activities involved in each covered process consistent with the *process safety information* and shall address at least the following elements. [Reference [paragraph \(f\)\(1\)\(i\) - \(iv\)](#)].

[1910.119\(f\)\(3\)](#) - The *operating procedures* shall be reviewed as often as necessary to assure that they reflect current *operating practice*, including changes that result from changes in process chemicals, technology, and equipment, and changes to facilities. The employer shall *certify annually* that these *operating procedures* are current and accurate.

[1910.119\(f\)\(4\)](#) - The employer shall *develop and implement safe work practices* to provide for the control of hazards during operations such as *lockout/tagout; confined space entry*; opening process equipment or piping; and control over entrance into a facility by maintenance, contractor, laboratory, or other support personnel. These *safe work practices* shall apply to employees and contractor employees.

[1910.119\(g\)\(1\)\(i\)](#) - 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.

[1910.119\(g\)\(1\)\(ii\)](#) - 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*.

[1910.119\(g\)\(2\)](#) - *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*.

[1910.119\(g\)\(3\)](#) - *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*.

[1910.119\(h\)\(2\)](#) - Employer responsibilities.

- [1910.119\(h\)\(2\)\(i\)](#) - The employer, when selecting a contractor, shall *obtain* and *evaluate information* regarding the contract employer's *safety performance and programs*.
- [1910.119\(h\)\(2\)\(ii\)](#) - The employer shall *inform contract employers* of the known potential fire, explosion, or toxic release hazards related to the contractor's work and the process.
- [1910.119\(h\)\(2\)\(iii\)](#) - The employer shall *explain to contract employers* the applicable provisions of the *emergency action plan* required by [paragraph \(n\)](#) of this section.
- [1910.119\(h\)\(2\)\(iv\)](#) - The employer shall *develop and implement safe work practices* consistent with [paragraph \(f\)\(4\)](#) of this section, to control the entrance, presence and exit of contract employers and contract employees in covered process areas.

- [1910.119\(h\)\(2\)\(v\)](#) - The employer shall *periodically evaluate the performance* of contract employers in fulfilling their obligations as specified in [paragraph \(h\)\(3\)](#) of this section.
- [1910.119\(h\)\(2\)\(vi\)](#) - The employer shall *maintain a contract employee injury and illness log* related to the contractor's work in process areas.

[1910.119\(h\)\(3\)](#) - Contract employer responsibilities.

- [1910.119\(h\)\(3\)\(i\)](#) - The contract employer shall assure that each contract employee is *trained* in the *work practices* necessary to safely perform his/her job.
- [1910.119\(h\)\(3\)\(ii\)](#) - 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*.
- [1910.119\(h\)\(3\)\(iii\)](#) - 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*.
- [1910.119\(h\)\(3\)\(iv\)](#) - 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.
- [1910.119\(h\)\(3\)\(v\)](#) - The contract employer shall *advise the employer* of any unique hazards presented by the contract employer's work, or of any hazards found by the contract employer's work.

[1910.119\(i\)\(1\)](#) - *Pre-startup safety review*. The employer shall perform a *pre-startup safety review* for new facilities and for modified facilities when the modification is significant enough to require a change in the process safety information.

[1910.119\(i\)\(2\)](#) - The *pre-startup safety review* shall confirm that prior to the introduction of highly hazardous chemicals to a process:

- [1910.119\(i\)\(2\)\(i\)](#) - Construction and equipment is in accordance with *design specifications*;
- [1910.119\(i\)\(2\)\(ii\)](#) - *Safety, operating, maintenance, and emergency procedures* are in place and are adequate;

- [1910.119\(i\)\(2\)\(iii\)](#) - For new facilities, a *process hazard analysis* has been performed and recommendations have been resolved or implemented before startup; and modified facilities meet the requirements contained in management of change, [paragraph \(l\)](#).
- [1910.119\(i\)\(2\)\(iv\)](#) - *Training* of each employee involved in operating a process has been completed.

[1910.119\(j\)\(2\)](#) - *Written procedures*. The employer shall *establish* and implement *written procedures* to maintain the on-going integrity of process equipment.

[1910.119\(j\)\(3\)](#) - *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.

[1910.119\(j\)\(4\)](#) - *Inspection and testing*.

- [1910.119\(j\)\(4\)\(i\)](#) - *Inspections and tests* shall be performed on process equipment.
- [1910.119\(j\)\(4\)\(ii\)](#) - *Inspection and testing procedures* shall follow recognized and generally accepted good *engineering practices*.
- [1910.119\(j\)\(4\)\(iii\)](#) - The *frequency of inspections and tests* of process equipment shall be consistent with applicable *manufacturers' recommendations* and good *engineering practices*, and more frequently if determined to be necessary by prior operating experience.
- [1910.119\(j\)\(4\)\(iv\)](#) - The employer shall *document* each *inspection* and *test* that has been performed on process equipment. The *documentation* shall identify the date of the *inspection or test*, the name of the person who performed the *inspection or test*, the serial number or other identifier of the equipment on which the *inspection or test* was performed, a description of the *inspection or test* performed, and the results of the *inspection or test*.

[1910.119\(j\)\(6\)\(ii\)](#) - Appropriate *checks and inspections* shall be performed to assure that equipment is installed properly and consistent with *design specifications* and the *manufacturer's instructions*.

[1910.119\(k\)](#) - *Hot work permits*

- [1910.119\(k\)\(1\)](#) - The employer shall issue a *hot work permit* for hot work operations conducted on or near a covered process.

- [1910.119\(k\)\(2\)](#) - The *permit* shall *document* that the fire prevention and protection requirements in [29 CFR 1910.252\(a\)](#) - welding, cutting and brazing, general requirements, have been implemented prior to beginning the *hot work operations*; it shall indicate the date(s) authorized for hot work; and identify the object on which hot work is to be performed. The *permit* shall be kept on *file* until completion of the *hot work operations*.

[1910.119\(l\)\(1\)](#) - The employer shall *establish* and implement *written procedures* to manage changes (except for "replacements in kind") to process chemicals, technology, equipment, and *procedures*; and, changes to facilities that affect a covered process.

[1910.119\(l\)\(2\)](#) - The *procedures* shall assure that the following considerations are addressed prior to any change.

- [1910.119\(l\)\(2\)\(iii\)](#) - Modifications to *operating procedures*;

[1910.119\(l\)\(3\)](#) - 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.

[1910.119\(l\)\(4\)](#) - If a change covered by this paragraph results in a change in the *process safety information* required by [paragraph \(d\)](#) of this section, such *information* shall be *updated* accordingly.

[1910.119\(l\)\(5\)](#) - If a change covered by this paragraph results in a change in the *operating procedures or practices* required by [paragraph \(f\)](#) of this section, such *procedures or practices* shall be *updated* accordingly.

[1910.119\(m\)\(1\)](#) - The employer shall *investigate* each incident which resulted in, or could reasonably have resulted in a catastrophic release of highly hazardous chemical in the workplace.

[1910.119\(m\)\(2\)](#) - An *incident investigation* shall be initiated as promptly as possible, but not later than 48 hours following the incident.

[1910.119\(m\)\(3\)](#) - An *incident investigation team* shall be *established* and consist of at least one *person knowledgeable* in the process involved, including a contract employee if the incident involved work of the contractor, and other persons with *appropriate knowledge and experience* to thoroughly *investigate* and analyze the incident.

[1910.119\(m\)\(4\)](#) - A *report* shall be *prepared* at the *conclusion of the investigation* which includes at a minimum [[Reference paragraphs \(m\)\(4\)\(i\) - \(v\)](#)].

[1910.119\(m\)\(5\)](#) - The employer shall establish a *system* to promptly address and resolve the incident report *findings* and *recommendations*. Resolutions and corrective actions shall be *documented*.

[1910.119\(m\)\(6\)](#) - The *report* shall be *reviewed* with all affected personnel whose job tasks are relevant to the incident findings including contract employees where applicable.

[1910.119\(m\)\(7\)](#) - *Incident investigation reports* shall be *retained* for five years.

[1910.119\(n\)](#) - *Emergency planning and response*. The employer shall *establish* and implement an *emergency action plan* for the entire plant in accordance with the provisions of [29 CFR 1910.38](#) - emergency action plans. In addition, the *emergency action plan* shall include *procedures* for handling small releases. Employers covered under this standard may also be subject to the hazardous waste and emergency response provisions contained in [29 CFR 1910.120](#) - hazardous waste operations and emergency response, [\(a\)](#) - clean-up operations, [\(p\)](#) - treatment, storage and disposal (TSD), and [\(q\)](#) - emergency response operations.

[1910.119\(o\)](#) - *Compliance Audits*.

- [1910.119\(o\)\(1\)](#) - Employers shall *certify* that they have *evaluated* compliance with the provisions of this section at least *every three years* to verify that the *procedures and practices developed* under the standard are adequate and are being followed.
- [1910.119\(o\)\(2\)](#) - The compliance *audit* shall be *conducted* by at least one person *knowledgeable* in the process.
- [1910.119\(o\)\(3\)](#) - A *report* of the findings of the *audit* shall be *developed*.
- [1910.119\(o\)\(4\)](#) - The employer shall promptly determine and *document* an appropriate response to each of the findings of the compliance *audit*, and *document* that deficiencies have been corrected.
- [1910.119\(o\)\(5\)](#) - Employers shall *retain the two (2) most recent compliance audit reports*.

[1910.119\(p\)](#) - *Trade secrets*.

- [1910.119\(p\)\(1\)](#) - Employers shall make all *information* necessary to comply with the section available to those *persons responsible* for compiling the *process safety information* (required by [paragraph \(d\)](#) of this section), those assisting in the development of the *process hazard analysis* (required by [paragraph \(e\)](#) of this section), those responsible for developing the *operating procedures* (required by [paragraph \(f\)](#) of this section), and those involved in

incident *investigations* (required by [paragraph \(m\)](#) of this section), emergency planning and response ([paragraph \(n\)](#) of this section) and compliance *audits* ([paragraph \(o\)](#) of this section) without regard to possible trade secret status of such *information*.

- [1910.119\(p\)\(2\)](#) - Nothing in this paragraph shall preclude the employer from requiring the persons to whom the *information* is made available under [paragraph \(p\)\(1\)](#) of this section to enter into *confidentiality agreements* not to disclose the *information* as set forth in [29 CFR 1910.1200](#) - hazard communication.
- [1910.119\(p\)\(3\)](#) - Subject to the *rules and procedures* set forth in [29 CFR 1910.1200\(i\)\(1\)](#) through 1910.1200(i)(12), employees and their designated representatives shall have access to *trade secret information* contained within the process hazard analysis and other *documents* required to be developed by this standard.

Highly hazardous chemical means a substance possessing toxic, reactive, flammable, or explosive properties.

Normally unoccupied remote facility means a facility which is operated, maintained or serviced by employees who visit the facility only periodically to check its operation and to perform necessary operating or maintenance tasks. No employees are permanently stationed at the facility. Facilities meeting this definition are not contiguous with, and must be geographically remote from all other buildings, processes or persons.

Process means any activity involving a highly hazardous chemical including any use, storage, manufacturing, handling, or the on-site movement of such chemicals, or combination of these activities. For purposes of this definition, any group of vessels which are interconnected and separate vessels which are located such that a highly hazardous chemical could be involved in a potential release shall be considered a single process.

1926.65 - Hazardous Waste Operations and Emergency Response

Scope: This [standard](#) provides the requirements for for clean-up operations by an employer [[paragraph \(a\) - \(o\)](#)]; treatment, storage and disposal [[paragraph \(p\)](#)]; and emergency response when dealing with hazardous waste [[paragraph \(q\)](#)].

Clean-up operation means an operation where hazardous substances are removed, contained, incinerated, neutralized, stabilized, cleared-up, or in any other manner processed or handled with the ultimate goal of making the site safer for people or the environment.

Emergency response or responding to emergencies means a response effort by employees from outside the immediate release area or by other designated responders (i.e., mutual-aid groups, local fire departments, etc.) to an occurrence which results, or is likely to result, in an uncontrolled release of a hazardous substance. Responses to incidental releases of hazardous substances where the substance can be absorbed, neutralized, or otherwise controlled at the time of release by employees in the immediate release area, or by maintenance personnel are not considered to be emergency responses within the scope of this standard. Responses to releases of hazardous substances where there is no potential safety or health hazard (i.e., fire, explosion, or chemical exposure) are not considered to be emergency responses.

Special Requirements: Safety and health program (written), training, workplan, safety and health training program, medical surveillance program, PPE, inform contractors, operating procedures, safety and health control procedures, evaluations, information program, organizational structure (written), air monitoring, review, update, spill containment program, confined space procedures, engineering controls, qualified person, emergency response procedures, emergency response plan (written), decontamination procedures, site safety and health supervisor, site control measures, site control program (written elements), briefings, inspections, hazard communication program (written), employee notification, surveys, communication, alerting, safe work practices, instruction, employee training program, personal protective equipment program (written), hazard monitoring procedure, techniques, certificate (written), sampling procedures, entry procedures, trainer qualifications (documented), physician, special precautions, donning and doffing procedures, written opinion, records, HazMat team, records, certification, competency, labels, material handling program, decontamination program, copies, published exposure levels, briefings, training course, references other standards

Clean-Up Operations

1926.65(b)(1)(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.

1926.65(b)(1)(ii) - The *written safety and health program* shall incorporate the following: [Reference paragraph (b)(1)(ii)(A) - (G)].

1926.65(b)(1)(iii) - Site excavation. Site excavations created during initial site preparation or during hazardous waste operations shall be shored or sloped as appropriate to prevent accidental collapse in accordance with subpart P - excavations, of 29 CFR part 1926.

1926.65(b)(1)(iv) - Contractors and sub-contractors. An employer who retains contractor or sub-contractor services for work in hazardous waste operations shall *inform* those contractors, sub-contractors, or their representatives of the site *emergency response*

procedures and any potential fire, explosion, health, safety or other hazards of the hazardous waste operation that have been identified by the employer, including those identified in the employer's *information program*.

[1926.65\(b\)\(1\)\(v\)](#) - *Program availability*. The *written safety and health program* shall be made available to any contractor or subcontractor or their representative who will be involved with the hazardous waste operation; to employees; to employee designated representatives; to OSHA personnel, and to personnel of other Federal, state, or local agencies with regulatory authority over the site.

[1926.65\(b\)\(2\)\(i\)](#) - The *organizational structure part of the program* shall establish the specific *chain of command* and specify the overall responsibilities of supervisors and employees. It shall include, at a minimum, the following elements: [Reference [paragraph \(b\)\(2\)\(i\)\(A\) - \(D\)](#)].

[1926.65\(b\)\(2\)\(ii\)](#) - The *organizational structure* shall be *reviewed and updated* as necessary to reflect the current status of waste site operations.

[1926.65\(b\)\(3\)](#) - *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. [Reference [paragraph \(b\)\(3\)\(i\) - \(vi\)](#)].

[1926.65\(b\)\(4\)\(i\)](#) - 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.

[1926.65\(b\)\(4\)\(ii\)](#) - Elements. The *site safety and health plan*, as a minimum, shall address the following: [Reference [paragraph \(b\)\(4\)\(ii\)\(A\) - \(J\)](#)].

[1926.65\(b\)\(4\)\(iii\)](#) - *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*.

[1926.65\(b\)\(4\)\(iv\)](#) - Effectiveness of *site safety and health plan*. *Inspections* shall be conducted by the *site safety and health supervisor* or, in the absence of that individual, another individual who is knowledgeable in occupational safety and health, acting on behalf of the employer as necessary to determine the effectiveness of the *site safety and health plan*. Any deficiencies in the effectiveness of the *site safety and health plan* shall be corrected by the employer.

[1926.65\(c\)\(1\)](#) - General. Hazardous waste sites shall be *evaluated* in accordance with this paragraph to identify specific site hazards and to determine the appropriate *safety and health control procedures* needed to protect employees from the identified hazards.

[1926.65\(c\)\(2\)](#) - *Preliminary evaluation*. A *preliminary evaluation* of a site's characteristics shall be performed prior to site entry by a *qualified person* in order to aid in the selection of appropriate *employee protection methods* prior to site entry. Immediately after initial site entry, a more detailed *evaluation* of the site's specific characteristics shall be performed by a *qualified person* in order to further identify existing site hazards and to further aid in the selection of the appropriate *engineering controls and personal protective equipment* for the tasks to be performed.

[1926.65\(c\)\(3\)](#) - *Hazard identification*. All suspected conditions that may pose inhalation or skin absorption hazards that are immediately dangerous to life or health (IDLH), or other conditions that may cause death or serious harm, shall be identified during the *preliminary survey* and evaluated during the *detailed survey*. Examples of such hazards include, but are not limited to, confined space entry, potentially explosive or flammable situations, visible vapor clouds, or areas where biological indicators such as dead animals or vegetation are located.

[1926.65\(c\)\(4\)](#) - *Required information*. The following *information* to the extent available shall be obtained by the employer prior to allowing employees to enter a site: [Reference [paragraph \(c\)\(4\)\(i\) - \(viii\)](#)].

[1926.65\(c\)\(5\)](#) - *Personal protective equipment*. *Personal protective equipment (PPE)* shall be provided and used during initial site entry in accordance with the following requirements: [Reference [paragraph \(c\)\(5\)\(i\) - \(iv\)](#)].

[1926.65\(c\)\(6\)](#) - *Monitoring*. The following *monitoring* shall be conducted during initial site entry when the *site evaluation* produces information that shows the potential for ionizing radiation or IDLH conditions, or when the site information is not sufficient reasonably to eliminate these possible conditions: [Reference [paragraph \(c\)\(6\)\(i\) - \(iv\)](#)].

[1926.65\(c\)\(7\)](#) - *Risk identification*. 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.

[1926.65\(c\)\(8\)](#) - *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.

[1926.65\(d\)\(1\)](#) - General. Appropriate *site control procedures* shall be implemented to control employee exposure to hazardous substances before clean-up work begins.

[1926.65\(d\)\(2\)](#) - *Site control program*. A *site control program* for protecting employees which is part of the employer's *site safety and health program* required in [paragraph \(b\)](#) of this section shall be developed during the planning stages of a hazardous waste clean-up operation and modified as necessary as new information becomes available.

[1926.65\(d\)\(3\)](#) - *Elements of the site control program*. The *site control program* shall, as a minimum, include: A *site map*; *site work zones*; *the use of a "buddy system"*; *site communications including alerting* means for emergencies; *the standard operating procedures or safe work practices*; and, identification of the nearest medical assistance. Where these requirements are covered elsewhere they need not be repeated.

[1926.65\(e\)\(1\)\(i\)](#) - 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.

[1926.65\(e\)\(1\)\(ii\)](#) - 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.

[1926.65\(e\)\(2\)](#) - Elements to be covered. The *training* shall thoroughly cover the following: [Reference [paragraph \(e\)\(2\)\(i\) - \(vii\)](#)].

[1926.65\(e\)\(3\)](#) - *Initial training*. [Reference [paragraph \(e\)\(3\)\(i\) - \(iv\)](#)].

[1926.65\(e\)\(4\)](#) - *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*.

[1926.65\(e\)\(5\)](#) - *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.

[1926.65\(e\)\(6\)](#) - *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.

[1926.65\(e\)\(7\)](#) - *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.

[1926.65\(e\)\(8\)](#) - *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.

[1926.65\(e\)\(9\)](#) - *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.

[1926.65\(f\)\(1\)](#) - *General.* Employers engaged in operations specified in [paragraphs \(a\)\(1\)\(i\) through \(a\)\(1\)\(iv\)](#) of this section and not covered by [\(a\)\(2\)\(iii\)](#) exceptions and employers of employees specified in [paragraph \(q\)\(9\)](#) shall institute a *medical surveillance program* in accordance with this paragraph.

[1926.65\(f\)\(2\)](#) - *Employees covered.* The *medical surveillance program* shall be instituted by the employer for the following employees: [Reference [paragraph \(f\)\(2\)\(i\) - \(iv\)](#)].

[1926.65\(f\)\(4\)\(i\)](#) - Medical examinations required by [paragraph \(f\)\(3\)](#) of this section shall include a *medical and work history* (or updated history if one is in the employee's file) with special emphasis on symptoms related to the handling of hazardous substances and health hazards, and to fitness for duty including the ability to wear any required PPE under conditions (i.e., temperature extremes) that may be expected at the work site.

[1926.65\(f\)\(4\)\(ii\)](#) - The content of medical examinations or consultations made available to employees pursuant to [paragraph \(f\)](#) shall be determined by the attending physician. The *guidelines* in the *Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities* (See [appendix D](#), Reference #10) should be consulted.

[1926.65\(f\)\(6\)](#) - *Information provided to the physician*. The employer shall provide one *copy of this standard and its appendices* to the attending physician, and in addition the following for each employee: [Reference [paragraph \(f\)\(6\)\(i\) - \(v\)](#)].

[1926.65\(f\)\(7\)](#) - *Physician's written opinion*.

- [1926.65\(f\)\(7\)\(i\)](#) - The employer shall obtain and furnish the employee with a *copy of a written opinion* from the attending physician containing the following: [Reference [paragraph \(f\)\(7\)\(i\)\(A\) - \(D\)](#)].

[1926.65\(f\)\(8\)\(i\)](#) - An accurate *record* of the medical surveillance required by [paragraph \(f\)](#) of this section shall be *retained*. This *record* shall be retained for the period specified and meet the criteria of [29 CFR 1926.33](#) - *access to employee exposure and medical records*.

[1926.65\(f\)\(8\)\(ii\)](#) - The *record* required in [paragraph \(f\)\(8\)\(i\)](#) of this section shall include at least the following *information*: [Reference [paragraph \(f\)\(8\)\(ii\)\(A\) - \(D\)](#)].

[1926.65\(g\)](#) - *Engineering controls, work practices, and personal protective equipment for employee protection*. *Engineering controls, work practices, personal protective equipment*, or a combination of these shall be implemented in accordance with this paragraph to protect employees from exposure to hazardous substances and safety and health hazards.

[1926.65\(g\)\(1\)\(i\)](#) - *Engineering controls and work practices* shall be instituted to reduce and maintain employee exposure to or below the permissible exposure limits for substances regulated either in [1926.55](#) - *gases, vapors, fumes, dusts, and mists* or other pertinent sections of this part, except to the extent that such controls and practices are not feasible.

[1926.65\(g\)\(2\)](#) - *Engineering controls, work practices, and PPE for substances not regulated either in 1926.55 - gases, vapors, fumes, dusts, and mists, elsewhere in subpart D, or in other pertinent sections of this part*. An appropriate combination of *engineering controls, work practices, and personal protective equipment* shall be used to reduce and maintain employee exposure to or below published exposure levels for hazardous substances and health hazards not regulated either in [1926.55](#) - *gases, vapors, fumes, dusts, and mists*,

elsewhere in [subpart D](#), or in other pertinent sections of this part. The employer may use the *published literature* and *Safety Data Sheets (SDS)* as a guide in making the employer's determination as to what level of protection the employer believes is appropriate for hazardous substances and health hazards for which there is no permissible exposure limit or *published exposure limit*.

[1926.65\(g\)\(3\)](#) - *Personal protective equipment selection*. [Reference [paragraph \(g\)\(3\)\(i\) - \(v\)](#)].

[1926.65\(g\)\(3\)\(vi\)](#) - *Personal protective equipment* shall be selected and used to meet the requirements of [subpart E - personal protective and life saving equipment](#) of this part and additional requirements specified in this section.

[1926.65\(g\)\(4\)](#) - *Totally-encapsulating chemical protective suits*. [Reference [paragraph \(g\)\(4\)\(i\) - \(iii\)](#)].

[1926.65\(g\)\(5\)](#) - *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. [Reference [paragraph \(g\)\(5\)\(i\) - \(x\)](#)].

[1926.65\(h\)\(1\)\(i\)](#) - *Monitoring* shall be performed in accordance with this paragraph where there may be a question of employee exposure to hazardous concentrations of hazardous substances in order to assure proper selection of *engineering controls, work practices and personal protective equipment* so that employees are not exposed to levels which exceed permissible exposure limits, or published exposure levels if there are no permissible exposure limits, for hazardous substances.

[1926.65\(h\)\(1\)\(ii\)](#) - *Air monitoring* shall be used to identify and quantify airborne levels of hazardous substances and safety and health hazards in order to determine the appropriate level of employee protection needed on site.

[1926.65\(h\)\(2\)](#) - *Initial entry*. Upon initial entry, representative *air monitoring* shall be conducted to identify any IDLH condition, exposure over permissible exposure limits or published exposure levels, exposure over a radioactive material's dose limits or other dangerous condition such as the presence of flammable atmospheres or oxygen-deficient environments.

[1926.65\(h\)\(3\)](#) - *Periodic monitoring*. *Periodic monitoring* shall be conducted when the possibility of an IDLH condition or flammable atmosphere has developed or when there is

indication that exposures may have risen over permissible exposure limits or published exposure levels since *prior monitoring*. Situations where it shall be considered whether the possibility that exposures have risen are as follows: [Reference [paragraph \(h\)\(3\)\(i\) - \(iv\)](#)].

[1926.65\(h\)\(4\)](#) - *Monitoring of high-risk employees*. After the actual clean-up phase of any hazardous waste operation commences; for example, when soil, surface water or containers are moved or disturbed; the employer shall *monitor* those employees likely to have the highest exposures to hazardous substances and health hazards likely to be present above permissible exposure limits or *published exposure levels* by using *personal sampling frequently* enough to characterize employee exposures. If the employees likely to have the highest exposure are over permissible exposure limits or *published exposure limits*, then monitoring shall continue to determine all employees likely to be above those limits. The employer may utilize a representative *sampling approach* by *documenting* that the employees and chemicals chosen for monitoring are based on the criteria stated above.

[1926.65\(i\)](#) - *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.

[1926.65\(j\)\(1\)\(i\)](#) - Hazardous substances and contaminated soils, liquids, and other residues shall be handled, transported, *labeled*, and disposed of in accordance with this paragraph.

[1926.65\(j\)\(1\)\(ii\)](#) - Drums and containers used during the clean-up shall meet the appropriate *DOT, OSHA, and EPA regulations* for the wastes that they contain.

[1926.65\(j\)\(1\)\(iii\)](#) - When practical, drums and containers shall be inspected and their integrity shall be assured prior to being moved. Drums or containers that cannot be inspected before being moved because of storage conditions (i.e., buried beneath the earth, stacked behind other drums, stacked several tiers high in a pile, etc.) shall be moved to an accessible location and inspected prior to further handling.

[1926.65\(j\)\(1\)\(iv\)](#) - *Unlabeled drums and containers* shall be considered to contain hazardous substances and handled accordingly until the contents are positively identified and *labeled*.

[1926.65\(j\)\(1\)\(vi\)](#) - 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.

[1926.65\(j\)\(1\)\(viii\)](#) - Where major spills may occur, a *spill containment program*, which is part of the employer's *safety and health program* required in paragraph (b) of this section, shall be implemented to contain and isolate the entire volume of the hazardous substance being transferred.

[1926.65\(j\)\(1\)\(xii\)](#) - Fire extinguishing equipment meeting the requirements of *subpart F - fire protection and prevention* of this part (1926) shall be on hand and ready for use to control incipient fires.

[1926.65\(j\)\(2\)](#) - Opening drums and containers. The following *procedures* shall be followed in areas where drums or containers are being opened: [Reference [paragraph \(j\)\(2\)\(i\) - \(vii\)](#)].

[1926.65\(j\)\(5\)](#) - Shock sensitive wastes. As a minimum, the following *special precautions* shall be taken when drums and containers containing or suspected of containing shock-sensitive wastes are handled: [Reference [paragraph \(j\)\(5\)\(i\) - \(vi\)](#)].

[1926.65\(j\)\(6\)](#) - Laboratory waste packs. In addition to the requirements of [paragraph \(j\)\(5\)](#) of this section, the following *precautions* shall be taken, as a minimum, in handling laboratory waste packs (lab packs): [Reference [paragraph \(j\)\(6\)\(i\) - \(ii\)](#)].

[1926.65\(j\)\(7\)](#) - *Sampling of drum and container contents*. *Sampling* of containers and drums shall be done in accordance with a *sampling procedure* which is part of the *site safety and health plan* developed for and available to employees and others at the specific worksite.

[1926.65\(j\)\(8\)\(i\)](#) - Drums and containers shall be identified and classified prior to packaging for shipment.

[1926.65\(j\)\(9\)\(ii\)](#) - Appropriate tank or *vault entry procedures* as described in the employer's *safety and health plan* shall be followed whenever employees must enter a tank or vault.

[1926.65\(k\)\(1\)](#) - General. *Procedures* for all phases of decontamination shall be developed and implemented in accordance with this paragraph.

[1926.65\(k\)\(2\)](#) - *Decontamination procedures*. [Reference [paragraph \(k\)\(2\)\(i\) - \(iv\)](#)].

[1926.65\(k\)\(5\)\(i\)](#) - *Protective clothing and equipment* shall be decontaminated, cleaned, laundered, maintained or replaced as needed to maintain their effectiveness.

[1926.65\(k\)\(7\)](#) - Commercial laundries or cleaning establishments. Commercial laundries or cleaning establishments that decontaminate protective clothing or equipment shall be *informed* of the potentially harmful effects of exposures to hazardous substances.

[1926.65\(k\)\(8\)](#) - Showers and change rooms. Where the *decontamination procedure* indicates a need for regular showers and change rooms outside of a contaminated area, they shall be provided and meet the requirements of [29 CFR 1910.141](#) - *sanitation*. If temperature conditions prevent the effective use of water, then other effective means for cleansing shall be provided and used.

[1926.65\(l\)\(1\)\(i\)](#) - An *emergency response plan* shall be developed and implemented by all employers within the scope of [paragraphs \(a\)\(1\)\(i\)-\(ii\)](#) of this section to handle anticipated emergencies prior to the commencement of hazardous waste operations. The *plan* shall be in *writing* and available for *inspection and copying* by employees, their representatives, OSHA personnel and other governmental agencies with relevant responsibilities.

[1926.65\(l\)\(1\)\(ii\)](#) - Employers who will evacuate their employees from the danger area when an emergency occurs, and who do not permit any of their employees to assist in handling the emergency, are exempt from the requirements of this paragraph if they provide an *emergency action plan* complying with [1926.35](#) - *employee emergency action plans* of this part (1926).

[1926.65\(l\)\(2\)](#) - Elements of an *emergency response plan*. The employer shall develop an *emergency response plan* for emergencies which shall address, as a minimum, the following: [Reference [paragraph \(l\)\(2\)\(i\) - \(xi\)](#)].

[1926.65\(l\)\(3\)\(i\)](#) - *Procedures for handling emergency incidents*. In addition to the elements for the *emergency response plan* required in [paragraph \(l\)\(2\)](#) of this section, the following elements shall be included for *emergency response plans*: [Reference [paragraph \(l\)\(3\)\(i\) - \(vii\)](#)].

[1926.65\(n\)\(7\)\(i\)](#) - Showers shall be provided and shall meet the requirements of [29 CFR 1926.51\(f\)\(4\)](#) - *sanitation*.

[1926.65\(n\)\(7\)\(ii\)](#) - Change rooms shall be provided and shall meet the requirements of [29 CFR 1926.51\(i\)](#) - *sanitation*. Change rooms shall consist of two separate change areas separated by the shower area required in [paragraph \(n\)\(7\)\(i\)](#) of this section. One change area, with an exit leading off the worksite, shall provide employees with a clean area where they can remove, store, and put on street clothing. The second area, with an exit to the worksite, shall provide employees with an area where they can put on, remove and store work clothing and personal protective equipment.

[1926.65\(o\)\(1\)](#) - *New technology programs*. 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.

Treatment, Storage and Disposal

[1926.65\(p\)\(1\)](#) - *Safety and health program*. The employer shall develop and implement a *written safety and health program* for employees involved in hazardous waste operations that shall be available for inspection by employees, their representatives and OSHA personnel. The *program* shall be designed to *identify, evaluate* and control safety and health hazards in their facilities for the purpose of employee protection, to provide for emergency response meeting the requirements of [paragraph \(p\)\(8\)](#) of this section and to address as appropriate site analysis, *engineering controls*, maximum exposure limits, *hazardous waste handling procedures* and uses of new technologies.

[1926.65\(p\)\(2\)](#) - *Hazard communication program*. The employer shall implement a *hazard communication program* meeting the requirements of [29 CFR 1926.59](#) - *hazard communication*, as part of the employer's *safety and program*.

[1926.65\(p\)\(3\)](#) - *Medical surveillance program*. The employer shall develop and implement a *medical surveillance program* meeting the requirements of [paragraph \(f\)](#) of this section.

[1926.65\(p\)\(4\)](#) - *Decontamination program*. The employer shall develop and implement a *decontamination procedure* meeting the requirements of [paragraph \(k\)](#) of this section.

[1926.65\(p\)\(5\)](#) - *New technology program*. The employer shall develop and implement *procedures* meeting the requirements of [paragraph \(o\)](#) of this section for introducing new and innovative equipment into the workplace.

[1926.65\(p\)\(6\)](#) - *Material handling program*. Where employees will be handling drums or containers, the employer shall develop and implement *procedures* meeting the requirements of [paragraphs \(j\)\(1\)\(ii\) through \(viii\)](#) and [\(xi\)](#) of this section, as well as [\(j\)\(3\)](#) and [\(j\)\(8\)](#) of this section prior to starting such work.

[1926.65\(p\)\(7\)](#) - *Training program* [Reference [paragraph \(p\)\(7\)\(i\) - \(iii\)](#)].

[1926.65\(p\)\(8\)\(i\)](#) - *Emergency response plan*. An *emergency response plan* shall be developed and implemented by all employers. Such *plans* need not duplicate any of the subjects fully addressed in the employer's contingency planning required by permits, such as those issued by the U.S. Environmental Protection Agency, provided that the contingency plan is made part of the *emergency response plan*. The *emergency response plan* shall be a *written portion* of the employers *safety and health program* required in [paragraph \(p\)\(1\)](#) of this section. Employers who will evacuate their employees from the worksite location when an emergency occurs and who do not permit any of their employees to assist in handling the emergency are exempt from the requirements of [paragraph \(p\)\(8\)](#) if they provide an *emergency action plan* complying with [1926.35](#) - *employee emergency action plans* of this part (1926).

[1926.65\(p\)\(8\)\(ii\)](#) - *Elements of an emergency response plan*. The employer shall develop an *emergency response plan* for emergencies which shall address, as a minimum, the following areas to the extent that they are not addressed in any specific program required in this paragraph: [Reference [paragraph \(p\)\(8\)\(ii\)\(A\) - \(K\)](#)].

[1926.65\(p\)\(8\)\(iii\)\(A\)](#) - *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.

[1926.65\(p\)\(8\)\(iii\)\(B\)](#) - 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.

[1926.65\(p\)\(8\)\(iii\)\(C\)](#) - 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.

[1926.65\(p\)\(8\)\(iv\)](#) - *Procedures for handling emergency incidents*. [Reference [paragraph \(p\)\(8\)\(iv\)\(A\) - \(F\)](#)].

Emergency Response

[1926.65\(q\)\(1\)](#) - *Emergency response plan*. An *emergency response plan* shall be developed and implemented to handle anticipated emergencies prior to the commencement of emergency response operations. The *plan* shall be in *writing* and available for *inspection and copying* by employees, their representatives and OSHA personnel. Employers who will evacuate their employees from the danger area when an emergency occurs, and who do not permit any of their employees to assist in handling the emergency, are exempt from the requirements of this paragraph if they provide an emergency action plan in accordance with [1926.35](#) - *employee emergency action plans* of this part.

[1926.65\(q\)\(2\)](#) - *Elements of an emergency response plan*. The employer shall develop an *emergency response plan* for emergencies which shall address, as a minimum, the following to the extent that they are not addressed elsewhere: [Reference [paragraph \(q\)\(2\)\(i\) - \(xii\)](#)].

1926.65(q)(3) - Procedures for handling emergency response. [Reference paragraph (q)(3)(i)-(x)].

1926.65(q)(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.

1926.65(q)(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.

1926.65(q)(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:

- 1926.65(q)(6)(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: [Reference paragraph (q)(6)(i)(A) - (F)].
- 1926.65(q)(6)(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: [Reference [paragraph \(q\)\(6\)\(ii\)\(A\) - \(F\)](#)].

- [1926.65\(q\)\(6\)\(iii\)](#) - *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: [Reference [paragraph \(q\)\(6\)\(iii\)\(A\) - \(I\)](#)].
- [1926.65\(q\)\(6\)\(iv\)](#) - *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: [Reference [paragraph \(q\)\(6\)\(iv\)\(A\) - \(I\)](#)].
- [1926.65\(q\)\(6\)\(v\)](#) - *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: [Reference [paragraph \(q\)\(6\)\(v\)\(A\) - \(F\)](#)].

[1926.65\(q\)\(7\)](#) - *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.

[1926.65\(q\)\(8\)](#) - *Refresher training*. [Reference [paragraph \(q\)\(8\)\(i\) - \(ii\)](#)].

[1926.65\(q\)\(9\)\(i\)](#) - Members of an organized and designated *HAZMAT team and hazardous materials specialists* shall receive a baseline physical examination and be provided with *medical surveillance* as required in [paragraph \(f\)](#) of this section.

[1926.65\(q\)\(10\)](#) - *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.*

[1926.65\(q\)\(11\)\(ii\)](#) - 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](#) - *employee emergency action plans*, [1926.59](#) - *hazard communication*, and [1926.103](#) - *respiratory protection*, 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.

1926.66 - Criteria for Design and Construction of Spray Booths

Scope: This [standard](#) provides requirements for the design and construction of spray booths.

[Spray booth.](#) A power-ventilated structure provided to enclose or accommodate a spraying operation to confine and limit the escape of spray, vapor, and residue, and to safely conduct or direct them to an exhaust system.

Special Requirements: Inspections, design, approved sprinklers, approved equipment, signs (posted), references other standards

[1926.66\(b\)\(5\)\(i\)](#) - Dry type overspray collectors - (exhaust air filters). The spraying operations except electrostatic spraying operations shall be so *designed*, installed and maintained that the average air velocity over the open face of the booth (or booth cross section during spraying operations) shall be not less than 100 linear feet per minute. Electrostatic spraying operations may be conducted with an air velocity over the open face of the booth of not less than 60 linear feet per minute, or more, depending on the volume of the finishing material being applied and its flammability and explosion characteristics. Visible gauges or audible alarm or pressure activated devices shall be installed to indicate or insure that the required air velocity is maintained. Filter rolls shall be *inspected* to insure proper replacement of filter media.

[1926.66\(b\)\(5\)\(iv\)](#) - Space within the spray booth on the downstream and upstream sides of filters shall be protected with *approved automatic sprinklers*.

[1926.66\(b\)\(5\)\(vi\)](#) - Clean filters or filter rolls shall be noncombustible or of a type having a combustibility not in excess of class 2 filters as *listed by Underwriters' Laboratories, Inc.* Filters and filter rolls shall not be alternately used for different types of coating materials, where the combination of materials may be conducive to spontaneous ignition.

[1926.66\(c\)\(4\)](#) - Wiring conformance. Electrical wiring and equipment shall conform to the provisions of this paragraph and shall otherwise be in accordance with [subpart S](#) - *electrical*, of this part.

[1926.66\(c\)\(6\)](#) - Wiring type approved. Electrical wiring and equipment not subject to deposits of combustible residues but located in a spraying area as herein defined shall be of explosion-proof type *approved for Class I, group D locations* and shall otherwise conform to the provisions of [subpart S](#) - *electrical* of this part, for *Class I, Division 1, Hazardous Locations*. Electrical wiring, motors, and other equipment outside of but within 20 feet (6.08 m) of any spraying area, and not separated therefrom by partitions, shall not produce sparks under normal operating conditions and shall otherwise conform to the provisions of [subpart S](#) - *electrical* of this part for *Class I, Division 2 Hazardous Locations*.

[1926.66\(c\)\(8\)](#) - Portable lamps. Portable electric lamps shall not be used in any spraying area during spraying operations. Portable electric lamps, if used during cleaning or repairing operations, shall be of the type *approved for hazardous Class I locations*.

[1926.66\(d\)\(1\)](#) - Conformance. Ventilating and exhaust systems shall be in accordance with the *Standard for Blower and Exhaust Systems for Vapor Removal, NFPA No. 91-1961*, where applicable and shall also conform to the provisions of this section.

[1926.66\(e\)\(2\)](#) - *Type approval*. Electrostatic apparatus and devices used in connection with coating operations shall be of *approved types*.

[1926.66\(e\)\(6\)](#) - Safe distance. A safe distance shall be maintained between goods being painted and electrodes or electrostatic atomizing heads or conductors of at least twice the sparking distance. A *suitable sign* indicating this safe distance shall be *conspicuously posted* near the assembly.

[1926.66\(e\)\(12\)](#) - Fire protection. All areas used for spraying, including the interior of the booth, shall be protected by automatic sprinklers where this protection is available. Where this protection is not available, other *approved automatic extinguishing equipment* shall be provided.

[1926.66\(f\)\(3\)](#) - *Equipment approval and specifications*. Electrostatic hand spray apparatus and devices used in connection with coating operations shall be of *approved types*. The high voltage circuits shall be designed so as to not produce a spark of sufficient intensity to ignite any vapor-air mixtures nor result in appreciable shock hazard upon coming in contact with a grounded object under all normal operating conditions. The electrostatically charged exposed elements of the handgun shall be capable of being energized only by a switch which also controls the coating material supply.

[1926.66\(g\)\(1\)](#) - Conformance. Drying, curing, or fusion apparatus in connection with spray application of flammable and combustible finishes shall conform to the *Standard for*

Ovens and Furnaces, NFPA 86A-1969, where applicable and shall also conform with the following requirements of this paragraph.

[1926.66\(g\)\(4\)\(iv\)](#) - All electrical wiring and equipment of the drying apparatus shall conform with the applicable sections of [subpart S](#) - electrical of this part. Only equipment of a *type approved for Class I, Division 2 hazardous locations* shall be located within 18 inches (45.72 cm) of floor level. All metallic parts of the drying apparatus shall be properly electrically bonded and grounded.

[1926.66\(g\)\(4\)\(v\)](#) - The drying apparatus shall contain a prominently located, permanently attached *warning sign* indicating that ventilation should be maintained during the drying period and that spraying should not be conducted in the vicinity that spray will deposit on apparatus.

Subpart E - [Personal Protective and Life Saving Equipment](#)

[Subpart E](#) provides the standards for personal protective equipment including foot protection; electrical protective equipment; head protection; hearing protection; eye and face protection; respiratory protection; safety belts, lifelines and lanyards; and safety nets. It also includes standards for working over or near water.

To learn if subpart E applies to you, go to [Does "Subpart E - Personal Protective and Life Saving Equipment" Apply to You?](#)

Special Requirements

1926.95 - Criteria for personal protective equipment

Scope: This [standard](#) provides requirements for protective equipment, including personal protective equipment for eyes, face, head, and extremities, protective clothing, respiratory devices, and protective shields and barriers, shall be provided, used, and maintained in a sanitary and reliable condition wherever it is necessary by reason of hazards of processes or environment, chemical hazards, radiological hazards, or mechanical irritants encountered in a manner capable of causing injury or impairment in the function of any part of the body through absorption, inhalation or physical contact.

Special Requirements: Personal protective equipment (i.e., footwear, eyewear), design, maintenance, affected employee

[1926.95\(b\)](#) - *Employee-owned equipment*. Where employees provide their own *protective equipment*, the employer shall be responsible to assure its adequacy, including proper *maintenance*, and sanitation of such equipment.

1926.95(c) - *Design and selection*. Employers must ensure that all *personal protective equipment*:

- 1926.95(c)(1) - Is of safe *design* and construction for the work to be performed; and
- 1926.95(c)(2) - Is selected to ensure that it properly fits each *affected employee*.

1926.95(d)(1) - Except as provided by paragraphs (d)(2) through (d)(6) of this section, the *protective equipment*, including *personal protective equipment (PPE)*, used to comply with this part (1926), shall be provided by the employer at no cost to employees.

1926.95(d)(2) - The employer is not required to pay for non-specialty *safety-toe protective footwear* (including *steel-toe shoes or steel-toe boots*) and *non-specialty prescription safety eyewear*, provided that the employer permits such items to be worn off the job-site.

1926.95(d)(3) - When the employer provides metatarsal guards and allows the employee, at his or her request, to use *shoes or boots* with built-in metatarsal protection, the employer is not required to reimburse the employee for the *shoes or boots*.

1926.95(d)(4) - The employer is not required to pay for: [Reference paragraph (d)(4)(i) - (ii)].

1926.95(d)(5) - The employer must pay for replacement *PPE*, except when the employee has lost or intentionally damaged the *PPE*.

1926.95(d)(6) - Where an employee provides adequate *protective equipment* he or she owns pursuant to paragraph (b) of this section, the employer may allow the employee to use it and is not required to reimburse the employee for that *equipment*. The employer shall not require an employee to provide or pay for his or her own *PPE*, unless the *PPE* is excepted by paragraphs (d)(2) through (d)(5) of this section.

1926.96 - Occupational Foot Protection

Scope: This standard provides requirements for foot protection.

Special Requirements: Personal protective equipment, specifications, references other standards

Safety-toe footwear for employees shall meet the requirements and *specifications* in *American National Standard for Men's Safety-Toe Footwear, Z41.1-1967*.

1926.97 - Electrical Protective Equipment

Scope: This standard provides the requirements for electrical protective equipment.

Special Requirements: Design, personal protective equipment (i.e., gloves, blankets), markings, proof tests, inspections, employer demonstrates, visually examine, certification, logs, guide, certify, methods, techniques, references other standards

1926.97(a) - Design requirements for specific types of *electrical protective equipment*. Rubber insulating blankets, rubber insulating matting, rubber insulating covers, rubber insulating line hose, rubber insulating gloves, and rubber insulating sleeves shall meet the following requirements:

- 1926.97(a)(1) - Manufacture and *marking* of rubber insulating equipment.
 - 1926.97(a)(1)(ii) - Each item shall be clearly *marked* as follows:
[Reference paragraph (a)(1)(ii)(A) - (I)].
 - 1926.97(a)(1)(iii) - *Markings* shall be nonconducting and shall be applied in such a manner as not to impair the insulating qualities of the equipment.
 - 1926.97(a)(1)(iv) - *Markings* on *gloves* shall be confined to the cuff portion of the *glove*.
- 1926.97(a)(2) - *Electrical requirements*.
 - 1926.97(a)(2)(i) - Equipment shall be capable of withstanding the *ac proof-test* voltage specified in Table E-1 or the *dc proof-test* voltage specified in Table E-2 (scroll down). [Reference paragraph (a)(2)(i)(A) - (C)].
 - 1926.97(a)(2)(ii) - When the *ac proof test* is used on gloves, the 60-hertz *proof-test* current may not exceed the values specified in Table E-1 at any time during the *test period*. [Reference paragraph (a)(2)(ii)(A) - (C)].
 - 1926.97(a)(2)(iii) - *Equipment* that has been subjected to a minimum *breakdown voltage test* may not be used for electrical protection.
 - 1926.97(a)(2)(iv) - Material used for Type II *insulating equipment* shall be capable of withstanding an *ozone test*, with no visible effects. The *ozone test* shall reliably indicate that the material will resist ozone exposure in actual use. Any visible signs of ozone deterioration of the material, such as checking, cracking, breaks, or pitting, is evidence of failure to meet the requirements for ozone-resistant material.
- 1926.97(a)(3)(i) - *Equipment* shall be free of physical irregularities that can adversely affect the insulating properties of the *equipment* and that can be detected by the *tests or inspections* required under this section. Note to paragraph (a): Rubber *insulating equipment* meeting the following *national consensus standards* is deemed to be in compliance with the performance requirements of paragraph (a) of this section: [Reference paragraph (a)(3)(ii)(B)].

1926.97(b) - Design requirements for other types of *electrical protective equipment*. The following requirements apply to the *design* and manufacture of *electrical protective equipment* that is not covered by paragraph (a) of this section: [Reference paragraph (b)(1) - (2)].

[1926.97\(c\)\(2\)\(ii\)](#) - *Insulating equipment shall be inspected for damage before each day's use and immediately following any incident that can reasonably be suspected of causing damage. Insulating gloves shall be given an air test, along with the inspection. Note to [paragraph \(c\)\(2\)\(ii\)](#): ASTM F1236-96 (2012), Standard Guide for Visual Inspection of Electrical Protective Rubber Products, presents methods and techniques for the visual inspection of electrical protective equipment made of rubber. This guide also contains descriptions and photographs of irregularities that can be found in this equipment.*

[1926.97\(c\)\(2\)\(iv\)](#) - *Insulating equipment found to have other defects that might affect its insulating properties shall be removed from service and returned for testing under [paragraphs \(c\)\(2\)\(viii\)](#) and [\(c\)\(2\)\(ix\)](#) of this section.*

[1926.97\(c\)\(2\)\(vii\)\(A\)](#) - *Protector gloves need not be used with Class 0 gloves, under limited-use conditions, when small equipment and parts manipulation necessitate unusually high finger dexterity. Note to [paragraph \(c\)\(2\)\(vii\)\(A\)](#): Persons inspecting rubber insulating gloves used under these conditions need to take extra care in visually examining them. Employees using rubber insulating gloves under these conditions need to take extra care to avoid handling sharp objects.*

[1926.97\(c\)\(2\)\(vii\)\(B\)](#) - *If the voltage does not exceed 250 volts, ac, or 375 volts, dc, protector gloves need not be used with Class 00 gloves, under limited-use conditions, when small equipment and parts manipulation necessitate unusually high finger dexterity. Note to [paragraph \(c\)\(2\)\(vii\)\(B\)](#): Persons inspecting rubber insulating gloves used under these conditions need to take extra care in visually examining them. Employees using rubber insulating gloves under these conditions need to take extra care to avoid handling sharp objects.*

[1926.97\(c\)\(2\)\(vii\)\(C\)](#) - *Any other class of glove may be used without protector gloves, under limited-use conditions, when small equipment and parts manipulation necessitate unusually high finger dexterity but only if the employer can demonstrate that the possibility of physical damage to the gloves is small and if the class of glove is one class higher than that required for the voltage involved.*

[1926.97\(c\)\(2\)\(vii\)\(D\)](#) - *Insulating gloves that have been used without protector gloves may not be reused until they have been tested under the provisions of [paragraphs \(c\)\(2\)\(viii\)](#) and [\(c\)\(2\)\(ix\)](#) of this section.*

[1926.97\(c\)\(2\)\(viii\)](#) - *Electrical protective equipment shall be subjected to periodic electrical tests. Test voltages and the maximum intervals between tests shall be in accordance with [Table E-4](#) and [Table E-5](#) (scroll down).*

[1926.97\(c\)\(2\)\(ix\)](#) - *The test method used under [paragraphs \(c\)\(2\)\(viii\)](#) and [\(c\)\(2\)\(xi\)](#) of this section shall reliably indicate whether the insulating equipment can withstand the voltages*

involved. Note to [paragraph \(c\)\(2\)\(ix\)](#): Standard *electrical test methods* considered as meeting this paragraph are given in the following national *consensus standards*: [Reference [paragraph \(c\)\(2\)\(ix\)](#)].

[1926.97\(c\)\(2\)\(x\)](#) - Insulating equipment failing to pass *inspections or electrical tests* may not be used by employees, except as follows: [Reference [paragraph \(c\)\(2\)\(x\)\(A\) - \(D\)](#)].

[1926.97\(c\)\(2\)\(xi\)](#) - Repaired *insulating equipment* shall be *retested* before it may be used by employees.

[1926.97\(c\)\(2\)\(xii\)](#) - The employer shall *certify* that *equipment* has been *tested* in accordance with the requirements of [paragraphs \(c\)\(2\)\(iv\)](#), [\(c\)\(2\)\(vii\)\(D\)](#), [\(c\)\(2\)\(viii\)](#), [\(c\)\(2\)\(ix\)](#), and [\(c\)\(2\)\(xi\)](#) of this section. The *certification* shall identify the equipment that passed the *test* and the date it was *tested* and shall be made available upon request to the Assistant Secretary for Occupational Safety and Health and to employees or their authorized representatives. Note to [paragraph \(c\)\(2\)\(xii\)](#): *Marking* equipment with, and entering onto *logs*, the results of the *tests* and the dates of *testing* are two acceptable means of meeting the *certification* requirement.

1926.100 - Head Protection

Scope: This [standard](#) provides the requirements for head protection.

Special Requirements: Personal protective equipment (helmets), specifications, employer demonstrates, references other standards

[1926.100\(a\)](#) - Employees working in areas where there is a possible danger of head injury from impact, or from falling or flying objects, or from electrical shock and burns, shall be protected by *protective helmets*.

[1926.100\(b\)\(1\)](#) - The employer must provide each employee with *head protection* that meets the *specifications* contained in any of the following *consensus standards*: [Reference [paragraph \(b\)\(1\)\(i\) - \(iii\)](#)].

[1926.100\(b\)\(2\)](#) - The employer must ensure that the *head protection* provided for each employee exposed to high-voltage electric shock and burns also meets the *specifications* contained in Section 9.7 ("Electrical Insulation") of any of the *consensus standards* identified in [paragraph \(b\)\(1\)](#) of this section.

[1926.100\(b\)\(3\)](#) - OSHA will deem any *head protection* device that the *employer demonstrates* is at least as effective as a *head protection device* constructed in accordance with one of the *consensus standards* identified in [paragraph \(b\)\(1\)](#) of this section to be in compliance with the requirements of this section.

1926.101 - Hearing Protection

Scope: This [standard](#) provides the requirements for hearing protection.

Special Requirements: Personal protective equipment (ear protective devices), competent person, references other standards

[1926.101\(a\)](#) - Wherever it is not feasible to reduce the noise levels or duration of exposures to those specified in [Table D-2](#), Permissible Noise Exposures, in [1926.52](#) - occupational noise exposure, *ear protective devices* shall be provided and used.

[1926.101\(b\)](#) - *Ear protective devices* inserted in the ear shall be fitted or determined individually by *competent persons*.

1926.102 - Eye and Face Protection

Scope: This [standard](#) provides the requirements for eye and face protection.

Special Requirements: Personal protective equipment (eye/face protection, side protection), laser safety goggles, affected employee, employer demonstrates, prescription lenses, marked, manufacturer identification, shade numbers, label, data, references other standards

[1926.102\(a\)\(1\)](#) - The employer shall ensure that each *affected employee* uses appropriate *eye or face protection* when exposed to eye or face hazards from flying particles, molten metal, liquid chemicals, acids or caustic liquids, chemical gases or vapors, or potentially injurious light radiation.

[1926.102\(a\)\(2\)](#) - The employer shall ensure that each *affected employee* uses *eye protection* that provides *side protection* when there is a hazard from flying objects. Detachable *side protectors* (e.g. clip-on or slide-on side shields) meeting the pertinent requirements of this section are acceptable.

[1926.102\(a\)\(3\)](#) - The employer shall ensure that each *affected employee* who wears *prescription lenses* while engaged in operations that involve eye hazards wears *eye protection* that incorporates the *prescription* in its design, or wears *eye protection* that can be worn over the *prescription lenses* without disturbing the proper position of the *prescription lenses* or the *protective lenses*.

[1926.102\(a\)\(4\)](#) - *Eye and face PPE* shall be distinctly *marked* to facilitate *identification* of the *manufacturer*.

[1926.102\(b\)\(1\)](#) - *Protective eye and face protection devices* must comply with any of the following *consensus standards*: [Reference [paragraph \(b\)\(1\)\(i\) - \(iii\)](#)].

[1926.102\(b\)\(2\)](#) - Protective eye and face protection devices that the *employer demonstrates* are at least as effective as protective eye and face protection devices that are constructed in accordance with one of the above *consensus standards* will be deemed to be in compliance with the requirements of this section.

[1926.102\(c\)\(1\)](#) - Selection of *shade numbers* for welding filter. [Table E-1](#) shall be used as a guide for the selection of the proper *shade numbers* of filter lenses or plates used in welding. Shades more dense than those listed may be used to suit the individual's needs.

[1926.102\(c\)\(2\)\(i\)](#) - Employees whose occupation or assignment requires exposure to laser beams shall be furnished suitable *laser safety goggles* which will protect for the specific wavelength of the laser and be of optical density (O.D.) adequate for the energy involved. [Table E-2](#) lists the maximum power or energy density for which adequate protection is afforded by glasses of optical densities from 5 through 8. Output levels falling between lines in this table shall require the higher optical density.

[1926.102\(c\)\(2\)\(ii\)](#) - All *protective goggles* shall bear a *label* identifying the following *data*: [Reference [paragraph \(c\)\(2\)\(ii\)\(A\) - \(C\)](#)].

1926.103 - Respiratory Protection

Scope: This [standard](#) provides the requirements for respiratory protection to prevent exposure to air contaminants. **Note:** 1926.103 refers to [1910.134](#) as being identical for construction.

Special Requirements: Engineering control measures, respirator program (written), procedures, respirators, training, fit testing, medical evaluations, program administrator, hazard evaluations, inspections, NIOSH-certified respirators, affected employees, change schedules, employer demonstrates, medical questionnaire, tests, certification, records, recordkeeping, assigned protection factors, tags, recommendations (written), PLHCP, references other standards

[1910.134\(a\)\(1\)](#) - In the control of those occupational diseases caused by breathing air contaminated with harmful dusts, fogs, fumes, mists, gases, smokes, sprays, or vapors, the primary objective shall be to prevent atmospheric contamination. This shall be accomplished as far as feasible by *accepted engineering control measures* (for example, enclosure or confinement of the operation, general and local ventilation, and substitution of less toxic materials). When effective *engineering controls* are not feasible, or while they are being instituted, appropriate *respirators* shall be used pursuant to this section.

[1910.134\(a\)\(2\)](#) - 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*.

[1910.134\(c\)\(1\)](#) - 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:

- [1910.134\(c\)\(1\)\(i\)](#) - *Procedures for selecting respirators for use in the workplace;*
- [1910.134\(c\)\(1\)\(ii\)](#) - *Medical evaluations of employees required to use respirators;*
- [1910.134\(c\)\(1\)\(iii\)](#) - *Fit testing procedures for tight-fitting respirators;*
- [1910.134\(c\)\(1\)\(iv\)](#) - *Procedures for proper use of respirators in routine and reasonably foreseeable emergency situations;*
- [1910.134\(c\)\(1\)\(v\)](#) - *Procedures and schedules for cleaning, disinfecting, storing, inspecting, repairing, discarding, and otherwise maintaining respirators;*
- [1910.134\(c\)\(1\)\(vi\)](#) - *Procedures to ensure adequate air quality, quantity, and flow of breathing air for atmosphere-supplying respirators;*
- [1910.134\(c\)\(1\)\(vii\)](#) - *Training of employees in the respiratory hazards to which they are potentially exposed during routine and emergency situations;*
- [1910.134\(c\)\(1\)\(viii\)](#) - *Training of employees in the proper use of respirators, including putting on and removing them, any limitations on their use, and their maintenance; and*
- [1910.134\(c\)\(1\)\(ix\)](#) - *Procedures for regularly evaluating the effectiveness of the program.*

[1910.134\(c\)\(2\)](#) - Where *respirator use* is not required:

- [1910.134\(c\)\(2\)\(i\)](#) - An employer may provide *respirators* at the *request of employees* or permit employees to use their own *respirators*, if the *employer determines* that such *respirator use* will not in itself create a hazard. If the *employer determines* that any *voluntary respirator use* is permissible, the employer shall provide the *respirator users* with the *information* contained in [appendix D](#) to this section ("Information for Employees Using Respirators When Not Required Under the Standard" - Mandatory); and

- [1910.134\(c\)\(2\)\(ii\)](#) - In addition, the employer must *establish* and implement those elements of a *written respiratory protection program* necessary to ensure that any employee using a *respirator* voluntarily is *medically able* to use that respirator, and that the respirator is cleaned, stored, and maintained so that its use does not present a health hazard to the user. *Exception:* Employers are not required to include in a *written respiratory protection program* those employees whose only use of *respirators* involves the voluntary use of *filtering facepieces (dust masks)*.

[1910.134\(c\)\(3\)](#) - 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*.

[1910.134\(c\)\(4\)](#) - The employer shall provide *respirators, training, and medical evaluations* at no cost to the employee.

[1910.134\(d\)](#) - Selection of *respirators*. This paragraph requires the employer to *evaluate respiratory hazard(s)* in the workplace, identify relevant workplace and user factors, and base *respirator selection* on these factors. The paragraph also specifies appropriately protective *respirators* for use in IDLH atmospheres, and limits the selection and use of *air-purifying respirators*.

- [1910.134\(d\)\(1\)\(ii\)](#) - The employer shall select a *NIOSH-certified respirator*. The respirator shall be used in compliance with the conditions of its *certification*.
- [1910.134\(d\)\(1\)\(iii\)](#) - The employer shall *identify and evaluate* the *respiratory hazard(s)* in the workplace; this *evaluation* shall include a reasonable estimate of employee exposures to respiratory hazard(s) and an identification of the contaminant's chemical state and physical form. Where the employer cannot identify or reasonably estimate the employee exposure, the employer shall consider the atmosphere to be IDLH.

[1910.134\(d\)\(2\)\(i\)](#) - The employer shall provide the following *respirators* for employee use in IDLH atmospheres:

- [1910.134\(d\)\(2\)\(i\)\(A\)](#) - A full facepiece pressure demand SCBA *certified by NIOSH* for a minimum service life of thirty minutes, or

[1910.134\(d\)\(2\)\(ii\)](#) - *Respirators* provided only for escape from IDLH atmospheres shall be *NIOSH-certified* for escape from the atmosphere in which they will be used.

[1910.134\(d\)\(2\)\(iii\)](#) - All oxygen-deficient atmospheres shall be considered IDLH. *Exception:* If the employer *demonstrates* that, under all foreseeable conditions, the oxygen concentration can be maintained within the ranges specified in [Table II](#) of this

section (i.e., for the altitudes set out in the table), then any *atmosphere-supplying respirator* may be used.

1910.134(d)(3)(i)(A) - *Assigned Protection Factors (APFs)*. Employers must use the *assigned protection factors* listed in [Table 1](#) to select a respirator that meets or exceeds the required level of employee protection. When using a combination *respirator* (e.g., airline respirators with an air-purifying filter), employers must ensure that the *assigned protection factor* is appropriate to the mode of operation in which the *respirator* is being used.

1910.134(d)(3)(iii)(B) - For protection against gases and vapors, the employer shall provide, an *air-purifying respirator*, provided that:

- 1910.134(d)(3)(iii)(B)(1) - The *respirator* is equipped with an *end-of-service-life indicator (ESLI)* certified by NIOSH for the contaminant; or
- 1910.134(d)(3)(iii)(B)(2) - If there is no ESLI appropriate for conditions in the employer's workplace, the employer implements a *change schedule* for canisters and cartridges that is based on *objective information or data* that will ensure that canisters and cartridges are changed before the end of their service life. The employer shall describe in the *respirator program* the *information and data* relied upon and the basis for the *canister and cartridge change schedule* and the basis for reliance on the *data*.

1910.134(e) - *Medical evaluation*. Using a respirator may place a physiological burden on employees that varies with the type of *respirator* worn, the job and workplace conditions in which the *respirator* is used, and the medical status of the employee. Accordingly, this paragraph specifies the minimum requirements for *medical evaluation* that employers must implement to determine the employee's ability to use a respirator.

1910.134(e)(1) - General. The employer shall provide a *medical evaluation* to determine the employee's ability to use a respirator, before the employee is *fit tested* or required to use the respirator in the workplace. The employer may discontinue an employee's *medical evaluations* when the employee is no longer required to use a *respirator*.

1910.134(e)(2)(i) - *Medical evaluation procedures*. The employer shall identify a *physician or other licensed health care professional (PLHCP)* to perform *medical evaluations* using a *medical questionnaire* or an initial medical examination that obtains the same information as the *medical questionnaire*.

1910.134(e)(2)(ii) - The *medical evaluation* shall obtain the *information requested* by the *questionnaire* in Sections 1 and 2, part A of [appendix C](#) (mandatory) of this section.

1910.134(e)(3)(i) - Follow-up medical examination. The employer shall ensure that a follow-up medical examination is provided for an employee who gives a *positive response to any*

question among questions 1 through 8 in Section 2, part A of [appendix C](#) (mandatory) or whose initial medical examination demonstrates the need for a follow-up medical examination.

[1910.134\(e\)\(4\)\(i\)](#) - Administration of the *medical questionnaire* and examinations. The *medical questionnaire* and examinations shall be *administered confidentially* during the employee's normal working hours or at a time and place convenient to the employee. The *medical questionnaire* shall be administered in a manner that ensures that the employee understands its content.

[1910.134\(e\)\(4\)\(ii\)](#) - The employer shall provide the employee with an opportunity to *discuss the questionnaire* and examination results with the PLHCP.

[1910.134\(e\)\(5\)\(i\)](#) - Supplemental *information* for the PLHCP. The following *information* must be provided to the PLHCP before the PLHCP makes a *recommendation* concerning an employee's ability to use a *respirator* [Reference [paragraph \(e\)\(5\)\(i\)\(A\) - \(E\)](#)].

[1910.134\(e\)\(5\)\(iii\)](#) - Supplemental *information* for the PLHCP. The employer shall provide the PLHCP with a *copy of the written respiratory protection program* and a *copy* of this section.

[1910.134\(e\)\(6\)](#) - Medical determination. In determining the employee's ability to use a *respirator*, the employer shall:

- [1910.134\(e\)\(6\)\(i\)](#) - Obtain a written *recommendation* regarding the employee's ability to use the *respirator* from the PLHCP. The *recommendation* shall provide only the following *information* [Reference [paragraph \(e\)\(6\)\(i\)\(A\) - \(C\)](#)].

[1910.134\(e\)\(7\)](#) - Additional medical evaluations. At a minimum, the employer shall provide additional *medical evaluations* that comply with the requirements of this section if:

- [1910.134\(e\)\(7\)\(i\)](#) - An *employee reports* medical signs or symptoms that are related to ability to use a *respirator*;
- [1910.134\(e\)\(7\)\(ii\)](#) - A PLHCP, supervisor, or the *respirator program administrator* informs the employer that an employee needs to be reevaluated;
- [1910.134\(e\)\(7\)\(iii\)](#) - *Information* from the *respiratory protection program*, including *observations* made during *fit testing* and *program evaluation*, indicates a need for employee reevaluation.

[1910.134\(f\)](#) - *Fit testing*. This paragraph requires that, before an employee may be required to use any *respirator* with a negative or positive pressure tight-fitting facepiece, the employee must be *fit tested* with the same make, model, style, and size of *respirator* that

will be used. This paragraph specifies the kinds of *fit tests* allowed, the *procedures* for conducting them, and how the results of the *fit tests* must be used.

1910.134(f)(1) - The employer shall ensure that employees using a tight-fitting *facepiece respirator* pass an appropriate *qualitative fit test (QLFT)* or *quantitative fit test (QNFT)* as stated in this paragraph.

1910.134(f)(2) - The employer shall ensure that an employee using a tight-fitting *facepiece respirator* is *fit tested prior to initial use* of the *respirator*, whenever a different *respirator facepiece* (size, style, model or make) is used, and *at least annually* thereafter.

1910.134(f)(3) - The employer shall *conduct an additional fit test* whenever the *employee reports*, or the *employer, PLHCP, supervisor, or program administrator makes visual observations* of, changes in the employee's physical condition that could affect respirator fit. Such conditions include, but are not limited to, facial scarring, dental changes, cosmetic surgery, or an obvious change in body weight.

1910.134(f)(4) - If after passing a QLFT or QNFT, the *employee subsequently notifies the employer, program administrator, supervisor, or PLHCP* that the fit of the respirator is unacceptable, the employee shall be given a reasonable opportunity to select a different *respirator facepiece* and to be *retested*.

1910.134(f)(5) - The *fit test* shall be administered using an *OSHA-accepted QLFT or QNFT protocol*. The *OSHA-accepted QLFT and QNFT protocols and procedures* are contained in [appendix A](#) - fit testing procedures (mandatory), of this section.

1910.134(f)(8) - *Fit testing* of tight-fitting atmosphere-supplying *respirators* and tight-fitting powered air-purifying *respirators* shall be accomplished by *performing quantitative or qualitative fit testing* in the negative pressure mode, regardless of the mode of operation (negative or positive pressure) that is used for respiratory protection.

- 1910.134(f)(8)(i) - *Qualitative fit testing* of these *respirators* shall be accomplished by temporarily converting the *respirator user's actual facepiece* into a negative pressure *respirator* with appropriate filters, or by using an identical negative pressure air-purifying *respirator facepiece* with the same sealing surfaces as a surrogate for the atmosphere-supplying or powered air-purifying *respirator facepiece*.
- 1910.134(f)(8)(ii) - *Quantitative fit testing* of these *respirators* shall be accomplished by modifying the facepiece to allow sampling inside the facepiece in the breathing zone of the user, midway between the nose and mouth. This requirement shall be accomplished by installing a permanent sampling probe onto a surrogate facepiece, or by using a sampling adapter *designed* to temporarily provide a means of sampling air from inside the facepiece.

[1910.134\(g\)](#) - Use of *respirators*. This paragraph requires employers to *establish and implement procedures* for the proper use of *respirators*. These requirements include prohibiting conditions that may result in facepiece seal leakage, preventing employees from removing respirators in hazardous environments, taking actions to ensure continued effective respirator operation throughout the work shift, and *establishing procedures* for the use of respirators in IDLH atmospheres or in interior structural firefighting situations.

- [1910.134\(g\)\(1\)\(iii\)](#) - For all tight-fitting *respirators*, the employer shall ensure that employees *perform a user seal check each time* they put on the respirator using the *procedures* in [appendix B-1](#) - user seal checks, or *procedures* recommended by the respirator manufacturer that the *employer demonstrates* are as effective as those in [appendix B-1](#) of this section.
- [1910.134\(g\)\(2\)\(i\)](#) - Continuing *respirator* effectiveness. Appropriate *surveillance* shall be maintained of work area conditions and degree of employee exposure or stress. When there is a change in work area conditions or degree of employee exposure or stress that may affect *respirator* effectiveness, the employer shall *reevaluate* the continued effectiveness of the *respirator*.

[1910.134\(g\)\(3\)](#) - *Procedures for IDLH atmospheres*. For all IDLH atmospheres, the employer shall ensure that [Reference [paragraphs \(g\)\(3\)\(i\) - \(g\)\(3\)\(vi\)](#)].

[1910.134\(g\)\(4\)](#) - *Procedures for interior structural firefighting*. In addition to the requirements set forth under [paragraph \(g\)\(3\)](#), in interior structural fires, the employer shall ensure that: [Reference [paragraphs \(g\)\(4\)\(i\) - \(g\)\(4\)\(iii\)](#)].

[1910.134\(h\)](#) - Maintenance and care of *respirators*. This paragraph requires the employer to provide for the cleaning and disinfecting, storage, *inspection*, and repair of *respirators* used by employees.

[1910.134\(h\)\(1\)](#) - Cleaning and disinfecting. The employer shall provide each *respirator* user with a *respirator* that is clean, sanitary, and in good working order. The employer shall ensure that *respirators* are cleaned and disinfected using the *procedures* in [appendix B-2](#) - respirator cleaning procedures (mandatory), of this section, or *procedures* recommended by the *respirator manufacturer*, provided that such *procedures* are of equivalent effectiveness. The *respirators* shall be cleaned and disinfected at the following intervals: [Reference [paragraphs \(h\)\(1\)\(i\) - \(h\)\(1\)\(iv\)](#)].

[1910.134\(h\)\(2\)](#) - Storage. The employer shall ensure that *respirators* are stored as follows:

- [1910.134\(h\)\(2\)\(ii\)\(C\)](#) - *Stored* in accordance with any applicable *manufacturer instructions*.

[1910.134\(h\)\(3\)\(i\)](#) - The employer shall ensure that *respirators* are *inspected* as follows:

- [1910.134\(h\)\(3\)\(i\)\(A\)](#) - All respirators used in routine situations shall be *inspected before each use and during cleaning*;
- [1910.134\(h\)\(3\)\(i\)\(B\)](#) - All respirators maintained for use in emergency situations shall be *inspected at least monthly and in accordance with the manufacturer's recommendations, and shall be checked for proper function before and after each use*; and
- [1910.134\(h\)\(3\)\(i\)\(C\)](#) - Emergency escape-only respirators shall be *inspected before being carried into the workplace* for use.

[1910.134\(h\)\(3\)\(ii\)](#) - The employer shall ensure that *respirator inspections* include the following: [Reference [paragraph \(h\)\(3\)\(ii\)\(A\) - \(h\)\(3\)\(ii\)\(B\)](#)].

[1910.134\(h\)\(3\)\(iii\)](#) - In addition to the requirements of [paragraphs \(h\)\(3\)\(i\) and \(ii\)](#) of this section, self-contained breathing apparatus shall be *inspected monthly*. Air and oxygen cylinders shall be maintained in a fully charged state and shall be recharged when the pressure falls to 90% of the *manufacturer's recommended* pressure level. The employer shall determine that the regulator and warning devices function properly.

[1910.134\(h\)\(3\)\(iv\)](#) - For respirators maintained for *emergency use*, the employer shall:

- [1910.134\(h\)\(3\)\(iv\)\(A\)](#) - *Certify the respirator by documenting* the date the inspection was performed, the name (or signature) of the person who made the *inspection*, the findings, required remedial action, and a serial number or other means of identifying the *inspected respirator*; and
- [1910.134\(h\)\(3\)\(iv\)\(B\)](#) - Provide this *information on a tag or label* that is attached to the storage compartment for the respirator, is kept with the respirator, or is included in *inspection reports* stored as paper or electronic files. This *information shall be maintained* until replaced following a *subsequent certification*.

[1910.134\(h\)\(4\)](#) - Repairs. The employer shall ensure that *respirators* that fail an *inspection* or are otherwise found to be defective are removed from service, and are discarded or repaired or adjusted in accordance with the *following procedures*:

- [1910.134\(h\)\(4\)\(i\)](#) - Repairs or adjustments to *respirators* are to be made only by *persons appropriately trained* to perform such operations and shall use only the *respirator manufacturer's NIOSH-approved* parts designed for the *respirator*;
- [1910.134\(h\)\(4\)\(ii\)](#) - Repairs shall be made according to the *manufacturer's recommendations and specifications* for the type and extent of repairs to be performed; and

- [1910.134\(h\)\(4\)\(iii\)](#) - Reducing and admission valves, regulators, and alarms shall be adjusted or repaired only by the manufacturer or a *technician trained* by the manufacturer.

[1910.134\(i\)\(4\)](#) - The employer shall ensure that cylinders used to supply breathing air to *respirators* meet the following requirements:

- [1910.134\(i\)\(4\)\(i\)](#) - Cylinders are *tested and maintained* as prescribed in the *Shipping Container Specification Regulations of the Department of Transportation (49 CFR part 180)*;
- [1910.134\(i\)\(4\)\(ii\)](#) - Cylinders of purchased breathing air have a *certificate of analysis* from the supplier that the breathing air meets the requirements for Grade D breathing air.

[1910.134\(i\)\(5\)\(iv\)](#) - Have a *tag* containing the most recent *change date and the signature* of the *person authorized* by the employer to perform the change. The *tag* shall be *maintained* at the compressor.

[1910.134\(i\)\(9\)](#) - The employer shall use only the *respirator manufacturer's NIOSH-approved* breathing-gas containers, *marked and maintained* in accordance with the *Quality Assurance provisions of the NIOSH approval* for the SCBA as issued in accordance with the *NIOSH respirator-certification standard* at [42 CFR part 84](#).

[1910.134\(j\)](#) - *Identification of filters, cartridges, and canisters*. The employer shall ensure that all filters, cartridges and canisters used in the workplace are *labeled and color coded* with the *NIOSH approval label* and that the *label is not removed* and remains legible.

[1910.134\(k\)](#) - *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](#) - (mandatory) Information for employees using respirators when not required under the standard, of this section to employees who wear *respirators* when not required by this section or by the employer to do so.

- [1910.134\(k\)\(1\)](#) - The employer shall ensure that each employee can *demonstrate knowledge* of at least the following: [Reference [paragraph \(k\)\(1\)\(i\) - \(k\)\(1\)\(vii\)](#)].

[1910.134\(k\)\(2\)](#) - The *training* shall be conducted in a manner that is understandable to the employee.

[1910.134\(k\)\(3\)](#) - The employer shall provide the *training prior to requiring* the employee to use a *respirator* in the workplace.

[1910.134\(k\)\(4\)](#) - 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*.

[1910.134\(k\)\(5\)](#) - *Retraining* shall be administered *annually*, and when the following situations occur: [Reference [paragraph \(k\)\(5\)\(i\) - \(k\)\(5\)\(iii\)](#)].

[1910.134\(k\)\(6\)](#) - 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.

[1910.134\(l\)](#) - *Program evaluation*. This section requires the employer to *conduct evaluations* of the workplace to ensure that the *written respiratory protection program* is being properly implemented, and to *consult employees* to ensure that they are using the *respirators* properly.

[1910.134\(l\)\(1\)](#) - The employer shall *conduct evaluations* of the workplace as necessary to ensure that the provisions of the current *written program* are being effectively implemented and that it continues to be effective.

[1910.134\(l\)\(2\)](#) - The employer shall regularly *consult employees* required to use *respirators* to assess the employees' views on *program effectiveness* and to identify any problems. Any problems that are identified during this *assessment* shall be corrected. Factors to be *assessed* include, but are not limited to: [Reference [paragraph \(l\)\(2\)\(i\) - \(l\)\(2\)\(iv\)](#)].

[1910.134\(m\)](#) - *Recordkeeping*. This section requires the employer to establish and *retain written information* regarding *medical evaluations, fit testing, and the respirator program*. This *information* will facilitate employee involvement in the *respirator program*, assist the employer in *auditing* the adequacy of the *program*, and provide a *record* for compliance determinations by OSHA.

[1910.134\(m\)\(1\)](#) - *Medical evaluation*. *Records of medical evaluations* required by this section must be *retained* and made available in accordance with [1910.1020](#) - access to employee exposure and medical records.

[1910.134\(m\)\(2\)\(i\)](#) - *Fit testing*. The employer shall establish a *record* of the *qualitative and quantitative fit tests* administered to an employee including [Reference [paragraph \(m\)\(2\)\(i\)\(A\) - \(E\)](#)]:

[1910.134\(m\)\(2\)\(ii\)](#) - *Fit test records shall be retained for respirator users until the next fit test is administered.*

[1910.134\(m\)\(3\)](#) - *A written copy of the current respirator program shall be retained by the employer.*

[1910.134\(m\)\(4\)](#) - *Written materials required to be retained under this paragraph shall be made available upon request to affected employees and to the Assistant Secretary or designee for examination and copying.*

1926.104 - Safety Belts, Lifelines, and Lanyards

Scope: This [standard](#) provides the requirements for lifelines, safety belts, and lanyards.

Special Requirements: Load testing, personal protective equipment (lanyards, lifelines, safety belts), specifications

[1926.104\(a\)](#) - *Lifelines, safety belts, and lanyards shall be used only for employee safeguarding. Any lifeline, safety belt, or lanyard actually subjected to in-service loading, as distinguished from static load testing, shall be immediately removed from service and shall not be used again for employee safeguarding.*

[1926.104\(e\)](#) - *All safety belt and lanyard hardware shall be drop forged or pressed steel, cadmium plated in accordance with type 1, Class B plating specified in Federal Specification QQ-P-416. Surface shall be smooth and free of sharp edges.*

[Air-purifying respirator](#) means a respirator with an air-purifying filter, cartridge, or canister that removes specific air contaminants by passing ambient air through the air-purifying element.

[Filtering facepiece](#) (dust mask) means a negative pressure particulate respirator with a filter as an integral part of the facepiece or with the entire facepiece composed of the filtering medium.

1926.105 - Safety Nets

Scope: This [standard](#) provides the requirements for safety nets.

Special Requirements: Personal protective equipment (safety nets), tested, load testing, certified, performance standards, label, proof test

[1926.105\(a\)](#) - *Safety nets shall be provided when workplaces are more than 25 feet above the ground or water surface, or other surfaces where the use of ladders, scaffolds, catch platforms, temporary floors, safety lines, or safety belts is impractical.*

[1926.105\(b\)](#) - Where *safety net* protection is required by this part (1926), operations shall not be undertaken until the *net* is in place and has been *tested*.

[1926.105\(c\)\(1\)](#) - *Nets* shall extend 8 feet beyond the edge of the work surface where employees are exposed and shall be installed as close under the work surface as practical but in no case more than 25 feet below such work surface. *Nets* shall be hung with sufficient clearance to prevent user's contact with the surfaces or structures below. Such clearances shall be determined by impact *load testing*.

[1926.105\(d\)](#) - The mesh size of *nets* shall not exceed 6 inches by 6 inches. All new *nets* shall meet accepted *performance standards* of 17,500 foot-pounds minimum impact resistance as determined and *certified* by the manufacturers, and shall bear a *label of proof test*. Edge ropes shall provide a minimum breaking strength of 5,000 pounds.

1926.106 - Working Over or Near Water

Scope: This [standard](#) provides the requirements for working over or near water.

Special Requirements: Approved, inspections, personal protective equipment

[1926.106\(a\)](#) - Employees working over or near water, where the danger of drowning exists, shall be provided with *U.S. Coast Guard-approved life jacket or buoyant work vests*.

[1926.106\(b\)](#) - Prior to and after each use, the buoyant work vests or life preservers shall be *inspected* for defects which would alter their strength or buoyancy. Defective units shall not be used.

Subpart F - [Fire Protection and Prevention](#)

[Subpart F](#) provides the requirements for fire protection, fire prevention, flammable liquids, liquefied petroleum gas, and temporary heating devices.

To learn if subpart F applies to you, go to [Does "Subpart F - Fire Protection and Prevention" Apply to You?](#)

Special Requirements

1926.150 - Fire Protection

Scope: This [standard](#) provides the requirements for fire protection.

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.

Special Requirements: Fire protection program, personal protective equipment (fire-fighting equipment), inspect, fire brigade, train, approved, applicable laws, authorized person, checks, markings, alarm system, alerts, alarm codes posted, reporting instructions, references other standards

1926.150(a)(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*.

1926.150(a)(2) - Access to all available *firefighting equipment* shall be maintained at all times.

1926.150(a)(3) - All *firefighting equipment*, provided by the employer, shall be conspicuously located.

1926.150(a)(4) - All *firefighting equipment* shall be periodically *inspected* and maintained in operating condition. Defective *equipment* shall be immediately replaced.

1926.150(a)(5) - As warranted by the project, the employer shall provide a *trained* and equipped *firefighting organization (Fire Brigade)* to assure adequate protection to life.

1926.150(c)(1)(viii) - Portable fire extinguishers shall be *inspected* periodically and maintained in accordance with *Maintenance and Use of Portable Fire Extinguishers, NFPA No. 10A-1970*.

1926.150(c)(1)(ix) - Fire extinguishers ([Table F-1 Fire Extinguishers Data](#)) which have been *listed or approved* by a *nationally recognized testing laboratory*, shall be used to meet the requirements of this subpart.

1926.150(d)(1)(i) - If the facility being constructed includes the installation of automatic sprinkler protection, the installation shall closely follow the construction and be placed in service as soon as *applicable laws* permit following completion of each story.

1926.150(d)(1)(ii) - During demolition or alterations, existing automatic sprinkler installations shall be retained in service as long as reasonable. The operation of sprinkler control valves shall be permitted only by properly *authorized persons*. Modification of sprinkler systems to permit alterations or additional demolition should be expedited so that the automatic protection may be returned to service as quickly as possible. Sprinkler

control valves shall be *checked daily* at close of work to ascertain that the protection is in service.

[1926.150\(d\)\(2\)](#) - Standpipes. In all structures in which standpipes are required, or where standpipes exist in structures being altered, they shall be brought up as soon as *applicable laws permit*, and shall be maintained as construction progresses in such a manner that they are always ready for fire protection use. The standpipes shall be provided with Siamese fire department connections on the outside of the structure, at the street level, which shall be *conspicuously marked*. There shall be at least one standard hose outlet at each floor.

[1926.150\(e\)\(1\)](#) - An *alarm system, e.g., telephone system, siren, etc.*, shall be established by the employer whereby employees on the site and the local fire department can be *alerted* for an emergency.

[1926.150\(e\)\(2\)](#) - The *alarm code and reporting instructions* shall be conspicuously *posted* at phones and at employee entrances.

1926.151 - Fire Protection and Prevention

Scope: This [standard](#) provides fire protection and prevention requirements.

Special Requirements: Posted, procedure, references other standards

[1926.151\(a\)\(1\)](#) - Electrical wiring and equipment for light, heat, or power purposes shall be installed in compliance with the requirements of [subpart K - electrical](#), of this part.

[1926.151\(a\)\(3\)](#) - Smoking shall be prohibited at or in the vicinity of operations which constitute a fire hazard, and shall be conspicuously *posted: "No Smoking or Open Flame."*

[1926.151\(c\)\(3\)](#) - The entire storage site shall be kept free from accumulation of unnecessary combustible materials. Weeds and grass shall be kept down and a regular *procedure* provided for the periodic cleanup of the entire area.

1926.152 - Flammable Liquids

Scope: This [standard](#) provides requirements pertaining to flammable liquids.

Special Requirements: Approved containers, approved storage cabinet, labels, test specifications, posted signs, identifiable switches, testing, design, flow tests, certified, inspections, nameplate, references other standards

[1926.152\(a\)\(1\)](#) - Only *approved containers and portable tanks* shall be used for storage and handling of flammable liquids. *Approved safety cans or Department of Transportation*

approved containers shall be used for the handling and use of flammable liquids in quantities of 5 gallons or less, except that this shall not apply to those flammable liquid materials which are highly viscid (extremely hard to pour), which may be used and handled in original shipping containers. For quantities of one gallon or less, the original container may be used, for storage, use and handling of flammable liquids.

Indoor Storage of Flammable Liquids

[1926.152\(b\)\(1\)](#) - No more than 25 gallons of flammable liquids shall be stored in a room outside of an *approved storage cabinet*. For storage of liquefied petroleum gas, see [1926.153](#) - *Liquefied petroleum gas (LP-Gas)*.

[1926.152\(b\)\(2\)](#) - Quantities of flammable liquid in excess of 25 gallons shall be stored in an *acceptable or approved cabinet* meeting the following requirements:
[Reference [paragraph \(b\)\(2\)\(i\) – \(iii\)](#)].

[1926.152\(b\)\(4\)\(i\)](#) - Inside storage rooms shall be constructed to meet the required fire-resistant rating for their use. Such construction shall comply with the *test specifications* set forth in *Standard Methods of Fire Test of Building Construction and Material*, [NFPA 251-1969](#).

[1926.152\(b\)\(4\)\(ii\)](#) - Where an automatic extinguishing system is provided, the system shall be designed and installed in an approved manner. Openings to other rooms or buildings shall be provided with noncombustible liquid-tight raised sills or ramps at least 4 inches in height, or the floor in the storage area shall be at least 4 inches below the surrounding floor. Openings shall be provided with *approved self-closing fire doors*. The room shall be liquid-tight where the walls join the floor. A permissible alternate to the sill or ramp is an open-grated trench, inside of the room, which drains to a safe location. Where other portions of the building or other buildings are exposed, windows shall be protected as set forth in the *Standard for Fire Doors and Windows*, [NFPA No. 80-1970](#), for Class E or F openings. Wood of at least 1-inch nominal thickness may be used for shelving, racks, dunnage, scuffboards, floor overlay, and similar installations.

[1926.152\(b\)\(4\)\(v\)](#) - Electrical wiring and equipment located in inside storage rooms shall be approved for Class I, Division 1, Hazardous Locations. For definition of Class I, Division 1, Hazardous Locations, see [1926.449](#) - *definitions applicable to this subpart*.

Storage Outside Buildings

[1926.152\(c\)\(6\)](#) - Portable tanks, not exceeding 660 gallons, shall be provided with emergency venting and other devices, as required by *chapters III and IV of NFPA 30-1969, The Flammable and Combustible Liquids Code*.

[1926.152\(c\)\(7\)](#) - Portable tanks, in excess of 660 gallons, shall have emergency venting and other devices, as required by *chapters II and III of The Flammable and Combustible Liquids Code, NFPA 30-1969*.

Fire Control for Flammable Liquid Storage

[1926.152\(d\)\(3\)](#) - When sprinklers are provided, they shall be installed in accordance with the *Standard for the Installation of Sprinkler Systems, NFPA 13-1969*.

Service and Refueling Areas

[1926.152\(g\)\(1\)](#) - Flammable liquids shall be stored in *approved closed containers*, in tanks located underground, or in aboveground portable tanks.

[1926.152\(g\)\(2\)](#) - The tank trucks shall comply with the requirements covered in the *Standard for Tank Vehicles for Flammable and Combustible Liquids, NFPA No. 385-1966*.

[1926.152\(g\)\(6\)](#) - *Clearly identified* and easily accessible switch(es) shall be provided at a location remote from dispensing devices to shut off the power to all dispensing devices in the event of an emergency.

[1926.152\(g\)\(9\)](#) - Conspicuous and *legible signs* prohibiting smoking shall be *posted*.

Atmospheric Tanks

[1926.152\(i\)\(1\)\(iii\)\(A\)](#) - Atmospheric tanks shall be built in accordance with acceptable *good standards of design*. Atmospheric tanks may be built in accordance with: [Reference [paragraph \(i\)\(1\)\(iii\)\(A\)\(1\) – \(3\)](#)].

Low Pressure Tanks

[1926.152\(i\)\(1\)\(iv\)\(B\)](#) - Low-pressure tanks shall be built in accordance with acceptable *standards of design*. Low-pressure tanks may be built in accordance with: [Reference [paragraph \(i\)\(1\)\(iv\)\(B\)\(1\) – \(2\)](#)].

Pressure Vessels

[1926.152\(i\)\(1\)\(v\)\(B\)](#) - Pressure vessels shall be built in accordance with the *Code for Unfired Pressure Vessels, Section VIII of the ASME Boiler and Pressure Vessel Code 1968*.

Normal Venting for Aboveground Tanks

[1926.152\(i\)\(2\)\(iv\)\(B\)](#) - Normal vents shall be sized either in accordance with:

[1926.152\(i\)\(2\)\(iv\)\(B\)\(1\)](#) - *The American Petroleum Institute Standard 2000 (1968), Venting Atmospheric and Low-Pressure Storage Tanks.*

Emergency Relief Venting for Fire Exposure for Aboveground Tanks

[1926.152\(i\)\(2\)\(v\)\(I\)](#) - The flow capacity of tank venting devices 12 inches (30.48 cm) and smaller in nominal pipe size shall be determined by actual test of each type and size of vent. These *flow tests* may be conducted by the manufacturer if *certified by a qualified impartial observer*, or may be conducted by an outside agency. The flow capacity of tank venting devices larger than 12 inches (30.48 cm) nominal pipe size, including manhole covers with long bolts or equivalent, may be calculated provided that the opening pressure is actually measured, the rating pressure and corresponding free orifice area are stated, the word "calculated" appears on the *nameplate*, and the computation is based on a flow coefficient of 0.5 applied to the rated orifice area.

Supports, Foundations, and Anchorage for All Tank Locations

[1926.152\(i\)\(5\)\(vi\)\(V\)](#) - *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: [Reference [paragraph \(i\)\(5\)\(vi\)\(V\)\(1\) – \(3\)](#)].

Testing

[1926.152\(i\)\(7\)\(i\)](#) - General. All tanks, whether shop built or field erected, shall be *strength tested* before they are placed in service in accordance with the applicable paragraphs of the *code* under which they were built. The *American Society of Mechanical Engineers (ASME) code stamp, American Petroleum Institute (API) monogram, or the label of the Underwriters' Laboratories, Inc.*, on a tank shall be evidence of compliance with this *strength test*. Tanks not *marked* in accordance with the above *codes* shall be *strength tested* before they are placed in service in accordance with good engineering principles and reference shall be made to the sections on *testing* in the *codes* listed in [paragraphs \(i\)\(1\)\(iii\)\(A\), \(iv\)\(B\), or \(v\)\(B\)](#) of this section.

[1926.152\(i\)\(7\)\(iii\)](#) - Tightness. In addition to the *strength test* called for in [paragraphs \(i\)\(7\)\(i\) and \(ii\)](#) of this section, all tanks and connections shall be *tested* for tightness. Except for underground tanks, this *tightness test* shall be made at operating pressure with air, inert gas, or water prior to placing the tank in service. In the case of field-erected tanks the *strength test* may be considered to be the test for tank tightness. Underground tanks and piping, before being covered, enclosed, or placed in use, shall be *tested* for tightness hydrostatically, or with air pressure at not less than 3 pounds per square inch (20.68 kPa) and not more than 5 pounds per square inch (34.47 kPa).

Piping, Valves, and Fittings

[1926.152\(j\)\(1\)\(i\)](#) - *Design*. The *design* (including selection of materials) fabrication, assembly, test, and inspection of piping systems containing flammable liquids shall be suitable for the expected working pressures and structural stresses. Conformity with the applicable provisions of *Pressure Piping, ANSI B31 series* and the provisions of this paragraph, shall be considered prima facie evidence of compliance with the foregoing provisions. [Reference [paragraph \(j\)\(1\) – \(7\)](#)].

1926.153 - Liquefied Petroleum Gas

Scope: This [standard](#) provides the requirements for liquefied petroleum gas (LP-Gas).

Special Requirements: Specifications, approved type, tests, classified, listing, marked, references other standards

[1926.153\(a\)\(1\)](#) - Each system shall have containers, valves, connectors, manifold valve assemblies, and regulators of an *approved type*.

[1926.153\(a\)\(2\)](#) - All cylinders shall meet the Department of Transportation *specification* identification requirements published in *49 CFR part 178, Shipping Container Specifications*.

Requirements for Appliances

[1926.153\(f\)\(1\)](#) - LP-Gas consuming appliances shall be *approved types*.

[1926.153\(f\)\(2\)](#) - Any appliance that was originally manufactured for operation with a gaseous fuel other than LP-Gas, and is in good condition, may be used with LP-Gas only after it is properly converted, adapted, and *tested* for performance with LP-Gas before the appliance is placed in use.

Containers and Equipment Used Inside of Buildings or Structures

[1926.153\(h\)\(7\)](#) - Hose shall be designed for a working pressure of at least 250 p.s.i.g. *Design*, construction, and performance of hose, and hose connections shall have their suitability determined by *listing by a nationally recognized testing agency*. The hose length shall be as short as practicable. Hoses shall be long enough to permit compliance with spacing provisions of [paragraphs \(h\)\(1\) through \(13\)](#) of this section, without kinking or straining, or causing hose to be so close to a burner as to be damaged by heat.

[1926.153\(l\)](#) - Fire protection. Storage locations shall be provided with at least one *approved* portable fire extinguisher having a rating of not less than 20-B:C.

Systems Utilizing Containers Other Than DOT Containers

[1926.153\(m\)\(2\)](#) - Design pressure and classification of storage containers. Storage containers shall be *designed and classified* in accordance with [Table F-31](#).

[1926.153\(m\)\(3\)](#) - Containers with foundations attached (portable or semiportable b containers with suitable steel "runners" or "skids" and popularly known in the industry as "skid tanks") shall be *designed*, installed, and used in accordance with these *rules* subject to the following provisions: [Reference [paragraph \(m\)\(3\)\(i\) - \(vi\)](#)].

[1926.153\(n\)](#) - When LP-Gas and one or more other gases are stored or used in the same area, the containers shall be *marked* to identify their content. *Marking* shall be in compliance with *American National Standard Z48.1-1954, "Method of Marking Portable Compressed Gas Containers To Identify the Material Contained."*

1926.154 - Temporary Heating Devices

Scope: This [standard](#) provides the requirements for temporary heating devices.

Special Requirements: Approval, listed, markings, designed, approved

[1926.154\(b\)\(2\)](#) - Temporary heating devices, which are *listed* for installation with lesser clearances than specified in [Table F-4](#), may be installed in accordance with their *approval*.

[1926.154\(c\)](#) - Stability. Heaters, when in use, shall be set horizontally level, unless otherwise permitted by the *manufacturer's markings*.

[1926.154\(e\)\(4\)](#) - Heaters specifically *designed and approved* for use with separate supply tanks may be directly connected for gravity feed, or an automatic pump, from a supply tank.

Subpart G - Signs, Signals, and Barricades

[Subpart G](#) provides the requirements for accident prevention signs and tags, signaling, and barricades.

To learn if subpart G applies to you, go to [Does "Subpart G - Signs, Signals and Barricades" Apply to You?](#)

Special Requirements

1926.200 - Accident Prevention Signs and Tags

Scope: This [standard](#) provides the requirements for accident prevention signs and tags.

Special Requirements: Signs, symbols, markings, wording, tags, letters, specifications, references other standards

1926.200(a) - General. *Signs and symbols* required by this subpart shall be visible at all times when work is being performed, and shall be removed or covered promptly when the hazards no longer exist.

1926.200(b)(1) - *Danger signs* shall be used only where an immediate hazard exists, and shall follow the *specifications* illustrated in Figure 1 of [ANSI Z35.1-1968](#) or in Figures 1 to 13 of [ANSI Z535.2-2011](#), incorporated by reference in [1926.6](#).

1926.200(b)(2) - *Danger signs* shall have red as the predominating color for the upper panel; black outline on the borders; and a white lower panel for additional *sign wording*.

1926.200(c)(1) - *Caution signs* shall be used only to warn against potential hazards or to caution against *unsafe practices*, and shall follow the specifications illustrated in Figure 4 of [ANSI Z35.1-1968](#) or in Figures 1 to 13 of [ANSI Z535.2-2011](#), incorporated by reference in [1926.6](#).

1926.200(c)(2) - *Caution signs* shall have yellow as the predominating color; black upper panel and borders: yellow *lettering of "caution"* on the black panel; and the lower yellow panel for additional *sign wording*. *Black lettering* shall be used for additional wording.

1926.200(c)(3) - The standard color of the background shall be yellow; and the panel, *black with yellow letters*. Any letters used against the yellow background shall be black. The colors shall be those of opaque glossy samples as specified in Table 1 of [ANSI Z53.1-1967](#) or in Table 1 of [ANSI Z535.1-2006 \(R2011\)](#), incorporated by reference in [1926.6](#).

1926.200(d) - *Exit signs*. Exit signs, when required, shall be lettered in legible red letters, not less than 6 inches high, on a white field and the principal stroke of the *letters* shall be at least three-fourths inch in width.

1926.200(e) - *Safety instruction signs*. *Safety instruction signs*, when used, shall be white with green upper panel with white letters to convey the principal message. Any additional *wording* on the *sign* shall be *black letters* on the white background.

1926.200(f) - *Directional signs*. *Directional signs*, other than automotive *traffic signs* specified in [paragraph \(g\)](#) of this section, shall be white with a black panel and a white *directional symbol*. Any additional *wording* on the *sign* shall be *black letters* on the white background.

1926.200(g)(1) - At points of hazard, construction areas shall be *posted* with legible *traffic control signs* and protected by traffic control devices.

[1926.200\(g\)\(2\)](#) - The *design* and use of all traffic control devices, including *signs, signals, markings, barricades*, and other devices, for protection of construction workers shall conform to Part 6 of the [MUTCD](#) (incorporated by reference, see [1926.6](#)).

[1926.200\(h\)\(1\)](#) - *Accident prevention tags* shall be used as a temporary means of warning employees of an existing hazard, such as defective tools, equipment, etc. They shall not be used in place of, or as a substitute for, *accident prevention signs*.

[1926.200\(h\)\(2\)](#) - For *accident prevention tags*, employers shall follow specifications that are similar to those in Figures 1 to 4 of [ANSI Z35.1-1968](#) or *Figures 1 to 8* of [ANSI Z535.2-2011](#), incorporated by reference in [1926.6](#).

[1926.200\(i\)](#) - *Additional rules*. [ANSI Z35.1-1968](#), [ANSI Z535.2-2011](#), [ANSI Z35.2-1968](#), and [ANSI Z535.5-2011](#), incorporated by reference in [1926.6](#), contain rules in addition to those specifically prescribed in this subpart. The employer shall comply with [ANSI Z35.1-1968](#) or [ANSI Z535.2-2011](#), and [ANSI Z35.2-1968](#) or [Z535.5-2011](#), with respect to such additional rules.

1926.201 – Signaling

Scope: This [standard](#) provides the requirements pertaining to signaling.

Special Requirements: Signals, flaggers, references other standards

[1926.201\(a\)](#) - *Flaggers*. *Signaling* by flaggers and the use of flaggers, including warning garments worn by *flaggers*, shall conform to Part 6 of the [MUTCD](#) (incorporated by reference, see [1926.6](#)).

[1926.201\(b\)](#) - *Crane and hoist signals*. Regulations for crane and hoist *signaling* will be found in applicable *American National Standards Institute standards*.

Subpart H - [Materials Handling, Storage, Use, and Disposal](#)

[Subpart H](#) provides the requirements for storage, rigging equipment for material handling and disposal of waste materials.

To learn if subpart H applies to you, go to [Does "Subpart H - Materials Handling, Storage, Use and Disposal" Apply to You?](#)

Special Requirements

1926.250 - General Requirements for Storage

Scope: This [standard](#) provides the general requirements pertaining to storage of materials.

Special Requirements: Safe load limits, post load limits, references other standards

[1926.250\(a\)\(2\)\(i\)](#) - The weight of stored materials on floors within buildings and structures shall not exceed *maximum safe load limits*.

[1926.250\(a\)\(2\)\(ii\)](#) - Employers shall conspicuously *post maximum safe load limits* of floors within buildings and structures, in pounds per square foot, in all storage areas, except when the storage area is on a floor or slab on grade. *Posting* is not required for storage areas in all single-family residential structures and wood-framed multi-family residential structures.

[1926.250\(b\)\(2\)](#) - Each employee required to work on stored material in silos, hoppers, tanks, and similar storage areas shall be equipped with personal fall arrest equipment meeting the requirements of [subpart M - fall protection](#) of this part (1926).

1926.251 - Rigging Equipment for Material Handling

Scope: This [standard](#) provides the requirements pertaining to rigging equipment for material handling.

Special Requirements: Inspections, markings/marked, proof-tested, safe working load, competent person, identification, rated capacity, records, manufacturer recommendations, certificate of proof test, tests

[1926.251\(a\)\(1\)](#) - Rigging equipment for material handling shall be *inspected prior to use* on each shift and as necessary during its use to ensure that it is safe. Defective rigging equipment shall be removed from service.

[1926.251\(a\)\(2\)](#) - Employers must ensure that rigging equipment:

- [1926.251\(a\)\(2\)\(i\)](#) - Has *permanently affixed and legible identification markings* as prescribed by the manufacturer that indicate the recommended *safe working load*;
- [1926.251\(a\)\(2\)\(ii\)](#) - Not be loaded in excess of its *recommended safe working load* as prescribed on the *identification markings* by the manufacturer; and
- [1926.251\(a\)\(2\)\(iii\)](#) - Not be used without *affixed, legible identification markings*, required by [paragraph \(a\)\(2\)\(i\)](#) of this section.

[1926.251\(a\)\(4\)](#) - Special custom design grabs, hooks, clamps, or other lifting accessories, for such units as modular panels, prefabricated structures and similar materials, shall be *marked* to indicate the *safe working loads* and shall be *proof-tested* prior to use to 125 percent of their *rated load*.

[1926.251\(a\)\(6\)](#) - Slings. *Inspections*. Each day before being used, the sling and all fastenings and attachments shall be *inspected* for damage or defects by a *competent person* designated by the employer. Additional *inspections* shall be performed during sling use, where service conditions warrant. Damaged or defective slings shall be immediately removed from service.

[1926.251\(b\)\(1\)](#) - Welded alloy steel chain slings shall have *permanently affixed durable identification* stating size, grade, *rated capacity*, and sling manufacturer.

[1926.251\(b\)\(2\)](#) - Hooks, rings, oblong links, pear-shaped links, welded or mechanical coupling links, or other attachments, when used with alloy steel chains, shall have a *rated capacity* at least equal to that of the chain.

[1926.251\(b\)\(4\)](#) - Employers must not use alloy steel-chain slings with loads in excess of the *rated capacities* (i.e., working load limits) indicated on the sling by *permanently affixed and legible identification markings* prescribed by the manufacturer.

[1926.251\(b\)\(6\)\(i\)](#) - In addition to the *inspection* required by other paragraphs of this section, a *thorough periodic inspection* of alloy steel chain slings in use shall be made on a regular basis, to be determined on the basis of: [Reference [paragraph \(b\)\(6\)\(i\)\(a\) - \(d\)](#)].

[1926.251\(b\)\(6\)\(ii\)](#) - The employer shall make and maintain a *record* of the most recent month in which each alloy steel chain sling was thoroughly *inspected*, and shall make such *record* available for examination.

[1926.251\(c\)\(1\)](#) - Employers must not use improved plow-steel wire rope and wire-rope slings with loads in excess of the *rated capacities* (i.e., working load limits) indicated on the sling by *permanently affixed and legible identification markings* prescribed by the manufacturer.

[1926.251\(c\)\(14\)](#) - Safe operating temperatures. Fiber core wire rope slings of all grades shall be permanently removed from service if they are exposed to temperatures in excess of 200 °F (93.33 °C). When nonfiber core wire rope slings of any grade are used at temperatures above 400 °F (204.44 °C) or below minus 60 °F (15.55 °C), *recommendations of the sling manufacturer* regarding use at that temperature shall be followed.

[1926.251\(c\)\(15\)\(ii\)](#) - All welded end attachments shall not be used unless proof tested by the manufacturer or equivalent entity at twice their *rated capacity* prior to initial use. The employer shall retain a *certificate of the proof test*, and make it available for examination.

[1926.251\(c\)\(16\)](#) - Wire rope slings shall have *permanently affixed, legible identification markings* stating size, *rated capacity* for the type(s) of hitch(es) used and the angle upon which it is based, and the number of legs if more than one.

[1926.251\(d\)\(1\)](#) - Employers must not use natural- and synthetic-fiber rope slings with loads in excess of the *rated capacities* (i.e., working load limits) indicated on the sling by *permanently affixed and legible identification markings* prescribed by the manufacturer.

[1926.251\(d\)\(2\)](#) - All splices in rope slings provided by the employer shall be made in accordance with *fiber rope manufacturers recommendations*.

[1926.251\(d\)\(3\)](#) - Safe operating temperatures. Natural and synthetic fiber rope slings, except for wet frozen slings, may be used in a temperature range from minus 20 °F (-28.88 °C) to plus 180 °F (82.2 °C) without decreasing the *working load limit*. For operations outside this temperature range and for wet frozen slings, the *sling manufacturer's recommendations* shall be followed.

[1926.251\(d\)\(4\)](#) - Splicing. Spliced fiber rope slings shall not be used unless they have been spliced in accordance with the following minimum requirements and in accordance with any additional *recommendations of the manufacturer*: [Reference paragraph (d)(4)(i) - (vii)].

[1926.251\(d\)\(7\)](#) - Employers must use natural- and synthetic-fiber rope slings that have *permanently affixed and legible identification markings* that state the *rated capacity* for the type(s) of hitch(es) used and the angle upon which it is based, type of fiber material, and the number of legs if more than one.

[1926.251\(e\)\(1\)](#) - The employer shall have each synthetic web sling *marked or coded* to show: [Reference [paragraph \(e\)\(1\)\(i\) - \(iii\)](#)].

[1926.251\(f\)\(1\)](#) - Employers must not use shackles with loads in excess of the *rated capacities* (i.e., working load limits) indicated on the shackle by *permanently affixed and legible identification markings* prescribed by the manufacturer.

[1926.251\(f\)\(2\)](#) - The *manufacturer's recommendations* shall be followed in determining the safe working loads of the various sizes and types of specific and identifiable hooks. All hooks for which no applicable *manufacturer's recommendations* are available shall be *tested* to twice the intended safe working load before they are initially put into use. The employer shall *maintain a record* of the dates and *results* of such tests.

1926.252 - Disposal of Waste Materials

Scope: This [standard](#) provides the requirements pertaining to the disposal of waste materials.

Special Requirements: Signs, references other standards (regulations)

[1926.252\(b\)](#) - When debris is dropped through holes in the floor without the use of chutes, the area onto which the material is dropped shall be completely enclosed with barricades

not less than 42 inches high and not less than 6 feet back from the projected edge of the opening above. *Signs* warning of the hazard of falling materials shall be posted at each level. Removal shall not be permitted in this lower area until debris handling ceases above.

[1926.252\(d\)](#) - Disposal of waste material or debris by burning shall comply with *local fire regulations*.

Subpart I - [Tools - Hand and Power](#)

[Subpart I](#) provides the general requirements for using hand and power tools.

To learn if subpart I applies to you, go to [Does "Subpart I - Tools - Hand and Power" Apply to You?](#)

Special Requirements

1926.300 - General Requirements

Scope: This [standard](#) provides the general requirements for hand and power tools.

Special Requirements: Designed, personal protective equipment, references other standards

[1926.300\(b\)\(4\)\(ii\)](#) - The point of operation of machines whose operation exposes an employee to injury, shall be guarded. The guarding device shall be in conformity with any appropriate *standards* therefor, or, in the absence of applicable specific *standards*, shall be so *designed* and constructed as to prevent the operator from having any part of his body in the danger zone during the operating cycle.

[1926.300\(b\)\(6\)](#) - Anchoring fixed machinery. Machines *designed* for a fixed location shall be securely anchored to prevent walking or moving.

[1926.300\(c\)](#) - *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 [subpart D](#) - *occupational health and environmental controls* and [subpart E](#) - *personal protective and life saving equipment* of this part (1926).

1926.302 - Power-Operated Hand Tools

Scope: This [standard](#) provides the requirements for power-operated hand tools.

Special Requirements: Approved, manufacturer's safe operating pressure, training, testing, manufacturer's recommended procedure, manufacturer recommendations, personal protective equipment, references other standards

[1926.302\(a\)\(1\)](#) - Electric power operated tools shall either be of the *approved* double-insulated type or grounded in accordance with [subpart K](#) - *electrical* of this part (1926).

Pneumatic Power Tools

[1926.302\(b\)\(4\)](#) - Compressed air shall not be used for cleaning purposes except where reduced to less than 30 p.s.i. and then only with effective chip guarding and *personal protective equipment* which meets the requirements of [subpart E](#) - *personal protective and life saving equipment* of this part. The 30 p.s.i. requirement does not apply for concrete form, mill scale and similar cleaning purposes.

[1926.302\(b\)\(5\)](#) - The *manufacturer's safe operating pressure* for hoses, pipes, valves, filters, and other fittings shall not be exceeded.

Fuel Powered Tools

[1926.302\(c\)\(1\)](#) - All fuel powered tools shall be stopped while being refueled, serviced, or maintained, and fuel shall be transported, handled, and stored in accordance with [subpart E](#) - *Fire Protection and Prevention* of this part.

[1926.302\(c\)\(2\)](#) - When fuel powered tools are used in enclosed spaces, the applicable requirements for concentrations of toxic gases and use of *personal protective equipment*, as outlined in [subpart D](#) - *occupational health and environmental controls* and [subpart E](#) - *personal protective and life saving equipment* of this part of this part, shall apply.

Hydraulic Power Tools

[1926.302\(d\)\(1\)](#) - The fluid used in hydraulic powered tools shall be fire-resistant fluids approved under *Schedule 30 of the U.S. Bureau of Mines, Department of the Interior*, and shall retain its operating characteristics at the most extreme temperatures to which it will be exposed.

[1926.302\(d\)\(2\)](#) - The *manufacturer's safe operating pressures* for hoses, valves, pipes, filters, and other fittings shall not be exceeded.

Powder-Actuated Tools

[1926.302\(e\)\(1\)](#) - Only employees who have been *trained* in the operation of the particular tool in use shall be allowed to operate a powder-actuated tool.

[1926.302\(e\)\(2\)](#) - The tool shall be *tested* each day before loading to see that safety devices are in proper working condition. The method of *testing* shall be in accordance with the *manufacturer's recommended procedure*.

[1926.302\(e\)\(4\)](#) - *Personal protective equipment* shall be in accordance with [subpart E](#) - *personal protective and life saving equipment* of this part of this part.

[1926.302\(e\)\(11\)](#) - All tools shall be used with the correct shield, guard, or attachment *recommended by the manufacturer*.

[1926.302\(e\)\(12\)](#) - Powder-actuated tools used by employees shall meet all other applicable requirements of *American National Standards Institute, A10.3-1970, Safety Requirements for Explosive-Actuated Fastening Tools*.

1926.303 - Abrasive Wheels and Tools

Scope: This [standard](#) provides the requirements for abrasive wheels and tools.

Special Requirements: Inspect, ring-test, references other standards

[1926.303\(b\)\(1\)](#) - Grinding machines shall be equipped with safety guards in conformance with the requirements of *American National Standards Institute, B7.1-1970, Safety Code for the Use, Care and Protection of Abrasive Wheels*, and [paragraph \(d\)](#) of this section.

[1926.303\(c\)\(3\)](#) - Cup type wheels used for external grinding shall be protected by either a revolving cup guard or a band type guard in accordance with the provisions of the *American National Standards Institute, B7.1-1970 Safety Code for the Use, Care, and Protection of Abrasive Wheels*. All other portable abrasive wheels used for external grinding, shall be provided with safety guards (protection hoods) meeting the requirements of [paragraph \(c\)\(5\)](#) of this section, except as follows: [Reference [paragraph \(c\)\(3\)\(i\) – \(ii\)](#)].

[1926.303\(c\)\(7\)](#) - All abrasive wheels shall be closely *inspected and ring-tested* before mounting to ensure that they are free from cracks or defects.

[1926.303\(d\)](#) - Other requirements. All abrasive wheels and tools used by employees shall meet other applicable requirements of *American National Standards Institute, B7.1-1970, Safety Code for the Use, Care and Protection of Abrasive Wheels*.

1926.304 - Woodworking Tools

Scope: This [standard](#) provides the requirements for woodworking tools.

Special Requirements: Locks, tags, marked, personal protective equipment, references other standards

[1926.304\(a\)](#) - Disconnect switches. All fixed power driven woodworking tools shall be provided with a disconnect switch that can either be *locked or tagged* in the off position.

[1926.304\(b\)](#) - Speeds. The operating speed shall be etched or otherwise permanently *marked* on all circular saws over 20 inches in diameter or operating at over 10,000 peripheral feet per minute. Any saw so *marked* shall not be operated at a speed other than that *marked* on the blade. When a *marked* saw is retensioned for a different speed, the *marking* shall be corrected to show the new speed.

[1926.304\(e\)](#) - *Personal protective equipment*. All *personal protective equipment* provided for use shall conform to [subpart E](#) - *personal protective and life saving equipment* of this part (1926).

[1926.304\(f\)](#) - Other requirements. All woodworking tools and machinery shall meet other applicable requirements of *American National Standards Institute, 01.1-1961, Safety Code for Woodworking Machinery*.

1926.305 - Jacks - Lever and Ratchet, Screw, and Hydraulic

Scope: This [standard](#) provides the requirements for jacks.

Special Requirements: Manufacturer's rated capacity, marked, inspected, tagged

[1926.305\(a\)\(1\)](#) - The *manufacturer's rated capacity* shall be legibly *marked* on all jacks and shall not be exceeded.

[1926.305\(d\)\(1\)\(iv\)](#) - Each jack shall be thoroughly *inspected* at times which depend upon the service conditions. *Inspections* shall be not less frequent than the following: [Reference [paragraph \(d\)\(1\)\(iv\)\(a\) – \(c\)](#)].

[1926.305\(d\)\(1\)\(vi\)](#) - Jacks which are out of order shall be *tagged* accordingly, and shall not be used until repairs are made.

1926.306 - Air Receivers

Scope: This [standard](#) provides the requirements for air receivers.

Special Requirements: Tests, references other standards

[1926.306\(a\)\(2\)\(i\)](#) - All new air receivers installed after the effective date of these regulations shall be constructed in accordance with the *1968 edition of the A.S.M.E. Boiler and Pressure Vessel Code Section VIII*.

[1926.306\(a\)\(2\)\(ii\)](#) - All safety valves used shall be constructed, installed, and maintained in accordance with the *A.S.M.E. Boiler and Pressure Vessel Code, Section VIII Edition 1968*.

[1926.306\(b\)\(3\)\(iv\)](#) - All safety valves shall be *tested frequently and at regular intervals* to determine whether they are in good operating condition.

1926.307 - Mechanical Power-Transmission Apparatus

Scope: This [standard](#) provides the requirements for mechanical power-transmission apparatus.

Special Requirements: Inspections, references other standards

[1926.307\(c\)\(5\)](#) - Power-transmission apparatus located in basements. All mechanical power transmission apparatus located in basements, towers, and rooms used exclusively for power transmission equipment shall be guarded in accordance with this section, except that the requirements for safeguarding belts, pulleys, and shafting need not be complied with when the following requirements are met:

- [1926.307\(c\)\(5\)\(iii\)](#) - The intensity of illumination conforms to the requirements of *ANSI A11.1-1965 (R-1970)*.

[1926.307\(p\)\(4\)](#) - Hangers. Hangers shall be *inspected* to make certain that all supporting bolts and screws are tight and that supports of hanger boxes are adjusted properly.

[1926.307\(p\)\(6\)\(ii\)](#) - *Inspection* shall be made of belts, lacings, and fasteners and such equipment kept in good repair.

Subpart I - [Tools - Hand and Power](#)

[Subpart I](#) provides the general requirements for using hand and power tools.

To learn if subpart I applies to you, go to [Does "Subpart I - Tools - Hand and Power" Apply to You?](#)

Special Requirements

1926.300 - General Requirements

Scope: This [standard](#) provides the general requirements for hand and power tools.

Special Requirements: Designed, personal protective equipment, references other standards

[1926.300\(b\)\(4\)\(ii\)](#) - The point of operation of machines whose operation exposes an employee to injury, shall be guarded. The guarding device shall be in conformity with any appropriate *standards* therefor, or, in the absence of applicable specific *standards*, shall be so *designed* and constructed as to prevent the operator from having any part of his body in the danger zone during the operating cycle.

[1926.300\(b\)\(6\)](#) - Anchoring fixed machinery. Machines *designed* for a fixed location shall be securely anchored to prevent walking or moving.

[1926.300\(c\)](#) - *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 [subpart D](#) - *occupational health and environmental controls* and [subpart E](#) - *personal protective and life saving equipment* of this part (1926).

1926.302 - Power-Operated Hand Tools

Scope: This [standard](#) provides the requirements for power-operated hand tools.

Special Requirements: Approved, manufacturer's safe operating pressure, training, testing, manufacturer's recommended procedure, manufacturer recommendations, personal protective equipment, references other standards

[1926.302\(a\)\(1\)](#) - Electric power operated tools shall either be of the *approved* double-insulated type or grounded in accordance with [subpart K](#) - *electrical* of this part (1926).

Pneumatic Power Tools

[1926.302\(b\)\(4\)](#) - Compressed air shall not be used for cleaning purposes except where reduced to less than 30 p.s.i. and then only with effective chip guarding and *personal protective equipment* which meets the requirements of [subpart E](#) - *personal protective and life saving equipment* of this part. The 30 p.s.i. requirement does not apply for concrete form, mill scale and similar cleaning purposes.

[1926.302\(b\)\(5\)](#) - The *manufacturer's safe operating pressure* for hoses, pipes, valves, filters, and other fittings shall not be exceeded.

Fuel Powered Tools

[1926.302\(c\)\(1\)](#) - All fuel powered tools shall be stopped while being refueled, serviced, or maintained, and fuel shall be transported, handled, and stored in accordance with [subpart E - Fire Protection and Prevention](#) of this part.

[1926.302\(c\)\(2\)](#) - When fuel powered tools are used in enclosed spaces, the applicable requirements for concentrations of toxic gases and use of *personal protective equipment*, as outlined in [subpart D - occupational health and environmental controls](#) and [subpart E - personal protective and life saving equipment](#) of this part of this part, shall apply.

Hydraulic Power Tools

[1926.302\(d\)\(1\)](#) - The fluid used in hydraulic powered tools shall be fire-resistant fluids approved under *Schedule 30 of the U.S. Bureau of Mines, Department of the Interior*, and shall retain its operating characteristics at the most extreme temperatures to which it will be exposed.

[1926.302\(d\)\(2\)](#) - The *manufacturer's safe operating pressures* for hoses, valves, pipes, filters, and other fittings shall not be exceeded.

Powder-Actuated Tools

[1926.302\(e\)\(1\)](#) - Only employees who have been *trained* in the operation of the particular tool in use shall be allowed to operate a powder-actuated tool.

[1926.302\(e\)\(2\)](#) - The tool shall be *tested* each day before loading to see that safety devices are in proper working condition. The method of *testing* shall be in accordance with the *manufacturer's recommended procedure*.

[1926.302\(e\)\(4\)](#) - *Personal protective equipment* shall be in accordance with [subpart E - personal protective and life saving equipment](#) of this part of this part.

[1926.302\(e\)\(11\)](#) - All tools shall be used with the correct shield, guard, or attachment *recommended by the manufacturer*.

[1926.302\(e\)\(12\)](#) - Powder-actuated tools used by employees shall meet all other applicable requirements of *American National Standards Institute, A10.3-1970, Safety Requirements for Explosive-Actuated Fastening Tools*.

1926.303 - Abrasive Wheels and Tools

Scope: This [standard](#) provides the requirements for abrasive wheels and tools.

Special Requirements: Inspect, ring-test, references other standards

[1926.303\(b\)\(1\)](#) - Grinding machines shall be equipped with safety guards in conformance with the requirements of *American National Standards Institute, B7.1-1970, Safety Code for the Use, Care and Protection of Abrasive Wheels*, and [paragraph \(d\)](#) of this section.

[1926.303\(c\)\(3\)](#) - Cup type wheels used for external grinding shall be protected by either a revolving cup guard or a band type guard in accordance with the provisions of the *American National Standards Institute, B7.1-1970 Safety Code for the Use, Care, and Protection of Abrasive Wheels*. All other portable abrasive wheels used for external grinding, shall be provided with safety guards (protection hoods) meeting the requirements of [paragraph \(c\)\(5\)](#) of this section, except as follows: [Reference [paragraph \(c\)\(3\)\(i\) – \(ii\)](#)].

[1926.303\(c\)\(7\)](#) - All abrasive wheels shall be closely *inspected and ring-tested* before mounting to ensure that they are free from cracks or defects.

[1926.303\(d\)](#) - Other requirements. All abrasive wheels and tools used by employees shall meet other applicable requirements of *American National Standards Institute, B7.1-1970, Safety Code for the Use, Care and Protection of Abrasive Wheels*.

1926.304 - Woodworking Tools

Scope: This [standard](#) provides the requirements for woodworking tools.

Special Requirements: Locks, tags, marked, personal protective equipment, references other standards

[1926.304\(a\)](#) - Disconnect switches. All fixed power driven woodworking tools shall be provided with a disconnect switch that can either be *locked or tagged* in the off position.

[1926.304\(b\)](#) - Speeds. The operating speed shall be etched or otherwise permanently *marked* on all circular saws over 20 inches in diameter or operating at over 10,000 peripheral feet per minute. Any saw so *marked* shall not be operated at a speed other than that *marked* on the blade. When a *marked* saw is retensioned for a different speed, the *marking* shall be corrected to show the new speed.

[1926.304\(e\)](#) - *Personal protective equipment*. All *personal protective equipment* provided for use shall conform to [subpart E - personal protective and life saving equipment](#) of this part (1926).

[1926.304\(f\)](#) - Other requirements. All woodworking tools and machinery shall meet other applicable requirements of *American National Standards Institute, 01.1-1961, Safety Code for Woodworking Machinery*.

1926.305 - Jacks - Lever and Ratchet, Screw, and Hydraulic

Scope: This [standard](#) provides the requirements for jacks.

Special Requirements: Manufacturer's rated capacity, marked, inspected, tagged

[1926.305\(a\)\(1\)](#) - The *manufacturer's rated capacity* shall be legibly marked on all jacks and shall not be exceeded.

[1926.305\(d\)\(1\)\(iv\)](#) - Each jack shall be thoroughly *inspected* at times which depend upon the service conditions. *Inspections* shall be not less frequent than the following:
[Reference [paragraph \(d\)\(1\)\(iv\)\(a\) – \(c\)](#)].

[1926.305\(d\)\(1\)\(vi\)](#) - Jacks which are out of order shall be *tagged* accordingly, and shall not be used until repairs are made.

1926.306 - Air Receivers

Scope: This [standard](#) provides the requirements for air receivers.

Special Requirements: Tests, references other standards

[1926.306\(a\)\(2\)\(i\)](#) - All new air receivers installed after the effective date of these regulations shall be constructed in accordance with the *1968 edition of the A.S.M.E. Boiler and Pressure Vessel Code Section VIII*.

[1926.306\(a\)\(2\)\(ii\)](#) - All safety valves used shall be constructed, installed, and maintained in accordance with the *A.S.M.E. Boiler and Pressure Vessel Code, Section VIII Edition 1968*.

[1926.306\(b\)\(3\)\(iv\)](#) - All safety valves shall be *tested frequently and at regular intervals* to determine whether they are in good operating condition.

1926.307 - Mechanical Power-Transmission Apparatus

Scope: This [standard](#) provides the requirements for mechanical power-transmission apparatus.

Special Requirements: Inspections, references other standards

[1926.307\(c\)\(5\)](#) - Power-transmission apparatus located in basements. All mechanical power transmission apparatus located in basements, towers, and rooms used exclusively for power transmission equipment shall be guarded in accordance with this section, except that the requirements for safeguarding belts, pulleys, and shafting need not be complied with when the following requirements are met:

- [1926.307\(c\)\(5\)\(iii\)](#) - The intensity of illumination conforms to the requirements of *ANSI A11.1-1965 (R-1970)*.

[1926.307\(p\)\(4\)](#) - Hangers. Hangers shall be *inspected* to make certain that all supporting bolts and screws are tight and that supports of hanger boxes are adjusted properly.

[1926.307\(p\)\(6\)\(ii\)](#) - *Inspection* shall be made of belts, lacings, and fasteners and such equipment kept in good repair.

Subpart J - [Welding and Cutting](#)

[Subpart J](#) provides the requirements for gas welding and cutting, arc welding and cutting, fire prevention, ventilation and protection in welding, cutting and heating, and welding, cutting and heating in way of preservative coatings.

To learn if subpart J applies to you, go to [Does "Subpart J - Welding and Cutting" Apply to You?](#)

Special Requirements

1926.350 - Gas Welding and Cutting

Scope: This [standard](#) provides the requirements for gas welding and cutting.

Special Requirements: Tags, signs, painted, tested, inspected, authorized (person), rules, references other standards

[1926.350\(a\)\(12\)](#) - The in-plant handling, storage, and utilization of all compressed gases in cylinders, portable tanks, rail tankcars, or motor vehicle cargo tanks shall be in accordance with *Compressed Gas Association Pamphlet P-1-1965*.

[1926.350\(c\)\(2\)](#) - No person other than the gas supplier shall attempt to mix gases in a cylinder. No one except the owner of the cylinder or person *authorized* by him, shall refill a cylinder. No one shall use a cylinder's contents for purposes other than those intended by the supplier. All cylinders used shall meet the *Department of Transportation requirements published in 49 CFR part 178, subpart C, Specification for Cylinders*.

[1926.350\(d\)\(5\)](#) - 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 work area. In the event that fuel gas should leak from the cylinder valve, rather than from the valve stem, and the gas cannot be shut off, the

cylinder shall be properly *tagged* and removed from the work area. If a regulator attached to a cylinder valve will effectively stop a leak through the valve seat, the cylinder need not be removed from the work area.

[1926.350\(e\)\(1\)](#) - Fuel gas and oxygen manifolds shall bear the name of the substance they contain in *letters* at least 1-inch high which shall be either *painted* on the manifold or on a *sign* permanently attached to it.

[1926.350\(f\)\(4\)](#) - Hose which has been subject to flashback, or which shows evidence of severe wear or damage, shall be *tested* to twice the normal pressure to which it is subject, but in no case less than 300 p.s.i. Defective hose, or hose in doubtful condition, shall not be used.

[1926.350\(g\)\(2\)](#) - Torches in use shall be *inspected* at the *beginning of each working shift* for leaking shutoff valves, hose couplings, and tip connections. Defective torches shall not be used.

[1926.350\(j\)](#) - Additional *rules*. For additional details not covered in this subpart, applicable technical portions of *American National Standards Institute, Z49.1-1967, Safety in Welding and Cutting*, shall apply.

1926.351 - Arc Welding and Cutting

Scope: This [standard](#) provides the requirements for arc welding and cutting.

Special Requirements: Inspections, checks, operating instructions, reporting, instruct, references other standards

[1926.351\(c\)\(2\)](#) - Pipelines containing gases or flammable liquids, or conduits containing electrical circuits, shall not be used as a ground return. For welding on natural gas pipelines, the technical portions of regulations issued by the *Department of Transportation, Office of Pipeline Safety, 49 CFR part 192, Minimum Federal Safety Standards for Gas Pipelines*, shall apply.

[1926.351\(c\)\(4\)](#) - When a structure or pipeline is continuously employed as a ground return circuit, all joints shall be bonded, and *periodic inspections* shall be conducted to ensure that no condition of electrolysis or fire hazard exists by virtue of such use.

[1926.351\(c\)\(5\)](#) - The frames of all arc welding and cutting machines shall be grounded either through a third wire in the cable containing the circuit conductor or through a separate wire which is grounded at the source of the current. Grounding circuits, other than by means of the structure, shall be *checked* to ensure that the circuit between the ground and the grounded power conductor has resistance low enough to permit sufficient current to flow to cause the fuse or circuit breaker to interrupt the current.

[1926.351\(c\)\(6\)](#) - All ground connections shall be *inspected* to ensure that they are mechanically strong and electrically adequate for the required current.

[1926.351\(d\)](#) - *Operating instructions*. Employers shall *instruct* employees in the safe means of arc welding and cutting as follows: [Reference [paragraph \(d\)\(1\) – \(5\)](#)].

- [1926.351\(d\)\(4\)](#) - Any faulty or defective equipment shall be *reported to the supervisor*.
- [1926.351\(d\)\(5\)](#) - See [1926.406\(c\)](#) - Specific purpose equipment and installations, electric welders – disconnecting means, for additional requirements.

1926.352 - Fire Prevention

Scope: This [standard](#) provides the fire prevention requirements during welding, cutting and heating operations.

Special Requirements: Fire extinguishing equipment, firefighting equipment, instructed, guarding, precautions, tested, references other standards

[1926.352\(d\)](#) - Suitable *fire extinguishing equipment* shall be immediately available in the work area and shall be maintained in a state of readiness for instant use.

[1926.352\(e\)](#) - 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.

[1926.352\(f\)](#) - 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.

[1926.352\(i\)](#) - Drums containers, or hollow structures which have contained toxic or flammable substances shall, before welding, cutting, or heating is undertaken on them, either be filled with water or thoroughly cleaned of such substances and ventilated and *tested*. For welding, cutting and heating on steel pipelines containing natural gas, the pertinent portions of regulations issued by the *Department of Transportation, Office of Pipeline Safety, 49 CFR part 192, Minimum Federal Safety Standards for Gas Pipelines*, shall apply.

1926.353 - Ventilation and Protection in Welding, Cutting, and Heating

Scope: This [standard](#) provides the requirements for ventilation and protection in welding, cutting, and heating.

Special Requirements: Communication, personal protective equipment (i.e., respirators, lifelines), rescue procedures, rescue operations, special precautions, references other standards

[1926.353\(a\)\(2\)](#) - General mechanical ventilation shall be of sufficient capacity and so arranged as to produce the number of air changes necessary to maintain welding fumes and smoke within safe limits, as defined in [subpart D - occupational health and environmental controls](#) of this part (1926).

[1926.353\(a\)\(3\)](#) - Local exhaust ventilation shall consist of freely movable hoods intended to be placed by the welder or burner as close as practicable to the work. This system shall be of sufficient capacity and so arranged as to remove fumes and smoke at the source and keep the concentration of them in the breathing zone within safe limits as defined in [subpart D - occupational health and environmental controls](#) of this part.

[1926.353\(b\)\(2\)](#) - When sufficient ventilation cannot be obtained without blocking the means of access, employees in the confined space shall be protected by air line respirators in accordance with the requirements of [subpart E - personal protective and life saving equipment](#) of this part, and an employee on the outside of such a confined space shall be assigned to maintain communication with those working within it and to aid them in an emergency.

[1926.353\(b\)\(3\)](#) - *Lifelines*. Where a welder must enter a confined space through a manhole or other small opening, means shall be provided for quickly removing him in case of emergency. When *safety belts and lifelines* are used for this purpose they shall be so attached to the welder's body that his body cannot be jammed in a small exit opening. An attendant with a *pre-planned rescue procedure* shall be stationed outside to observe the welder at all times and be capable of putting *rescue operations* into effect.

[1926.353\(c\)\(2\)](#) - Welding, cutting, or heating in any enclosed spaces involving the metals specified in this subparagraph shall be performed with local exhaust ventilation in accordance with the requirements of [paragraph \(a\)](#) of this section, or employees shall be protected by *air line respirators* in accordance with the requirements of [subpart E - personal protective and life saving equipment](#) of this part: [Reference [paragraph \(c\)\(2\)\(i\) – \(iv\)](#)].

[1926.353\(c\)\(3\)](#) - Employees performing such operations in the open air shall be protected by filter-type respirators in accordance with the requirements of [subpart E - personal protective and life saving equipment](#) of this part, except that employees performing such operations on beryllium-containing base or filler metals shall be protected by *air line*

respirators in accordance with the requirements of [subpart E](#) - *personal protective and life saving equipment* of this part.

[1926.353\(d\)\(1\)](#) - Since the inert-gas metal-arc welding process involves the production of ultra-violet radiation of intensities of 5 to 30 times that produced during shielded metal-arc welding, the decomposition of chlorinated solvents by ultraviolet rays, and the liberation of toxic fumes and gases, employees shall not be permitted to engage in, or be exposed to the process until the following *special precautions* have been taken: [Reference [paragraph \(d\)\(1\)\(i\) – \(iv\)](#)].

[1926.353\(e\)\(1\)](#) - Welding, cutting, and heating, not involving conditions or materials described in [paragraph \(b\)](#), [\(c\)](#), or [\(d\)](#) of this section, may normally be done without mechanical ventilation or *respiratory protective equipment*, but where, because of unusual physical or atmospheric conditions, an unsafe accumulation of contaminants exists, suitable mechanical ventilation or *respiratory protective equipment* shall be provided.

[1926.353\(e\)\(2\)](#) - Employees performing any type of welding, cutting, or heating shall be protected by suitable *eye protective equipment* in accordance with the requirements of [subpart E](#) - *personal protective and life saving equipment* of this part.

1926.354 - Welding, Cutting, and Heating in Way of Preservative Coatings

Scope: This [standard](#) provides the requirements for welding, cutting, and heating in way of preservative coatings.

Special Requirements: Tests, competent person, precautions, personal protective equipment (respirators), references other standards

[1926.354\(a\)](#) - 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.

[1926.354\(b\)](#) - *Precautions* shall be taken to prevent ignition of highly flammable hardened preservative coatings. When coatings are determined to be highly flammable, they shall be stripped from the area to be heated to prevent ignition.

[1926.354\(c\)\(1\)](#) - In enclosed spaces, all surfaces covered with toxic preservatives shall be stripped of all toxic coatings for a distance of at least 4 inches from the area of heat application, or the employees shall be protected by *air line respirators*, meeting the requirements of [subpart e](#) - *personal protective and life saving equipment* of this part (1926).

[1926.354\(c\)\(2\)](#) - In the open air, employees shall be protected by a respirator, in accordance with requirements of [subpart e - personal protective and life saving equipment](#) of this part.

Subpart K - [Electrical](#)

[Subpart K](#) provides the electrical standards for construction work.

To learn if subpart K applies to you, go to [Does "Subpart K - Electrical" Apply to You?](#)

Special Requirements

1926.403 - General Requirements

Scope: This [standard](#) provides the general requirements for electrical work in construction.

Special Requirements: Listing, labeling, certification, instructions, markings, trademark, qualified persons, warning signs, caution signs, designed

[1926.403\(b\)\(1\)](#) - Examination. The employer shall ensure that electrical equipment is free from recognized hazards that are likely to cause death or serious physical harm to employees. Safety of equipment shall be determined on the basis of the following considerations: [Reference [paragraph \(b\)\(1\)\(i\) - \(vii\)](#)].

- [1926.403\(b\)\(1\)\(i\)](#) - Suitability for installation and use in conformity with the provisions of this subpart. Suitability of equipment for an identified purpose may be evidenced by *listing, labeling, or certification* for that identified purpose.

[1926.403\(b\)\(2\)](#) - Installation and use. *Listed, labeled, or certified* equipment shall be installed and used in accordance with *instructions* included in the *listing, labeling, or certification*.

[1926.403\(g\)](#) - *Marking*. Electrical equipment shall not be used unless the *manufacturer's name, trademark, or other descriptive marking* by which the organization responsible for the product may be identified is placed on the equipment and unless other *markings* are provided giving voltage, current, wattage, or other ratings as necessary. The *marking* shall be of sufficient durability to withstand the environment involved.

[1926.403\(h\)](#) - Identification of disconnecting means and circuits. Each disconnecting means required by this subpart for motors and appliances shall be legibly *marked* to indicate its purpose, unless located and arranged so the purpose is evident. Each service,

feeder, and branch circuit, at its disconnecting means or overcurrent device, shall be *legibly marked* to indicate its purpose, unless located and arranged so the purpose is evident. These *markings* shall be of sufficient durability to withstand the environment involved.

[1926.403\(i\)\(2\)\(i\)](#) - Except as required or permitted elsewhere in this subpart, live parts of electric equipment operating at 50 volts or more shall be guarded against accidental contact by cabinets or other forms of enclosures, or by any of the following means:

- [1926.403\(i\)\(2\)\(i\)\(A\)](#) - By location in a room, vault, or similar enclosure that is accessible only to *qualified persons*.
- [1926.403\(i\)\(2\)\(i\)\(B\)](#) - By partitions or screens so arranged that only *qualified persons* will have access to the space within reach of the live parts. Any openings in such partitions or screens shall be so sized and located that persons are not likely to come into accidental contact with the live parts or to bring conducting objects into contact with them.

[1926.403\(i\)\(2\)\(iii\)](#) - Entrances to rooms and other guarded locations containing exposed live parts shall be *marked* with conspicuous *warning signs* forbidding unqualified persons to enter.

[1926.403\(j\)\(2\)](#) - Enclosure for electrical installations. Electrical installations in a vault, room, closet or in an area surrounded by a wall, screen, or fence, access to which is controlled by *lock and key* or other equivalent means, are considered to be accessible to *qualified persons* only. A wall, screen, or fence less than 8 feet (2.44 m) in height is not considered adequate to prevent access unless it has other features that provide a degree of isolation equivalent to an 8-foot (2.44-m) fence. The entrances to all buildings, rooms or enclosures containing exposed live parts or exposed conductors operating at over 600 volts, nominal, shall be kept locked or shall be under the observation of a *qualified person* at all times.

- [1926.403\(j\)\(2\)\(i\)](#) - Installations accessible to *qualified persons* only. Electrical installations having exposed live parts shall be accessible to *qualified persons* only and shall comply with the applicable provisions of [paragraph \(j\)\(3\)](#) of this section.
- [1926.403\(j\)\(2\)\(ii\)](#) - Installations accessible to *unqualified persons*. Electrical installations that are open to *unqualified persons* shall be made with metal-enclosed equipment or shall be enclosed in a vault or in an area, access to which is controlled by a lock. Metal-enclosed switchgear, unit substations, transformers, pull boxes, connection boxes, and other similar associated equipment shall be marked with appropriate *caution signs*. If equipment is exposed to physical damage from vehicular traffic, guards shall be provided to prevent such damage. Ventilating or similar openings in metal-enclosed equipment shall be *designed* so that foreign objects inserted through these openings will be deflected from energized parts.

1926.404 - Wiring Design and Protection

Scope: This [standard](#) provides the requirements for wiring design and protection.

Special Requirements: Assured equipment grounding conductor program (written), inspections, tests, test record, listed/labeled tools, marked, competent person, qualified persons, warning signs (posted), affected employees, references other standards

[1926.404\(b\)\(1\)\(i\)](#) - General. The employer shall use either ground fault circuit interrupters as specified in [paragraph \(b\)\(1\)\(ii\)](#) of this section or an *assured equipment grounding conductor program* as specified in [paragraph \(b\)\(1\)\(iii\)](#) of this section to protect employees on construction sites. These requirements are in addition to any other requirements for equipment grounding conductors.

[1926.404\(b\)\(1\)\(ii\)](#) - Ground-fault circuit interrupters. All 120-volt, single-phase, 15- and 20-ampere receptacle outlets on construction sites, which are not a part of the permanent wiring of the building or structure and which are in use by employees, shall have *approved* ground-fault circuit interrupters for personnel protection. Receptacles on a two-wire, single-phase portable or vehicle-mounted generator rated not more than 5kW, where the circuit conductors of the generator are insulated from the generator frame and all other grounded surfaces, need not be protected with ground-fault circuit interrupters.

[1926.404\(b\)\(1\)\(iii\)](#) - *Assured equipment grounding conductor program*. The employer shall establish and implement an *assured equipment grounding conductor program* on construction sites covering all cord sets, receptacles which are not a part of the building or structure, and equipment connected by cord and plug which are available for use or used by employees. This *program* shall comply with the following minimum requirements:

- [1926.404\(b\)\(1\)\(iii\)\(A\)](#) - A *written description of the program*, including the specific *procedures* adopted by the employer, shall be available at the jobsite for *inspection and copying* by the Assistant Secretary and any affected employee.
- [1926.404\(b\)\(1\)\(iii\)\(B\)](#) - The employer shall designate one or more *competent persons* [as defined in [1926.32\(f\)](#) - *definitions*] to implement the *program*.
- [1926.404\(b\)\(1\)\(iii\)\(C\)](#) - Each cord set, attachment cap, plug and receptacle of cord sets, and any equipment connected by cord and plug, except cord sets and receptacles which are fixed and not exposed to damage, shall be *visually inspected* before each day's use for external defects, such as deformed or missing pins or insulation damage, and for indications of possible internal damage. Equipment found damaged or defective shall not be used until repaired.
- [1926.404\(b\)\(1\)\(iii\)\(D\)](#) - The following *tests* shall be performed on all cord sets, receptacles which are not a part of the permanent wiring of the building or structure, and cord- and plug-connected equipment required to be grounded:
[Reference [paragraph \(b\)\(1\)\(iii\)\(D\)\(1\) - \(2\)](#)].

- [1926.404\(b\)\(1\)\(iii\)\(E\)](#) - All required tests shall be performed: [Reference [paragraph \(b\)\(1\)\(iii\)\(E\)\(1\) – \(4\)](#)].
- [1926.404\(b\)\(1\)\(iii\)\(G\)](#) - Tests performed as required in this paragraph shall be *recorded*. This *test record* shall identify each receptacle, cord set, and cord- and plug-connected equipment that passed the *test* and shall indicate the last date it was *tested* or the interval for which it was *tested*. This *record* shall be kept by means of *logs*, *color coding*, or other effective means and shall be *maintained* until replaced by a more current *record*. The *record* shall be made *available on the jobsite* for inspection by the Assistant Secretary and any *affected employee*.

Services

[1926.404\(d\)\(2\)\(i\)](#) - Guarding. Service-entrance conductors installed as open wires shall be guarded to make them accessible only to *qualified persons*.

[1926.404\(d\)\(2\)\(ii\)](#) - *Warning signs*. Signs warning of high voltage shall be *posted* where unauthorized employees might come in contact with live parts.

Grounding

[1926.404\(f\)\(7\)\(iii\)\(F\)](#) - If equipment operates with any terminal at over 150 volts to ground; however, the following need not be grounded:

- [1926.404\(f\)\(7\)\(iii\)\(F\)\(1\)](#) - Enclosures for switches or circuit breakers used for other than service equipment and accessible to *qualified persons* only;
- [1926.404\(f\)\(7\)\(iv\)\(C\)\(6\)](#) - Tools likely to be used in wet and/or conductive locations need not be grounded if supplied through an isolating transformer with an ungrounded secondary of not over 50 volts. *Listed or labeled portable tools and appliances* protected by a system of double insulation, or its equivalent, need not be grounded. If such a system is employed, the equipment shall be *distinctively marked* to indicate that the tool or appliance utilizes a system of double insulation.

1926.405 - Wiring Methods, Components, and Equipment for General Use

Scope: This [standard](#) provides the requirements for wiring methods, components and equipment for general use.

Special Requirements: Designed, authorized/qualified personnel, approved, qualified persons, markings, identified fixture wire, caution signs, identified blade, supervised alarm, switching procedure, references other standards

[1926.405\(a\)\(2\)\(ii\)\(J\)](#) - Extension cord sets used with portable electric tools and appliances shall be of three-wire type and shall be *designed* for hard or extra-hard usage. Flexible cords used with temporary and portable lights shall be *designed* for hard or extra-hard

usage. **Note:** *The National Electrical Code, ANSI/NFPA 70, in Article 400, Table 400-4, lists various types of flexible cords, some of which are noted as being designed for hard or extra-hard usage. Examples of these types of flexible cords include hard service cord (types S, ST, SO, STO) and junior hard service cord (types SJ, SJO, SJT, SJTO).*

[1926.405\(a\)\(2\)\(iii\)](#) - *Guarding.* For temporary wiring over 600 volts, nominal, fencing, barriers, or other effective means shall be provided to prevent access of other than *authorized and qualified personnel*.

[1926.405\(b\)\(2\)](#) - *Covers and canopies.* All pull boxes, junction boxes, and fittings shall be provided with covers. If metal covers are used, they shall be grounded. In energized installations each outlet box shall have a cover, faceplate, or fixture canopy. Covers of outlet boxes having holes through which flexible cord pendants pass shall be provided with bushings *designed* for the purpose or shall have smooth, well-rounded surfaces on which the cords may bear.

[1926.405\(b\)\(3\)\(ii\)](#) - *Covers.* Boxes shall be closed by covers securely fastened in place. Underground box covers that weigh over 100 pounds (43.6 kg) meet this requirement. Covers for boxes shall be *permanently marked "HIGH VOLTAGE."* The *marking* shall be on the outside of the box cover and shall be *readily visible and legible*.

[1926.405\(c\)](#) - *Knife switches.* Single-throw knife switches shall be so connected that the blades are dead when the switch is in the open position. Single-throw knife switches shall be so placed that gravity will not tend to close them. Single-throw knife switches *approved* for use in the inverted position shall be provided with a locking device that will ensure that the blades remain in the open position when so set. Double-throw knife switches may be mounted so that the throw will be either vertical or horizontal. However, if the throw is vertical, a locking device shall be provided to ensure that the blades remain in the open position when so set.

[1926.405\(d\)](#) - *Switchboards and panelboards.* Switchboards that have any exposed live parts shall be located in permanently dry locations and accessible only to *qualified persons*. Panelboards shall be mounted in cabinets, cutout boxes, or enclosures *designed* for the purpose and shall be dead front. However, panelboards other than the dead front externally-operable type are permitted where accessible only to *qualified persons*. Exposed blades of knife switches shall be dead when open.

[1926.405\(g\)\(2\)\(iii\)](#) - *Marking.* Type SJ, SJO, SJT, SJTO, S, SO, ST, and STO cords shall not be used unless durably *marked* on the surface with the type designation, size, and number of conductors.

[1926.405\(h\)](#) - *Portable cables over 600 volts, nominal.* Multiconductor portable cable for use in supplying power to portable or mobile equipment at over 600 volts, nominal, shall consist of No. 8 or larger conductors employing flexible stranding. Cables operated at over

2000 volts shall be shielded for the purpose of confining the voltage stresses to the insulation. Grounding conductors shall be provided. Connectors for these cables shall be of a locking type with provisions to prevent their opening or closing while energized. Strain relief shall be provided at connections and terminations. Portable cables shall not be operated with splices unless the splices are of the permanent molded, vulcanized, or other equivalent type. Termination enclosures shall be marked with a high voltage hazard warning, and terminations shall be accessible only to *authorized and qualified personnel*.

[1926.405\(j\)\(1\)](#) - *General*. Fixture wires shall be suitable for the voltage, temperature, and location of use. A fixture wire which is used as a grounded conductor shall be *identified*.

[1926.405\(j\)\(1\)\(iii\)](#) - Portable lamps. Portable lamps shall be wired with flexible cord and an attachment plug of the polarized or grounding type. If the portable lamp uses an Edison-based lampholder, the grounded conductor shall be identified and attached to the screw shell and the *identified blade* of the attachment plug. In addition, portable handlamps shall comply with the following: [Reference [paragraph \(j\)\(1\)\(iii\)\(A\) – \(D\)](#)].

[1926.405\(j\)\(1\)\(v\)](#) - Fixtures. Fixtures installed in wet or damp locations shall be *identified* for the purpose and shall be installed so that water cannot enter or accumulate in wireways, lampholders, or other electrical parts.

[1926.405\(j\)\(2\)\(ii\)](#) - Damp and wet locations. A receptacle installed in a wet or damp location shall be *designed* for the location.

[1926.405\(j\)\(3\)\(iii\)](#) - Rating. Each appliance shall be *marked* with its rating in volts and amperes or volts and watts.

[1926.405\(j\)\(4\)\(iii\)](#) - Motor overload, short-circuit, and ground-fault protection. Motors, motor-control apparatus, and motor branch-circuit conductors shall be protected against overheating due to motor overloads or failure to start, and against short-circuits or ground faults. These provisions do not require overload protection that will stop a motor where a shutdown is likely to introduce additional or increased hazards, as in the case of fire pumps, or where continued operation of a motor is necessary for a safe shutdown of equipment or process and motor overload sensing devices are connected to a *supervised alarm*.

[1926.405\(j\)\(4\)\(iv\)\(A\)](#) - Stationary motors having commutators, collectors, and brush rigging located inside of motor end brackets and not conductively connected to supply circuits operating at more than 150 volts to ground need not have such parts guarded. Exposed live parts of motors and controllers operating at 50 volts or more between terminals shall be guarded against accidental contact by any of the following: [Reference [paragraph \(j\)\(4\)\(iv\)\(A\)\(1\) – \(3\)](#)].

- [1926.405\(j\)\(4\)\(iv\)\(A\)\(1\)](#) - By installation in a room or enclosure that is accessible only to *qualified persons*;

[1926.405\(j\)\(6\)\(ii\)](#) - Over 600 volts. Capacitors rated over 600 volts, nominal, shall comply with the following additional requirements:

- [1926.405\(j\)\(6\)\(ii\)\(A\)](#) - Isolating or disconnecting switches (with no interrupting rating) shall be interlocked with the load interrupting device or shall be provided with prominently displayed *caution signs* to prevent switching load current.
- [1926.405\(j\)\(6\)\(ii\)\(B\)](#) - Over 600 volts. For series capacitors the proper switching shall be assured by use of at least one of the following: [Reference [paragraph \(j\)\(6\)\(ii\)\(B\)\(1\) – \(3\)](#)].
 - [1926.405\(j\)\(6\)\(ii\)\(B\)\(3\)](#) - *Switching procedure* prominently *displayed* at the switching location.

1926.406 - Specific Purpose Equipment and Installations

Scope: This [standard](#) provides the requirements for specific purpose equipment and installations; cranes, hoists, runways, elevators, escalators, welders, x-ray equipment, and other similar equipment.

Special Requirements: Maintenance, locked, references other standards

[1926.406\(a\)\(3\)](#) - Clearance. The dimension of the working space in the direction of access to live parts which may require examination, adjustment, servicing, or *maintenance* while alive shall be a minimum of 2 feet 6 inches (762 mm). Where controls are enclosed in cabinets, the door(s) shall open at least 90 degrees or be removable, or the installation shall provide equivalent access.

[1926.406\(a\)\(4\)](#) - Grounding. All exposed metal parts of cranes, monorail hoists, hoists and accessories including pendant controls shall be metallically joined together into a continuous electrical conductor so that the entire crane or hoist will be grounded in accordance with [1926.404\(f\)](#) - *wiring design and protection, grounding*. Moving parts, other than removable accessories or attachments, having metal-to-metal bearing surfaces shall be considered to be electrically connected to each other through the bearing surfaces for grounding purposes. The trolley frame and bridge frame shall be considered as electrically grounded through the bridge and trolley wheels and its respective tracks unless conditions such as paint or other insulating materials prevent reliable metal-to-metal contact. In this case a separate bonding conductor shall be provided.

[1926.406\(b\)\(2\)](#) - Control panels. If control panels are not located in the same space as the drive machine, they shall be located in cabinets with doors or panels capable of being *locked* closed.

1926.407 - Hazardous (Classified) Locations

Scope: This [standard](#) provides requirements for hazardous locations.

Special Requirements: Classified, designations, markings, listing/labeling, design, employer demonstrates, guidelines (document), references other standards

[1926.407\(a\)](#) - Scope. This section sets forth requirements for electric equipment and wiring in locations which are *classified* depending on the properties of the flammable vapors, liquids or gases, or combustible dusts or fibers which may be present therein and the likelihood that a flammable or combustible concentration or quantity is present. Each room, section or area shall be considered individually in determining its *classification*. These hazardous (*classified*) locations are assigned *six designations* as follows:

Class I, Division 1
Class I, Division 2
Class II, Division 1
Class II, Division 2
Class III, Division 1
Class III, Division 2

For definitions of these locations see [1926.449 – definitions](#) applicable to this subpart. All applicable requirements in this subpart apply to all hazardous (*classified*) locations, unless modified by provisions of this section.

[1926.407\(b\)](#) - Electrical installations. Equipment, wiring methods, and installations of equipment in hazardous (*classified*) locations shall be approved as intrinsically safe or *approved* for the hazardous (*classified*) location or safe for the hazardous (*classified*) location. Requirements for each of these options are as follows:

- [1926.407\(b\)\(1\)](#) - *Intrinsically safe*. Equipment and associated wiring approved as intrinsically safe is permitted in any hazardous (*classified*) location included in its *listing or labeling*.
- [1926.407\(b\)\(2\)](#) - *Approved* for the hazardous (*classified*) location
 - [1926.407\(b\)\(2\)\(i\)](#) - General. Equipment shall be *approved* not only for the *class* of location but also for the ignitable or combustible properties of the specific gas, vapor, dust, or fiber that will be present.

Note: *NFPA 70, the National Electrical Code*, lists or defines hazardous gases, vapors, and dusts by "Groups" characterized by their ignitable or combustible properties.

[1926.407\(b\)\(2\)\(ii\)](#) - *Marking*. Equipment shall not be used unless it is marked to show the class, group, and operating temperature or temperature range, based on operation in a 40-

degree C ambient, for which it is approved. The temperature *marking* shall not exceed the ignition temperature of the specific gas, vapor, or dust to be encountered. However, the following provisions modify this *marking* requirement for specific equipment:

[Reference [paragraph \(b\)\(2\)\(ii\)\(A\) – \(D\)](#)].

[1926.407\(b\)\(3\)](#) - Safe for the hazardous (*classified*) location. Equipment which is safe for the location shall be of a type and *design* which the *employer demonstrates* will provide protection from the hazards arising from the combustibility and flammability of vapors, liquids, gases, dusts, or fibers.

Note: The *National Electrical Code, NFPA 70*, contains *guidelines* for determining the type and design of equipment and installations which will meet this requirement.

The *guidelines* of this *document* address electric wiring, equipment, and systems installed in hazardous (*classified*) locations and contain specific provisions for the following: wiring methods, wiring connections, conductor insulation, flexible cords, sealing and drainage, transformers, capacitors, switches, circuit breakers, fuses, motor controllers, receptacles, attachment plugs, meters, relays, instruments, resistors, generators, motors, lighting fixtures, storage battery charging equipment, electric cranes, electric hoists and similar equipment, utilization equipment, signaling systems, alarm systems, remote control systems, local loud speaker and communication systems, ventilation piping, live parts, lightning surge protection, and grounding. Compliance with these *guidelines* will constitute one means, but not the only means, of compliance with this paragraph.

1926.408 - Special Systems

Scope: This [standard](#) provides requirements for special systems (over 600 volts).

Special Requirements: Signs, marked, (authorized) qualified personnel, inspection, rating, locked doors, method, classification

[1926.408\(a\)\(2\)\(i\)](#) - Circuit breakers. Circuit breakers located indoors shall consist of metal-enclosed or fire-resistant, cell-mounted units. In locations accessible only to *qualified personnel*, open mounting of circuit breakers is permitted. A means of indicating the open and closed position of circuit breakers shall be provided.

[1926.408\(a\)\(2\)\(iii\)](#) - Equipment isolating means. A means shall be provided to completely isolate equipment for *inspection* and repairs. Isolating means which are not designed to interrupt the load current of the circuit shall be either interlocked with a circuit interrupter or provided with a *sign warning* against opening them under load.

[1926.408\(a\)\(3\)\(i\)](#) - Power cable connections to mobile machines. A metallic enclosure shall be provided on the mobile machine for enclosing the terminals of the power cable. The enclosure shall include provisions for a solid connection for the ground wire(s) terminal to ground effectively the machine frame. The method of cable termination used shall prevent

any strain or pull on the cable from stressing the electrical connections. The enclosure shall have provision for *locking* so only *authorized qualified persons* may open it and shall be *marked* with a *sign warning* of the presence of energized parts.

[1926.408\(a\)\(3\)\(ii\)](#) - Guarding live parts. All energized switching and control parts shall be enclosed in effectively grounded metal cabinets or enclosures. Circuit breakers and protective equipment shall have the operating means projecting through the metal cabinet or enclosure so these units can be reset without *locked doors* being opened. Enclosures and metal cabinets shall be locked so that only *authorized qualified persons* have access and shall be *marked* with a *sign warning* of the presence of energized parts. Collector ring assemblies on revolving-type machines (shovels, draglines, etc.) shall be guarded.

[1926.408\(b\)\(1\)](#) - *Classification*. Class 1, Class 2, or Class 3 remote control, signaling, or power-limited circuits are characterized by their usage and electrical power limitation which differentiates them from light and power circuits. These circuits are *classified* in accordance with their respective voltage and power limitations as summarized in [paragraphs \(b\)\(1\)\(i\) through \(b\)\(1\)\(iii\)](#) of this section.

[1926.408\(b\)\(2\)](#) - *Marking*. A Class 2 or Class 3 power supply unit shall not be used unless it is durably *marked* where plainly visible to indicate the class of supply and its *electrical rating*.

1926.416 - General Requirements

Scope: This [standard](#) provides the requirements for employee protection.

Special Requirements: Post warning signs, advise employees, protective measures, load ratings

[1926.416\(a\)\(3\)](#) - 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.

[1926.416\(c\)](#) - *Load ratings*. In existing installations, no changes in circuit protection shall be made to increase the load in excess of the *load rating* of the circuit wiring.

1926.417 - Lockout and Tagging of Circuits

Scope: This [standard](#) provides the requirements for lockout and tagging of circuits.

Special Requirements: Tags

[1926.417\(a\)](#) - Controls. Controls that are to be deactivated during the course of work on energized or deenergized equipment or circuits shall be *tagged*.

[1926.417\(b\)](#) - Equipment and circuits. Equipment or circuits that are deenergized shall be rendered inoperative and shall have *tags* attached at all points where such equipment or circuits can be energized.

[1926.417\(c\)](#) - *Tags*. *Tags* shall be placed to identify plainly the equipment or circuits being worked on.

1926.441 - Batteries and Battery Charging

Scope: This [standard](#) provides the requirements for equipment maintenance.

Special Requirements: Personal protective equipment (face shields, aprons, gloves), quick drenching facilities, designated areas, flushing facilities

[1926.441\(a\)\(5\)](#) - *Face shields, aprons, and rubber gloves* shall be provided for workers handling acids or batteries.

[1926.441\(a\)\(6\)](#) - *Facilities for quick drenching* of the eyes and body shall be provided within 25 feet (7.62 m) of battery handling areas.

[1926.441\(a\)\(7\)](#) - *Facilities* shall be provided for *flushing and neutralizing* spilled electrolyte and for fire protection.

[1926.441\(b\)\(1\)](#) - Battery charging installations shall be located in *areas designated* for that purpose.

Subpart L - [Scaffolds](#)

[Subpart L](#) provides the standards for scaffolds and aerial lifts used in construction. It does not apply to crane or derrick suspended personnel platforms.

[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.

Personal fall arrest system means a system used to arrest an employee's fall. It consists of an anchorage, connectors, a body belt or body harness and may include a lanyard, deceleration device, lifeline, or combinations of these.

Scaffold means any temporary elevated platform (supported or suspended) and its supporting structure (including points of anchorage), used for supporting employees or materials or both.

To learn if subpart L applies to you, go to [Does "Subpart L - Scaffolds" Apply to You?](#)

Special Requirements

1926.451 - General Requirements

Scope: This [standard](#) provides the general requirements for scaffolds. This section does not apply to aerial lifts, the criteria for which are set out exclusively in [1926.453](#) - aerial lifts.

Special Requirements: Rated load, qualified person, design, employer demonstrates, personal fall arrest system, competent person, marked, evaluated, registered professional engineer, inspections, manufacturer's recommendations, determination, emergency systems, trained, measures, personal fall arrest system, references other standards

[1926.451\(a\)\(1\)](#) - Except as provided in [paragraphs \(a\)\(2\), \(a\)\(3\), \(a\)\(4\), \(a\)\(5\)](#) and [\(g\)](#) of this section, each scaffold and scaffold component shall be capable of supporting, without failure, its own weight and at least 4 times the *maximum intended load* applied or transmitted to it.

[1926.451\(a\)\(2\)](#) - Direct connections to roofs and floors, and counterweights used to balance adjustable suspension scaffolds, shall be capable of resisting at least 4 times the tipping moment imposed by the scaffold operating at the *rated load* of the hoist, or 1.5 (minimum) times the tipping moment imposed by the scaffold operating at the stall load of the hoist, whichever is greater.

[1926.451\(a\)\(3\)](#) - Each suspension rope, including connecting hardware, used on non-adjustable suspension scaffolds shall be capable of supporting, without failure, at least 6 times the *maximum intended load* applied or transmitted to that rope.

[1926.451\(a\)\(4\)](#) - Each suspension rope, including connecting hardware, used on adjustable suspension scaffolds shall be capable of supporting, without failure, at least 6 times the maximum intended load applied or transmitted to that rope with the scaffold operating at either the *rated load* of the hoist, or 2 (minimum) times the stall load of the hoist, whichever is greater.

[1926.451\(a\)\(5\)](#) - The stall load of any scaffold hoist shall not exceed 3 times its *rated load*.

[1926.451\(a\)\(6\)](#) - Scaffolds shall be *designed by a qualified person* and shall be constructed and loaded in accordance with that *design*. Non-mandatory [appendix A - scaffold specifications](#), to this subpart contains examples of criteria that will enable an employer to comply with [paragraph \(a\)](#) of this section.

[1926.451\(b\)\(2\)\(ii\)](#) - Where scaffolds must be used in areas that the *employer can demonstrate* are so narrow that platforms and walkways cannot be at least 18 inches (46 cm) wide, such platforms and walkways shall be as wide as feasible, and employees on those platforms and walkways shall be protected from fall hazards by the use of guardrails and/or *personal fall arrest systems*.

[1926.451\(b\)\(3\)](#) - Except as provided in [paragraphs \(b\)\(3\)\(i\) and \(ii\)](#) of this section, the front edge of all platforms shall not be more than 14 inches (36 cm) from the face of the work, unless guardrail systems are erected along the front edge and/or *personal fall arrest systems* are used in accordance with [paragraph \(g\)](#) of this section to protect employees from falling.

[1926.451\(b\)\(9\)](#) - Wood platforms shall not be covered with opaque finishes, except that platform edges may be covered or *marked for identification*. Platforms may be coated periodically with wood preservatives, fire-retardant finishes, and slip-resistant finishes; however, the coating may not obscure the top or bottom wood surfaces.

[1926.451\(b\)\(10\)](#) - Scaffold components manufactured by different manufacturers shall not be intermixed unless the components fit together without force and the scaffold's structural integrity is maintained by the user. Scaffold components manufactured by different manufacturers shall not be modified in order to intermix them unless a *competent person* determines the resulting scaffold is structurally sound.

[1926.451\(b\)\(11\)](#) - Scaffold components made of dissimilar metals shall not be used together unless a *competent person* has determined that galvanic action will not reduce the strength of any component to a level below that required by [paragraph \(a\)\(1\)](#) of this section.

[1926.451\(c\)\(2\)\(iv\)](#) - Front-end loaders and similar pieces of equipment shall not be used to support scaffold platforms unless they have been specifically *designed* by the manufacturer for such use.

[1926.451\(d\)\(3\)\(i\)](#) - Before the scaffold is used, direct connections shall be *evaluated by a competent person* who shall confirm, based on the evaluation, that the supporting surfaces are capable of supporting the loads to be imposed. In addition, masons' multi-point adjustable suspension scaffold connections shall be *designed by an engineer* experienced in such scaffold *design*.

[1926.451\(d\)\(3\)\(viii\)](#) - Outrigger beams shall be placed perpendicular to its bearing support (usually the face of the building or structure). However, where the *employer can demonstrate* that it is not possible to place an outrigger beam perpendicular to the face of the building or structure because of obstructions that cannot be moved, the outrigger beam may be placed at some other angle, provided opposing angle tiebacks are used.

[1926.451\(d\)\(10\)](#) - Ropes shall be *inspected* for defects by a *competent person prior to each workshift* and after every occurrence which could affect a rope's integrity. Ropes shall be replaced if any of the following conditions exist: [Reference [paragraph \(d\)\(10\)\(i\) - vi](#)].

[1926.451\(d\)\(11\)](#) - Swaged attachments or spliced eyes on wire suspension ropes shall not be used unless they are made by the wire rope manufacturer or a *qualified person*.

[1926.451\(d\)\(12\)](#) - When wire rope clips are used on suspension scaffolds:

- [1926.451\(d\)\(12\)\(ii\)](#) - Clips shall be installed according to the *manufacturer's recommendations*;
- [1926.451\(d\)\(12\)\(iii\)](#) - Clips shall be retightened to the *manufacturer's recommendations* after the initial loading;
- [1926.451\(d\)\(12\)\(iv\)](#) - Clips shall be *inspected* and retightened to the *manufacturer's recommendations* at the start of each workshift thereafter;

[1926.451\(d\)\(18\)](#) - Two-point and multi-point suspension scaffolds shall be tied or otherwise secured to prevent them from swaying, as determined to be necessary based on an *evaluation by a competent person*. Window cleaners' anchors shall not be used for this purpose.

[1926.451\(d\)\(19\)](#) - Devices whose sole function is to provide emergency escape and rescue shall not be used as working platforms. This provision does not preclude the use of systems which are *designed* to function both as suspension scaffolds and *emergency systems*.

[1926.451\(e\)\(2\)](#) - Portable, hook-on, and attachable ladders (Additional requirements for the proper construction and use of portable ladders are contained in [subpart X of this part - Stairways and Ladders](#)): [Reference [paragraph \(e\)\(2\)\(i\) - vi](#)].

[1926.451\(e\)\(5\)\(i\)](#) - Ramps and walkways 6 feet (1.8 m) or more above lower levels shall have guardrail systems which comply with [subpart M of this part - Fall Protection](#).

[1926.451\(e\)\(6\)\(iii\)](#) - Not be used as work platforms when rungs are less than 11½ inches in length, unless each affected employee uses fall protection, or a positioning device, which complies with [1926.502 - fall protection systems criteria and practices](#).

[1926.451\(e\)\(9\)\(i\)](#) - The employer shall provide safe means of access for each employee erecting or dismantling a scaffold where the provision of safe access is feasible and does not create a greater hazard. The employer shall have a *competent person determine* whether it is feasible or would pose a greater hazard to provide, and have employees use a safe means of access. This *determination* shall be based on site conditions and the type of scaffold being erected or dismantled.

[1926.451\(f\)\(1\)](#) - Scaffolds and scaffold components shall not be loaded in excess of their maximum *intended loads* or *rated capacities*, whichever is less.

[1926.451\(f\)\(3\)](#) - Scaffolds and scaffold components shall be *inspected* for visible defects by a *competent person* before *each work shift*, and after any occurrence which could affect a scaffold's structural integrity.

[1926.451\(f\)\(5\)](#) - Scaffolds shall not be moved horizontally while employees are on them, unless they have been designed by a *registered professional engineer* specifically for such movement or, for mobile scaffolds, where the provisions of [1926.452\(w\)](#) - *Additional requirements applicable to specific types of scaffolds, mobile scaffolds*, are followed.

[1926.451\(f\)\(7\)](#) - 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*.

[1926.451\(f\)\(9\)](#) - Where swinging loads are being hoisted onto or near scaffolds such that the loads might contact the scaffold, tag lines or *equivalent measures* to control the loads shall be used.

[1926.451\(f\)\(12\)](#) - Work on or from scaffolds is prohibited during storms or high winds unless a *competent person* has determined that it is safe for employees to be on the scaffold and those employees are protected by a *personal fall arrest system* or wind screens. Wind screens shall not be used unless the scaffold is secured against the anticipated wind forces imposed.

[1926.451\(g\)\(1\)](#) - Each employee on a scaffold more than 10 feet (3.1 m) above a lower level shall be protected from falling to that lower level. [Paragraphs \(g\)\(1\)\(i\) through \(vii\)](#) of this section establish the types of *fall protection* to be provided to the employees on each type of scaffold. [Paragraph \(g\)\(2\)](#) of this section addresses *fall protection* for scaffold erectors and dismantlers.

[1926.451\(g\)\(2\)](#) - Effective September 2, 1997, the employer shall have a *competent person* determine the feasibility and safety of providing *fall protection* for employees erecting or dismantling supported scaffolds. Employers are required to provide *fall*

protection for employees erecting or dismantling supported scaffolds where the installation and use of such protection is feasible and does not create a greater hazard.

[1926.451\(g\)\(3\)](#) - In addition to meeting the requirements of [1926.502\(d\)](#) - *Fall protection systems criteria and practices*, *personal fall arrest systems* used on scaffolds shall be attached by lanyard to a vertical lifeline, horizontal lifeline, or scaffold structural member. Vertical lifelines shall not be used when overhead components, such as overhead protection or additional platform levels, are part of a single-point or two-point adjustable suspension scaffold. [Reference [paragraph \(g\)\(3\)\(i\) - \(iv\)](#)].

[1926.451\(g\)\(4\)\(xiv\)](#) - Manila or plastic (or other synthetic) rope being used for top rails or mid rails shall be *inspected by a competent person* as frequently as necessary to ensure that it continues to meet the strength requirements of [paragraph \(g\)](#) of this section.

[1926.451\(h\)\(1\)](#) - In addition to wearing hardhats each employee on a scaffold shall be provided with additional protection from falling hand tools, debris, and other small objects through the installation of toeboards, screens, or guardrail systems, or through the erection of debris nets, catch platforms, or canopy structures that contain or deflect the falling objects. When the falling objects are too large, heavy or massive to be contained or deflected by any of the *above-listed measures*, the employer shall place such potential falling objects away from the edge of the surface from which they could fall and shall secure those materials as necessary to prevent their falling.

1926.452 - Additional Requirements Applicable to Specific Types of Scaffolds

Scope: This [standard](#) provides additional requirements pertaining to scaffolds. In addition to the applicable requirements of [1926.451](#) - general requirements, the following requirements apply to the specific types of scaffolds indicated. Scaffolds not specifically addressed by 1926.452, such as but not limited to systems scaffolds, must meet the requirements of [1926.451](#).

General Requirements: Registered professional engineer, personal fall arrest systems, qualified person, rated capacity, design, loading, tested, listed, nationally recognized testing laboratory, references other standards

[1926.452\(a\)\(10\)](#) - Pole scaffolds over 60 feet in height shall be designed by a *registered professional engineer*, and shall be constructed and loaded in accordance with that design. Non-mandatory [appendix A - scaffold specifications](#), to this subpart contains examples of criteria that will enable an employer to comply with *design and loading requirements* for pole scaffolds under 60 feet in height.

[1926.452\(b\)\(2\)](#) - Tube and coupler scaffolds. Transverse bracing forming an “X” across the width of the scaffold shall be installed at the scaffold ends and at least at every third set of

posts horizontally (measured from only one end) and every fourth runner vertically. Bracing shall extend diagonally from the inner or outer posts or runners upward to the next outer or inner posts or runners. Building ties shall be installed at the bearer levels between the transverse bracing and shall conform to the requirements of [1926.451\(c\)\(1\)](#) - *general requirements*.

[1926.452\(b\)\(10\)](#) - Tube and coupler scaffolds over 125 feet in height shall be designed by a *registered professional engineer*, and shall be constructed and loaded in accordance with such *design*. Non-mandatory [appendix A - scaffold specifications](#), to this subpart contains examples of criteria that will enable an employer to comply with *design and loading* requirements for tube and coupler scaffolds under 125 feet in height.

[1926.451\(c\)\(6\)](#) - Fabricated frame scaffolds. Scaffolds over 125 feet (38.0 m) in height above their base plates shall be *designed by a registered professional engineer*, and shall be constructed and *loaded* in accordance with such *design*.

[1926.452\(i\)\(8\)](#) - Outrigger scaffolds. Scaffolds and scaffold components shall be *designed by a registered professional engineer* and shall be constructed and loaded in accordance with such *design*.

[1926.452\(k\)\(2\)](#) - Ladder jack scaffolds. All ladders used to support ladder jack scaffolds shall meet the requirements of [subpart X of this part - stairways and ladders](#), except that job-made ladders shall not be used to support ladder jack scaffolds.

[1926.452\(n\)\(2\)](#) - Step, platform, and trestle ladder scaffolds. All ladders used in conjunction with step, platform and trestle ladder scaffolds shall meet the pertinent requirements of [subpart X of this part - stairways and ladders](#), except that job-made ladders shall not be used to support such scaffolds.

[1926.452\(o\)\(2\)](#) - The supporting rope between the scaffold and the suspension device shall be kept vertical unless all of the following conditions are met: [Reference [paragraph \(o\)\(2\)\(i\) - \(iv\)](#)].

- [1926.452\(o\)\(2\)\(i\)](#) - The rigging has been designed by a *qualified person*.

[1926.452\(p\)\(1\)](#) - Two-point adjustable suspension scaffolds (swing stages). Platforms shall not be more than 36 inches (0.9 m) wide unless *designed by a qualified person* to prevent unstable conditions.

[1926.452\(p\)\(2\)](#) - Two-point adjustable suspension scaffolds (swing stages). The platform shall be securely fastened to hangers (stirrups) by U-bolts or by other means which satisfy the requirements of [1926.451\(a\)](#) - *general requirements*.

[1926.452\(p\)\(4\)](#) - Two-point adjustable suspension scaffolds (swing stages). Platforms shall be of the ladder-type, plank-type, beam-type, or light-metal type. Light metal-type platforms having a *rated capacity* of 750 pounds or less and platforms 40 feet (12.2 m) or less in length shall be *tested and listed* by a *nationally recognized testing laboratory*.

[1926.452\(w\)\(6\)\(ii\)](#) - Mobile scaffolds. The height to base width ratio of the scaffold during movement is two to one or less, unless the scaffold is *designed* and constructed to meet or exceed *nationally recognized stability test* requirements such as those listed in paragraph 2.(w) of [appendix A - scaffold specifications](#), to this subpart.

[1926.452\(x\)\(5\)](#) - Repair bracket scaffolds. When a wire rope is placed around the structure in order to provide a safe anchorage for *personal fall arrest systems* used by employees erecting or dismantling scaffolds, the wire rope shall meet the requirements of [subpart M - fall protection](#), of this part, but shall be at least 5/16 inch (0.8 cm) in diameter.

[1926.452\(x\)\(6\)](#) - Repair bracket scaffolds. Each wire rope used for securing brackets in place or as an anchorage for *personal fall arrest systems* shall be protected from damage due to contact with edges, corners, protrusions, or other discontinuities of the supporting structure or scaffold components.

1926.453 - Aerial Lifts

Scope: This [standard](#) provides the requirements for aerial lifts.

Special Requirements: Tests, authorized persons, approved, inspected, nationally recognized testing laboratory, certified in writing, references other standards

[1926.453\(a\)\(1\)](#) - Unless otherwise provided in this section, aerial lifts acquired for use on or after January 22, 1973 shall be designed and constructed in conformance with the applicable requirements of the *American National Standards for "Vehicle Mounted Elevating and Rotating Work Platforms," ANSI A92.2-1969*, including appendix. Aerial lifts acquired before January 22, 1973 which do not meet the requirements of *ANSI A92.2-1969*, may not be used after January 1, 1976, unless they shall have been modified so as to conform with the applicable *design* and construction requirements of *ANSI A92.2-1969*. Aerial lifts include the following types of vehicle-mounted aerial devices used to elevate personnel to job-sites above ground: [Reference [paragraph \(a\)\(1\)\(i\) - \(v\)](#)].

[1926.453\(a\)\(2\)](#) - Aerial lifts may be "field modified" for uses other than those intended by the manufacturer provided the modification has been *certified in writing* by the manufacturer or by any other equivalent entity, such as a *nationally recognized testing laboratory*, to be in conformity with all applicable provisions of *ANSI A92.2-1969* and this section and to be at least as safe as the equipment was before modification.

[1926.453\(b\)\(2\)](#) - Extensible and articulating boom platforms. [Reference [paragraph \(b\)\(2\)\(i\) - \(xii\)](#)].

- [1926.453\(b\)\(2\)\(i\)](#) - Lift controls shall be *tested each day* prior to use to determine that such controls are in safe working condition.
- [1926.453\(b\)\(2\)\(ii\)](#) - Only *authorized persons* shall operate an aerial lift.
- [1926.453\(b\)\(2\)\(xi\)](#) - Before moving an aerial lift for travel, the boom(s) shall be *inspected* to see that it is properly cradled and outriggers are in stowed position except as provided in [paragraph \(b\)\(2\)\(viii\)](#) of this section.

[1926.453\(b\)\(3\)](#) - *Electrical tests*. All *electrical tests* shall conform to the requirements of ANSI A92.2-1969 *section 5*. However equivalent d.c.; voltage tests may be used in lieu of the a.c. voltage specified in A92.2-1969; *d.c. voltage tests* which are *approved* by the equipment manufacturer or equivalent entity shall be considered an *equivalent test* for the purpose of this [paragraph \(b\)\(3\)](#).

[1926.453\(b\)\(4\)](#) - Bursting safety factor. The provisions of the *American National Standards Institute standard ANSI A92.2-1969, section 4.9 Bursting Safety Factor* shall apply to all critical hydraulic and pneumatic components. Critical components are those in which a failure would result in a free fall or free rotation of the boom. All noncritical components shall have a bursting safety factor of at least 2 to 1.

[1926.453\(b\)\(5\)](#) - Welding standards. All welding shall conform to the following *standards* as applicable: [Reference [paragraph \(b\)\(5\)\(i\) - \(iv\)](#)].

1926.453 - Training Requirements

Scope: This [standard](#) provides the training requirements for scaffolds. This section supplements and clarifies the requirements of [1926.21\(b\)\(2\)](#) - safety training and education, as these relate to the hazards of work on scaffolds.

Special Requirements: Training, qualified person, procedures, inspections, competent person, references other standards

[1926.454\(a\)](#) -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: [Reference [paragraph \(a\)\(1\) - \(5\)](#)].

[1926.454\(b\)](#) - 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:
[Reference [paragraph \(b\)\(1\) - \(4\)](#)].

[1926.454\(c\)](#) - 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: [Reference [paragraph \(c\)\(1\) - \(3\)](#)].

Subpart M - [Fall Protection](#)

[Subpart M](#) provides the requirements for fall protection in construction workplaces. **Note:** The provisions of this subpart do not apply when employees are making an inspection, investigation, or assessment of workplace conditions prior to the actual start of construction work or after all construction work has been completed.

[Personal fall arrest system](#) means a system used to arrest an employee in a fall from a working level. It consists of an anchorage, connectors, a body belt or body harness and may include a lanyard, deceleration device, lifeline, or suitable combinations of these. As of January 1, 1998, the use of a body belt for fall arrest is prohibited.

To learn if subpart M applies to you, go to [Does "Subpart M - Fall Protection" Apply to You?](#)

Special Requirements

1926.501 - Duty to Have Fall Protection

Scope: This [standard](#) provides the requirements for fall protection.

Special Requirements: Systems (i.e., Personal fall arrest systems, safety net systems, fall protection systems, guardrail systems, warning line systems), controlled access zone, hard hats, fall protection plan (written), employer determination, employer demonstrates, fall protection measures, references other standards

[1926.501\(a\)\(1\)](#) - This section sets forth requirements for employers to provide *fall protection systems*. All fall protection required by this section shall conform to the criteria set forth in [1926.502 - fall protection systems criteria and practices](#), of this subpart.

[1926.501\(a\)\(2\)](#) - The *employer shall determine* if the walking/working surfaces on which its employees are to work have the strength and structural integrity to support employees safely. Employees shall be allowed to work on those surfaces only when the surfaces have the requisite strength and structural integrity.

[1926.501\(b\)\(1\)](#) - Unprotected sides and edges. Each employee on a walking/working surface (horizontal and vertical surface) with an unprotected side or edge which is 6 feet (1.8 m) or more above a lower level shall be protected from falling by the use of *guardrail systems, safety net systems, or personal fall arrest systems*.

[1926.501\(b\)\(2\)\(i\)](#) - Each employee who is constructing a leading edge 6 feet (1.8 m) or more above lower levels shall be protected from falling by *guardrail systems, safety net systems, or personal fall arrest systems*. **Exception:** When the *employer can demonstrate* that it is infeasible or creates a greater hazard to use these systems, the employer shall develop and implement a *fall protection plan* which meets the requirements of [paragraph \(k\)](#) - *fall protection plan, of 1926.502 - fall protection systems criteria and practices*.

Note: There is a presumption that it is feasible and will not create a greater hazard to implement at least one of the above-listed *fall protection systems*. Accordingly, the employer has the burden of establishing that it is appropriate to implement a *fall protection plan* which complies with [1926.502\(k\)](#) - *fall protection plan*, for a particular workplace situation, in lieu of implementing any of those systems.

[1926.501\(b\)\(2\)\(ii\)](#) - Each employee on a walking/working surface 6 feet (1.8 m) or more above a lower level where leading edges are under construction, but who is not engaged in the leading edge work, shall be protected from falling by a *guardrail system, safety net system, or personal fall arrest system*. If a guardrail system is chosen to provide the fall protection, and a *controlled access zone* has already been established for leading edge work, the control line may be used in lieu of a guardrail along the edge that parallels the leading edge.

[1926.501\(b\)\(3\)](#) - Hoist areas. Each employee in a hoist area shall be protected from falling 6 feet (1.8 m) or more to lower levels by *guardrail systems or personal fall arrest systems*. If guardrail systems, [or chain, gate, or guardrail] or portions thereof, are removed to facilitate the hoisting operation (e.g., during landing of materials), and an employee must lean through the access opening or out over the edge of the access opening (to receive or guide equipment and materials, for example), that employee shall be protected from fall hazards by a *personal fall arrest system*.

[1926.501\(b\)\(4\)\(i\)](#) - Each employee on walking/working surfaces shall be protected from falling through holes (including skylights) more than 6 feet (1.8 m) above lower levels, by *personal fall arrest systems, covers, or guardrail systems* erected around such holes.

[1926.501\(b\)\(5\)](#) - Formwork and reinforcing steel. Each employee on the face of formwork or reinforcing steel shall be protected from falling 6 feet (1.8 m) or more to lower levels by *personal fall arrest systems, safety net systems, or positioning device systems*.

[1926.501\(b\)\(8\)\(ii\)](#) - Each employee 6 feet (1.8 m) or more above dangerous equipment shall be protected from fall hazards by *guardrail systems, personal fall arrest systems, or safety net systems*.

[1926.501\(b\)\(9\)\(i\)](#) - Except as otherwise provided in [paragraph \(b\)](#) of this section, each employee performing overhand bricklaying and related work 6 feet (1.8 m) or more above lower levels, shall be protected from falling by *guardrail systems, safety net systems, personal fall arrest systems, or shall work in a controlled access zone*.

[1926.501\(b\)\(9\)\(ii\)](#) - Each employee reaching more than 10 inches (25 cm) below the level of the walking/working surface on which they are working, shall be protected from falling by a *guardrail system, safety net system, or personal fall arrest system*. **Note:** Bricklaying operations performed on scaffolds are regulated by [subpart L - scaffolds of this part \(1926\)](#).

[1926.501\(b\)\(10\)](#) - Roofing work on Low-slope roofs. Except as otherwise provided in [paragraph \(b\)](#) of this section, each employee engaged in roofing activities on low-slope roofs, with unprotected sides and edges 6 feet (1.8 m) or more above lower levels shall be protected from falling by *guardrail systems, safety net systems, personal fall arrest systems, or a combination of warning line system and guardrail system, warning line system and safety net system, or warning line system and personal fall arrest system, or warning line system and safety monitoring system*. Or, on roofs 50-feet (15.25 m) or less in width (see [Appendix A - determining roof widths - non-mandatory guidelines for complying with 1926.501\(b\)\(10\)](#), to [subpart M of this part](#)), the use of a *safety monitoring system* alone [i.e. without the warning line system] is permitted.

[1926.501\(b\)\(11\)](#) - Steep roofs. Each employee on a steep roof with unprotected sides and edges 6 feet (1.8 m) or more above lower levels shall be protected from falling by *guardrail systems with toeboards, safety net systems, or personal fall arrest systems*.

[1926.501\(b\)\(12\)](#) - Precast concrete erection. Each employee engaged in the erection of precast concrete members (including, but not limited to the erection of wall panels, columns, beams, and floor and roof "tees") and related operations such as grouting of precast concrete members, who is 6 feet (1.8 m) or more above lower levels shall be protected from falling by *guardrail systems, safety net systems, or personal fall arrest systems*, unless another provision in [paragraph \(b\)](#) of this section provides for an alternative *fall protection measure*. **Exception:** When the *employer can demonstrate* that it is infeasible or creates a greater hazard to use these systems, the employer shall develop and implement a *fall protection plan* which meets the requirements of [paragraph \(k\) - fall protection plan, of 1926.502 - fall protection systems criteria and practices](#).

Note: There is a presumption that it is feasible and will not create a greater hazard to implement at least one of the above-listed *fall protection systems*. Accordingly, the employer has the burden of establishing that it is appropriate to implement a *fall protection*

plan which complies with [1926.502\(k\)](#) - *fall protection plan*, for a particular workplace situation, in lieu of implementing any of those systems.

[1926.501\(b\)\(13\)](#) - Residential construction. Each employee engaged in residential construction activities 6 feet (1.8 m) or more above lower levels shall be protected by guardrail systems, safety net system, or personal fall arrest system unless another provision in [paragraph \(b\)](#) of this section provides for an alternative fall protection measure. **Exception:** When the *employer can demonstrate* that it is infeasible or creates a greater hazard to use these systems, the employer shall develop and implement a fall protection plan which meets the requirements of [paragraph \(k\)](#) - *fall protection plan*, of [1926.502](#) - *fall protection systems criteria and practices*.

Note: There is a presumption that it is feasible and will not create a greater hazard to implement at least one of the above-listed *fall protection systems*. Accordingly, the employer has the burden of establishing that it is appropriate to implement a *fall protection plan* which complies with [1926.502\(k\)](#) - *fall protection plan*, for a particular workplace situation, in lieu of implementing any of those systems.

[1926.501\(b\)\(14\)](#) - Wall openings. Each employee working on, at, above, or near wall openings (including those with chutes attached) where the outside bottom edge of the wall opening is 6 feet (1.8 m) or more above lower levels and the inside bottom edge of the wall opening is less than 39 inches (1.0 m) above the walking/working surface, shall be protected from falling by the use of a *guardrail system, a safety net system, or a personal fall arrest system*.

[1926.501\(b\)\(15\)](#) - Walking/working surfaces not otherwise addressed. Except as provided in [1926.500\(a\)\(2\)](#) or in [1926.501\(b\)\(1\) through \(b\)\(14\)](#), each employee on a walking/working surface 6 feet (1.8 m) or more above lower levels shall be protected from falling by a *guardrail system, safety net system, or personal fall arrest system*.

[1926.501\(c\)](#) - Protection from falling objects. When an employee is exposed to falling objects, the employer shall have each employee wear a *hard hat* and shall implement one of the following *measures*: [Reference [paragraph \(c\)\(1\) - \(3\)](#)].

1926.502 - Fall Protection Systems Criteria and Practices

Scope: This [standard](#) provides the requirements for fall protection systems.

Special Requirements: Fall protection systems (i.e., personal fall arrest systems, positioning device systems, safety monitoring systems), controlled access zones, employer demonstrates, safety monitor, employer determination, competent person, certify, certification record, inspection, signature, drop test, qualified person, safety net systems, communicate orally, approved plan, supervision, fall protection plan (written), investigation, measures (written), markings, regular intervals, references other standards

[1926.502\(a\)\(2\)](#) - Employers shall provide and install all *fall protection systems* required by this subpart for an employee, and shall comply with all other pertinent requirements of this subpart before that employee begins the work that necessitates the fall protection.

[1926.502\(b\)](#) - *Guardrail systems*. *Guardrail systems* and their use shall comply with the following provisions: [Reference [paragraph \(b\)\(1\) - \(15\)](#)].

[1926.502\(c\)](#) - *Safety net systems*. *Safety net systems* and their use shall comply with the following provisions: [Reference [paragraph \(c\)\(1\) - \(9\)](#)].

- [1926.502\(c\)\(4\)\(ii\)](#) - When the *employer can demonstrate* that it is unreasonable to perform the *drop-test* required by [paragraph \(c\)\(4\)\(i\)](#) of this section, the employer (or a *designated competent person*) shall *certify* that the net and net installation is in compliance with the provisions of [paragraphs \(c\)\(3\)](#) and [\(c\)\(4\)\(i\)](#) of this section by preparing a *certification record* prior to the net being used as a *fall protection system*. The *certification record* must include an identification of the net and net installation for which the *certification record* is being prepared; the date that it was *determined* that the identified net and net installation were in compliance with [paragraph \(c\)\(3\)](#) of this section and the *signature* of the person making the *determination and certification*. The most recent *certification record* for each net and net installation shall be available at the jobsite for *inspection*.

[1926.502\(d\)](#) - *Personal fall arrest systems*. *Personal fall arrest systems* and their use shall comply with the provisions set forth below. Effective January 1, 1998, body belts are not acceptable as part of a personal fall arrest system. **Note:** The use of a body belt in a *positioning device system* is acceptable and is regulated under [paragraph \(e\)](#) of this section. [Reference [paragraph \(d\)\(1\) - \(24\)](#)].

- [1926.502\(d\)\(19\)](#) - *Personal fall arrest systems* and components subjected to impact loading shall be immediately removed from service and shall not be used again for employee protection until inspected and *determined by a competent person* to be undamaged and suitable for reuse.
- [1926.502\(d\)\(21\)](#) - *Personal fall arrest systems* shall be *inspected prior to each use* for wear, damage and other deterioration, and defective components shall be removed from service.

[1926.502\(e\)](#) - *Positioning device systems*. *Positioning device systems* and their use shall conform to the following provisions: [Reference [paragraph \(e\)\(1\) - \(10\)](#)].

- [1926.502\(e\)\(9\)](#) - Positioning device systems shall be *inspected prior to each use* for wear, damage, and other deterioration, and defective components shall be removed from service.

- [1926.502\(e\)\(10\)](#) - Body belts, harnesses, and components shall be used only for employee protection (as part of a *personal fall arrest system* or *positioning device system*) and not to hoist materials.

[1926.502\(f\)](#) - *Warning line systems*. *Warning line systems* [See [1926.501\(b\)\(10\)](#)] and their use shall comply with the following provisions: [Reference [paragraph \(f\)\(1\) - \(4\)](#)].

[1926.502\(g\)](#) - *Controlled access zones*. *Controlled access zones* [See [1926.501\(b\)\(9\)](#) and [1926.502\(k\)](#)] and their use shall conform to the following provisions. [Reference [paragraph \(g\)\(1\) - \(5\)](#)].

[1926.502\(h\)](#) - *Safety monitoring systems*. *Safety monitoring systems* [See [1926.501\(b\)\(10\)](#) and [1926.502\(k\)](#)] and their use shall comply with the following provisions: [Reference [paragraph \(h\)\(1\) - \(4\)](#)].

- [1926.502\(h\)\(1\)](#) - The employer shall *designate a competent person* to monitor the safety of other employees and the employer shall ensure that the *safety monitor* complies with the following requirements: [Reference [paragraph \(h\)\(1\)\(i\) - \(v\)](#)].
 - [1926.502\(h\)\(1\)\(iv\)](#) - The *safety monitor* shall be close enough to *communicate orally* with the employees.

[1926.502\(i\)](#) - *Covers*. *Covers* for holes in floors, roofs, and other walking/working surfaces shall meet the following requirements: [Reference [paragraph \(i\)\(1\) - \(4\)](#)].

- [1926.502\(i\)\(4\)](#) - All covers shall be *color coded* or they shall be *marked* with the word "HOLE" or "COVER" to provide warning of the hazard. **Note:** This provision does not apply to cast iron manhole covers or steel grates used on streets or roadways.

[1926.502\(j\)](#) - *Protection from falling objects*. *Falling object protection* shall comply with the following provisions: [Reference [paragraph \(j\)\(1\) - \(8\)](#)].

- [1926.502\(j\)\(6\)](#) - During the performance of overhand bricklaying and related work:
 - [1926.502\(j\)\(6\)\(ii\)](#) - Excess mortar, broken or scattered masonry units, and all other materials and debris shall be kept clear from the work area by *removal at regular intervals*.

[1926.502\(k\)](#) - *Fall protection plan*. This option is available only to employees engaged in leading edge work, precast concrete erection work, or residential construction work [See [1926.501\(b\)\(2\)](#) - leading edges, [\(b\)\(12\)](#) - precast concrete, and [\(b\)\(13\)](#) - residential construction] who can *demonstrate* that it is infeasible or it creates a greater hazard to use conventional fall protection equipment. The *fall protection plan* must conform to the following provisions.

- [1926.502\(k\)\(1\)](#) - The *fall protection plan* shall be prepared by a *qualified person* and developed specifically for the site where the leading edge work, precast concrete work, or residential construction work is being performed and the *plan* must be maintained up to date.
- [1926.502\(k\)\(2\)](#) - Any changes to the *fall protection plan* shall be *approved by a qualified person*.
- [1926.502\(k\)\(3\)](#) - A *copy of the fall protection plan* with all *approved changes* shall be *maintained* at the job site.
- [1926.502\(k\)\(4\)](#) - The implementation of the *fall protection plan* shall be under the *supervision* of a *competent person*.
- [1926.502\(k\)\(5\)](#) - The *fall protection plan* shall *document* the reasons why the use of *conventional fall protection systems (guardrail systems, personal fall arrest systems, or safety nets systems)* are infeasible or why their use would create a greater hazard.
- [1926.502\(k\)\(6\)](#) - The *fall protection plan* shall include a *written discussion* of other *measures* that will be taken to reduce or eliminate the fall hazard for workers who cannot be provided with protection from the *conventional fall protection systems*. For example, the employer shall *discuss* the extent to which scaffolds, ladders, or vehicle mounted work platforms can be used to provide a safer working surface and thereby reduce the hazard of falling.
- [1926.502\(k\)\(7\)](#) - The *fall protection plan* shall identify each location where *conventional fall protection methods* cannot be used. These locations shall then be *classified as controlled access zones* and the employer must comply with the criteria in paragraph (g) of this section.
- [1926.502\(k\)\(8\)](#) - Where no other *alternative measure* has been implemented, the employer shall implement a *safety monitoring system* in conformance with [1926.502\(h\)](#).
- [1926.502\(k\)\(9\)](#) - The *fall protection plan* must include a *statement* which provides the name or other method of identification for each employee who is *designated* to work in *controlled access zones*. No other employees may enter *controlled access zones*.
- [1926.502\(k\)\(10\)](#) - In the event an employee falls, or some other related, serious incident occurs, (e.g., a near miss) the employer shall *investigate* the circumstances of the fall or other incident to determine if the *fall protection plan* needs to be changed (e.g. *new practices, procedures, or training*) and shall implement those changes to prevent similar types of falls or incidents.

1926.503 - Training Requirements

Scope: This [standard](#) provides the training requirements regarding hazards addressed in 1926 - Subpart M - Fall Protection.

Special Requirements: Training program, training, competent person, procedures, qualified, certification of training, determined, written certification record, signature, retraining, employer verify compliance

[1926.503\(a\)\(1\)](#) - 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.

[1926.503\(a\)\(2\)](#) - The employer shall assure that each employee has been *trained*, as necessary, by a *competent person qualified* in the following areas: [Reference [paragraph \(a\)\(2\)\(i\) - \(viii\)](#)].

[1926.503\(b\)\(1\)](#) - 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*.

[1926.503\(b\)\(2\)](#) - The latest *training certification* shall be *maintained*.

[1926.503\(c\)](#) - *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: [Reference [paragraph \(c\)\(1\) - \(3\)](#)].

Subpart N - [Helicopters, Hoists, Elevators, and Conveyors](#)

[Subpart N](#) provides the standards related to the use of helicopters, material hoists, personnel hoists, elevators, base-mounted drum hoists, overhead hoists, and conveyors. Do you have any of these types of equipment? If yes, then click on the appropriate tabs below for more information.

To learn if subpart N applies to you, go to [Does "Subpart N - Helicopters, Hoists, Elevators, and Conveyors" Apply to You?](#)

Special Requirements

1926.551 - Helicopters

Scope: This [standard](#) provides requirements for helicopters.

Special Requirements: Briefings, plan of operation, tested, personal protective equipment, manufacturer's rating, signal systems, designated employee, communications, signalman, hand signals, authorized persons, references other standards

[1926.551\(a\)](#) - *Helicopter regulations.* Helicopter cranes shall be expected to comply with any applicable *regulations of the Federal Aviation Administration.*

[1926.551\(b\)](#) - *Briefing.* Prior to each day's operation a *briefing* shall be conducted. This *briefing* shall set forth the *plan of operation* for the pilot and ground personnel.

[1926.551\(d\)](#) - *Cargo hooks.* All electrically operated cargo hooks shall have the electrical activating device so designed and installed as to prevent inadvertent operation. In addition, these cargo hooks shall be equipped with an emergency mechanical control for releasing the load. The hooks shall be *tested prior to each day's operation* to determine that the release functions properly, both electrically and mechanically.

[1926.551\(e\)\(1\)](#) - *Personal protective equipment* for employees receiving the load shall consist of complete *eye protection and hard hats* secured by chinstraps.

[1926.551\(j\)](#) - *Static charge.* Static charge on the suspended load shall be dissipated with a grounding device before ground personnel touch the suspended load, or *protective rubber gloves* shall be worn by all ground personnel touching the suspended load.

[1926.551\(k\)](#) - *Weight limitation.* The weight of an external load shall not exceed the *manufacturer's rating.*

[1926.551\(n\)](#) - *Signal systems.* *Signal systems* between aircrew and ground personnel shall be understood and checked in advance of hoisting the load. This applies to either radio or *hand signal systems.* *Hand signals* shall be as shown in [Figure N-1.](#)

[1926.551\(p\)](#) - *Approaching helicopter.* Whenever approaching or leaving a helicopter with blades rotating, all employees shall remain in full view of the pilot and keep in a crouched position. Employees shall avoid the area from the cockpit or cabin rearward unless *authorized* by the helicopter operator to work there.

[1926.551\(r\)](#) - *Communications.* There shall be constant reliable *communication* between the pilot, and a *designated employee* of the ground crew who acts as a *signalman* during the period of loading and unloading. This *signalman* shall be distinctly recognizable from other ground personnel.

1926.552 - Material Hoists, Personnel Hoists, and Elevators

Scope: This [standard](#) provides requirements for material hoists, personnel hoists and elevators.

Special Requirements: Inspections, tests, manufacturer specifications, professional engineer, competent person, certification record, rated load capacities (posted, hazard warnings (posted, instructions (posted), manufacturer recommendations, signature, recommended operating speeds (posted), operating rules (posted), maintenance, capacity/data plate, removed from service, painted bars/gates, markings, references other standards

[1926.552\(a\)\(1\)](#) - The employer shall comply with the *manufacturer's specifications and limitations* applicable to the operation of all hoists and elevators. Where manufacturer's specifications are not available, the limitations assigned to the equipment shall be based on the determinations of a *professional engineer competent* in the field.

[1926.552\(a\)\(2\)](#) - *Rated load capacities, recommended operating speeds, and special hazard warnings or instructions* shall be posted on cars and platforms.

[1926.552\(a\)\(3\)](#) - Wire rope shall be *removed from service* when any of the following conditions exists: [Reference [paragraph \(a\)\(3\)\(i\) - \(iv\)](#)].

[1926.552\(a\)\(4\)](#) - Hoisting ropes shall be installed in accordance with the wire rope *manufacturers' recommendations*.

[1926.552\(b\)\(1\)](#) - *Operating rules* shall be established and *posted* at the operator's station of the hoist. Such rules shall include signal system and allowable line speed for various loads. *Rules and notices shall be posted* on the car frame or crosshead in a conspicuous location, including the *statement "No Riders Allowed."*

- [1926.552\(b\)\(1\)\(ii\)](#) - No person shall be allowed to ride on material hoists except for the purposes of *inspection and maintenance*.

[1926.552\(b\)\(2\)](#) - All entrances of the hoistways shall be protected by substantial gates or bars which shall guard the full width of the landing entrance. All hoistway entrance bars and gates shall be *painted* with diagonal contrasting colors, such as *black and yellow stripes*.

[1926.552\(b\)\(7\)](#) - All material hoist towers shall be designed by a *licensed professional engineer*.

[1926.552\(b\)\(8\)](#) - All material hoists shall conform to the requirements of *ANSI A10.5-1969, Safety Requirements for Material Hoists*.

[1926.552\(c\)\(10\)](#) - Cars shall be provided with a *capacity and data plate* secured in a conspicuous place on the car or crosshead.

[1926.552\(c\)\(13\)](#) - An emergency stop switch shall be provided in the car and *marked "Stop."*

[1926.552\(c\)\(15\)](#) - Following assembly and erection of hoists, and before being put in service, an *inspection and test* of all functions and safety devices shall be made under the supervision of a *competent person*. A similar *inspection and test* is required following major alteration of an existing installation. All hoists shall be *inspected and tested* at not more than *3-month intervals*. The employer shall prepare a certification record which includes the date the *inspection and test* of all functions and safety devices was performed; the *signature of the person* who performed the *inspection and test*; and a serial number, or other identifier, for the hoist that was *inspected and tested*. The most recent *certification record* shall be *maintained on file*.

[1926.552\(c\)\(16\)](#) - All personnel hoists used by employees shall be constructed of materials and components which meet the *specifications* for materials, construction, safety devices, assembly, and structural integrity as stated in the *American National Standard A10.4-1963, Safety Requirements for Workmen's Hoists*. The requirements of this [paragraph \(c\)\(16\)](#) do not apply to cantilever type personnel hoists.

[1926.552\(c\)\(17\)\(i\)](#) - Personnel hoists used in bridge tower construction shall be *approved by a registered professional engineer* and erected under the supervision of a *qualified engineer competent* in this field.

[1926.552\(c\)\(17\)\(iii\)](#) - These hoists shall be *inspected and maintained on a weekly basis*. Whenever the hoisting equipment is exposed to winds exceeding 35 miles per hour it shall be *inspected* and put in operable condition before reuse.

[1926.552\(c\)\(17\)\(iv\)](#) - Wire rope shall be *taken out of service* when any of the following conditions exist: [Reference [paragraph \(c\)\(17\)\(iv\)\(A\) - \(E\)](#)].

[1926.552\(d\)](#) - Permanent elevators under the care and custody of the employer and used by employees for work covered by this Act shall comply with the requirements of *American National Standards Institute A17.1-1965 with addenda A17.1a-1967, A17.1b-1968, A17.1c-1969, A17.1d-1970, and inspected in accordance with A17.2-1960 with addenda A17.2a-1965, A17.2b-1967*.

1926.553 - Base-Mounted Drum Hoists

Scope: This [standard](#) provides the requirements for base-mounted hoists.

Special Requirements: Manufacturer requirements, references other standards

[1926.553\(a\)\(4\)](#) - All base-mounted drum hoists in use shall meet the applicable *requirements for design, construction, installation, testing, inspection, maintenance, and operations*, as prescribed by the *manufacturer*.

[1926.553\(c\)](#) - This section does not apply to base-mounted drum hoists used in conjunction with derricks. Base-mounted drum hoists used in conjunction with derricks must conform to [1926.1436\(e\) - derricks - swingers and hoists](#).

1926.554 - Overhead Hoists

Scope: This [standard](#) provides the requirements for overhead hoists.

Special Requirements: Safe working load (indicated on hoist), manufacturer determination, manufacturer requirements

[1926.554\(a\)\(1\)](#) - The *safe working load* of the overhead hoist, as *determined by the manufacturer*, shall be *indicated on the hoist*, and this *safe working load* shall not be exceeded.

[1926.554\(a\)\(2\)](#) - The supporting structure to which the hoist is attached shall have a *safe working load* equal to that of the hoist.

[1926.554\(a\)\(6\)](#) - All overhead hoists in use shall meet the applicable *requirements for construction, design, installation, testing, inspection, maintenance, and operation*, as prescribed by the *manufacturer*.

1926.555 – Conveyors

Scope: This [standard](#) provides requirements for conveyors.

Special Requirements: Warning signal, tags, locked out, maintenance, inspections, signs, markings, testing, references other standards

[1926.555\(a\)\(1\)](#) - Means for stopping the motor or engine shall be provided at the operator's station. Conveyor systems shall be equipped with an *audible warning signal* to be sounded immediately before starting up the conveyor.

[1926.555\(a\)\(6\)](#) - All crossovers, aisles, and passageways shall be conspicuously *marked* by suitable *signs*, as required by [subpart G - signs, signals, and barricades, of this part \(1926\)](#)

[1926.555\(a\)\(7\)](#) - Conveyors shall be *locked out* or otherwise rendered inoperable, and *tagged out* with a "*Do Not Operate*" tag during repairs and when operation is hazardous to employees performing *maintenance work*.

[1926.555\(a\)\(8\)](#) - All conveyors in use shall meet the applicable *requirements for design, construction, inspection, testing, maintenance, and operation, as prescribed in the ANSI B20.1–1957, Safety Code for Conveyors, Cableways, and Related Equipment.*

Subpart O - Motor Vehicles, Mechanical Equipment, and Marine Operations

[Subpart O](#) provides the standards for motor vehicles, material handling equipment, pile driving equipment, site clearing, and marine operations and equipment.

To learn if subpart O applies to you, go to [Does "Subpart O - Motor Vehicles, Mechanized Equipment, and Marine Operations" Apply to You?](#)

Special Requirements

1926.600 - Equipment

Scope: This [standard](#) provides the general requirements for motor vehicles, mechanized equipment, and marine operations.

Special Requirements: Designated person, warning devices, precautions, authorities, references other standards

[1926.600\(a\)\(4\)](#) - The use, care and charging of all batteries shall conform to the requirements of [subpart K - electrical](#) of this part.

[1926.600\(a\)\(6\)\(iv\)](#) - A person shall be *designated* to observe clearance of the equipment and give timely warning for all operations where it is difficult for the operator to maintain the desired clearance by visual means.

[1926.600\(a\)\(6\)\(v\)](#) - Cage-type boom guards, insulating links, or proximity *warning devices* may be used on cranes, but the use of such devices shall not alter the requirements of any *other regulation* of this part even if such device is required by *law or regulation*.

[1926.600\(a\)\(6\)\(vi\)](#) - Any overhead wire shall be considered to be an energized line unless and until the person owning such line or the *electrical utility authorities* indicate that it is not an energized line and it has been visibly grounded;

[1926.600\(a\)\(6\)\(vii\)](#) - Prior to work near transmitter towers where an electrical charge can be induced in the equipment or materials being handled, the transmitter shall be de-energized or tests shall be made to determine if electrical charge is induced on the crane. The

following *precautions* shall be taken when necessary to dissipate induced voltages:
[Reference [paragraph \(a\)\(6\)\(vii\)\(A\) - \(C\)](#)].

1926.601 - Motor Vehicles

Scope: This [standard](#) provides the requirements for motor vehicles that operate within an off-highway jobsite, not open to public traffic.

Special Requirements: Audible warning device, reverse signal alarm, inspections, maintenance, checked, references other standards

[1926.601\(b\)\(3\)](#) - All vehicles shall be equipped with an adequate *audible warning device* at the operator's station and in an operable condition.

[1926.601\(b\)\(4\)](#) - No employer shall use any motor vehicle equipment having an obstructed view to the rear unless:

- [1926.601\(b\)\(4\)\(i\)](#) -The vehicle has a *reverse signal alarm* audible above the surrounding noise level or: [Reference [paragraph \(b\)\(4\)\(ii\)](#)].

[1926.601\(b\)\(9\)](#) - Seat belts and anchorages meeting the requirements of *49 CFR part 571 (Department of Transportation, Federal Motor Vehicle Safety Standards)* shall be installed in all motor vehicles.

[1926.601\(b\)\(10\)](#) - Trucks with dump bodies shall be equipped with positive means of support, permanently attached, and capable of being locked in position to prevent accidental lowering of the body while *maintenance or inspection work* is being done.

[1926.601\(b\)\(14\)](#) - All vehicles in use shall be *checked* at the *beginning of each shift* to assure that the following parts, equipment, and accessories are in safe operating condition and free of apparent damage that could cause failure while in use: service brakes, including trailer brake connections; parking system (hand brake); emergency stopping system (brakes); tires; horn; steering mechanism; coupling devices; seat belts; operating controls; and safety devices. All defects shall be corrected before the vehicle is placed in service. These requirements also apply to equipment such as lights, reflectors, windshield wipers, defrosters, fire extinguishers, etc., where such equipment is necessary.

1926.602 - Material Handling Equipment

Scope: This [standard](#) provides requirements for scrapers, loaders, crawler or wheel tractors, bulldozers, off-highway trucks, graders, agricultural and industrial tractors, and similar equipment.

Special Requirements: Audible alarms, signals, authorized person, precautions, rated capacity (posted), manufacturer's written approval, inspection, testing, training, maintenance instruction plates, tags, decals, references other standards

[1926.602\(a\)\(2\)\(i\)](#) - Seat belts shall be provided on all equipment covered by this section and shall meet the *requirements of the Society of Automotive Engineers, J386-1969, Seat Belts for Construction Equipment. Seat belts for agricultural and light industrial tractors shall meet the seat belt requirements of Society of Automotive Engineers J333a-1970, Operator Protection for Agricultural and Light Industrial Tractors.*

[1926.602\(a\)\(4\)](#) - *Brakes.* All earthmoving equipment mentioned in this [1926.602\(a\)](#) shall have a service braking system capable of stopping and holding the equipment fully loaded, as specified in *Society of Automotive Engineers SAE-J237, Loader Dozer-1971, J236, Graders-1971, and J319b, Scrapers-1971.* Brake systems for self-propelled rubber-tired off-highway equipment manufactured after January 1, 1972 shall meet the applicable minimum performance criteria set forth in the following *Society of Automotive Engineers Recommended Practices: Reference [paragraph \(a\)\(4\)](#).*

[1926.602\(a\)\(5\)](#) - *Fenders.* Pneumatic-tired earth-moving haulage equipment (trucks, scrapers, tractors, and trailing units) whose maximum speed exceeds 15 miles per hour, shall be equipped with fenders on all wheels to meet the requirements of *Society of Automotive Engineers SAE J321a-1970, Fenders for Pneumatic-Tired Earthmoving Haulage Equipment.* An employer may, of course, at any time seek to show under [1926.2](#) - variances from safety and health standards, that the uncovered wheels present no hazard to personnel from flying materials.

[1926.602\(a\)\(6\)](#) - *Rollover protective structures (ROPS).* See [subpart W](#) - *rollover protection structures; overhead protection,* of this part for requirements for rollover protective structures and overhead protection.

[1926.602\(a\)\(9\)\(i\)](#) - All bidirectional machines, such as rollers, compacters, front-end loaders, bulldozers, and similar equipment, shall be equipped with a *horn (audible alarm),* distinguishable from the surrounding noise level, which shall be operated as needed when the machine is moving in either direction. The *horn* shall be maintained in an operative condition.

[1926.602\(a\)\(9\)\(ii\)](#) - No employer shall permit earthmoving or compacting equipment which has an obstructed view to the rear to be used in reverse gear unless the equipment has in operation a *reverse signal alarm* distinguishable from the surrounding noise level or an *employee signals* that it is safe to do so.

[1926.602\(b\)\(2\)](#) - For the purposes of this subpart and of subpart N of this part, the nomenclatures and descriptions for measurement of dimensions of machinery and

attachments shall be as described in *Society of Automotive Engineers 1970 Handbook*, pages 1088 through 1103.

[1926.602\(b\)\(3\)](#) - The safety requirements, ratios, or limitations applicable to machines or attachment usage covered in *Power Crane and Shovel Associations Standards No. 1 and No. 2 of 1968, and No. 3 of 1969*, shall be complied with, and shall apply to cranes, machines, and attachments under this part (1926).

[1926.602\(c\)](#) - Lifting and hauling equipment (other than equipment covered under [subpart N](#) - *helicopters, hoists, elevators, and conveyors*, of this part).

[1926.602\(c\)\(1\)](#) - Industrial trucks shall meet the requirements of [1926.600 - equipment](#), and the following:

- [1926.602\(c\)\(1\)\(i\)](#) - Lift trucks, stackers, etc., shall have the *rated capacity clearly posted* on the vehicle so as to be *clearly visible* to the operator. When auxiliary removable counterweights are provided by the *manufacturer*, corresponding alternate *rated capacities* also shall be clearly shown on the vehicle. These *ratings* shall not be exceeded.
- [1926.602\(c\)\(1\)\(ii\)](#) - No modifications or additions which affect the capacity or safe operation of the equipment shall be made without the *manufacturer's written approval*. If such modifications or changes are made, the capacity, operation, and *maintenance instruction plates, tags, or decals* shall be changed accordingly. In no case shall the original safety factor of the equipment be reduced.
- [1926.602\(c\)\(1\)\(v\)](#) - All high lift rider industrial trucks shall be equipped with overhead guards which meet the configuration and structural requirements as defined in *paragraph 421 of American National Standards Institute B56.1-1969, Safety Standards for Powered Industrial trucks*.
- [1926.602\(c\)\(1\)\(vi\)](#) - All industrial trucks in use shall meet the applicable requirements of *design, construction, stability, inspection, testing, maintenance, and operation*, as defined in *American National Standards Institute B56.1-1969, Safety Standards for Powered Industrial Trucks*.
- [1926.602\(c\)\(1\)\(vii\)](#) - Unauthorized personnel shall not be permitted to ride on powered industrial trucks. A safe place to ride shall be provided where riding of trucks is *authorized*.
- [1926.602\(c\)\(1\)\(viii\)](#) - Whenever a truck is equipped with vertical only, or vertical and horizontal controls elevatable with the lifting carriage or forks for lifting personnel, the following additional *precautions* shall be taken for the protection of personnel being elevated.

[1926.602\(d\)](#) - *Powered industrial truck operator training*. **Note:** The requirements applicable to construction work under this paragraph are identical to those set forth at [1910.178\(l\)](#) - *powered industrial trucks - operator training*, of this chapter.

1926.603 - Pile Driving Equipment

Scope: This [standard](#) provides the requirements for pile driving equipment.

Special Requirements: Designated signalman, signals, engineers, winchman, references other standards

[1926.603\(a\)\(1\)](#) - Boilers and piping systems which are a part of, or used with, pile driving equipment shall meet the applicable requirements of the *American Society of Mechanical Engineers, Power Boilers (section I)*.

[1926.603\(a\)\(2\)](#) - All pressure vessels which are a part of, or used with, pile driving equipment shall meet the applicable requirements of the *American Society of Mechanical Engineers, Pressure Vessels (section VIII)*.

[1926.603\(a\)\(3\)](#) - Overhead protection, which will not obscure the vision of the operator and which meets the requirements of [subpart N](#) - *helicopters, hoists, elevators, and conveyors* of this part, shall be provided. Protection shall be the equivalent of 2-inch planking or other solid material of equivalent strength.

[1926.603\(b\)](#) - Pile driving from barges and floats. Barges or floats supporting pile driving operations shall meet the applicable requirements of [1926.605](#) - *marine operations and equipment*.

[1926.603\(c\)\(1\)](#) - Pile Driving Equipment - *Engineers and winchmen* shall accept *signals* only from the *designated signalmen*.

1926.604 - Site Clearing

Scope: This [standard](#) provides the requirements for site clearing.

Special Requirements: Instructed, references other standards

[1926.604\(a\)\(1\)](#) - Employees engaged in site clearing shall be protected from hazards of irritant and toxic plants and suitably *instructed* in the first aid treatment available.

[1926.604\(a\)\(2\)](#) - All equipment used in site clearing operations shall be equipped with rollover guards meeting the *requirements of this subpart*. In addition, rider-operated equipment shall be equipped with an overhead and rear canopy guard meeting the following requirements:[Reference [paragraph \(a\)\(2\)\(i\) - \(ii\)](#)].

1926.605 - Marine Operations and Equipment

Scope: This [standard](#) provides the requirements for marine operations and equipment.

Special Requirements: First aid measures, U.S. Coast Guard-approved 30-inch lifering, U.S. Coast Guard-approved work vests or buoyant vests, references other standards

[1926.605\(a\)\(1\)](#) - Operations fitting the definition of “material handling” shall be performed in conformance with applicable requirements of [part 1918](#), “*Safety and Health Regulations for Longshoring*” of this chapter. The term “longshoring operations” means the loading, unloading, moving, or handling of construction materials, equipment and supplies, etc. into, in, on, or out of any vessel from a fixed structure or shore-to-vessel, vessel-to-shore or fixed structure or vessel-to-vessel.

[1926.605\(d\)\(1\)](#) - Provisions for rendering *first aid and medical assistance* shall be in accordance with [subpart D - occupational health and environmental controls](#), of this part (1926).

[1926.605\(d\)\(2\)](#) - The employer shall ensure that there is in the vicinity of each barge in use at least one *U.S. Coast Guard-approved 30-inch lifering* with not less than 90 feet of line attached, and at least one portable or permanent ladder which will reach the top of the apron to the surface of the water. If the above equipment is not available at the pier, the employer shall furnish it during the time that he is working the barge.

[1926.605\(d\)\(3\)](#) - Employees walking or working on the unguarded decks of barges shall be protected with *U.S. Coast Guard-approved work vests or buoyant vests*.

[1926.605\(e\)](#) - Commercial diving operations. Commercial diving operations shall be subject to [subpart I - commercial diving operations](#), of part 1910.401–1910.441, of this chapter.

Subpart P - [Excavations](#)

[Subpart P](#) applies to all open excavations made in the earth's surface. Note: Excavations are defined to include trenches.

To learn if subpart P applies to you, go to [Does "Subpart P - Excavations" Apply to You?](#)

Special Requirements

1926.651 - Specific Excavation Requirements

Scope: This [standard](#) provides the requirements for excavations.

[Excavation](#) means any man-made cut, cavity, trench, or depression in an earth surface, formed by earth removal.

Special requirements: Determinations, advise companies/owners, designed, competent person, inspections, support systems, warning vests, garments marked, monitor, warning system, registered professional engineer, respiratory protection, testing, emergency rescue equipment, references other standards

[1926.651\(b\)\(1\)](#) - The estimated location of utility installations, such as sewer, telephone, fuel, electric, water lines, or any other underground installations that reasonably may be expected to be encountered during excavation work, shall be *determined* prior to opening an excavation.

[1926.651\(b\)\(2\)](#) - Utility companies or owners shall be *contacted* within established or customary local response times, *advised* of the proposed work, and asked to establish the location of the utility underground installations prior to the start of actual excavation. When utility companies or owners cannot respond to a request to locate underground utility installations within 24 hours (unless a longer period is required by state or local law), or cannot establish the exact location of these installations, the employer may proceed, provided the employer does so with caution, and provided detection equipment or other acceptable means to locate utility installations are used.

[1926.651\(c\)\(1\)\(i\)](#) - Structural ramps that are used solely by employees as a means of access or egress from excavations shall be *designed by a competent person*. Structural ramps used for access or egress of equipment shall be designed by a *competent person qualified* in structural design, and shall be constructed in accordance with the *design*.

[1926.651\(d\)](#) - Exposure to vehicular traffic. Employees exposed to public vehicular traffic shall be provided with, and shall wear, *warning vests or other suitable garments marked* with or made of *reflectorized or high-visibility material*.

[1926.651\(e\)](#) - Exposure to falling loads. No employee shall be permitted underneath loads handled by lifting or digging equipment. Employees shall be required to stand away from any vehicle being loaded or unloaded to avoid being struck by any spillage or falling materials. Operators may remain in the cabs of vehicles being loaded or unloaded when the vehicles are equipped, in accordance with [1926.601\(b\)\(6\)](#) - motor vehicles, to provide adequate protection for the operator during loading and unloading operations.

[1926.651\(f\)](#) - *Warning system* for mobile equipment. When mobile equipment is operated adjacent to an excavation, or when such equipment is required to approach the edge of an excavation, and the operator does not have a clear and direct view of the edge of the excavation, a *warning system* shall be utilized such as barricades, hand or mechanical signals, or stop logs. If possible, the grade should be away from the excavation.

[1926.651\(g\)\(1\)](#) - *Testing and controls*. In addition to the requirements set forth in [subpart D](#) - *occupational health and environmental controls* and [subpart E](#) - *personal protective and life saving equipment*, of this part (29 CFR 1926.50 - 1926.107) to prevent exposure to

harmful levels of atmospheric contaminants and to assure acceptable atmospheric conditions, the following requirements shall apply: [Reference [paragraph \(g\)\(1\)\(i\) - \(iv\)](#)].

[1926.651\(g\)\(2\)](#) - *Emergency rescue equipment, such as breathing apparatus, a safety harness and line, or a basket stretcher, shall be readily available where hazardous atmospheric conditions exist or may reasonably be expected to develop during work in an excavation. This equipment shall be attended when in use.*

- [1926.651\(g\)\(2\)\(ii\)](#) - Employees entering bell-bottom pier holes, or other similar deep and confined footing excavations, shall wear a *harness with a life-line* securely attached to it. The lifeline shall be separate from any line used to handle materials, and shall be individually attended at all times while the employee wearing the *lifeline* is in the excavation.

[1926.651\(h\)\(2\)](#) - If water is controlled or prevented from accumulating by the use of water removal equipment, the water removal equipment and operations shall be *monitored by a competent person* to ensure proper operation.

[1926.651\(h\)\(3\)](#) - If excavation work interrupts the natural drainage of surface water (such as streams), diversion ditches, dikes, or other suitable means shall be used to prevent surface water from entering the excavation and to provide adequate drainage of the area adjacent to the excavation. Excavations subject to runoff from heavy rains will require an *inspection by a competent person* and compliance with paragraphs [\(h\)\(1\)](#) and [\(h\)\(2\)](#) of this section.

[1926.651\(i\)\(1\)](#) - Where the stability of adjoining buildings, walls, or other structures is endangered by excavation operations, *support systems* such as shoring, bracing, or underpinning shall be provided to ensure the stability of such structures for the protection of employees.

[1926.651\(i\)\(2\)](#) - Excavation below the level of the base or footing of any foundation or retaining wall that could be reasonably expected to pose a hazard to employees shall not be permitted except when:

- [1926.651\(i\)\(2\)\(i\)](#) - A *support system*, such as underpinning, is provided to ensure the safety of employees and the stability of the structure; or
- [1926.651\(i\)\(2\)\(ii\)](#) - The excavation is in stable rock; or
- [1926.651\(i\)\(2\)\(iii\)](#) - A *registered professional engineer* has approved the *determination* that the structure is sufficiently removed from the excavation so as to be unaffected by the excavation activity; or
- [1926.651\(i\)\(2\)\(iv\)](#) - A *registered professional engineer* has approved the *determination* that such excavation work will not pose a hazard to employees.

[1926.651\(k\)\(1\)](#) - *Daily inspections* of excavations, the adjacent areas, and *protective systems* shall be made by a *competent person* for evidence of a situation that could result in possible cave-ins, indications of failure of protective systems, hazardous atmospheres, or other hazardous conditions. An *inspection* shall be conducted by the *competent person* prior to the start of work and as needed throughout the shift. *Inspections* shall also be made after every rainstorm or other hazard increasing occurrence. These *inspections* are only required when employee exposure can be reasonably anticipated.

[1926.651\(k\)\(2\)](#) - Where the *competent person* finds evidence of a situation that could result in a possible cave-in, indications of failure of *protective systems*, hazardous atmospheres, or other hazardous conditions, exposed employees shall be removed from the hazardous area until the necessary precautions have been taken to ensure their safety.

[1926.651\(l\)](#) - Walkways shall be provided where employees or equipment are required or permitted to cross over excavations. Guardrails which comply with [1926.502\(b\)](#) - fall protection systems criteria and practices, guardrail systems, shall be provided where walkways are 6 feet (1.8 m) or more above lower levels.

1926.652 - Requirements for Protective Systems

Scope: This [standard](#) provides the requirements for protective systems.

Special Requirements: Protective systems, design (copy), sloping and benching systems, designed, registered professional engineer, tabulated data, protective systems, manufacturer recommendations, competent person, approved, removed from service, evaluated, precautions, calculated

[1926.652\(a\)\(1\)](#) - Each employee in an excavation shall be protected from cave-ins by an adequate *protective system designed* in accordance with [paragraph \(b\)](#) or [\(c\)](#) of this section except when: [Reference [paragraph \(a\)\(1\)\(i\) - \(ii\)](#)].

[1926.652\(b\)](#) - *Design of sloping and benching systems*. The slopes and configurations of *sloping and benching systems* shall be selected and constructed by the employer or his designee and shall be in accordance with the requirements of [paragraph \(b\)\(1\)](#); or, in the alternative, [paragraph \(b\)\(2\)](#); or, in the alternative, [paragraph \(b\)\(3\)](#), or, in the alternative, [paragraph \(b\)\(4\)](#), as follows: [Reference [paragraph \(b\)\(1\) - \(4\)](#)].

[1926.652\(c\)](#) - *Design of support systems, shield systems, and other protective systems*. *Designs of support systems shield systems, and other protective systems* shall be selected and constructed by the employer or his designee and shall be in accordance with the requirements of [paragraph \(c\)\(1\)](#); or, in the alternative, [paragraph \(c\)\(2\)](#); or, in the alternative, [paragraph \(c\)\(3\)](#); or, in the alternative, [paragraph \(c\)\(4\)](#) as follows: [Reference [paragraph \(c\)\(1\) - \(4\)](#)].

[1926.652\(d\)\(1\)](#) - Materials and equipment used for *protective systems* shall be free from damage or defects that might impair their proper function.

[1926.652\(d\)\(2\)](#) - Manufactured materials and equipment used for *protective systems* shall be used and maintained in a manner that is consistent with the *recommendations of the manufacturer*, and in a manner that will prevent employee exposure to hazards.

[1926.652\(d\)\(3\)](#) - When material or equipment that is used for *protective systems* is damaged, a *competent person* shall examine the material or equipment and evaluate its suitability for continued use. If the *competent person* cannot assure the material or equipment is able to support the intended loads or is otherwise suitable for safe use, then such material or equipment shall be *removed from service*, and shall be *evaluated and approved by a registered professional engineer* before being returned to service.

[1926.652\(e\)\(1\)\(iv\)](#) - Before temporary removal of individual members begins, additional *precautions* shall be taken to ensure the safety of employees, such as installing other structural members to carry the loads imposed on the *support system*.

[1926.652\(g\)\(1\)\(i\)](#) - *Shield systems* shall not be subjected to loads exceeding those which the *system* was *designed* to withstand.

[1926.652\(g\)\(2\)](#) - Additional requirement for *shield systems* used in trench excavations. Excavations of earth material to a level not greater than 2 feet (.61 m) below the bottom of a shield shall be permitted, but only if the shield is designed to resist the forces *calculated* for the full depth of the trench, and there are no indications while the trench is open of a possible loss of soil from behind or below the bottom of the shield.

Subpart Q - [Concrete and Masonry Construction](#)

[Subpart Q](#) provides the standards for concrete and masonry construction operations.

To learn if subpart Q applies to you, go to [Does "Subpart Q - Concrete and Masonry Construction" Apply to You?](#)

Special Requirements

1926.701 - General requirements

Scope: This [standard](#) provides the general requirements pertaining to concrete and masonry construction.

Special Requirements: Employer determination, qualified person, signs, barriers, personal protective equipment

1926.701(a) - Construction loads. No construction loads shall be placed on a concrete structure or portion of a concrete structure unless the *employer determines*, based on information received from a *person who is qualified* in structural design, that the structure or portion of the structure is capable of supporting the loads.

1926.701(c)(2) - *Signs and barriers* shall be erected to limit employee access to the post-tensioning area during tensioning operations.

1926.701(f) - *Personal protective equipment*. No employee shall be permitted to apply a cement, sand, and water mixture through a pneumatic hose unless the employee is wearing *protective head and face equipment*.

1926.702 - Requirements for Equipment and Tools

Scope: This [standard](#) provides the requirements for equipment and tools used in concrete and masonry construction.

Special Requirements: Locked, tagged, maintenance, lockout/tagout procedures

1926.702(a)(2) - No employee shall be permitted to enter storage facilities unless the ejection system has been shut down, *locked out*, and *tagged* to indicate that the ejection system is not to be operated.

1926.702(j) - *Lockout/Tagout Procedures*.

- 1926.702(j)(1) - No employee shall be permitted to perform *maintenance or repair* activity on equipment (such as compressors, mixers, screens or pumps used for concrete and masonry construction activities) where the inadvertent operation of the equipment could occur and cause injury, unless all potentially hazardous energy sources have been *locked out and tagged*.
- 1926.702(j)(2) - *Tags shall read Do Not Start* or similar language to indicate that the equipment is not to be operated.

1926.703 - Requirements for Cast-in-Place Concrete

Scope: This [standard](#) provides the requirements for cast-in-place concrete.

Special Requirements: Drawings, plans, maintained, designed, qualified designer, engineer, tested, test results, inspects, load, rated capacity, references other standards

[1926.703\(a\)\(1\)](#) - Formwork shall be *designed*, fabricated, erected, supported, braced and maintained so that it will be capable of supporting without failure all vertical and lateral loads that may reasonably be anticipated to be applied to the formwork. Formwork which is *designed*, fabricated, erected, supported, braced and *maintained* in conformance with the *appendix* to this section will be deemed to meet the requirements of this paragraph.

[1926.703\(a\)\(2\)](#) - *Drawings or plans*, including all revisions, for the jack layout, formwork (including shoring equipment), working decks, and scaffolds, shall be *available at the jobsite*.

[1926.703\(b\)\(1\)](#) - All shoring equipment (including equipment used in reshoring operations) shall be *inspected prior to erection* to determine that the equipment meets the requirements specified in the *formwork drawings*.

[1926.703\(b\)\(3\)](#) - Erected shoring equipment shall be *inspected immediately* prior to, during, and immediately after concrete placement.

[1926.703\(b\)\(5\)](#) - The sills for shoring shall be sound, rigid, and capable of carrying the *maximum intended load*.

[1926.703\(b\)\(8\)\(i\)](#) - The *design* of the shoring shall be *prepared by a qualified designer and* the erected shoring shall be *inspected by an engineer qualified* in structural design.

[1926.703\(c\)\(4\)](#) - Jacks and vertical supports shall be positioned in such a manner that the loads do not exceed the *rated capacity* of the jacks.

[1926.703\(c\)\(6\)](#) - The form structure shall be maintained within all *design tolerances* specified for plumbness during the jacking operation.

[1926.703\(e\)\(1\)\(i\)](#) - The *plans and specifications* stipulate conditions for removal of forms and shores, and such conditions have been followed, or

[1926.703\(e\)\(1\)\(ii\)](#) - The concrete has been properly *tested* with an appropriate *ASTM standard test method* designed to indicate the concrete compressive strength, and the *test results* indicate that the concrete has gained sufficient strength to support its weight and superimposed loads.

1926.704 - Requirements for Precast Concrete

Scope: This [standard](#) provides the requirements for precast concrete.

Special Requirements: Maximum intended load

[1926.704\(b\)](#) - Lifting inserts which are embedded or otherwise attached to tilt-up precast concrete members shall be capable of supporting at least two times the *maximum intended load* applied or transmitted to them.

[1926.704\(c\)](#) - Lifting inserts which are embedded or otherwise attached to precast concrete members, other than the tilt-up members, shall be capable of supporting at least four times the *maximum intended load* applied or transmitted to them.

[1926.704\(d\)](#) - Lifting hardware shall be capable of supporting at least five times the *maximum intended load* applied or transmitted to the lifting hardware.

1926.705 - Requirements for Lift-Slab Operations

Scope: This [standard](#) provides the requirements for lift-slab operations.

Special Requirements: Designed, registered professional engineer, instructions, sketches, plans, designs, rated capacity, marked, competent person, certified welder, specifications, measures, references other standards

[1926.705\(a\)](#) - Lift-slab operations shall be *designed* and planned by a *registered professional engineer* who has experience in lift-slab construction. Such *plans and designs* shall be implemented by the employer and shall include detailed *instructions and sketches* indicating the prescribed method of erection. These *plans and designs* shall also include provisions for ensuring lateral stability of the building/structure during construction.

[1926.705\(b\)](#) - Jacks/lifting units shall be *marked* to indicate their *rated capacity* as established by the manufacturer.

[1926.705\(c\)](#) - Jacks/lifting units shall not be loaded beyond their *rated capacity* as established by the manufacturer.

[1926.705\(e\)](#) - Jacks/lifting units shall be *designed* and installed so that they will neither lift nor continue to lift when they are loaded in excess of their *rated capacity*.

[1926.705\(i\)](#) - If leveling is maintained by manual controls, such controls shall be located in a central location and attended by a *competent person* while lifting is in progress. In addition to meeting the definition in [1926.32\(f\)](#) - *definitions*, the *competent person* must be experienced in the lifting operation and with the lifting equipment being used.

[1926.705\(k\)\(1\)](#) - No employee, except those essential to the jacking operation, shall be permitted in the building/structure while any jacking operation is taking place unless the building/structure has been reinforced sufficiently to ensure its integrity during erection. The phrase "reinforced sufficiently to ensure its integrity" used in this paragraph means that

a *registered professional engineer*, independent of the engineer who *designed and planned* the lifting operation, has determined from the *plans* that if there is a loss of support at any jack location, that loss will be confined to that location and the structure as a whole will remain stable.

[1926.705\(k\)\(4\)](#) - Employers who comply with [appendix A](#) to 1926.705 shall be considered to be in compliance with the provisions of [paragraphs \(k\)\(1\) through \(k\)\(3\)](#) of this section.

[1926.705\(m\)](#) - All welding on temporary and permanent connections shall be performed by a *certified welder*, familiar with the welding requirements specified in the *plans and specifications* for the lift-slab operation.

[1926.705\(p\)](#) - Equipment shall be *designed* and installed so that the lifting rods cannot slip out of position or the employer shall institute other *measures*, such as the use of locking or blocking devices, which will provide positive connection between the lifting rods and attachments and will prevent components from disengaging during lifting operations.

1926.706 - Requirements for Masonry Construction

Scope: This [standard](#) provides the requirements for masonry construction.

Special Requirements: Limited access zone

[1926.706\(a\)](#) - A *limited access zone* shall be established whenever a masonry wall is being constructed. The *limited access zone* shall conform to the following; [Reference [paragraph \(a\)\(1\) - \(5\)](#)].

Subpart R - [Steel Erection](#)

[Subpart R](#) provides the standards for steel erection activities involved in the construction, alteration, and/or repair of single and multi-story buildings, bridges, and other structures where steel erection occurs.

To learn if subpart R applies to you, go to [Does "Subpart R - Steel Erection" Apply to You?](#)

Special Requirements

1926.752 - Site Layout, Site-specific Erection Plan and Construction Sequence

Scope: This [standard](#) provides the requirements for a site layout, site-specific erection plan and construction sequence.

Special Requirements: Controlling contractor, test method, written notification, pre-planning, approval, qualified person, guidelines, site-specific erection plan, references other standards

1926.752(a) - *Approval* to begin steel erection. Before authorizing the commencement of steel erection, the *controlling contractor* shall ensure that the steel erector is provided with the following *written notifications*:

- 1926.752(a)(1) - The concrete in the footings, piers and walls and the mortar in the masonry piers and walls has attained, on the basis of an appropriate *ASTM standard test method* of field-cured samples, either 75 percent of the intended minimum compressive design strength or sufficient strength to support the loads imposed during steel erection.
- 1926.752(a)(2) - Any repairs, replacements and modifications to the anchor bolts were conducted in accordance with 1926.755(b) - column anchorage.

1926.752(b) - Commencement of steel erection. A steel erection contractor shall not erect steel unless it has received *written notification* that the concrete in the footings, piers and walls or the mortar in the masonry piers and walls has attained, on the basis of an appropriate *ASTM standard test method* of field-cured samples, either 75 percent of the intended minimum compressive design strength or sufficient strength to support the loads imposed during steel erection.

1926.752(c) - Site layout. The *controlling contractor* shall ensure that the following is provided and maintained: [Reference paragraph (c)(1) - (2)].

1926.752(d) - Pre-planning of overhead hoisting operations. All hoisting operations in steel erection shall be *pre-planned* to ensure that the requirements of 1926.753(d) - hoisting and rigging, are met.

1926.752(e) - *Site-specific erection plan*. Where employers elect, due to conditions specific to the site, to develop alternate means and methods that provide employee protection in accordance with 1926.753(c)(5) - hoisting and rigging, 1926.757(a)(4) - open web steel joists, or 1926.757(e)(4), a *site-specific erection plan* shall be developed by a *qualified person* and be available at the work site. *Guidelines* for establishing a *site-specific erection plan* are contained in appendix A - Guidelines for establishing the components of a site-specific erection plan: Non-Mandatory Guidelines for Complying with 1926.752(e) to this subpart.

1926.753 - Hoisting and Rigging

Scope: This standard provides the requirements for hoisting and rigging.

Special Requirements: Inspections, competent person, pre-planned, trained, procedures, manufacturer's specifications and limitations, rigging rating chart, load chart, site-specific erection plan, qualified rigger, qualified person, certified, references other standards

[1926.753\(a\)](#) - All the provisions of [subpart CC - cranes and derricks in construction](#), apply to hoisting and rigging with the exception of [1926.1431\(a\) - hoisting personnel](#).

[1926.753\(c\)\(1\)](#) - *Pre-shift visual inspection of cranes.*

- [1926.753\(c\)\(1\)\(i\)](#) - Cranes being used in steel erection activities shall be *visually inspected prior to each shift* by a [competent person](#); the *inspection* shall include observation for deficiencies during operation. At a minimum this *inspection* shall include the following: [Reference [paragraph \(c\)\(1\)\(i\) - \(iv\)](#)].

[1926.753\(c\)\(2\)](#) - A *qualified rigger* (a rigger who is also a *qualified person*) shall *inspect* the rigging *prior to each shift* in accordance with [1926.251 - rigging equipment for material handling](#).

[1926.753\(c\)\(4\)](#) - Cranes or derricks may be used to hoist employees on a personnel platform when work under this subpart is being conducted, provided that all provisions of [1926.1431 - hoisting personnel](#) [except for [1926.1431\(a\)](#)] are met.

[1926.753\(c\)\(5\)\(i\)](#) - When a *qualified rigger* has determined that the hoisting and placing of purlins and single joists can be performed more safely by doing so; or

[1926.753\(c\)\(5\)\(ii\)](#) - When equivalent protection is provided in a *site-specific erection plan*.

[1926.753\(d\)\(1\)](#) - Routes for suspended loads shall be *pre-planned* to ensure that no employee is required to work directly below a suspended load except for: [Reference [paragraph \(d\)\(1\)\(i\) - \(ii\)](#)].

[1926.753\(d\)\(2\)\(iii\)](#) - All loads shall be rigged by a *qualified rigger*.

[1926.753\(e\)\(1\)\(iv\)](#) - All employees engaged in the multiple lift have been *trained* in these *procedures* in accordance with [1926.761\(c\)\(1\) - training](#).

[1926.753\(e\)\(1\)\(v\)](#) - No crane is permitted to be used for a multiple lift where such use is contrary to the *manufacturer's specifications and limitations*.

[1926.753\(e\)\(2\)](#) - Components of the multiple lift rigging assembly shall be specifically designed and assembled with a *maximum capacity* for total assembly and for each individual attachment point. This capacity, *certified* by the manufacturer or a *qualified*

rigger, shall be based on the *manufacturer's specifications* with a 5 to 1 safety factor for all components.

1926.753(e)(3) - The total load shall not exceed:

- 1926.753(e)(3)(i) - The *rated capacity* of the hoisting equipment specified in the hoisting equipment *load charts*;
- 1926.753(e)(3)(ii) - The *rigging capacity* specified in the *rigging rating chart*.

1926.754 - Structural Steel Assembly

cope: This standard provides the requirements for structural steel assembly.

Special Requirements: Registered engineer, competent person, drawings, painted, fall protection, marked, warning, approval, references other standards

1926.754(a) - Structural stability shall be maintained at all times during the erection process.

Note to paragraph (a): *Federal Highway Administration (FHWA) regulations* incorporate by reference a number of *standards, policies, and standard specifications* published by the *American Association of State Highway and Transportation Officials (AASHTO)* and other organizations. (See 23 CFR 625.4). Many of these incorporated provisions may be relevant to maintaining structural stability during the erection process. For instance, as of May 17, 2010, in many cases FHWA requires a *Registered Engineer* to prepare and seal *working drawings* for falsework used in highway bridge construction. (See AASHTO *Specifications for Highway Bridges, Div. II, § 3.2.1, 15th edition, 1992*, which FHWA incorporates by reference in 23 CFR 625.4). FHWA also encourages compliance with *AASHTO Specifications that the FHWA regulations* do not currently incorporate by reference. (See <http://www.fhwa.dot.gov/bridge/lrfd/index.htm>.)

1926.754(d)(1) - When deemed necessary by a *competent person*, plumbing-up equipment shall be installed in conjunction with the steel erection process to ensure the stability of the structure.

1926.754(d)(3) - Plumbing-up equipment shall be removed only with the *approval of a competent person*.

1926.754(e)(1)(iii) - Bundles of metal decking on joists shall be landed in accordance with 1926.757(e)(4) - *open web steel joists*.

1926.754(e)(2)(ii) - Roof and floor holes and openings shall be decked over. Where large size, configuration or other structural design does not allow openings to be decked over

(such as elevator shafts, stair wells, etc.) employees shall be protected in accordance with [1926.760\(a\)\(1\)](#) - *fall protection*.

[1926.754\(e\)\(3\)\(iii\)](#) - All covers shall be *painted* with high-visibility paint or shall be *marked* with the word "HOLE" or "COVER" to provide *warning* of the hazard.

[1926.754\(e\)\(4\)](#) - Decking gaps around columns. Wire mesh, exterior plywood, or equivalent, shall be installed around columns where planks or metal decking do not fit tightly. The materials used must be of sufficient strength to provide *fall protection* for personnel and prevent objects from falling through.

[1926.754\(e\)\(5\)\(i\)](#) - Except as provided in [1926.760\(c\)](#) - *fall protection*, metal decking shall be laid tightly and immediately secured upon placement to prevent accidental movement or displacement.

1926.755 - Column Anchorage

Scope: This [standard](#) provides the requirements for column anchorage.

Special Requirements: Competent person, structural engineer (of record), controlling contractor, approval, written notification

[1926.755\(a\)\(4\)](#) - All columns shall be evaluated by a *competent person* to determine whether guying or bracing is needed; if guying or bracing is needed, it shall be installed.

[1926.755\(b\)\(1\)](#) - Anchor rods (anchor bolts) shall not be repaired, replaced or field-modified without the *approval* of the *project structural engineer of record*.

[1926.755\(b\)\(2\)](#) - Prior to the erection of a column, the *controlling contractor* shall provide *written notification* to the steel erector if there has been any repair, replacement or modification of the anchor rods (anchor bolts) of that column.

1926.756 - Beams and Columns

Scope: This [standard](#) provides the requirements for beams and columns.

Special Requirements: Project structural engineer (on record), erection drawings, competent person

[1926.756\(a\)\(1\)](#) - During the final placing of solid web structural members, the load shall not be released from the hoisting line until the members are secured with at least two bolts per connection, of the same size and strength as shown in the *erection drawings*, drawn up wrench-tight or the equivalent as specified by the *project structural engineer of record*, except as specified in [paragraph \(b\)](#) of this section.

[1926.756\(a\)\(2\)](#) - A *competent person* shall determine if more than two bolts are necessary to ensure the stability of cantilevered members; if additional bolts are needed, they shall be installed.

[1926.756\(b\)](#) - Diagonal bracing. Solid web structural members used as diagonal bracing shall be secured by at least one bolt per connection drawn up wrench-tight or the equivalent as specified by the *project structural engineer of record*.

1926.757 - Open Web Steel Joists

Scope: This [standard](#) provides the requirements for open web steel joists.

Special Requirements: Qualified person, erection drawings, alternative method, site-specific erection plan (documentation), project structural engineer (record), approval (written), fall arrest system, erection drawings, references other standards

[1926.757\(a\)\(2\)](#) - Where constructability does not allow a steel joist to be installed at the column: [Reference [paragraph \(a\)\(2\)\(i\)\(A\) - \(D\)](#)].

- [1926.757\(a\)\(2\)\(i\)\(B\)](#) - be designed by a *qualified person*.
- [1926.757\(a\)\(2\)\(i\)\(D\)](#) - be included in the *erection drawings*.

[1926.757\(a\)\(4\)](#) - Where steel joists at or near columns span more than 60 feet (18.3 m), the joists shall be set in tandem with all bridging installed unless an *alternative method* of erection, which provides equivalent stability to the steel joist, is *designed by a qualified person* and is included in the *site-specific erection plan*.

[1926.757\(a\)\(7\)](#) - No modification that affects the strength of a steel joist or steel joist girder shall be made without the *approval* of the *project structural engineer of record*.

[1926.757\(a\)\(9\)](#) - Steel joists and steel joist girders shall not be used as anchorage points for a *fall arrest system* unless *written approval* to do so is obtained from a *qualified person*.

[1926.757\(d\)\(4\)](#) - For steel members spanning over 144 feet (43.9 m), the erection methods used shall be in accordance with [1926.756](#) - *beams and columns*.

[1926.757\(d\)\(6\)\(i\)](#) - The bridging shall be indicated on the *erection drawing*.

[1926.757\(d\)\(6\)\(ii\)](#) - The *erection drawing* shall be the exclusive indicator of the proper placement of this bridging.

[1926.757\(e\)\(4\)](#) - No bundle of decking may be placed on steel joists until all bridging has been installed and anchored and all joist bearing ends attached, unless all of the following conditions are met: [Reference [paragraph \(e\)\(4\)\(i\) - \(vi\)](#)].

- [1926.757\(e\)\(4\)\(i\)](#) - The employer has first determined from a *qualified person* and *documented* in a *site-specific erection plan* that the structure or portion of the structure is capable of supporting the load.

1926.758 - Systems-engineered Metal Buildings

Scope: This [standard](#) provides the requirements for systems-engineered metal buildings.

Special Requirements: Qualified person, written approval, fall arrest system, fall protection (safety systems), references other standards

[1926.758\(a\)](#) - All of the requirements of this subpart apply to the erection of systems-engineered metal buildings except [1926.755](#) (column anchorage) and [1926.757](#) (open web steel joists).

[1926.758\(g\)](#) - Purlins and girts shall not be used as an anchorage point for a *fall arrest system* unless *written approval* is obtained from a *qualified person*.

[1926.758\(h\)](#) - Purlins may only be used as a walking/working surface when installing *safety systems*, after all permanent bridging has been installed and *fall protection* is provided.

1926.759 - Falling Object Protection

Scope: This [standard](#) provides the requirements for falling object protection.

Special Requirements: Controlling contractor

[1926.759\(b\)](#) - Protection from falling objects other than materials being hoisted. The *controlling contractor* shall bar other construction processes below steel erection unless overhead protection for the employees below is provided.

1926.760 - Fall Protection

Scope: This [standard](#) provides the requirements for fall protection.

Special Requirements: Fall protection systems, controlled decking zones, steel erector, training, authorizing persons, custody, inspections, connectors, references other standards

[1926.760\(a\)\(1\)](#) - Except as provided by [paragraph \(a\)\(3\)](#) of this section, each employee engaged in a steel erection activity who is on a walking/working surface with an unprotected side or edge more than 15 feet (4.6 m) above a lower level shall be protected from fall hazards by *guardrail systems*, *safety net systems*, *personal fall arrest systems*, *positioning device systems* or *fall restraint systems*.

[1926.760\(a\)\(3\)](#) - *Connectors* and employees working in *controlled decking zones* shall be protected from fall hazards as provided in [paragraphs \(b\)](#) and [\(c\)](#) of this section, respectively.

[1926.760\(b\)](#) - *Connectors*. Each *connector* shall:

- [1926.760\(b\)\(2\)](#) - Have completed connector *training* in accordance with [1926.761](#) - *training*; and
- [1926.760\(b\)\(3\)](#) - Be provided, at heights over 15 and up to 30 feet above a lower level, with a *personal fall arrest system*, positioning device system or *fall restraint system* and wear the equipment necessary to be able to be tied off; or be provided with other means of protection from fall hazards in accordance with [paragraph \(a\)\(1\)](#) of this section.

[1926.760\(c\)](#) - *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: [Reference [paragraph \(c\)\(1\) - \(7\)](#)].

[1926.760\(d\)](#) - Criteria for fall protection equipment.

- [1926.760\(d\)\(1\)](#) - *Guardrail systems, safety net systems, personal fall arrest systems, positioning device systems* and their components shall conform to the criteria in [1926.502](#) - *Fall protection systems criteria and practices* (see [appendix G](#) - [1926.502 \(b\)-\(e\) Fall Protection Systems Criteria and Practices](#)) to this subpart).
- [1926.760\(d\)\(2\)](#) - Fall arrest system components shall be used in *fall restraint systems* and shall conform to the criteria in [1926.502](#) - *Fall protection systems criteria and practices* (see [appendix G](#) - [1926.502 \(b\)-\(e\) Fall Protection Systems Criteria and Practices](#)). Either body belts or body harnesses shall be used in *fall restraint systems*.
- [1926.760\(d\)\(3\)](#) - Perimeter safety cables shall meet the criteria for *guardrail systems* in [1926.502](#) - *Fall protection systems criteria and practices* (see [appendix G](#) - [1926.502 \(b\)-\(e\) Fall Protection Systems Criteria and Practices](#)).

[1926.760\(e\)](#) - *Custody of fall protection*. *Fall protection* provided by the *steel erector* shall remain in the area where steel erection activity has been completed, to be used by other trades, only if the *controlling contractor* or *its authorized representative*:

- [1926.760\(e\)\(1\)](#) - Has *directed* the *steel erector* to leave the *fall protection* in place; and
- [1926.760\(e\)\(2\)](#) - Has *inspected* and *accepted* control and responsibility of the *fall protection* prior to *authorizing persons* other than *steel erectors* to work in the area.

1926.761 - Training

Scope: This [standard](#) provides the requirements for training.

Special Requirements: Training, qualified person, training program(s), instruction, employee participation, procedures, work practices, connecting techniques, CDZ, references other standards

The following provisions supplement the requirements of [1926.21](#) - *Safety training and education*, regarding the hazards addressed in this subpart.

[1926.761\(a\)](#) - *Training personnel*. Training required by this section shall be provided by a *qualified person(s)*.

[1926.761\(b\)](#) - *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*. The *program* shall include *training and instruction* in the following areas: [Reference [paragraph \(b\)\(1\) - \(5\)](#)].

[1926.761\(c\)](#) - *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.

- [1926.761\(c\)\(1\)](#) - *Multiple lift rigging procedure*. The employer shall ensure that each employee who performs multiple lift rigging has been provided *training* in the following areas:
 - [1926.761\(c\)\(1\)\(ii\)](#) - The *proper procedures* and equipment to perform multiple lifts required by [1926.753\(e\)](#) - *hoisting and rigging, multiple lift rigging procedure*.
- [1926.761\(c\)\(2\)](#) - *Connector procedures*. The employer shall ensure that each *connector* has been provided *training* in the following areas:
 - [1926.761\(c\)\(2\)\(ii\)](#) - The establishment, access, proper *connecting techniques and work practices* required by [1926.756\(c\)](#) - *beams and columns*, and [1926.760\(b\)](#) - *fall protection, connectors*.
- [1926.761\(c\)\(3\)](#) - *Controlled Decking Zone Procedures*. Where CDZs are being used, the employer shall assure that each employee has been provided *training* in the following areas:
 - [1926.761\(c\)\(3\)\(ii\)](#) - The establishment, access, proper installation *techniques and work practices* required by [1926.760\(c\)](#) - *fall protection, CDZ*, and [1926.754\(e\)](#) - *structural steel assembly, metal decking*.

Subpart S - [Underground Construction, Caissons, Cofferdams, and Compressed Air](#)

[Subpart S](#) provides the standards for underground construction, caissons, cofferdams, and compressed air.

To learn if subpart S applies to you, go to [Does "Subpart S - Underground Construction, Caissons, Cofferdams, and Compressed Air" Apply to You?](#)

Special Requirements

1926.800 - Underground Construction

Scope: This standard provides the requirements for underground construction.

Special Requirements: Warning signs (posted), check-in/check-out procedure, designated person, practice, familiar, respirators, rescue procedures, rescue services, air monitoring, procedure, communication systems, tested, informed, observation, environmental controls, communications, safety instruction, self-rescuers, rescue teams, qualifications, alarm, informed, records, recordkeeping, review, ventilation controls, competent person, demonstrated (employer), reasonable determination, MSHA-approved equipment, dust control measures, notifying, classified, history, references other standards

[1926.800\(b\)\(3\)](#) - The employer shall control access to all openings to prevent unauthorized entry underground. Unused chutes, manways, or other openings shall be tightly covered, bulkheaded, or fenced off, and shall be *posted with warning signs* indicating "Keep Out" or similar language. Completed or unused sections of the underground facility shall be barricaded.

[1926.800\(c\)](#) - *Check-in/check-out*. The employer shall maintain a *check-in/check-out procedure* that will ensure that above-ground personnel can determine an accurate *count* of the number of persons underground in the event of an emergency. However, this *procedure* is not required when the construction of underground facilities designed for human occupancy has been sufficiently completed so that the permanent *environmental controls* are effective, and when the remaining construction activity will not cause any environmental hazard or structural failure within the facilities.

[1926.800\(d\)](#) - *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: [Reference [paragraph \(d\)\(1\) - \(d\)\(10\)](#)].

[1926.800\(e\)\(1\)](#) - Oncoming shifts shall be *informed* of any hazardous occurrences or conditions that have affected or might affect employee safety, including liberation of gas, equipment failures, earth or rock slides, cave-ins, floodings, fires or explosions.

[1926.800\(e\)\(2\)](#) - The employer shall *establish and maintain direct communications* for coordination of activities with other employers whose operations at the jobsite affect or may affect the safety of employees underground.

[1926.800\(f\)\(1\)](#) - When natural unassisted *voice communication* is ineffective, a power-assisted means of *voice communication* shall be used to provide *communication* between the work face, the bottom of the shaft, and the surface.

[1926.800\(f\)\(2\)](#) - Two effective means of *communication*, at least one of which shall be *voice communication*, shall be provided in all shafts which are being developed or used either for personnel access or for hoisting. Additional requirements for hoist operator *communication* are contained in paragraph (t)(3)(xiv) of this section.

[1926.800\(f\)\(3\)](#) - Powered *communication systems* shall operate on an independent power supply, and shall be installed so that the use of or disruption of any one phone or signal location will not disrupt the operation of the *system* from any other location.

[1926.800\(f\)\(4\)](#) - *Communication systems* shall be *tested* upon initial entry of *each shift* to the underground, and as often as necessary at later times, to ensure that they are in working order.

[1926.800\(f\)\(5\)](#) - Any employee working alone underground in a hazardous location, who is both out of the range of natural unassisted *voice communication* and not under *observation* by other persons, shall be provided with an effective means of obtaining assistance in an emergency.

[1926.800\(g\)\(1\)](#) - Hoisting capability. When a shaft is used as a means of egress, the employer shall make advance arrangements for power-assisted hoisting capability to be readily available in an emergency, unless the regular hoisting means can continue to function in the event of an electrical power failure at the jobsite. Such hoisting means shall be *designed* so that the load hoist drum is powered in both directions of rotation and so that the brake is automatically applied upon power release or failure.

[1926.800\(g\)\(2\)](#) - *Self-rescuers*. The employer must provide *self-rescuers approved* by the *National Institute for Occupational Safety and Health under 42 CFR part 84*. The *respirators* must be immediately available to all employees at work stations in underground areas where employees might be trapped by smoke or gas. The selection, issuance, use, and care of *respirators* must be in accordance with [29 CFR 1926.103](#) - *respiratory protection*.

[1926.800\(g\)\(3\)](#) - *Designated person*. At least one *designated person* shall be on duty above ground whenever any employee is working underground. This *designated person* shall be responsible for securing immediate aid and keeping an *accurate count* of employees

underground in case of emergency. The *designated person* must not be so busy with other responsibilities that the counting function is encumbered.

[1926.800\(g\)\(5\)\(i\)](#) - On jobsites where 25 or more employees work underground at one time, the employer shall provide (or make arrangements in advance with locally available *rescue services* to provide) at least two *5-person rescue teams*, one on the jobsite or within one-half hour travel time from the entry point, and the other within 2 hours travel time.

[1926.800\(g\)\(5\)\(ii\)](#) - On jobsites where less than 25 employees work underground at one time, the employer shall provide (or make arrangements in advance with locally available *rescue services* to provide) at least one *5-person rescue team* to be either on the jobsite or within one-half hour travel time from the entry point.

[1926.800\(g\)\(5\)\(iii\)](#) - *Rescue team members shall be qualified in rescue procedures, the use and limitations of breathing apparatus, and the use of firefighting equipment. Qualifications shall be reviewed not less than annually.*

[1926.800\(g\)\(5\)\(iv\)](#) - 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.*

[1926.800\(g\)\(5\)\(v\)](#) - The employer shall ensure that *rescue teams are familiar* with conditions at the jobsite.

[1926.800\(h\)\(1\)](#) - *Potentially gassy operations.* Underground construction operations shall be *classified* as potentially gassy if either:

- [1926.800\(h\)\(1\)\(i\)](#) - *Air monitoring* discloses 10 percent or more of the lower explosive limit for methane or other flammable gases measured at 12 inches (304.8 mm) ± 0.25 inch (6.35 mm) from the roof, face, floor or walls in any underground work area for more than a 24-hour period; or
- [1926.800\(h\)\(1\)\(ii\)](#) - The *history* of the geographical area or geological formation indicates that 10 percent or more of the lower explosive limit for methane or other flammable gases is likely to be encountered in such underground operations.

[1926.800\(h\)\(2\)](#) - *Gassy operations.* Underground construction operations shall be *classified* as gassy if:

- [1926.800\(h\)\(2\)\(i\)](#) - *Air monitoring* discloses 10 percent or more of the lower explosive limit for methane or other flammable gases measured at 12 inches (304.8 mm) ± 0.25 inch (6.35 mm) from the roof, face, floor or walls in any underground work area for three consecutive days; or

- [1926.800\(h\)\(2\)\(iii\)](#) - The underground construction operation is both connected to an underground work area which is currently *classified* as gassy and is also subject to a continuous course of air containing the flammable gas concentration.

[1926.800\(h\)\(3\)](#) - *Declassification to potentially gassy operations.* Underground construction gassy operations may be *declassified* to Potentially Gassy when air monitoring results remain under 10 percent of the lower explosive limit for methane or other flammable gases for three consecutive days.

[1926.800\(i\)\(2\)](#) - Mobile diesel-powered equipment used in gassy operations shall be either approved in accordance with the requirements of *30 CFR part 36 (formerly Schedule 31)* by MSHA, or shall be *demonstrated by the employer* to be fully equivalent to such MSHA-*approved equipment*, and shall be operated in accordance with that part.

[1926.800\(i\)\(3\)](#) - Each entrance to a gassy operation shall be prominently *posted with signs notifying* all entrants of the *gassy classification*.

[1926.800\(i\)\(5\)](#) - A *fire watch* as described in [1926.352\(e\)](#) - *fire prevention*, shall be maintained when hot work is performed.

[1926.800\(i\)\(6\)](#) - Once an operation has met the criteria in [paragraph \(h\)\(2\) warranting classification](#) as gassy, all operations in the affected area, except the following, shall be discontinued until the operation either is in compliance with all of the gassy operation requirements or has been declassified in accordance with [paragraph \(h\)\(3\)](#) of this section:

[1926.800\(j\)\(1\)](#) - *General.* Air quality limits and control requirements for construction are found in [1926.55](#) - *gases, vapors, fumes, dusts, and mists*, except as modified by this section.

- [1926.800\(j\)\(1\)\(i\)](#)
 - [1926.800\(j\)\(1\)\(i\)\(A\)](#) - The employer shall assign a *competent person* who shall perform all *air monitoring* required by this section.
 - [1926.800\(j\)\(1\)\(i\)\(B\)](#) - Where this paragraph requires monitoring of airborne contaminants “as often as necessary,” the *competent person* shall make a *reasonable determination* as to which substances to *monitor* and how frequently to *monitor*, considering at least the following factors:
[Reference [paragraph \(j\)\(1\)\(i\)\(B\(1\) - \(4\)\)](#)].

[1926.800\(j\)\(1\)\(ii\)\(A\)](#) - The atmosphere in all underground work areas shall be *tested* as often as necessary to assure that the atmosphere at normal atmospheric pressure contains at least 19.5 percent oxygen and no more than 22 percent oxygen.

[1926.800\(j\)\(1\)\(ii\)\(B\)](#) - *Tests* for oxygen content shall be made before *tests* for air contaminants.

[1926.800\(j\)\(1\)\(iii\)\(A\)](#) - The atmosphere in all underground work areas shall be *tested* quantitatively for carbon monoxide, nitrogen dioxide, hydrogen sulfide, and other toxic gases, dusts, vapors, mists, and fumes as often as necessary to ensure that the permissible exposure limits prescribed in [1926.55](#) - *gases, vapors, fumes, dusts, and mists*, are not exceeded.

[1926.800\(j\)\(1\)\(iii\)\(B\)](#) - The atmosphere in all underground work areas shall be *tested* quantitatively for methane and other flammable gases as often as necessary to determine:

[1926.800\(j\)\(1\)\(iii\)\(D\)](#) - *Testing* shall be performed as often as necessary to ensure that the ventilation requirements of [paragraph \(k\)](#) of this section are met.

[1926.800\(j\)\(1\)\(v\)\(A\)](#) - Whenever *air monitoring* indicates the presence of 5 ppm or more of hydrogen sulfide, a *test* shall be conducted in the affected underground work area(s), at least at the *beginning and midpoint* of each shift, until the concentration of hydrogen sulfide has been less than 5 ppm for 3 consecutive days.

[1926.800\(j\)\(1\)\(v\)\(B\)](#) - Whenever hydrogen sulfide is detected in an amount exceeding 10 ppm, a *continuous sampling* and indicating hydrogen sulfide monitor shall be used to *monitor* the affected work area.

[1926.800\(j\)\(1\)\(v\)\(C\)](#) - Employees shall be *informed* when a concentration of 10 ppm hydrogen sulfide is exceeded.

[1926.800\(j\)\(1\)\(v\)\(D\)](#) - The *continuous sampling* and indicating hydrogen sulfide monitor shall be designed, installed, and maintained to provide a *visual and aural alarm* when the hydrogen sulfide concentration reaches 20 ppm to signal that *additional measures*, such as *respirator use*, increased ventilation, or evacuation, might be necessary to maintain hydrogen sulfide exposure below the permissible exposure limit.

[1926.800\(j\)\(1\)\(vi\)](#) - When the *competent person determines*, on the basis of *air monitoring results or other information*, that air contaminants may be present in sufficient quantity to be dangerous to life, the employer shall: [Reference [paragraph \(j\)\(1\)\(vi\)](#)].

[1926.800\(j\)\(1\)\(vii\)](#) - Whenever five percent or more of the lower explosive limit for methane or other flammable gases is detected in any underground work area(s) or in the air return, steps shall be taken to increase ventilation air volume or otherwise control the gas concentration, unless the employer is operating in accordance with the potentially gassy or gassy operation requirements. Such additional *ventilation controls* may be discontinued when gas concentrations are reduced below five percent of the lower explosive limit, but shall be reinstated whenever the five percent level is exceeded.

[1926.800\(j\)\(2\)](#) - *Additional monitoring for potentially gassy and gassy operations*. Operations which meet the criteria for potentially gassy and gassy operations set forth in [paragraph \(h\)](#) of this section shall be subject to the additional *monitoring* requirements of this paragraph.

[1926.800\(j\)\(3\)](#) - *Recordkeeping*. A *record* of all air quality tests shall be maintained above ground at the worksite and be made available to the Secretary of Labor upon request. The *record* shall include the location, date, time, substance and amount monitored. *Records of exposures* to toxic substances shall be *retained* in accordance with [1926.33](#) - *access to employee exposure and medical records*, of this chapter. All other air quality *test records* shall be retained until completion of the project.

[1926.800\(k\)\(1\)\(ii\)](#) - Mechanical ventilation shall be provided in all underground work areas except when the *employer can demonstrate* that natural ventilation provides the necessary air quality through sufficient air volume and air flow.

[1926.800\(k\)\(7\)](#) - When ventilation has been reduced to the extent that hazardous levels of methane or flammable gas may have accumulated, a *competent person* shall *test* all affected areas after ventilation has been restored and shall determine whether the atmosphere is within flammable limits before any power, other than for acceptable equipment, is restored or work is resumed.

[1926.800\(k\)\(8\)](#) - Whenever the ventilation system has been shut down with all employees out of the underground area, only *competent persons authorized to test* for air contaminants shall be allowed underground until the ventilation has been restored and all affected areas have been *tested* for air contaminants and declared safe.

[1926.800\(k\)\(9\)](#) - When drilling rock or concrete, appropriate *dust control measures* shall be taken to maintain dust levels within limits set in [1926.55](#) - *gases, vapors, fumes, dusts, and mists*. Such *measures* may include, but are not limited to, wet drilling, the use of vacuum collectors, and water mix spray systems.

[1926.800\(k\)\(10\)\(ii\)](#) - Mobile diesel-powered equipment used underground in atmospheres other than gassy operations:

- [1926.800\(k\)\(10\)\(ii\)\(A\)](#) - Shall comply with *MSHA provisions in 30 CFR 57.5067*; or
- [1926.800\(k\)\(10\)\(ii\)\(B\)](#) - If purchased on or before July 15, 2019, may alternatively comply with *MSHA provisions under 30 CFR part 32* (revised as of July 1, 1996) (formerly Schedule 24), or be *demonstrated by the employer* to be fully equivalent to such *MSHA-approved equipment*, and be operated in accordance with that part.

[1926.800\(l\)\(1\)](#) - Illumination requirements applicable to underground construction operations are found in [Table D-3](#) of [1926.56](#) - *Illumination*, of this part.

[1926.800\(m\)](#) - *Fire prevention and control*. Fire prevention and protection requirements applicable to underground construction operations are found in [subpart F - fire protection and prevention](#), of this part, except as modified by the following additional standards.

[1926.800\(m\)\(2\)\(ii\)](#) - Readily *visible signs* prohibiting smoking and open flames shall be *posted* in areas having fire or explosion hazards.

[1926.800\(m\)\(5\)\(ii\)](#) - Acetylene, liquefied petroleum gas, and Methylacetylene Propadiene Stabilized gas may be used underground only for welding, cutting and other hot work, and only in accordance with [subpart J - welding and cutting](#), of this part, and paragraphs [\(j\)](#), [\(k\)](#), [\(m\)](#), and [\(n\)](#) of this section.

[1926.800\(m\)\(9\)\(ii\)](#) - Lighting fixtures in storage areas, or within 25 feet (7.62 m) of underground areas where oil, grease, or diesel fuel are stored, shall be *approved for Class I, Division 2 locations*, in accordance with [subpart K - electrical](#), of this part.

[1926.800\(n\)](#) - *Welding, cutting, and other hot work*. In addition to the requirements of [subpart J - welding and cutting](#) of this part, the following requirements shall apply to underground welding, cutting, and other hot work.

[1926.800\(o\)\(2\)](#) - Subsidence areas. The employer shall ensure ground stability in hazardous subsidence areas by shoring, by filling in, or by erecting barricades and *posting warning signs* to prevent entry.

[1926.800\(o\)\(3\)\(i\)\(A\)](#) - A *competent person* shall *inspect* the roof, face, and walls of the work area at the *start of each shift* and as often as necessary to determine ground stability.

[1926.800\(o\)\(3\)\(i\)\(B\)](#) - *Competent persons* conducting such *inspections* shall be protected from loose ground by location, ground support or equivalent means.

[1926.800\(o\)\(3\)\(ii\)](#) - Ground conditions along haulageways and travelways shall be *inspected as frequently* as necessary to ensure safe passage.

[1926.800\(o\)\(3\)\(iv\)\(B\)](#) - A *competent person* shall *determine* whether rock bolts meet the necessary torque, and shall determine the *testing frequency* in light of the bolt system, ground conditions and the distance from vibration sources.

[1926.800\(p\)](#) - *Blasting*. This paragraph applies in addition to the requirements for blasting and explosives operations, including handling of misfires, which are found in [subpart U - blasting and use of explosives](#), of this part.

1926.801 – Caissons

Scope: This [standard](#) provides the requirements for caissons.

Caisson - A wood, steel, concrete or reinforced concrete, air- and water-tight chamber in which it is possible for men to work under air pressure greater than atmospheric pressure to excavate material below water level.

Special Requirements: Tests, stamped, references other standards

1926.801(b) - Shafts shall be subjected to a *hydrostatic or air-pressure test*, at which pressure they shall be tight. The shaft shall be *stamped* on the outside shell about 12 inches from each flange to show the pressure to which they have been subjected.

1926.801(f) - In caisson operations where employees are exposed to compressed air working environments, the requirements contained in **1926.803 - compressed air**, shall be complied with.

1926.802 - Cofferdams

Scope: This [standard](#) provides the requirements for cofferdams.

Special Requirements: Warning signals, posted, references other standards

1926.802(b) - *Warning signals* for evacuation of employees in case of emergency shall be developed and *posted*.

1926.802(c) - Cofferdam walkways, bridges, or ramps with at least two means of rapid exit shall be provided with guardrails as specified in [subpart M - fall protection](#), of this part.

1926.803 - Compressed Air

Scope: This [standard](#) provides the requirements for compressed air.

Special Requirements: Competent person (familiar), rules, regulations, instruction, records, copy to OSHA, designated, licensed physician, medical supervision, physically qualified, first aid station, lock attendant, station/field office, observation port, decompression tables, identification badges, posted signals/time, communication, instruction, ambulance, analyze air, tests, training, medical lock, maintenance, methods, rated capacity (posted), procedures, fire watch, approved extinguisher, taped programs, cams, references other standards

1926.803(a)(1) - There shall be present, at all times, at least one *competent person* designated by and representing the employer, who shall be *familiar* with this subpart in all respects, and responsible for full compliance with these and other *applicable subparts*.

[1926.803\(a\)\(2\)](#) - Every employee shall be *instructed in the rules and regulations* which concern his safety or the safety of others.

[1926.803\(b\)\(1\)](#) - There shall be retained one or more *licensed physicians* familiar with and experienced in the physical requirements and the medical aspects of compressed air work and the treatment of decompression illness. He shall be *available at all times* while work is in progress in order to provide *medical supervision* of employees employed in compressed air work. He shall himself be *physically qualified* and be willing to enter a pressurized environment.

[1926.803\(b\)\(2\)](#) - No employee shall be permitted to enter a compressed air environment until he has been examined by the *physician* and reported by him to be *physically qualified* to engage in such work.

[1926.803\(b\)\(3\)](#) - In the event an employee is absent from work for 10 days, or is absent due to sickness or injury, he shall not resume work until he is *reexamined by the physician*, and his physical condition reported, as provided in this paragraph, to be such as to permit him to work in compressed air.

[1926.803\(b\)\(4\)](#) - After an employee has been employed continuously in compressed air for a period *designated by the physician*, but not to exceed 1 year, he shall be reexamined by the physician to determine if he is still *physically qualified* to engage in compressed air work.

[1926.803\(b\)\(5\)](#) - Such *physician* shall at all times keep a complete and *full record* of examinations made by him. The *physician* shall also keep an accurate *record* of any decompression illness or other illness or injury incapacitating any employee for work, and of all loss of life that occurs in the operation of a tunnel, caisson, or other compartment in which compressed air is used.

[1926.803\(b\)\(6\)](#) - *Records* shall be *available for the inspection* of the Secretary or his representatives, and a *copy* thereof shall be forwarded to *OSHA within 48 hours* following the occurrence of the accident, death, injury, or decompression illness. It shall state as fully as possible the cause of said death or decompression illness, and the place where the injured or sick employee was taken, and such other relative information as may be required by the Secretary.

[1926.803\(b\)\(7\)](#) - A fully equipped *first aid station* shall be provided at each tunnel project regardless of the number of persons employed. An *ambulance* or transportation suitable for a litter case shall be at each project.

[1926.803\(b\)\(10\)](#) - The *medical lock* shall: [Reference [paragraph \(b\)\(10\)\(i\) - \(xvi\)](#)].

[1926.803\(b\)\(11\)](#) - *Identification badges* shall be furnished to all employees, indicating that the wearer is a compressed air worker. A permanent *record* shall be kept of all *identification badges* issued. The *badge* shall give the employee's name, address of the medical lock, the telephone number of the licensed physician for the compressed air project, and contain *instructions* that in case of emergency of unknown or doubtful cause or illness, the wearer shall be rushed to the *medical lock*. The *badge* shall be worn at all times—off the job, as well as on the job.

[1926.803\(c\)\(1\)](#) - Effective and reliable means of *communication*, such as bells, whistles, or telephones, shall be *maintained*, at all times between all the following locations:
[Reference [paragraph \(c\)\(1\)\(i\) - \(viii\)](#)].

[1926.803\(d\)\(1\)](#) - The time of decompression shall be *posted* in each *man lock* as follows:
[Reference [paragraph \(d\)\(1\)](#)].

[1926.803\(d\)\(2\)](#) - Any *code of signals* used shall be conspicuously *posted* near workplace entrances and such other locations as may be necessary to bring them to the attention of all employees concerned.

[1926.803\(d\)\(3\)](#) - For each 8-hour shift, a *record* of employees employed under air pressure shall be kept by an employee who shall remain outside the lock near the entrance. This *record* shall show the period each employee spends in the air chamber and the time taken from decompression. A *copy* shall be submitted to the *appointed physician after each shift*.

[1926.803\(e\)\(1\)](#) - Every employee going under air pressure for the first time shall be *instructed* on how to avoid excessive discomfort.

[1926.803\(e\)\(4\)](#) - If any employee complains of discomfort, the pressure shall be held to determine if the symptoms are relieved. If, after 5 minutes the discomfort does not disappear, the *lock attendant* shall gradually reduce the pressure until the *employee signals* that the discomfort has ceased. If he does not indicate that the discomfort has disappeared, the *lock attendant* shall reduce the pressure to atmospheric and the employee shall be released from the lock.

[1926.803\(f\)\(1\)](#) - Decompression to normal condition shall be in accordance with the *Decompression Tables* in [appendix A](#) of this subpart.

[1926.803\(f\)\(2\)](#) - In the event it is necessary for an employee to be in compressed air more than once in a 24-hour period, the *appointed physician* shall be responsible for the establishment of *methods* and *procedures* of decompression applicable to repetitive exposures.

[1926.803\(f\)\(3\)](#) - If decanting is necessary, the appointed *physician* shall establish *procedures* before any employee is permitted to be decompressed by decanting methods. The period of time that the employees spend at atmospheric pressure between the decompression *following the shift* and recompression shall not exceed 5 minutes.

[1926.803\(g\)\(1\)\(i\)](#) - *Man locks* - Except in emergency, no employees employed in compressed air shall be permitted to pass from the working chamber to atmospheric pressure until after decompression, in accordance with the *procedures* in this subpart.

[1926.803\(g\)\(1\)\(iii\)](#) - Except where air pressure in the working chamber is below 12 p.s.i.g., each man lock shall be equipped with automatic controls which, through *taped programs*, *cams*, or similar apparatus, shall automatically regulate decompressions. It shall also be equipped with manual controls to permit the *lock attendant* to override the automatic mechanism in the event of an emergency, as provided in [paragraph \(g\)\(1\)\(viii\)](#) of this section.

[1926.803\(g\)\(1\)\(v\)](#) - A clock, thermometer, and continuous *recording pressure gauge* with a 4-hour graph shall be installed outside of each man lock and shall be *changed prior to each shift's decompression*. The *chart* shall be of sufficient size to *register a legible record* of variations in pressure within the man lock and shall be visible to the lock attendant. A *copy* of each graph shall be submitted to the appointed physician after each shift. In addition, a pressure gauge, clock, and thermometer shall also be installed in each man lock. Additional fittings shall be provided so that *test gauges* may be attached whenever necessary.

[1926.803\(g\)\(2\)\(i\)](#) - The headroom in the special decompression chamber shall be not less than a minimum 7 feet and the cubical content shall provide at least 50 cubic feet of airspace for each employee. For each occupant, there shall be provided 4 square feet of free walking area and 3 square feet of seating space, exclusive of area required for lavatory and toilet facilities. The *rated capacity* shall be based on the stated minimum space per employee and shall be *posted* at the chamber entrance. The *posted capacity* shall not be exceeded, except in case of emergency.

[1926.803\(g\)\(2\)\(ii\)](#) - Each special decompression chamber shall be equipped with the following:

- [1926.803\(g\)\(2\)\(ii\)\(e\)](#) - Effective means of *oral intercommunication* between the attendant, occupants of the chamber, and the air compressor plant; and
- [1926.803\(g\)\(2\)\(ii\)\(f\)](#) - An *observation port* at the entrance to permit observation of the chamber occupants.

[1926.803\(h\)\(1\)](#) - Compressor plant and air supply. At all times there shall be a thoroughly experienced, *competent, and reliable person* on duty at the air control valves as a gauge tender who shall regulate the pressure in the working areas. During tunneling operations,

one gauge tender may regulate the pressure in not more than two headings: Provided, That the gauge and controls are all in one location. In caisson work, there shall be a gauge tender for each caisson.

1926.803(h)(4) - The capacity, arrangement, and number of compressors shall be sufficient to maintain the necessary pressure without overloading the equipment and to assure *maintenance* of such pressure in the working chamber during periods of breakdown, repair, or emergency.

1926.803(h)(10) - Gauges indicating the pressure in the working chamber shall be installed in the compressor building, the *lock attendant's station*, and at the *employer's field office*.

1926.803(i)(2) - The air in the workplace shall be *analyzed* by the employer not less than once *each shift*, and *records* of such tests shall be *kept on file* at the place where the work is in progress. The *test results* shall be within the threshold limit values specified in subpart D - *occupational health and environmental controls*, of this part, for hazardous gases, and within 10 percent of the lower explosive limit of flammable gases. If these limits are not met, immediate action to correct the situation shall be taken by the employer.

1926.803(j)(3) - All electrical equipment and wiring for light and power circuits shall comply with the requirements of subpart K - *electrical*, of this part for use in damp, hazardous, high temperature, and compressed air environments.

1926.803(l)(1) - *Firefighting equipment* shall be available at all times and shall be *maintained* in working condition.

1926.803(l)(2) - While welding or flame-cutting is being done in compressed air, a *firewatch* with a fire hose or *approved extinguisher* shall stand by until such operation is completed.

1926.803(l)(14) - All explosives used in connection with compressed air work shall be selected, stored, transported, and used as specified in subpart U - *blasting and the use of explosives*, of this part.

1926.803(m)(2) - In tunnels 16 feet or more in diameter, hanging walkways shall be provided from the face to the man lock as high in the tunnel as practicable, with at least 6 feet of head room. Walkways shall be constructed of noncombustible material. Standard railings shall be securely installed throughout the length of all walkways on open sides in accordance with subpart M - *fall protection*, of this part. Where walkways are ramped under safety screens, the walkway surface shall be skidproofed by cleats or by equivalent means.

[1926.803\(m\)\(3\)](#) - Bulkheads used to contain compressed air shall be *tested*, where practicable, to prove their ability to resist the highest air pressure which may be expected to be used.

Subpart T - [Demolition](#)

[Subpart T](#) provides the requirements for demolition work.

To learn if subpart T applies to you, go to [Does "Subpart T - Demolition" Apply to You?](#)

Special Requirements

1926.850 - Preparatory Operations

Scope: This [standard](#) provides the requirements for operations preparing the site.

Special Requirements: Engineering survey, competent person, evidence (writing), utility company notified, determined (hazards), testing, posted signs

[1926.850\(a\)](#) - Prior to permitting employees to start demolition operations, an *engineering survey* shall be made, by a *competent person*, of the structure to determine the condition of the framing, floors, and walls, and possibility of unplanned collapse of any portion of the structure. Any adjacent structure where employees may be exposed shall also be similarly checked. The employer shall have in *writing evidence* that such a *survey* has been performed.

[1926.850\(c\)](#) - All electric, gas, water, steam, sewer, and other service lines shall be shut off, capped, or otherwise controlled, outside the building line before demolition work is started. In each case, any *utility company* which is involved shall be *notified* in advance.

[1926.850\(e\)](#) - It shall also be *determined* if any type of hazardous chemicals, gases, explosives, flammable materials, or similarly dangerous substances have been used in any pipes, tanks, or other equipment on the property. When the presence of any such substances is apparent or suspected, *testing* and purging shall be performed and the hazard eliminated before demolition is started.

[1926.850\(h\)](#) - When debris is dropped through holes in the floor without the use of chutes, the area onto which the material is dropped shall be completely enclosed with barricades not less than 42 inches high and not less than 6 feet back from the projected edge of the opening above. *Signs*, warning of the hazard of falling materials, shall be *posted* at each level. Removal shall not be permitted in this lower area until debris handling ceases above.

1926.851 - Stairs, Passageways, and Ladders

Scope: This [standard](#) provides the requirements for stairs, passageways and ladders.

Special Requirements: Designated access, inspected, illumination

[1926.851\(a\)](#) - Only those stairways, passageways, and ladders, *designated as means of access* to the structure of a building, shall be used. Other access ways shall be entirely closed at all times.

[1926.851\(b\)](#) - All stairs, passageways, ladders and incidental equipment thereto, which are covered by this section, shall be *periodically inspected* and maintained in a clean safe condition.

[1926.851\(c\)](#) - In a multistory building, when a stairwell is being used, it shall be properly *illuminated* by either natural or artificial means, and completely and substantially covered over at a point not less than two floors below the floor on which work is being performed, and *access* to the floor where the work is in progress shall be through a properly lighted, protected, and separate passageway.

1926.852 – Chutes

Scope: This [standard](#) provides the requirements for chutes.

Special Requirements: Competent employee (assigned), designed

[1926.852\(c\)](#) - A substantial gate shall be installed in each chute at or near the discharge end. A *competent employee* shall be assigned to control the operation of the gate, and the backing and loading of trucks.

[1926.852\(g\)](#) - Chutes shall be *designed and constructed* of such strength as to eliminate failure due to impact of materials or debris loaded therein.

1926.853 - Removal of Materials Through Floor Openings

Scope: This [standard](#) provides the requirements for the removal of materials through floor openings.

Special Requirements: Load

Any openings cut in a floor for the disposal of materials shall be no larger in size than 25 percent of the aggregate of the total floor area, unless the lateral supports of the removed flooring remain in place. Floors weakened or otherwise made unsafe by demolition

operations shall be shored to carry safely the *intended imposed load* from demolition operations.

1926.854 - Removal of Walls, Masonry Sections, and Chimneys

Scope: This [standard](#) provides the requirements for the removal of walls, masonry sections, and chimneys.

Special Requirements: Stable (each shift), designed, references other standards

[1926.854\(b\)](#) - No wall section, which is more than one story in height, shall be permitted to stand alone without lateral bracing, unless such wall was originally *designed* and constructed to stand without such lateral support, and is in a condition safe enough to be self-supporting. All walls shall be *left in a stable condition* at the end of *each shift*.

[1926.854\(d\)](#) - Structural or load-supporting members on any floor shall not be cut or removed until all stories above such a floor have been demolished and removed. This provision shall not prohibit the cutting of floor beams for the disposal of materials or for the installation of equipment, provided that the requirements of [1926.853](#) - *removal of materials through floor openings*, and [1926.855](#) - *manual removal of floors*, are met.

1926.856 - Removal of Walls, Floors, and Material With Equipment

Scope: This [standard](#) provides the requirements for the removal of walls, floors, and material with equipment.

Special Requirements: References other standards

[1926.856\(c\)](#) - *Cranes, derricks, and other mechanical equipment*. Employers must meet the requirements specified in [subpart N](#) - *helicopters, hoists, elevators, and conveyors*, [subpart O](#) - *Motor Vehicles, Mechanized Equipment, and Marine Operations*, and [subpart CC](#) - *cranes and derricks in construction*, of this part.

1926.857 – Storage

Scope: This [standard](#) provides the requirements pertaining to storage.

Special Requirements: Floor loads

[1926.857\(a\)](#) - The storage of waste material and debris on any floor shall not exceed the *allowable floor loads*.

1926.858 - Removal of Steel Construction

Scope: This [standard](#) provides the requirements for the removal of steel construction.

Special Requirements: References other standards

[1926.858\(a\)](#) - When floor arches have been removed, planking in accordance with [1926.855\(b\)](#) - *manual removal of floors*, shall be provided for the workers engaged in razing the steel framing.

[1926.858\(b\)](#) - Cranes, derricks, and other hoisting equipment. Employers must meet the requirements specified in [subpart N](#) - *helicopters, hoists, elevators, and conveyors* and [subpart CC](#) - *cranes and derricks in construction* of this part.

1926.859 - Mechanical Demolition

Scope: This [standard](#) provides the requirements for mechanical demolition.

Special Requirements: Rated load

[1926.859\(b\)](#) - The weight of the demolition ball shall not exceed 50 percent of the *crane's rated load*, based on the length of the boom and the maximum angle of operation at which the demolition ball will be used, or it shall not exceed 25 percent of the nominal breaking strength of the line by which it is suspended, whichever results in a lesser value.

1926.860 - Selective Demolition by Explosives

Scope: This [standard](#) provides the requirements for demolition by explosives.

Special Requirements: References other standards

Selective demolition by explosives shall be conducted in accordance with the applicable sections of [subpart U](#) - *blasting and use of explosives*, of this part.

Subpart U - [Blasting and the Use of Explosions](#)

[Subpart U](#) applies to blasting and using explosives.

Blaster - The person or persons authorized to use explosives for blasting purposes and meeting the qualifications contained in [1926.901](#) - *blaster qualifications*.

To learn if subpart U applies to you, go to [Does "Subpart U - Blasting and the Use of Explosives" Apply to You?](#)

Special Requirements

1926.900 - General Provisions

Scope: This [standard](#) provides the general provisions for blasting and the use of explosives.

Special Requirements: Authorized person, qualified person, notified, record, inventory, warning signals, signs, competent person, description (alternatives), writing, certified, safe control measures, references other standards

[1926.900\(a\)](#) - The employer shall permit only *authorized and qualified persons* to handle and use explosives.

[1926.900\(d\)](#) - All explosives shall be accounted for at all times. Explosives not being used shall be kept in a locked magazine, unavailable to persons *not authorized* to handle them. The employer shall *maintain an inventory* and use *record* of all explosives. *Appropriate authorities* shall be *notified* of any loss, theft, or unauthorized entry into a magazine.

[1926.900\(i\)](#) - *Employees authorized* to prepare explosive charges or conduct blasting operations shall use every reasonable precaution including, but not limited to, *visual and audible warning signals, flags, or barricades*, to ensure employee safety.

[1926.900\(k\)\(3\)\(i\)](#) - The prominent display of adequate *signs*, warning against the use of mobile radio transmitters, on all roads within 1,000 feet of blasting operations. Whenever adherence to the 1,000-foot distance would create an operational handicap, a *competent person* shall be consulted to evaluate the particular situation, and alternative provisions may be made which are adequately designed to prevent any premature firing of electric blasting caps. A *description* of any such alternatives shall be reduced to *writing* and shall be *certified* as meeting the purposes of this subdivision by the *competent person* consulted. The *description shall be maintained* at the construction site during the duration of the work, and shall be *available* for inspection by representatives of the Secretary of Labor.

[1926.900\(k\)\(3\)\(ii\)](#) - Specimens of *signs* which would meet the requirements of [paragraph \(k\)\(3\)](#) of this section are the following: [Reference [paragraph \(k\)\(3\)\(ii\)](#)].

[1926.900\(k\)\(5\)](#) - Compliance with the recommendations of *The Institute of the Makers of Explosives* with regard to blasting in the vicinity of radio transmitters as stipulated in *Radio Frequency Energy-A Potential Hazard in the Use of Electric Blasting Caps, IME Publication No. 20, March 1971*.

[1926.900\(n\)](#) - Delivery and issue of explosives shall only be made by and to *authorized persons* and into authorized magazines or approved temporary storage or handling areas.

[1926.900\(o\)](#) - Blasting operations in the proximity of overhead power lines, communication lines, utility services, or other services and structures shall not be carried on until the operators and/or owners have been *notified and measures for safe control* have been taken.

[1926.900\(q\)](#) - All loading and firing shall be directed and *supervised by competent persons* thoroughly experienced in this field.

[1926.900\(r\)](#) - All blasts shall be fired electrically with an electric blasting machine or properly designed electric power source, except as provided in [1926.906\(a\)](#) - *Initiation of explosive charges - electric blasting, and (r)*.

1926.901 - Blaster Qualifications

Scope: This [standard](#) provides the requirements for blaster qualifications.

Special Requirements: Understand written orders, physical condition, qualified, training, evidence of competency, competent, knowledgeable, knowledge of State and local laws and regulations

Blaster - The person or persons authorized to use explosives for blasting purposes and meeting the qualifications contained in [1926.901](#) - *blaster qualifications*.

[1926.901\(a\)](#) - A blaster shall be able to *understand and give written and oral orders*.

[1926.901\(b\)](#) - A blaster shall be in good *physical condition* and not be addicted to narcotics, intoxicants, or similar types of drugs.

[1926.901\(c\)](#) - 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.

[1926.901\(d\)](#) - Blasters shall be required to furnish *satisfactory evidence of competency* in handling explosives and performing in a safe manner the type of blasting that will be required.

[1926.901\(e\)](#) - The *blaster* shall be *knowledgeable and competent* in the use of each type of blasting method used.

1926.902 - Surface Transportation of Explosives

Scope: This [standard](#) provides the requirements for surface transportation of explosives.

Special Requirements: Licensed driver, physically fit, regulations, manufacturer's container, markings, placarding, explosives (word), Underwriters Laboratory-approved extinguisher, trained, reference other standards

[1926.902\(a\)](#) - Transportation of explosives shall meet the provisions of *Department of Transportation regulations contained in 46 CFR parts 146-149, Water Carriers; 49 CFR parts 171-179, Highways and Railways; 49 CFR part 195, Pipelines; and 49 CFR parts 390-397, Motor Carriers.*

[1926.902\(b\)](#) - Motor vehicles or conveyances transporting explosives shall only be driven by, and be in the charge of, a *licensed driver* who is *physically fit*. He shall be familiar with the *local, State, and Federal regulation* governing the transportation of explosives.

[1926.902\(f\)](#) - When explosives are transported by a vehicle with an open body, a Class II magazine or original *manufacturer's container* shall be securely mounted on the bed to contain the cargo.

[1926.902\(h\)](#) - Every motor vehicle or conveyance used for transporting explosives shall be *marked or placarded* on both sides, the front, and the rear with the word "*Explosives*" in red letters, not less than 4 inches in height, on white background. In addition to such *marking or placarding*, the motor vehicle or conveyance may display, in such a manner that it will be readily *visible* from all directions, a red flag 18 inches by 30 inches, with the word "*Explosives*" *painted, stamped, or sewed* thereon, in white letters, at least 6 inches in height.

[1926.902\(i\)](#) - Each vehicle used for transportation of explosives shall be equipped with a fully charged fire extinguisher, in good condition. An *Underwriters Laboratory-approved extinguisher* of not less than 10-ABC rating will meet the minimum requirement. The driver shall be *trained* in the use of the extinguisher on his vehicle.

1926.903 - Underground Transportation of Explosives

Scope: This [standard](#) provides the requirements for underground transportation of explosives.

Special Requirements: Certification record, hoist operator notified, inspection, signature, weekly checks, sign, word (explosives)

[1926.903\(d\)](#) - The *hoist operator shall be notified* before explosives or blasting agents are transported in a shaft conveyance.

[1926.903\(e\)](#) - Trucks used for the transportation of explosives underground shall have the electrical system *checked weekly* to detect any failures which may constitute an electrical hazard. A *certification record* which includes the date of the inspection; the *signature* of the

person who performed the inspection; and a serial number, or other identifier, of the truck *inspected* shall be prepared and the most recent *certification record* shall be maintained *on file*.

[1926.903\(m\)](#) - The powder car or conveyance especially built for the purpose of transporting explosives or blasting agents shall bear a reflectorized *sign* on each side with the word "*Explosives*" in letters, not less than 4 inches in height; upon a background of sharply contrasting color.

1926.904 - Storage of Explosives and Blasting Agents

Scope: This [standard](#) provides the requirements for the storage of explosives and blasting agents.

Special Requirements: Reference other standards

[1926.904\(a\)](#) - Explosives and related materials shall be stored in approved facilities required under the applicable provisions of the *Bureau of Alcohol, Tobacco and Firearms regulations contained in 27 CFR part 55, Commerce in Explosives*.

1926.905 - Loading of Explosives or Blasting Agents

Scope: This [standard](#) provides the requirements for the loading of explosives or blasting agents.

Special Requirements: Procedures, authorized magazine, locked out, blaster, warning signs, records, inventory, Fume Class, references other standards

[1926.905\(a\)](#) - *Procedures* that permit safe and efficient loading shall be established before loading is started.

[1926.905\(d\)](#) - No holes shall be loaded except those to be fired in the next round of blasting. After loading, all remaining explosives and detonators shall be immediately returned to an *authorized magazine*.

[1926.905\(j\)](#) - Powerlines and portable electric cables for equipment being used shall be kept a safe distance from explosives or blasting agents being loaded into drill holes. Cables in the proximity of the blast area shall be deenergized and *locked out* by the *blaster*.

[1926.905\(n\)](#) - No explosives other than those in *Fume Class 1*, as set forth by the *Institute of Makers of Explosives*, shall be used; however, explosives complying with the requirements of *Fume Class 2 and Fume Class 3* may be used if adequate ventilation has been provided.

[1926.905\(p\)](#) - *Warning signs*, indicating a blast area, shall be maintained at all approaches to the blast area. The *warning sign lettering* shall not be less than 4 inches in height on a contrasting background.

[1926.905\(t\)](#) - The *blaster* shall keep an accurate, up-to-date *record* of explosives, blasting agents, and blasting supplies used in a blast and shall keep an accurate *running inventory* of all explosives and blasting agents stored on the operation.

1926.906 - Initiation of Explosive Charges - Electric Blasting

Scope: This [standard](#) provides the requirements for the initiation of explosive charges - electric blasting.

Special Requirements: Survey, manufacturer's recommendations, approved contractor, blaster. tested, rated capacity

[1926.906\(b\)](#) - Before adopting any system of electrical firing, the blaster shall conduct a thorough *survey* for extraneous currents, and all dangerous currents shall be eliminated before any holes are loaded.

[1926.906\(d\)](#) - Electric blasting shall be carried out by using blasting circuits or power circuits in accordance with the electric blasting cap *manufacturer's recommendations*, or an *approved contractor* or his designated representative.

[1926.906\(e\)](#) - When firing a circuit of electric blasting caps, care must be exercised to ensure that an adequate quantity of delivered current is available, in accordance with the *manufacturer's recommendations*.

[1926.906\(l\)](#) - When firing from a power circuit, the firing switch shall be locked in the open or "Off" position at all times, except when firing. It shall be so designed that the firing lines to the cap circuit are automatically short-circuited when the switch is in the "Off" position. Keys to this switch shall be entrusted only to the *blaster*.

[1926.906\(m\)](#) - Blasting machines shall be in good condition and the efficiency of the machine shall be *tested periodically* to make certain that it can deliver power at its rated capacity.

[1926.906\(n\)](#) - When firing with blasting machines, the connections shall be made as *recommended by the manufacturer* of the electric blasting caps used.

[1926.906\(o\)](#) - The number of electric blasting caps connected to a blasting machine shall not be in excess of its *rated capacity*. Furthermore, in primary blasting, a series circuit shall contain no more caps than the limits *recommended by the manufacturer* of the electric blasting caps in use.

[1926.906\(p\)](#) - The *blaster* shall be in charge of the blasting machines, and no other person shall connect the leading wires to the machine.

[1926.906\(q\)](#) - *Blasters*, when testing circuits to charged holes, shall use only blasting galvanometers or other instruments that are specifically designed for this purpose.

1926.907 - Use of Safety Fuse

Scope: This [standard](#) provides requirements for the use of the safety fuse.

Special Requirements: Approved design

[1926.907\(d\)](#) - Only a cap crimper of *approved design* shall be used for attaching blasting caps to safety fuse. Crimpers shall be kept in good repair and accessible for use.

1926.908 - Use of Detonating Cord

Scope: This [standard](#) provides the requirements for the use of the detonating cord.

Special Requirements: Approved methods, recommended methods, inspected, manufacturer recommendations.

[1926.908\(e\)](#) - Detonating cord connections shall be competent and positive in accordance with *approved and recommended methods*. Knot-type or other cord-to-cord connections shall be made only with detonating cord in which the explosive core is dry.

[1926.908\(g\)](#) - All detonating cord connections shall be *inspected* before firing the blast.

[1926.908\(h\)](#) - When detonating cord millisecond-delay connectors or short-interval-delay electric blasting caps are used with detonating cord, the practice shall conform strictly to the *manufacturer's recommendations*.

1926.909 - Firing the Blast

Scope: This [standard](#) provides the requirements for firing the blast.

Special Requirements: Signs, signals (code), blaster, flagman, duty, danger zone, posted, warning

[1926.909\(a\)](#) - A *code* of blasting signals equivalent to [Table U-1](#), shall be *posted* on one or more conspicuous places at the operation, and all employees shall be required to familiarize themselves with the *code* and conform to it. *Danger signs* shall be placed at suitable locations.

[1926.909\(b\)](#) - Before a blast is fired, a loud *warning signal* shall be given by the *blaster in charge*, who has made certain that all surplus explosives are in a safe place and all employees, vehicles, and equipment are at a safe distance, or under sufficient cover.

[1926.909\(c\)](#) - *Flagmen* shall be safely stationed on highways which pass through the danger zone so as to stop traffic during blasting operations.

[1926.909\(d\)](#) - It shall be the *duty* of the *blaster* to fix the time of blasting.

[1926.909\(e\)](#) - Before firing an underground blast, *warning* shall be given, and all possible entries into the blasting area, and any entrances to any working place where a drift, raise, or other opening is about to hole through, shall be carefully guarded. The *blaster* shall make sure that all employees are out of the blast area before firing a blast.

1926.910 - Inspection After Blast

Scope: This [standard](#) provides the requirements for inspecting after blasting.

Special Requirements: Inspection, blaster

[1926.910\(b\)](#) - Sufficient time shall be allowed, not less than 15 minutes in tunnels, for the smoke and fumes to leave the blasted area before returning to the shot. An *inspection* of the area and the surrounding rubble shall be made by the *blaster* to determine if all charges have been exploded before employees are allowed to return to the operation, and in tunnels, after the muck pile has been wetted down.

1926.911 – Misfires

Scope: This [standard](#) provides the requirements pertaining to misfires.

Special Requirements: Danger zone, blaster, person in charge, authorized representative, approved work

[1926.911\(a\)](#) - If a misfire is found, the *blaster* shall provide proper safeguards for excluding all employees from the *danger zone*.

[1926.911\(b\)](#) - No other work shall be done except that necessary to remove the hazard of the misfire and only those employees necessary to do the work shall remain in the *danger zone*.

[1926.911\(d\)](#) - If there are any misfires while using cap and fuse, all employees shall remain away from the charge for at least 1 hour. Misfires shall be handled under the direction of the *person in charge* of the blasting. All wires shall be carefully traced and a search made for unexploded charges.

[1926.911\(e\)](#) - No drilling, digging, or picking shall be permitted until all missed holes have been detonated or the *authorized representative has approved* that work can proceed.

1926.912 - Underwater Blasting

Scope: This [standard](#) provides the requirements pertaining to underwater blasting.

Special Requirements: Blaster, approval, notified (nearby craft), signals, blasting flags, agreed upon arrangements, references other standards

[1926.912\(a\)](#) - A *blaster* shall conduct all blasting operations, and no shot shall be fired without his *approval*.

[1926.912\(d\)](#) - No blast shall be fired while any vessel under way is closer than 1,500 feet to the blasting area. Those on board vessels or craft moored or anchored within 1,500 feet shall be *notified* before a blast is fired.

[1926.912\(e\)](#) - No blast shall be fired while any swimming or diving operations are in progress in the vicinity of the blasting area. If such operations are in progress, *signals and arrangements* shall be *agreed upon* to assure that no blast shall be fired while any person is in the water.

[1926.912\(f\)](#) - *Blasting flags* shall be displayed.

[1926.912\(h\)](#) - When more than one charge is placed under water, a float device shall be attached to an element of each charge in such manner that it will be released by the firing. Misfires shall be handled in accordance with the requirements of [1926.911](#) - *misfires*.

1926.913 - Blasting in Excavation Work Under Compressed Air

Scope: This [standard](#) provides the requirements for blasting in excavation work under compressed air.

Special Requirements: Fume Class 1, blasting zone, powderman, blaster, lock tender

[1926.913\(a\)](#) - Detonators and explosives shall not be stored or kept in tunnels, shafts, or caissons. Detonators and explosives for each round shall be taken directly from the magazines to the *blasting zone* and immediately loaded. Detonators and explosives left over after loading a round shall be removed from the working chamber before the connecting wires are connected up.

[1926.913\(b\)](#) - When detonators or explosives are brought into an air lock, no employee except the *powderman, blaster, lock tender* and the employees necessary for carrying,

shall be permitted to enter the air lock. No other material, supplies, or equipment shall be locked through with the explosives.

[1926.913\(d\)](#) - The *blaster or powderman* shall be responsible for the receipt, unloading, storage, and on-site transportation of explosives and detonators.

[1926.913\(f\)](#) - The explosives suitable for use in wet holes shall be water-resistant and shall be *Fume Class 1*.

Subpart V - [Electric Power Transmission and Distribution](#)

[Subpart V](#) provides the standards for electric power transmission and distribution. It does not apply to electrical safety-related work practices for unqualified employees.

[Construction](#) includes the erection of new electric transmission and distribution lines and equipment, and the alteration, conversion, and improvement of existing electric transmission and distribution lines and equipment.

To learn if subpart V applies to you, go to [Does "Subpart V - Electric Power Transmission and Distribution" Apply to You?](#)

Special Requirements

1926.950 – General

Scope: This [standard](#) provides the general requirements for electric power transmission and distribution.

Special Requirements: Training, electrical safety-related work practices, supervision, advise, communicated, information, contract employer, host employer, inform, demonstrated, determined, safety-related work practices, inspections, competent, safety procedures, work rules, references other standards

[1926.950\(a\)\(1\)\(i\)](#) - This subpart, except for [paragraph \(a\)\(3\)](#) of this section, covers the construction of electric power transmission and distribution lines and equipment. As used in this subpart, the term "construction" includes the erection of new electric transmission and distribution lines and equipment, and the alteration, conversion, and improvement of existing electric transmission and distribution lines and equipment.

Note to [paragraph \(a\)\(1\)\(i\)](#): An employer that complies with [1910.269 - electric power generation, transmission, and distribution](#), of this chapter will be considered in compliance with requirements in this subpart that do not reference other subparts of this part.

Compliance with [1910.269](#) - *electric power generation, transmission, and distribution*, of this chapter will not excuse an employer from compliance obligations under other subparts of this part.

[1926.950\(a\)\(1\)\(ii\)](#) - Notwithstanding [paragraph \(a\)\(1\)\(i\)](#) of this section, this subpart does not apply to *electrical safety-related work practices* for unqualified employees.

[1926.950\(a\)\(2\)](#) - *Other part 1926 standards*. This subpart applies in addition to all other applicable standards contained in this part 1926. Employers covered under this subpart are not exempt from complying with other applicable provisions in part 1926 by the operation of [1910.5\(c\)](#) of this chapter. Specific references in this subpart to other sections of part 1926 are provided for emphasis only.

[1926.950\(a\)\(3\)](#) - *Applicable part 1910 requirements*.

- [1926.950\(a\)\(3\)\(i\)](#) - Line-clearance tree trimming performed for the purpose of clearing space around electric power generation, transmission, or distribution lines or equipment and on behalf of an organization that operates, or that controls the operating procedures for, those lines or equipment shall comply with [1910.269](#) - *electric power generation, transmission, and distribution* of this chapter.
- [1926.950\(a\)\(3\)\(ii\)](#) - Work involving electric power generation installations shall comply with [1910.269](#) - *electric power generation, transmission, and distribution* of this chapter.

[1926.950\(b\)\(1\)](#) - All employees.

- [1926.950\(b\)\(1\)\(i\)](#) - Each employee shall be *trained in*, and familiar with, the *safety-related work practices, safety procedures*, and other safety requirements in this subpart that pertain to his or her job assignments.
- [1926.950\(b\)\(1\)\(ii\)](#) - Each employee 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 subpart but that are related to his or her work and are necessary for his or her safety.
- [1926.950\(b\)\(1\)\(iii\)](#) - The degree of *training* shall be determined by the risk to the employee for the hazard involved.

[1926.950\(b\)\(2\)](#) - *Qualified employees*. Each *qualified employee* shall also be *trained and competent in*: [Reference [paragraph \(b\)\(2\)\(i\) - \(v\)](#)].

[1926.950\(b\)\(3\)](#) - *Supervision and annual inspection*. 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 subpart.

1926.950(b)(4) - *Additional training*. An employee shall receive additional *training (or retraining)* under any of the following conditions: [Reference paragraph (b)(4)(i) - (iii)].

1926.950(b)(5) - *Type of training*. The *training* required by paragraph (b) of this section shall be of the *classroom or on-the-job* type.

1926.950(b)(6) - *Training goals*. The *training* shall establish employee proficiency in the *work practices* required by this subpart and shall introduce the *procedures* necessary for compliance with this subpart.

1926.950(b)(7) - *Demonstration of proficiency*. The employer shall ensure that each employee has *demonstrated* proficiency in the *work practices* involved before that employee is considered as having completed the *training* required by paragraph (b) of this section.

1926.950(c)(1) - *Host employer responsibilities*. Before work begins, the *host employer* shall *inform contract employers* of: [Reference paragraph (c)(1)(i) - (iv)].

1926.950(c)(2)(i) - The *contract employer* shall ensure that each of its employees is instructed in the hazardous conditions relevant to the employee's work that the *contract employer* is aware of as a result of *information communicated* to the *contract employer* by the *host employer* under paragraph (c)(1) of this section.

1926.950(c)(2)(ii) - Before work begins, the *contract employer* shall *advise the host employer* of any unique hazardous conditions presented by the *contract employer's* work.

1926.950(c)(2)(iii) - The *contract employer* shall *advise the host employer* of any unanticipated hazardous conditions found during the *contract employer's* work that the *host employer* did not mention under paragraph (c)(1) of this section. The *contract employer* shall *provide this information* to the *host employer* within *2 working days* after discovering the hazardous condition.

1926.950(c)(3) - *Joint host- and contract-employer responsibilities*. The *contract employer* and the *host employer* shall coordinate their *work rules and procedures* so that each employee of the *contract employer* and the *host employer* is protected as required by this subpart.

1926.950(d) - Existing characteristics and conditions. Existing characteristics and conditions of electric lines and equipment that are related to the safety of the work to be performed shall be *determined before work* on or near the lines or equipment is started. Such characteristics and conditions include, but are not limited to: [Reference paragraph (d)(1) - (d)(8)].

1926.951 - Medical Services and First Aid

Scope: This [standard](#) provides the requirements for medical services and first aid.

Special Requirements: Training, references other standards

[1926.951\(a\)](#) - General. The employer shall provide medical services and first aid as required in [1926.50](#) - *medical services and first aid*.

[1926.951\(b\)](#) - *First-aid training*. In addition to the requirements of [1926.50](#) - *medical services and first aid*, when employees are performing work on, or associated with, exposed lines or equipment energized at 50 volts or more, persons with *first-aid training* shall be available as follows:

- [1926.951\(b\)\(1\)](#) - *Field work*. For field work involving two or more employees at a work location, at least *two trained persons* shall be available.
- [1926.951\(b\)\(2\)](#) - *Fixed work locations*. For fixed work locations such as substations, 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), each employee at the work location shall be a *trained employee*.

1926.952 - Job Briefing

Scope: This [standard](#) provides the requirements for job briefings.

Special Requirements: Information, determination, job briefings, employee in charge, work procedures, special precautions, personal protective equipment, training, discussions

[1926.952\(a\)](#) - Before each job.

- [1926.952\(a\)\(1\)](#) - *Information* provided by the employer. In assigning an employee or a group of employees to perform a job, the employer shall provide the *employee in charge* of the job with all available *information* that relates to the *determination* of existing characteristics and conditions required by [1926.950\(d\)](#) - *general, existing characteristics and conditions*.
- [1926.952\(a\)\(2\)](#) - *Briefing* by the *employee in charge*. The employer shall ensure that the *employee in charge* conducts a *job briefing* that meets paragraphs [\(b\)](#), [\(c\)](#), and [\(d\)](#) of this section with the employees involved before they start each job.

[1926.952\(b\)](#) - Subjects to be covered. The *briefing* shall cover at least the following subjects: Hazards associated with the job, *work procedures involved*, *special precautions*, energy-source controls, and *personal protective equipment* requirements.

1926.952(c) - *Number of briefings.*

- 1926.952(c)(1) - *At least one before each day or shift.* If the work or operations to be performed during the work day or shift are repetitive and similar, at least one *job briefing* shall be conducted before the start of the first job of each day or shift.
- 1926.952(c)(2) - *Additional briefings.* Additional *job briefings* shall be held if significant changes, which might affect the safety of the employees, occur during the course of the work.

1926.952(d)(1) - *Short discussion.* A brief *discussion* is satisfactory if the work involved is routine and if the employees, by virtue of *training* and experience, can reasonably be expected to recognize and avoid the hazards involved in the job.

1926.952(d)(2) - *Detailed discussion.* A more extensive *discussion* shall be conducted: [Reference paragraph (d)(2)(i) - (ii)].

1926.952(e) - *Working alone.* An employee working alone need not conduct a *job briefing*. However, the employer shall ensure that the tasks to be performed are *planned* as if a *briefing* were required.

1926.953 - Enclosed Spaces

Scope: This standard provides the requirements pertaining to enclosed spaces.

Special Requirements: Training, work practices, rescue equipment, evaluation, monitor, test equipment, calibration, site evaluation, continuous monitoring program, attendants, first aid training, determination, testing, precautions, entry procedures, rescue procedures, data samples, references other standards

1926.953(a) - *General.* This section covers enclosed spaces that may be entered by employees. It does not apply to vented vaults if the employer makes a determination that the ventilation system is operating to protect employees before they enter the space. This section applies to routine entry into enclosed spaces. If, after the employer takes the *precautions* given in this section and in 1926.965 - *underground electrical installations*, the hazards remaining in the enclosed space endanger the life of an entrant or could interfere with an entrant's escape from the space, then entry into the enclosed space must meet the permit space entry requirements of subpart AA - *confined spaces in construction*, of this part. For routine entries where the hazards remaining in the enclosed space do not endanger the life of an entrant or interfere with an entrant's escape from the space, this section applies in lieu of the permit-space entry requirements contained in 1926.1204 through 1926.1211.

[1926.953\(b\)](#) - *Safe work practices*. The employer shall ensure the use of *safe work practices* for entry into, and work in, enclosed spaces and for *rescue* of employees from such spaces.

[1926.953\(c\)](#) - *Training*. Each employee who enters an enclosed space or who serves as an attendant shall be *trained* in the hazards of enclosed-space entry, in *enclosed-space entry procedures*, and in *enclosed-space rescue procedures*.

[1926.953\(d\)](#) - *Rescue equipment*. Employers shall provide equipment to ensure the prompt and safe *rescue* of employees from the enclosed space.

[1926.953\(e\)](#) - Evaluating potential hazards. Before any entrance cover to an enclosed space is removed, the employer shall *determine* whether it is safe to do so by checking for the presence of any atmospheric pressure or temperature differences and by evaluating whether there might be a hazardous atmosphere in the space. Any conditions making it unsafe to remove the cover shall be eliminated before the cover is removed.

Note to [paragraph \(e\)](#): The *determination* called for in this paragraph may consist of a check of the conditions that might foreseeably be in the enclosed space. For example, the cover could be checked to see if it is hot and, if it is fastened in place, could be loosened gradually to release any residual pressure. An evaluation also needs to be made of whether conditions at the site could cause a hazardous atmosphere, such as an oxygen-deficient or flammable atmosphere, to develop within the space.

[1926.953\(g\)](#) - Hazardous atmosphere. Employees may not enter any enclosed space while it contains a hazardous atmosphere, unless the entry conforms to the confined spaces in construction standard in [subpart AA - confined spaces in construction](#) of this part.

[1926.953\(h\)](#) - *Attendants*. While work is being performed in the enclosed space, an *attendant* with *first-aid training* shall be immediately available outside the enclosed space to provide assistance if a hazard exists because of traffic patterns in the area of the opening used for entry. The *attendant* is not precluded from performing other *duties* outside the enclosed space if these duties do not distract the *attendant* from: *Monitoring* employees within the space or ensuring that it is safe for employees to enter and exit the space.

Note to [paragraph \(h\)](#): See [1926.965 - Underground electrical installations](#), for additional requirements on *attendants* for work in manholes and vaults.

[1926.953\(i\)](#) - *Calibration of test instruments*. *Test instruments* used to *monitor* atmospheres in enclosed spaces shall be kept in calibration and shall have a minimum accuracy of ± 10 percent.

[1926.953\(j\)](#) - *Testing for oxygen deficiency.* Before an employee enters an enclosed space, the atmosphere in the enclosed space shall be *tested* for oxygen deficiency with a direct-reading meter or similar instrument, capable of collection and immediate analysis of data samples without the need for *off-site evaluation*. If continuous forced-air ventilation is provided, *testing* is not required provided that the *procedures* used ensure that employees are not exposed to the hazards posed by oxygen deficiency.

[1926.953\(k\)](#) - *Testing for flammable gases and vapors.* Before an employee enters an enclosed space, the internal atmosphere shall be *tested* for flammable gases and vapors with a direct-reading meter or similar instrument capable of collection and immediate analysis of *data samples* without the need for off-site evaluation. This *test* shall be performed after the oxygen testing and ventilation required by [paragraph \(j\)](#) of this section demonstrate that there is sufficient oxygen to ensure the accuracy of the test for flammability.

[1926.953\(l\)](#) - Ventilation, and monitoring for flammable gases or vapors. If flammable gases or vapors are detected or if an oxygen deficiency is found, forced-air ventilation shall be used to maintain oxygen at a safe level and to prevent a hazardous concentration of flammable gases and vapors from accumulating. A *continuous monitoring program* to ensure that no increase in flammable gas or vapor concentration above safe levels occurs may be followed in lieu of ventilation if flammable gases or vapors are initially detected at safe levels.

Note to [paragraph \(l\)](#): See the definition of "hazardous atmosphere" for guidance in *determining* whether a specific concentration of a substance is hazardous.

[1926.953\(m\)](#) - Specific ventilation requirements. If continuous forced-air ventilation is used, it shall begin before entry is made and shall be maintained long enough for the employer to be able to *demonstrate* that a safe atmosphere exists before employees are allowed to enter the work area. The forced-air ventilation shall be so directed as to ventilate the immediate area where employees are present within the enclosed space and shall continue until all employees leave the enclosed space.

[1926.953\(o\)](#) - Open flames. If open flames are used in enclosed spaces, a test for flammable gases and vapors shall be made immediately before the open flame device is used and at least once per hour while the device is used in the space. *Testing* shall be conducted more frequently if conditions present in the enclosed space indicate that once per hour is insufficient to detect hazardous accumulations of flammable gases or vapors.

Note to [paragraph \(o\)](#): See the definition of "hazardous atmosphere" for guidance in *determining* whether a specific concentration of a substance is hazardous.

Note to 1926.953: Entries into enclosed spaces conducted in accordance with the permit space entry requirements of [subpart AA - confined spaces in construction](#), of this part are considered as complying with this section.

1926.954 - Personal Protective Equipment

Scope: This [standard](#) provides the requirements for personal protective equipment.

Special Requirements: Personal protective equipment (fall arrest systems, positioning devices), inspections, design, references other standards

[1926.954\(a\)](#) - General. *Personal protective equipment* shall meet the requirements of [subpart E - personal protective and life saving equipment](#), of this part.

Note to paragraph (a): [Paragraph \(d\)](#) of 1926.95 - *Criteria for personal protective equipment, payment for protective equipment*, sets employer payment obligations for the personal protective equipment required by this subpart, including, but not limited to, the *fall protection equipment* required by [paragraph \(b\)](#) of this section, the *electrical protective equipment* required by [1926.960\(c\)](#) - *working on or near exposed energized parts, live work*, and the *flame-resistant and arc-rated clothing and other protective equipment* required by [1926.960\(g\)](#) - *working on or near exposed energized parts, protection from flames and electric arcs*.

[1926.954\(b\)\(1\)\(i\)](#) - *Personal fall arrest systems* shall meet the requirements of [subpart M - fall protection](#), of this part.

[1926.954\(b\)\(1\)\(ii\)](#) - *Personal fall arrest equipment* used by employees who are exposed to hazards from flames or electric arcs, as determined by the employer under [1926.960\(g\)\(1\)](#) - *working on or near exposed energized parts, protection from flames and electric arcs*., shall be capable of passing a drop test equivalent to that required by [paragraph \(b\)\(2\)\(xii\)](#) of this section after exposure to an electric arc with a heat energy of 40 ± 5 cal/cm².

[1926.954\(b\)\(2\)](#) - *Work-positioning equipment*. Body belts and positioning straps for *work-positioning equipment* shall meet the following requirements: [Reference [paragraph \(b\)\(2\)\(i\) - \(xii\)](#)].

[1926.954\(b\)\(3\)](#) - *Care and use of personal fall protection equipment*.

- [1926.954\(b\)\(3\)\(i\)](#) - *Work-positioning equipment* shall be *inspected before use each day* to determine that the equipment is in safe working condition. *Work-positioning equipment* that is not in safe working condition may not be used.

Note to [paragraph \(b\)\(3\)\(i\)](#): [Appendix F](#) to subpart V of Part 1926 - *work-positioning*

equipment inspection guidelines, to this subpart contains guidelines for *inspecting work-positioning equipment*.

- [1926.954\(b\)\(3\)\(ii\)](#) - *Personal fall arrest systems* shall be used in accordance with [1926.502\(d\)](#) - *fall protection systems criteria and practices, personal fall arrest systems*.

Note to [paragraph \(b\)\(3\)\(ii\)](#): Fall protection equipment rigged to arrest falls is considered a *fall arrest system* and must meet the applicable requirements for the *design* and use of those systems. *Fall protection equipment* rigged for work positioning is considered *work-positioning equipment* and must meet the applicable requirements for the design and use of that equipment.

- [1926.954\(b\)\(3\)\(iii\)](#) - The employer shall ensure that employees use *fall protection systems* as follows: {Reference [paragraph \(b\)\(3\)\(iii\)\(A\) - \(C\)](#)}.

1926.955 - Portable Ladders and Platforms

Scope: This [standard](#) provides the requirements for ladders and platforms.

Special Requirements: Maximum load, employer demonstrates, references other standards

[1926.955\(a\)](#) - *General*. Requirements for portable ladders contained in [subpart X - stairways and ladders](#), of this part apply in addition to the requirements of this section, except as specifically noted in [paragraph \(b\) - special ladders and platforms](#), of this section.

[1926.955\(b\)](#) - *Special ladders and platforms*. Portable ladders used on structures or conductors in conjunction with overhead line work need not meet [1926.1053\(b\)\(5\)\(i\)](#) and [\(b\)\(12\)](#) - *ladders*. Portable ladders and platforms used on structures or conductors in conjunction with overhead line work shall meet the following requirements:[Reference [paragraph \(b\)\(1\) - \(4\)](#)].

[1926.955\(c\)](#) - *Conductive ladders*. Portable metal ladders and other portable conductive ladders may not be used near exposed energized lines or equipment. However, in specialized high-voltage work, conductive ladders shall be used when the *employer demonstrates* that nonconductive ladders would present a greater hazard to employees than conductive ladders.

1926.956 - Hand and Portable Power Equipment

Scope: This [standard](#) provides the requirements for hand and portable power equipment.

Special Requirements: References other standards

[1926.956\(b\)](#) - Cord- and plug-connected equipment. Cord- and plug-connected equipment not covered by [subpart K](#) - electrical, of this part shall comply with one of the following instead of [1926.302\(a\)\(1\)](#) - electric power-operated tools: [Reference [paragraph \(b\)\(1\) - \(3\)](#)].

[1926.956\(d\)](#) - Hydraulic and pneumatic tools.

- [1926.956\(d\)\(1\)](#) - Hydraulic fluid in insulating tools. [Paragraph \(d\)\(1\) of 1926.302](#) - hydraulic power tools, does not apply to hydraulic fluid used in insulating sections of hydraulic tools.

1926.957 - Live-line Tools

Scope: This standard provides the requirements for live-line tools.

Special Requirements: Tests, employer demonstrates, inspections, examined, references other standards

[1926.957\(a\)](#) - *Design of tools.* Live-line tool rods, tubes, and poles shall be designed and constructed to withstand the following minimum tests:

- [1926.957\(a\)\(1\)](#) - Fiberglass-reinforced plastic. If the tool is made of fiberglass-reinforced plastic (FRP), it shall withstand 328,100 volts per meter (100,000 volts per foot) of length for 5 minutes, or
Note to paragraph (a)(1): Live-line tools using rod and tube that meet *ASTM F711-02 (2007), Standard Specification for Fiberglass-Reinforced Plastic (FRP) Rod and Tube Used in Live Line Tools*, are deemed to comply with [paragraph \(a\)\(1\)](#) of this section.
- [1926.957\(a\)\(3\)](#) - *Equivalent tests.* The tool shall withstand other tests that the employer can *demonstrate* are equivalent.

[1926.957\(b\)\(1\)](#) - *Daily inspection.* Each live-line tool shall be wiped clean and *visually inspected* for defects *before use each day*.

[1926.957\(b\)\(2\)](#) - *Defects.* If any defect or contamination that could adversely affect the insulating qualities or mechanical integrity of the live-line tool is present after wiping, the tool shall be removed from service and *examined and tested* according to [paragraph \(b\)\(3\)](#) of this section before being returned to service

[1926.957\(b\)\(3\)](#) - *Biennial inspection and testing.* Live-line tools used for primary employee protection shall be removed from service *every 2 years*, and whenever required under [paragraph \(b\)\(2\)](#) of this section, for *examination*, cleaning, repair, and *testing* as follows: [Reference [paragraph \(b\)\(3\)\(i\) - \(v\)](#)].

1926.958 - Materials Handling and Storage

Scope: This [standard](#) provides the requirements for materials handling and storage.

Special Requirements: Qualified persons, restricted areas, references other standards

[1926.958\(a\)](#) - General. Materials handling and storage shall comply with applicable material-handling and material-storage requirements in this part, including those in [subpart N](#) - *helicopters, hoists, elevators, and conveyors* and [subpart CC](#) - *cranes and derricks in construction*, of this part.

[1926.958\(b\)\(1\)](#) - *Unrestricted areas*. In areas to which access is not restricted to *qualified persons* only, materials or equipment may not be stored closer to energized lines or exposed energized parts of equipment than the following distances, plus a distance that provides for the maximum sag and side swing of all conductors and for the height and movement of material-handling equipment:

[1926.958\(b\)\(2\)](#) - *Restricted areas*. In areas restricted to *qualified employees*, materials may not be stored within the working space about energized lines or equipment.

Note to [paragraph \(b\)\(2\)](#): [Paragraph \(b\)](#) - access and working space, of [1926.966](#) - substations, specifies the size of the working space.

1926.959 - Mechanical Equipment

Scope: This [standard](#) provides the requirements for mechanical equipment.

Special Requirements: Inspections, operator, employer demonstrates, warnings, techniques, observer, qualified employee, load rating, measures, methods, designated employee, minimum approach distances, references other standards

[1926.959\(a\)\(1\)](#) - *Other applicable requirements*. Mechanical equipment shall be operated in accordance with applicable requirements in this part, including [subpart N](#) - *helicopters, hoists, elevators*, [subpart O](#) - *motor vehicles, mechanized equipment, and marine operations*, and [subpart CC](#) - *cranes and derricks in construction*, of this part, except that [1926.600\(a\)\(6\)](#) - *motor vehicles, mechanized equipment, and marine operations, general requirements*, does not apply to operations performed by *qualified employees*.

[1926.959\(a\)\(2\)](#) - *Inspection before use*. The critical safety components of mechanical elevating and rotating equipment shall receive a *thorough visual inspection* before use on each shift.

Note to [paragraph \(a\)\(2\)](#): Critical safety components of mechanical elevating and rotating equipment are components for which failure would result in free fall or free rotation of the boom.

[1926.959\(a\)\(3\)](#) - *Operator*. The operator of an electric line truck may not leave his or her position at the controls while a load is suspended, unless the employer can *demonstrate* that no employee (including the operator) is endangered.

[1926.959\(b\)\(3\)](#) - *Operation without outriggers*. If the work area or the terrain precludes the use of outriggers, the equipment may be operated only within its *maximum load ratings specified by the equipment manufacturer* for the particular configuration of the equipment without outriggers.

[1926.959\(c\)](#) - *Applied loads*. Mechanical equipment used to lift or move lines or other material shall be used within its *maximum load rating* and other *design limitations* for the conditions under which the mechanical equipment is being used.

[1926.959\(d\)\(1\)](#) - *Minimum approach distance*. Mechanical equipment shall be operated so that the *minimum approach distances, established by the employer* under [1926.960\(c\)\(1\)\(i\)](#), are maintained from exposed energized lines and equipment. However, the insulated portion of an aerial lift operated by a *qualified employee* in the lift is exempt from this requirement if the applicable *minimum approach distance* is maintained between the uninsulated portions of the aerial lift and exposed objects having a different electrical potential.

[1926.959\(d\)\(2\)](#) - *Observer*. A *designated employee* other than the equipment operator shall observe the approach distance to exposed lines and equipment and provide timely *warnings* before the *minimum approach distance* required by [paragraph \(d\)\(1\)](#) of this section is reached, unless the employer can *demonstrate* that the operator can accurately determine that the *minimum approach distance* is being maintained.

[1926.959\(d\)\(3\)\(ii\)](#) - The mechanical equipment shall be insulated for the voltage involved. The mechanical equipment shall be positioned so that its uninsulated portions cannot approach the energized lines or equipment any closer than the *minimum approach distances, established by the employer* under [1926.960\(c\)\(1\)\(i\)](#).

[1926.959\(d\)\(3\)\(iii\)](#) - Each employee shall be protected from hazards that could arise from mechanical equipment contact with energized lines or equipment. The *measures* used shall ensure that employees will not be exposed to hazardous differences in electric potential. Unless the employer can *demonstrate* that the methods in use protect each employee from the hazards that could arise if the mechanical equipment contacts the energized line or equipment, the measures used shall include all of the following *techniques*: [Reference [paragraph \(d\)\(3\)\(iii\)\(A\) - \(D\)](#)].

1926.960 - Working On or Near Exposed Energized Parts

Scope: This [standard](#) provides the requirements for working on or near exposed energized parts.

Special Requirements: Qualified employees, two employees, designed, determine, calculate, inspects, designs, engineering analysis, estimate, hazard assessment, minimum approach distances, employer demonstrates, assess, PPE, references other standards

1926.960(b)(1) - *Qualified employees only.*

- 1926.960(b)(1)(i) - Only *qualified employees* may work on or with exposed energized lines or parts of equipment.
- 1926.960(b)(1)(ii) - Only *qualified employees* may work in areas containing unguarded, uninsulated energized lines or parts of equipment operating at 50 volts or more.

1926.960(b)(2) - Treat as energized. Electric lines and equipment shall be considered and treated as energized unless they have been deenergized in accordance with 1926.961 - *deenergizing lines and equipment for employee protection.*

1926.960(b)(3) - *At least two employees.*

- 1926.960(b)(3)(i) - Except as provided in paragraph (b)(3)(ii) of this section, at least two employees shall be present while any employees perform the following types of work:
- 1926.960(b)(3)(ii) - Paragraph (b)(3)(i) of this section does not apply to the following operations:
 - 1926.960(b)(3)(ii)(A) - Routine circuit switching, when the employer can *demonstrate* that conditions at the site allow safe performance of this work,

1926.960(c)(1)(i) - The employer shall establish *minimum approach distances* no less than the distances computed by Table V-2 for ac systems or Table V-7 for dc systems.

1926.960(c)(1)(ii) - No later than April 1, 2015, for voltages over 72.5 kilovolts, the employer shall *determine* the maximum anticipated per-unit transient overvoltage, phase-to-ground, through an *engineering analysis* or assume a maximum anticipated per-unit transient overvoltage, phase-to-ground, in accordance with Table V-8. When the employer uses portable protective gaps to control the maximum transient overvoltage, the value of the maximum anticipated per-unit transient overvoltage, phase-to-ground, must provide for five standard deviations between the statistical sparkover voltage of the gap and the statistical withstand voltage corresponding to the electrical component of the *minimum approach distance*. The employer shall make any *engineering analysis* conducted to determine maximum anticipated per-unit transient overvoltage available upon request to employees and to the Assistant Secretary or designee for *examination and copying*.

Note to paragraph (c)(1)(ii): See appendix B - Appendix B to subpart V of Part 1926 - working on exposed energized parts, to this subpart for information on how to *calculate* the

maximum anticipated per-unit transient overvoltage, phase-to-ground, when the employer uses portable protective gaps to reduce maximum transient overvoltages.

[1926.960\(c\)\(1\)\(iii\)](#) - The employer shall ensure that no employee approaches or takes any conductive object closer to exposed energized parts than the employer's established *minimum approach distance*, unless: [Reference [paragraph \(c\)\(1\)\(iii\)\(A\) - \(C\)](#)].

[1926.960\(c\)\(2\)\(ii\)](#) - When an employee uses rubber insulating gloves or rubber insulating gloves and sleeves as insulation from energized parts (under [paragraph \(c\)\(1\)\(iii\)\(A\)](#) of this section), the employer shall ensure that the employee:

- [1926.960\(c\)\(2\)\(ii\)\(A\)](#) - Puts on the rubber insulating gloves and sleeves in a position where he or she cannot reach into the *minimum approach distance*, established by the employer under [paragraph \(c\)\(1\)](#) of this section; and
- [1926.960\(c\)\(2\)\(ii\)\(B\)](#) - Does not remove the rubber insulating gloves and sleeves until he or she is in a position where he or she cannot reach into the *minimum approach distance*, established by the employer under [paragraph \(c\)\(1\)](#) of this section.

[1926.960\(d\)\(2\)](#) - *Requirements for working without electrical protective equipment.* When an employee performs work near exposed parts energized at more than 600 volts, but not more than 72.5 kilovolts, and is not wearing rubber insulating gloves, being protected by insulating equipment covering the energized parts, performing work using live-line tools, or performing live-line barehand work under [1926.964\(c\)](#) - *overhead lines and live-line barehand work, live-line barehand work*, the employee shall work from a position where he or she cannot reach into the *minimum approach distance*, established by the employer under [paragraph \(c\)\(1\)](#) of this section.

[1926.960\(g\)\(1\)](#) - *Hazard assessment.* The employer shall assess the workplace to identify employees exposed to hazards from flames or from electric arcs.

[1926.960\(g\)\(2\)](#) - *Estimate of available heat energy.* For each employee exposed to hazards from electric arcs, the employer shall make a *reasonable estimate* of the incident heat energy to which the employee would be exposed.

Note 1 to [paragraph \(g\)\(2\)](#): [Appendix E](#) - *Appendix E to subpart V of Part 1926 - protection from flames and electric arcs*, to this subpart provides guidance on *estimating* available heat energy. The Occupational Safety and Health Administration will deem employers following the guidance in appendix E to this subpart to be in compliance with [paragraph \(g\)\(2\)](#) of this section. An employer may choose a *method* of calculating incident heat energy not included in appendix E to this subpart if the chosen method reasonably predicts the incident energy to which the employee would be exposed.

Note 2 to [paragraph \(g\)\(2\)](#): This paragraph does not require the employer to estimate the

incident heat energy exposure for every *job task performed* by each employee. The employer may make broad estimates that cover multiple system areas provided the employer uses reasonable assumptions about the energy-exposure distribution throughout the system and provided the estimates represent the maximum employee exposure for those areas. For example, the employer could *estimate* the heat energy just outside a substation feeding a radial distribution system and use that *estimate* for all jobs performed on that radial system.

[1926.960\(g\)\(3\)](#) - *Prohibited clothing*. The employer shall ensure that each employee who is exposed to hazards from flames or electric arcs does not wear clothing that could melt onto his or her skin or that could ignite and continue to burn when exposed to flames or the heat energy *estimated* under [paragraph \(g\)\(2\)](#) of this section.

Note to [paragraph \(g\)\(3\)](#): This paragraph prohibits clothing made from acetate, nylon, polyester, rayon and polypropylene, either alone or in blends, unless the *employer demonstrates* that the fabric has been treated to withstand the conditions that may be encountered by the employee or that the employee wears the clothing in such a manner as to eliminate the hazard involved.

[1926.960\(g\)\(5\)](#) - *Arc rating*. The employer shall ensure that each employee exposed to hazards from electric arcs wears *protective clothing and other protective equipment* with an arc rating greater than or equal to the heat energy *estimated* under [paragraph \(g\)\(2\)](#) of this section whenever that estimate exceeds 2.0 cal/cm². This *protective equipment* shall cover the employee's entire body, except as follows: [Reference [paragraph \(g\)\(5\)\(i\) - \(v\)](#)].

[1926.960\(j\)](#) - *Non-current-carrying metal parts*. Non-current-carrying metal parts of equipment or devices, such as transformer cases and circuit-breaker housings, shall be treated as energized at the highest voltage to which these parts are exposed, unless the employer *inspects* the installation and *determines* that these parts are grounded before employees begin performing the work.

[1926.960\(k\)](#) - *Opening and closing circuits under load*.

- [1926.960\(k\)\(1\)](#) - The employer shall ensure that devices used by employees to open circuits under load conditions are *designed* to interrupt the current involved.
- [1926.960\(k\)\(2\)](#) - The employer shall ensure that devices used by employees to close circuits under load conditions are *designed* to safely carry the current involved.

1926.961 - Deenergizing Lines and Equipment for Employee Protection

Scope: This [standard](#) provides the requirements for deenergizing lines and equipment for employee protection.

Special Requirements: System operator, procedures, demonstrate, designated employee, inform, clearances, notify, employee in charge, tags, testing, references other standards

[1926.961\(a\)](#) - Application. This section applies to the deenergizing of transmission and distribution lines and equipment for the purpose of protecting employees. Conductors and parts of electric equipment that have been deenergized under *procedures* other than those required by this section shall be treated as energized.

[1926.961\(b\)\(1\)](#) - *System operator*. If a system operator is in charge of the lines or equipment and their means of disconnection, the employer shall *designate one employee* in the crew to be *in charge* of the clearance and shall comply with all of the requirements of [paragraph \(c\)](#) of this section in the order specified.

[1926.961\(b\)\(2\)](#) - No system operator. If no system operator is *in charge* of the lines or equipment and their means of disconnection, the employer shall *designate one employee* in the crew to be in charge of the clearance and to perform the functions that the system operator would otherwise perform under this section. All of the requirements of [paragraph \(c\)](#) of this section apply, in the order specified, except as provided in [paragraph \(b\)\(3\)](#) of this section.

[1926.961\(b\)\(3\)](#) - Single crews working with the means of disconnection under the control of the *employee in charge* of the clearance. If only one crew will be working on the lines or equipment and if the means of disconnection is accessible and visible to, and under the sole control of, the *employee in charge* of the clearance, [paragraphs \(c\)\(1\)](#), [\(c\)\(3\)](#), and [\(c\)\(5\)](#) of this section do not apply. Additionally, the employer does not need to use the *tags* required by the remaining provisions of [paragraph \(c\)](#) of this section.

[1926.961\(b\)\(4\)\(i\)](#) - The crews shall coordinate their activities under this section with a single *employee in charge* of the clearance for all of the crews and follow the requirements of this section as if all of the employees formed a single crew, or

[1926.961\(b\)\(4\)\(ii\)](#) - Each crew shall independently comply with this section and, if there is no *system operator in charge* of the lines or equipment, shall have separate *tags* and coordinate deenergizing and reenergizing the lines and equipment with the other crews.

[1926.961\(c\)\(1\)](#) - *Request to deenergize*. The employee that the employer *designates* pursuant to [paragraph \(b\)](#) of this section as being in charge of the clearance shall make a request of the system operator to deenergize the particular section of line or equipment. The *designated employee* becomes the *employee in charge* (as this term is used in [paragraph \(c\)](#) of this section) and is responsible for the clearance.

[1926.961\(c\)\(2\)](#) - Open disconnecting means. The employer shall ensure that all switches, disconnectors, jumpers, taps, and other means through which known sources of electric energy may be supplied to the particular lines and equipment to be deenergized are open.

The employer shall render such means inoperable, unless its design does not so permit, and then ensure that such means are *tagged* to indicate that employees are at work.

[1926.961\(c\)\(3\)](#) - Automatically and remotely controlled switches. The employer shall ensure that automatically and remotely controlled switches that could cause the opened disconnecting means to close are also *tagged* at the points of control. The employer shall render the automatic or remote control feature inoperable, unless its design does not so permit.

[1926.961\(c\)\(4\)](#) - Network protectors. The employer need not use the *tags* mentioned in [paragraphs \(c\)\(2\)](#) and [\(c\)\(3\)](#) of this section on a network protector for work on the primary feeder for the network protector's associated network transformer when the employer can *demonstrate* all of the following conditions: [Reference [paragraph \(c\)\(4\)\(i\) - \(iii\)](#)].

[1926.961\(c\)\(5\)](#) - *Tags*. *Tags* shall prohibit operation of the disconnecting means and shall indicate that employees are at work.

[1926.961\(c\)\(6\)](#) - *Test for energized condition*. After the applicable requirements in [paragraphs \(c\)\(1\) through \(c\)\(5\)](#) of this section have been followed and the system operator gives a clearance to the *employee in charge*, the employer shall ensure that the lines and equipment are deenergized by *testing* the lines and equipment to be worked with a device *designed* to detect voltage.

[1926.961\(c\)\(7\)](#) - Install grounds. The employer shall ensure the installation of protective grounds as required by [1926.962](#) - *grounding for the protection of employees*.

[1926.961\(c\)\(9\)](#) - *Transferring clearances*. To transfer the *clearance*, the *employee in charge* (or the employee's supervisor if the *employee in charge* must leave the worksite due to illness or other emergency) shall *inform* the *system operator* and employees in the crew; and the new *employee in charge* shall be responsible for the *clearance*.

[1926.961\(c\)\(10\)](#) - *Releasing clearances*. To *release a clearance*, the employee in charge shall: [Reference [paragraph \(c\)\(10\)\(i\) - \(iv\)](#)].

[1926.961\(c\)\(11\)](#) - *Person releasing clearance*. Only the *employee in charge* who requested the *clearance may release the clearance*, unless the employer transfers responsibility under [paragraph \(c\)\(9\)](#) of this section.

[1926.961\(c\)\(12\)](#) - *Removal of tags*. No one may remove *tags* without the release of the associated clearance as specified under [paragraphs \(c\)\(10\)](#) and [\(c\)\(11\)](#) of this section.

[1926.961\(c\)\(13\)](#) - Reenergizing lines and equipment. The employer shall ensure that no one initiates action to reenergize the lines or equipment at a point of disconnection until all protective grounds have been removed, all crews working on the lines or equipment

release their clearances, all employees are clear of the lines and equipment, and all *protective tags* are removed from that point of disconnection.

1926.962 - Grounding for the Protection of Employees

Scope: This [standard](#) provides the requirements for grounding for the protection of employees.

Special Requirements: Employer demonstrates, employer establishes, testing, test procedure, measures, references other standards

[1926.962\(b\)](#) - General. For any employee to work transmission and distribution lines or equipment as deenergized, the employer shall ensure that the lines or equipment are deenergized under the provisions of [1926.961 - deenergizing lines and equipment for employee protection](#), and shall ensure proper grounding of the lines or equipment as specified in [paragraphs \(c\) through \(h\)](#) of this section. However, if the employer can *demonstrate* that installation of a ground is impracticable or that the conditions resulting from the installation of a ground would present greater hazards to employees than working without grounds, the lines and equipment may be treated as deenergized provided that the *employer establishes* that all of the following conditions apply: [Reference [paragraph \(b\)\(1\) - \(5\)](#)].

[1926.962\(b\)\(1\)](#) - Deenergized. The employer ensures that the lines and equipment are deenergized under the provisions of [1926.961 - deenergizing lines and equipment for employee protection](#).

[1926.962\(c\)](#) - Equipotential zone. Temporary protective grounds shall be placed at such locations and arranged in such a manner that the employer can *demonstrate* will prevent each employee from being exposed to hazardous differences in electric potential.

Note to [paragraph \(c\)](#): [Appendix C](#) - *Appendix C to subpart V of Part 1926 - protection from hazardous differences in electric potential*, to this subpart contains guidelines for establishing the equipotential zone required by this paragraph. The Occupational Safety and Health Administration will deem grounding practices meeting these guidelines as complying with [paragraph \(c\)](#) of this section.

[1926.962\(d\)\(2\)](#) - Impedance. Protective grounds shall have an impedance low enough so that they do not delay the operation of protective devices in case of accidental energizing of the lines or equipment.

Note to [paragraph \(d\)](#): *American Society for Testing and Materials Standard Specifications for Temporary Protective Grounds to Be Used on De-Energized Electric Power Lines and Equipment, ASTM F855-09*, contains guidelines for protective grounding equipment. *The Institute of Electrical Engineers Guide for Protective Grounding of Power Lines, IEEE Std*

1048-2003, contains guidelines for selecting and installing protective grounding equipment.

[1926.962\(e\)](#) - *Testing*. The employer shall ensure that, unless a previously installed ground is present, employees test lines and equipment and verify the absence of nominal voltage before employees install any ground on those lines or that equipment.

[1926.962\(f\)\(1\)](#) - *Order of connection*. The employer shall ensure that, when an employee attaches a ground to a line or to equipment, the employee attaches the ground-end connection first and then attaches the other end by means of a live-line tool. For lines or equipment operating at 600 volts or less, the employer may permit the employee to use insulating equipment other than a live-line tool if the employer ensures that the line or equipment is not energized at the time the ground is connected or if the employer can *demonstrate* that each employee is protected from hazards that may develop if the line or equipment is energized.

[1926.962\(f\)\(2\)](#) - *Order of removal*. The employer shall ensure that, when an employee removes a ground, the employee removes the grounding device from the line or equipment using a live-line tool before he or she removes the ground-end connection. For lines or equipment operating at 600 volts or less, the employer may permit the employee to use insulating equipment other than a live-line tool if the employer ensures that the line or equipment is not energized at the time the ground is disconnected or if the employer can *demonstrate* that each employee is protected from hazards that may develop if the line or equipment is energized.

[1926.962\(h\)](#) - *Removal of grounds for test*. The employer may permit employees to remove grounds temporarily during *tests*. During the *test procedure*, the employer shall ensure that each employee uses insulating equipment, shall isolate each employee from any hazards involved, and shall implement any additional *measures* necessary to protect each exposed employee in case the previously grounded lines and equipment become energized.

1926.963 - Testing and Test Facilities

Scope: This [standard](#) provides the requirements for testing and test facilities.

Special Requirements: Safe work practices, safe grounding practices, safety check, test facility, test trailer, test vehicle, tests, training, special precautions, safety signs, colored safety tape, test observers, test areas, qualified person, inspections, maintenance, work procedures, safety checks, marked, test observers, monitor, PPE, references other standards

[1926.963\(a\)](#) - **Application**. This section provides for *safe work practices* for high-voltage and high-power *testing* performed in laboratories, shops, and substations, and in the field and on electric transmission and distribution lines and equipment. It applies only

to *testing* involving interim measurements using high voltage, high power, or combinations of high voltage and high power, and not to *testing* involving continuous measurements as in routine metering, relaying, and normal line work.

Note to [paragraph \(a\)](#): OSHA considers routine *inspection and maintenance* measurements made by *qualified employees* to be routine line work not included in the scope of this section, provided that the hazards related to the use of intrinsic high-voltage or high-power sources require only the normal precautions associated with routine work specified in the other paragraphs of this subpart. Two typical examples of such excluded *test work procedures* are “phasing-out” testing and testing for a “no-voltage” condition.

[1926.963\(b\)\(1\)](#) - *Safe work practices*. The employer shall establish and enforce *work practices* for the protection of each worker from the hazards of high-voltage or high-power testing at all test areas, temporary and permanent. Such *work practices* shall include, as a minimum, *test area* safeguarding, grounding, the safe use of measuring and control circuits, and a means providing for periodic *safety checks* of field *test areas*.

[1926.963\(b\)\(2\)](#) - *Training*. The employer shall ensure that each employee, upon initial assignment to the *test area*, receives *training in safe work practices*, with *retraining* provided as required by [1926.950\(b\)](#) - *general, training*.

[1926.963\(c\)\(1\)](#) - *Safeguarding*. The employer shall provide safeguarding within *test areas* to control access to *test equipment* or to apparatus under *test* that could become energized as part of the *testing* by either direct or inductive coupling and to prevent accidental employee contact with energized parts.

[1926.963\(c\)\(2\)](#) - *Permanent test areas*. The employer shall guard permanent *test areas* with walls, fences, or other barriers designed to keep employees out of the *test areas*.

[1926.963\(c\)\(3\)](#) - *Temporary test areas*. In field testing, or at a temporary test site not guarded by permanent fences and gates, the employer shall ensure the use of one of the following means to prevent employees without authorization from entering:

- [1926.963\(c\)\(3\)\(i\)](#) - Distinctively *colored safety tape* supported approximately waist high with *safety signs* attached to it,
- [1926.963\(c\)\(3\)\(ii\)](#) - A barrier or barricade that limits access to the *test area* to a degree equivalent, physically and visually, to the barricade specified in [paragraph \(c\)\(3\)\(i\)](#) of this section, or
- [1926.963\(c\)\(3\)\(iii\)](#) - One or more *test observers* stationed so that they can *monitor* the entire area.

[1926.963\(d\)\(1\)](#) - *Establish and implement practices*. The employer shall establish and implement *safe grounding practices* for the *test facility*.

[1926.963\(d\)\(4\)](#) - Equipment grounding conductors. For tests in which using the equipment grounding conductor in the equipment power cord to ground the test equipment would result in greater hazards to *test personnel* or prevent the taking of satisfactory measurements, the employer may use a ground clearly indicated in the test set-up if the employer can *demonstrate* that this ground affords protection for employees equivalent to the protection afforded by an equipment grounding conductor in the power supply cord.

[1926.963\(d\)\(5\)](#) - *Grounding after tests*. The employer shall ensure that, when any employee enters the *test area* after equipment is deenergized, a ground is placed on the high-voltage terminal and any other exposed terminals.

[1926.963\(d\)\(6\)](#) - *Grounding test vehicles*. If the employer uses a *test trailer or test vehicle* in field testing, its chassis shall be grounded. The employer shall protect each employee against hazardous touch potentials with respect to the vehicle, instrument panels, and other conductive parts accessible to employees with bonding, insulation, or isolation.

[1926.963\(e\)\(1\)](#) - Control wiring. The employer may not run control wiring, meter connections, test leads, or cables from a *test area* unless contained in a grounded metallic sheath and terminated in a grounded metallic enclosure or unless the employer takes other *precautions* that it can *demonstrate* will provide employees with equivalent safety.

[1926.963\(e\)\(4\)](#) - *Test observer*. If any employee will be present in the *test area* during *testing*, a *test observer* shall be present. The *test observer* shall be capable of implementing the immediate deenergizing of test circuits for safety purposes.

[1926.963\(f\)\(1\)](#) - *Before each test*. *Safety practices* governing employee work at temporary or field *test areas* shall provide, at the beginning of each series of *tests*, for a routine *safety check* of such *test areas*.

[1926.963\(f\)\(2\)](#) - *Conditions to be checked*. The *test operator in charge* shall conduct these routine *safety checks* before each series of *tests* and shall verify at least the following conditions: [Reference [paragraph \(f\)\(2\)\(i\) - \(vi\)](#)].

1926.964 - Overhead Lines and Live-line Barehand Work

Scope: This [standard](#) provides the requirements for overhead lines and live-line barehand work.

Special Requirements: Test methods, checking, checks, PPE (electrical protective equipment), technique, training, communications, measures, work practices, demonstrate, load ratings, tension-stringing method, tag lines, minimum approach distances, procedures, references other standards

[1926.964\(a\)\(2\)](#) - *Checking structure before climbing.* Before allowing employees to subject elevated structures, such as poles or towers, to such stresses as climbing or the installation or removal of equipment may impose, the employer shall ascertain that the structures are capable of sustaining the additional or unbalanced stresses. If the pole or other structure cannot withstand the expected loads, the employer shall brace or otherwise support the pole or structure so as to prevent failure.

Note to [paragraph \(a\)\(2\)](#): [Appendix D](#) - *Appendix D to Subpart V of Part 1926 - methods of inspecting and testing wood poles*, to this subpart contains *test methods* that employers can use in ascertaining whether a wood pole is capable of sustaining the forces imposed by an employee climbing the pole. This paragraph also requires the employer to ascertain that the pole can sustain all other forces imposed by the work employees will perform.

[1926.964\(a\)\(3\)\(ii\)](#) - When a pole is set, moved, or removed near an exposed energized overhead conductor, the employer shall ensure that each employee wears *electrical protective equipment* or uses insulated devices when handling the pole and that no employee contacts the pole with uninsulated parts of his or her body.

[1926.964\(b\)\(1\)](#) - *Tension stringing method.* When lines that employees are installing or removing can contact energized parts, the employer shall use the *tension-stringing method*, barriers, or other equivalent *measures* to minimize the possibility that conductors and cables the employees are installing or removing will contact energized power lines or equipment.

[1926.964\(b\)\(2\)](#) - Conductors, cables, and pulling and tensioning equipment. For conductors, cables, and pulling and tensioning equipment, the employer shall provide the *protective measures* required by [1926.959\(d\)\(3\)](#) - *mechanical equipment*, when employees are installing or removing a conductor or cable close enough to energized conductors that any of the following failures could energize the pulling or tensioning equipment or the conductor or cable being installed or removed: [Reference [paragraph \(b\)\(2\)\(i\) - iii](#)].

[1926.964\(b\)\(4\)\(ii\)](#) - Unless the employer can demonstrate that the lines that employees are installing are not subject to the induction of a hazardous voltage or unless the lines are treated as energized, temporary protective grounds shall be placed at such locations and arranged in such a manner that the employer can *demonstrate* will prevent exposure of each employee to hazardous differences in electric potential.

Note to [paragraph \(b\)\(4\)\(ii\)](#): [Appendix C](#) - *Appendix C to Subpart V of Part 1926 - protection from hazardous differences in electric potential*, to this subpart contains *guidelines* for protecting employees from hazardous differences in electric potential as required by this paragraph.

Note to [paragraph \(b\)\(4\)](#): If the employer takes no precautions to protect employees from

hazards associated with involuntary reactions from electric shock, a hazard exists if the induced voltage is sufficient to pass a current of 1 milliampere through a 500-ohm resistor. If the employer protects employees from injury due to involuntary reactions from electric shock, a hazard exists if the resultant current would be more than 6 milliamperes.

[1926.964\(b\)\(6\)](#) - *Load ratings*. The employer shall ensure that employees do not exceed *load ratings* of stringing lines, pulling lines, conductor grips, load-bearing hardware and accessories, rigging, and hoists.

[1926.964\(b\)\(9\)](#) - *Communications*. The employer shall ensure that employees maintain reliable *communications*, through two-way radios or other equivalent means, between the reel tender and the pulling-rig operator.

[1926.964\(c\)\(1\)](#) - *Training*. Before an employee uses or supervises the use of the live-line barehand technique on energized circuits, the employer shall ensure that the employee completes *training* conforming to [1926.950\(b\)](#) - *general, training*, in the *technique* and in the safety requirements of [paragraph \(c\)](#) of this section.

[1926.964\(c\)\(2\)](#) - *Existing conditions*. Before any employee uses the live-line barehand technique on energized high-voltage conductors or parts, the employer shall ascertain the following information in addition to information about other existing conditions required by [1926.950\(d\)](#) - *general*, existing characteristics and conditions: [Reference [paragraph \(c\)\(2\)\(i\) - \(iii\)](#)].

[1926.964\(c\)\(3\)\(i\)](#) - The employer shall ensure that the insulated equipment, insulated tools, and aerial devices and platforms used by employees are *designed, tested*, and made for live-line barehand work.

[1926.964\(c\)\(5\)](#) - *Adverse weather conditions*. The employer shall ensure that employees do not perform work when adverse weather conditions would make the work hazardous even after the employer implements the *work practices* required by this subpart. Additionally, employees may not perform work when winds reduce the phase-to-phase or phase-to-ground clearances at the work location below the *minimum approach distances* specified in [paragraph \(c\)\(13\)](#) of this section, unless insulating guards cover the grounded objects and other lines and equipment.

Note to [paragraph \(c\)\(5\)](#): Thunderstorms in the vicinity, high winds, snow storms, and ice storms are examples of adverse weather conditions that make live-line barehand work too hazardous to perform safely even after the employer implements the *work practices* required by this subpart.

[1926.964\(c\)\(10\)](#) - *Check controls*. The employer shall ensure that, before employees elevate an aerial lift into the work position, the employees check all controls (ground level and bucket) to determine that they are in proper working condition.

[1926.964\(c\)\(12\)](#) - *Boom-current test*. The employer shall ensure that employees perform a *boom-current test* before *starting work each day*, each time during the day when they encounter a higher voltage, and when changed conditions indicate a need for an additional test.

- [1926.964\(c\)\(12\)\(i\)](#) - This test shall consist of placing the bucket in contact with an energized source equal to the voltage to be encountered for a minimum of 3 minutes.

[1926.964\(c\)\(13\)](#) - *Minimum approach distance*. The employer shall ensure that employees maintain the *minimum approach distances, established by the employer under [1926.960\(c\)\(1\)\(i\)](#) - Working on or near exposed energized parts*, from all grounded objects and from lines and equipment at a potential different from that to which the live-line barehand equipment is bonded, unless insulating guards cover such grounded objects and other lines and equipment.

[1926.964\(c\)\(14\)](#) - *Approaching, leaving, and bonding to energized part*. The employer shall ensure that, while an employee is approaching, leaving, or bonding to an energized circuit, the employee maintains the minimum approach distances, established by the employer under [1926.960\(c\)\(1\)\(i\)](#) - *Working on or near exposed energized parts*, between the employee and any grounded parts, including the lower boom and portions of the truck and between the employee and conductive objects energized at different potentials.

[1926.964\(c\)\(15\)](#) - *Positioning bucket near energized bushing or insulator string*. While the bucket is alongside an energized bushing or insulator string, the employer shall ensure that employees maintain the phase-to-ground *minimum approach distances, established by the employer under [1926.960\(c\)\(1\)\(i\)](#) - Working on or near exposed energized parts*, between all parts of the bucket and the grounded end of the bushing or insulator string or any other grounded surface.

[1926.964\(c\)\(18\)](#) - *Nonconductive measuring device*. A nonconductive measuring device shall be readily accessible to employees performing live-line barehand work to assist them in maintaining the required *minimum approach distance*.

[1926.964\(d\)\(2\)](#) - *Tag lines*. The employer shall ensure that employees use *tag lines* or other similar devices to maintain control of tower sections being raised or positioned, unless the employer can *demonstrate* that the use of such devices would create a greater hazard to employees.

[1926.964\(d\)\(4\)](#) - *Adverse weather conditions*. The employer shall ensure that, except during emergency restoration *procedures*, employees discontinue work when adverse weather conditions would make the work hazardous in spite of the *work practices* required by this subpart.

Note to paragraph (d)(4): Thunderstorms in the vicinity, high winds, snow storms, and ice storms are examples of adverse weather conditions that make this work too hazardous to perform even after the employer implements the *work practices* required by this subpart.

1926.965 - Underground Electrical Installations

Scope: This [standard](#) provides the requirements for underground electrical installations.

Special Requirements: Checks, first aid training, attendants, qualified employees, identification, inspection, communications, demonstrate, references other standards

[1926.965\(c\)\(1\)](#) - Hoisting equipment. Equipment used to lower materials and tools into manholes or vaults shall be capable of supporting the weight to be lowered and shall be *checked* for defects before use.

[1926.965\(d\)](#) - *Attendants for manholes and vaults* -

- [1926.965\(d\)\(1\)](#) - When required. While work is being performed in a manhole or vault containing energized electric equipment, an employee with *first-aid training* shall be *available* on the surface in the immediate vicinity of the manhole or vault entrance to render emergency assistance.
- [1926.965\(d\)\(2\)](#) - Brief entries allowed. Occasionally, the employee on the surface may briefly enter a manhole or vault to provide nonemergency assistance.

Note 1 to [paragraph \(d\)\(2\)](#): [Paragraph \(h\)](#) of [1926.953](#) - *enclosed spaces*, may also require an *attendant* and does not permit this *attendant* to enter the manhole or vault.

Note 2 to [paragraph \(d\)\(2\)](#): [Paragraph \(b\)\(1\)\(ii\)](#) of [1926.960](#) - *working on or near exposed energized parts*, requires employees entering manholes or vaults containing unguarded, uninsulated energized lines or parts of electric equipment operating at 50 volts or more to be *qualified*.

[1926.965\(d\)\(3\)](#) - *Entry without attendant*. For the purpose of *inspection*, housekeeping, taking readings, or similar work, an employee working alone may enter, for brief periods of time, a manhole or vault where energized cables or equipment are in service if the employer can *demonstrate* that the employee will be protected from all electrical hazards.

[1926.965\(d\)\(4\)](#) - *Communications*. The employer shall ensure that employees maintain reliable *communications*, through two-way radios or other equivalent means, among all employees involved in the job.

[1926.965\(f\)](#) - *Multiple cables*. When multiple cables are present in a work area, the employer shall *identify* the cable to be worked by electrical means, unless its identity is obvious by reason of distinctive appearance or location or by other readily apparent means

of *identification*. The employer shall protect cables other than the one being worked from damage.

[1926.965\(g\)](#) - Moving cables. Except when [paragraph \(h\)\(2\)](#) of this section permits employees to perform work that could cause a fault in an energized cable in a manhole or vault, the employer shall ensure that employees *inspect* energized cables to be moved for abnormalities.

[1926.965\(h\)\(1\)](#) - Cables with abnormalities. Where a cable in a manhole or vault has one or more abnormalities that could lead to a fault or be an indication of an impending fault, the employer shall deenergize the cable with the abnormality before any employee may work in the manhole or vault, except when service-load conditions and a lack of feasible alternatives require that the cable remain energized. In that case, employees may enter the manhole or vault provided the employer protects them from the possible effects of a failure using shields or other devices that are capable of containing the adverse effects of a fault. The employer shall treat the following abnormalities as indications of impending faults unless the employer can *demonstrate* that the conditions could not lead to a fault: Oil or compound leaking from cable or joints, broken cable sheaths or joint sleeves, hot localized surface temperatures of cables or joints, or joints swollen beyond normal tolerance.

1926.966 – Substations

Scope: This [standard](#) provides the requirements for substations.

Special Requirements: Signs, unqualified persons, locked, job briefing, qualified person, information, report, references other standards

[1926.966\(b\)](#) - *Access and working space*. The employer shall provide and maintain sufficient access and working space about electric equipment to permit ready and safe operation and maintenance of such equipment by employees.

Note to [paragraph \(b\)](#): *American National Standard National Electrical Safety Code, ANSI/IEEE C2-2012* contains guidelines for the dimensions of access and working space about electric equipment in substations. Installations meeting the *ANSI provisions* comply with [paragraph \(b\)](#) of this section. The Occupational Safety and Health Administration will determine whether an installation that does not conform to this *ANSI standard* complies with [paragraph \(b\)](#) of this section based on the following criteria: [Reference [paragraph \(b\)\(1\) - \(3\)](#)].

[1926.966\(d\)](#) - Substation fences. Conductive fences around substations shall be grounded. When a substation fence is expanded or a section is removed, fence sections shall be isolated, grounded, or bonded as necessary to protect employees from hazardous differences in electric potential.

Note to [paragraph \(d\)](#): *IEEE Std 80-2000, IEEE Guide for Safety in AC Substation Grounding*, contains guidelines for protection against hazardous differences in electric potential.

[1926.966\(e\)\(2\)](#) - Prevent access by *unqualified persons*. Fences, screens, partitions, or walls shall enclose the rooms and other spaces so as to minimize the possibility that *unqualified persons* will enter.

[1926.966\(e\)\(3\)](#) - Restricted entry. *Unqualified persons* may not enter the rooms or other spaces while the electric supply lines or equipment are energized.

[1926.966\(e\)\(4\)](#) - *Warning signs*. The employer shall *display signs* at entrances to the rooms and other spaces warning *unqualified persons* to keep out.

[1926.966\(e\)\(5\)](#) - *Entrances to rooms and other*. The employer shall keep each entrance to a room or other space *locked*, unless the entrance is under the observation of a person who is attending the room or other space for the purpose of preventing *unqualified employees* from entering.

[1926.966\(f\)\(1\)](#) - Type of guarding. The employer shall provide guards around all live parts operating at more than 150 volts to ground without an insulating covering unless the location of the live parts gives sufficient clearance (horizontal, vertical, or both) to minimize the possibility of accidental employee contact.

Note to [paragraph \(f\)\(1\)](#): *American National Standard National Electrical Safety Code, ANSI/IEEE C2-2002* contains guidelines for the dimensions of clearance distances about electric equipment in substations. Installations meeting the *ANSI provisions* comply with [paragraph \(f\)\(1\)](#) of this section. The Occupational Safety and Health Administration will determine whether an installation that does not conform to this *ANSI standard* complies with [paragraph \(f\)\(1\)](#) of this section based on the following criteria: [Reference [paragraph \(f\)\(1\) -\(3\)](#)].

[1926.966\(f\)\(2\)](#) - *Maintaining guards during operation*. Except for fuse replacement and other necessary access by *qualified persons*, the employer shall maintain guarding of energized parts within a compartment during operation and maintenance functions to prevent accidental contact with energized parts and to prevent dropped tools or other equipment from contacting energized parts.

[1926.966\(g\)\(1\)](#) - *Report upon entering*. Upon entering an *attended substation*, each employee, other than employees regularly working in the station, shall *report* his or her presence to the employee in charge of substation activities to receive *information* on special system conditions affecting employee safety.

[1926.966\(g\)\(2\)](#) - *Job briefing*. The *job briefing* required by [1926.952](#) - *job briefing*, shall cover *information on special system* conditions affecting employee safety, including the location of energized equipment in or adjacent to the work area and the limits of any deenergized work area.

1926.967 - Special Conditions

Scope: This [standard](#) provides the requirements for special conditions.

Special Requirements: Illumination, inspect, communication facilities, flotation devices, specific instruction, engineering controls, administrative controls, PPE, traffic control devices, warning lights, radiation protection guide, (post) warning signs, flags, measures, warning symbol, statement, references other standards

[1926.967\(c\)\(1\)](#) - Applicable requirements. If the open-circuit voltage exceeds 600 volts, the employer shall ensure that employees work on series streetlighting circuits in accordance with [1926.964](#) - *overhead lines and live-line barehand work* or [1926.965](#) - *underground electrical installations*, as appropriate.

[1926.967\(d\)](#) - *Illumination*. The employer shall provide sufficient *illumination* to enable the employee to perform the work safely.

Note to paragraph (d): See [1926.56](#) - *illumination*, which requires specific levels of *illumination*.

[1926.967\(e\)\(1\)](#) - *Personal flotation devices*. Whenever an employee may be pulled or pushed, or might fall, into water where the danger of drowning exists, the employer shall provide the employee with, and shall ensure that the employee uses, a *personal flotation device* meeting [1926.106](#) - *working over or near water*.

[1926.967\(e\)\(2\)](#) - *Maintaining flotation devices* in safe condition. The employer shall maintain each *personal flotation device* in safe condition and shall *inspect* each personal flotation device frequently enough to ensure that it does not have rot, mildew, water saturation, or any other condition that could render the device unsuitable for use.

[1926.967\(f\)](#) - Excavations. Excavation operations shall comply with [subpart P](#) - *excavations*, of this part.

[1926.967\(g\)\(1\)](#) - *Traffic control devices*. *Traffic-control signs and traffic-control devices* used for the protection of employees shall meet [1926.200\(g\)\(2\)](#) - *accident prevention signs and tags*.

[1926.967\(g\)\(2\)](#) - *Controlling traffic*. Before employees begin work in the vicinity of vehicular or pedestrian traffic that may endanger them, the employer shall place *warning signs* or

flags and other *traffic-control devices* in conspicuous locations to alert and channel approaching traffic.

[1926.967\(g\)\(5\)](#) - *Warning lights*. The employer shall *display warning lights* prominently at night.

[1926.967\(h\)](#) - *Backfeed*. When there is a possibility of voltage backfeed from sources of cogeneration or from the secondary system (for example, backfeed from more than one energized phase feeding a common load), the requirements of [1926.960](#) - *Working on or near exposed energized parts*, apply if employees will work the lines or equipment as energized, and the requirements of [1926.961](#) - *deenergizing lines and equipment for employee protection*, and [1926.962](#) - *Grounding for the protection of employees*, apply if employees will work the lines or equipment as deenergized.

[1926.967\(i\)](#) - *Lasers*. The employer shall install, adjust, and operate laser equipment in accordance with [1926.54](#) - *nonionizing radiation*.

[1926.967\(k\)\(1\)\(ii\)](#) - If the electromagnetic-radiation level within an accessible area associated with microwave *communications systems* exceeds the *radiation-protection guide* specified by [1910.97\(a\)\(2\)](#) - *nonionizing radiation*, of this chapter, the employer shall post the area with warning signs containing the *warning symbol* described in 1910.97(a)(3) of this chapter. The lower half of the *warning symbol* shall include the following *statements*, or ones that the employer can *demonstrate* are equivalent: "Radiation in this area may exceed hazard limitations and special precautions are required. Obtain *specific instruction* before entering."

[1926.967\(k\)\(1\)\(iii\)](#) - When an employee works in an area where the electromagnetic radiation could exceed the *radiation-protection guide*, the employer shall institute *measures* that ensure that the employee's exposure is not greater than that permitted by that *guide*. Such *measures* may include *administrative and engineering controls and personal protective equipment*.

Subpart W - [Rollover Protective Structures; Overhead Protection](#)

[Subpart W](#) provides the requirements on rollover protection structures (ROPS) and overhead protection.

[Agricultural tractor](#) means a wheel-type vehicle of more than 20 engine horsepower, used in construction work, that is designed to furnish the power to pull, propel, or drive implements. (SAE standard J333a-1970 ("Operator protection for wheel-type agricultural and industrial tractors") defines "agricultural tractor" as a "wheel-type vehicle of more than 20 engine horsepower designed to furnish the power to pull, carry, propel, or drive

implements that are designed for agricultural usage.” Since this part 1926 applies only to construction work, the SAE definition of “agricultural tractor” is adopted for purposes of this subpart.)

Industrial tractor means that class of wheel-type tractors of more than 20 engine horsepower (other than rubber-tired loaders and dozers described in [29 CFR 1926.1001](#)), used in operations such as landscaping, construction services, loading, digging, grounds keeping, and highway maintenance.

To learn if subpart W applies to you, go to [Does "Subpart W - Rollover Protective Structures; Overhead Protection" Apply to You?](#)

Special Requirements

1926.1001 - Minimum Performance Criteria for ROPS for Designated Scrapers, Loaders, Dozers, Graders, Crawler Tractors, Compactors, and Rubber-tired Skid Steer Equipment

Scope: This [standard](#) provides the requirements for minimum performance criteria for rollover protective structures for designated scrapers, loaders, dozers, graders, crawler tractors, compactors, and rubber-tired skid steer equipment.

Special Requirements: References other standards

[1926.1001\(b\)](#) - Equipment manufactured before July 15, 2019. For equipment listed in paragraph (a) of this section (excluding compactors and rubber-tired skid steer equipment) manufactured before July 15, 2019, the protective frames shall conform to the following *Society of Automotive Engineers Recommended Practices as applicable: SAE J320a, Minimum Performance Criteria for Roll-Over Protective Structure for Rubber-Tired, Self-Propelled Scrapers; SAE J394, Minimum Performance Criteria for Roll-Over Protective Structure for Rubber-Tired Front End Loaders and Rubber-Tired Dozers; SAE J395, Minimum Performance Criteria for Roll-Over Protective Structure for Crawler Tractors and Crawler-Type Loaders; SAE J396, Minimum Performance Criteria for Roll-Over Protective Structure for Motor Graders; and SAE J397, Critical Zone Characteristics and Dimensions for Operators of Construction and Industrial Machinery*, as applicable (each incorporated by reference, see [1926.6](#)), or comply with the *consensus standard (ISO 3471:2008)* listed in [paragraph \(c\)](#) of this section.

[1926.1001\(c\)](#) - *Equipment manufactured on or after July 15, 2019.* For equipment listed in paragraph (a) of this section manufactured on or after July 15, 2019, the protective frames shall meet the *test and performance requirements of the International Organization for Standardization (ISO) standard ISO 3471:2008 Earth-Moving Machinery—Roll-over*

protective structures—Laboratory tests and performance requirements (incorporated by reference, see [1926.6](#)).

1926.1002 - Protective Frames (roll-over protective structures, known as ROPS) for Wheel-type Agricultural and Industrial Tractors used in Construction

Scope: This [standard](#) provides the requirements for protective frames (roll-over protective structures, known as ROPS) for wheel-type agricultural and industrial tractors used in construction.

Special Requirements: References other standards

[1926.1002\(b\)](#) - Equipment manufactured before July 15, 2019. For equipment manufactured before July 15, 2019, the protective frames shall meet the test and performance requirements of the *Society of Automotive Engineers Standard J334a, Protective Frame Test Procedures and Performance Requirements and J168, Protective enclosures-test procedures and performance requirements*, as applicable (incorporated by reference, see [1926.6](#)), or comply with the *consensus standard (ISO 5700:2013)* listed in [paragraph \(c\)](#) of this section.

[1926.1002\(c\)](#) - Equipment manufactured on or after July 15, 2019. For equipment manufactured on or after July 15, 2019, the protective frames shall meet the test and performance requirements of the *International Organization for Standardization (ISO) standard ISO 5700:2013, Tractors for agriculture and forestry—Roll-over protective structures—static test method and acceptance conditions or ISO 3471:2008 Earth-Moving Machinery—Roll-over protective structures—Laboratory tests and performance requirements* (incorporated by reference, see [1926.6](#)).

[1926.1002\(d\)](#) - Overhead protection requirements. For overhead protection requirements, see [1926.1003](#) - *overhead protection for operators of agricultural and industrial tractors used in construction*.

1926.1003 - Overhead Protection for Operators of Agricultural and Industrial Tractors used in Construction

Scope: This [standard](#) provides the requirements for overhead protection for operators of agricultural and industrial tractors used in construction.

Special Requirements: References other standards

[1926.1003\(b\)](#) - Equipment manufactured before July 15, 2019. When overhead protection is provided on wheel-type agricultural and industrial tractors manufactured before July 15,

2019, the overhead protection shall be designed and installed according to the requirements contained in the *test and performance requirements of Society of Automotive Engineers Standard J167, Protective Frame with Overhead Protection-Test Procedures and Performance Requirements*, which pertains to overhead protection requirements (incorporated by reference, see [1926.6](#)) or comply with the *consensus standard (ISO 27850:2013)* listed in [paragraph \(c\)](#) of this section.

[1926.1003\(c\)](#) - Equipment manufactured on or after July 15, 2019. When overhead protection is provided on wheel-type agricultural and industrial tractors manufactured on or after July 15, 2019, the overhead protection shall be designed and installed according to the requirements contained in the test and performance requirements of the *International Organization for Standardization (ISO) standard ISO 27850:2013, Tractors for agriculture and forestry—Falling object protective structures—Test procedures* and performance requirements, which pertains to overhead protection requirements (incorporated by reference, see [1926.6](#)).

[1926.1003\(d\)](#) - Site clearing. In the case of machines to which [1926.604 - site clearing](#) (relating to site clearing) also applies, the overhead protection may be either the type of protection provided in [1926.604 - site clearing](#), or the type of protection provided by this section.

Subpart X - [Stairways and Ladders](#)

[Subpart X](#) applies to all stairways and ladders used in construction, alteration, repair (including painting and decorating), and demolition workplaces and whenever ladders and stairways are required to be provided.

To learn if subpart X applies to you, go to [Does "Subpart X - Stairways and Ladders" Apply to You?](#)

Special Requirements

1926.1051 - General Requirements

Scope: This [standard](#) provides the general requirements for stairways and ladders.

Special Requirements: Fall protection systems.

[1926.1051\(b\)](#) - Employers shall provide and install all stairway and ladder *fall protection systems* required by this subpart and shall comply with all other pertinent requirements of this subpart before employees begin the work that necessitates the installation and use of stairways, ladders, and their respective *fall protection systems*.

1926.1052 – Stairways

Scope: This [standard](#) provides the requirements for stairways.

Special Requirements: Stairrail systems, guardrail systems, reference other standards

[1926.1052\(c\)\(8\)](#) - *Stairrail systems* and handrails shall be so surfaced as to prevent injury to employees from punctures or lacerations, and to prevent snagging of clothing.

[1926.1052\(c\)\(10\)](#) - The ends of *stairrail systems* and handrails shall be constructed so as not to constitute a projection hazard.

[1926.1052\(c\)\(11\)](#) - Handrails that will not be a permanent part of the structure being built shall have a minimum clearance of 3 inches (8 cm) between the handrail and walls, *stairrail systems*, and other objects.

[1926.1052\(c\)\(12\)](#) - Unprotected sides and edges of stairway landings shall be provided with *guardrail systems*. *Guardrail system* criteria are contained in [subpart M - fall protection](#) of this part (1926).

1926.1053 – Ladders

Scope: This [standard](#) provides the requirements for ladders.

Special Requirements: Loads, manufacturer rated capacity, identification or warning labels, ladder safety devices, competent person, inspected, taken out of service, tagged, marked

[1926.1053\(a\)\(1\)](#) - Ladders shall be capable of supporting the following *loads* without failure: [Reference [paragraph \(a\)\(1\)\(i\) - \(iii\)](#)].

[1926.1053\(a\)\(12\)](#) - Wood ladders shall not be coated with any opaque covering, except for *identification or warning labels* which may be placed on one face only of a side rail.

[1926.1053\(a\)\(23\)](#) - The mounting of *ladder safety devices* for fixed ladders shall conform to the following: [Reference [paragraphs \(a\)\(23\)\(i\) - \(iii\)](#)].

[1926.1053\(a\)\(25\)](#) - For through-fixed-ladder extensions, the steps or rungs shall be omitted from the extension and the extension of the side rails shall be flared to provide not less than 24 inches (61 cm) nor more than 30 inches (76 cm) clearance between side rails. Where *ladder safety devices* are provided, the maximum clearance between side rails of the extensions shall not exceed 36 inches (91 cm).

[1926.1053\(b\)\(3\)](#) - Ladders shall not be loaded beyond the *maximum intended load* for which they were built, nor beyond their *manufacturer's rated capacity*.

[1926.1053\(b\)\(15\)](#) - Ladders shall be *inspected by a competent person* for visible defects on a *periodic basis* and after any occurrence that could affect their safe use.

[1926.1053\(b\)\(16\)](#) - Portable ladders with structural defects, such as, but not limited to, broken or missing rungs, cleats, or steps, broken or split rails, corroded components, or other faulty or defective components, shall either be immediately *marked* in a manner that readily identifies them as defective, or be *tagged with "Do Not Use" or similar language*, and shall be *withdrawn from service* until repaired.

[1926.1053\(b\)\(17\)](#) - Fixed ladders with structural defects, such as, but not limited to, broken or missing rungs, cleats, or steps, broken or split rails, or corroded components, shall be *withdrawn from service* until repaired. The requirement to *withdraw a defective ladder from service* is satisfied if the ladder is either: [Reference [paragraph \(b\)\(17\)\(i\) - \(iii\)](#)].

1926.1060 - Training Requirements

Scope: This [standard](#) provides the training requirements for stairways and ladders.

Special Requirements: Training provisions, training program, training, competent person, procedures, retraining, standards, fall protection systems, references other standards

The following *training provisions* clarify the requirements of [1926.21\(b\)\(2\)](#) - safety training and education, regarding the hazards addressed in [subpart X - stairways and ladders](#).

[1926.1060\(a\)](#) - 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.

- [1926.1060\(a\)\(1\)](#) - The employer shall ensure that each employee has been *trained by a competent person* in the following areas, as applicable: [Reference [paragraph \(a\)\(1\)\(i\) - \(v\)](#)].

[1926.1060\(b\)](#) - *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 - [Commercial Diving Operations](#)

[Subpart Y](#) provides the requirements for commercial diving operations and applies to diving and related support operations that are conducted in connection with all types of work and employments, including general industry, construction, ship repairing, shipbuilding, shipbreaking and longshoring.

[Scientific diving](#) ([1926.1072](#) references [1910.402](#)) means diving performed solely as a necessary part of a scientific, research, or educational activity by employees whose sole purpose for diving is to perform scientific research tasks. Scientific diving does not include performing any tasks usually associated with commercial diving such as: Placing or removing heavy objects underwater; inspection of pipelines and similar objects; construction; demolition; cutting or welding; or the use of explosives.

[Recreational diving instruction](#) ([1926.1072](#) references [1910.402](#)) means training diving students in the use of recreational diving procedures and the safe operation of diving equipment, including an open-circuit, semi-closed-circuit, or closed-circuit self-contained underwater breathing apparatus, during dives.

To learn if subpart Y applies to you, go to [Does "Subpart Y - Commercial Diving Operations" Apply to You?](#)

Note: The requirements applicable to construction work are identical to the standards found in general industry, [subpart T](#), for commercial diving operations.

Special Requirements

1926.1076 - Qualifications of Dive Team

Scope: This [standard](#) (references [1910.410](#)) provides the qualification requirements for the dive team.

Special Requirements: Training, decompression/treatment procedures, supervision, dive team members, designated person in charge

[1910.410\(a\)\(1\)](#) - Each dive team member shall have the *experience or training* necessary to perform assigned tasks in a safe and healthful manner.

[1910.410\(a\)\(2\)](#) - Each dive team member shall have *experience or training* in the following: [Reference [paragraph \(a\)\(2\)\(i\) - \(iii\)](#)].

[1910.410\(a\)\(3\)](#) - All dive team members shall be *trained in cardiopulmonary resuscitation and first aid* (American Red Cross standard course or equivalent).

[1910.410\(a\)\(4\)](#) - 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*.

[1910.410\(b\)\(1\)](#) - 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.

[1910.410\(b\)\(2\)](#) - The employer shall not require a dive team member to be exposed to hyperbaric conditions against the employee's will, except when necessary to complete *decompression or treatment procedures*.

[1910.410\(c\)\(1\)](#) - 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*.

[1910.410\(c\)\(2\)](#) - The *designated person-in-charge* shall have *experience and training* in the conduct of the assigned diving operation.

1926.1080 - Safe Practices Manual

Scope: This [standard](#) (references [1910.420](#)) provides the requirements pertaining to a safe practices manual.

Special Requirements: Safe practices manual (written), policies, copy of standard, procedures, checklists, assignments

[1910.420\(a\)](#) - General. The employer shall *develop* and maintain a *safe practices manual* which shall be made available at the dive location to each dive team member.

[1910.420\(b\)\(1\)](#) - The *safe practices manual* shall contain a *copy of this standard* and the *employer's policies* for implementing the requirements of this standard.

[1910.420\(b\)\(2\)](#) - For each diving mode engaged in, the *safe practices manual* shall include:

- [1910.420\(b\)\(2\)\(i\)](#) - *Safety procedures and checklists* for diving operations;
- [1910.420\(b\)\(2\)\(ii\)](#) - *Assignments and responsibilities* of the dive team members;
- [1910.420\(b\)\(2\)\(iii\)](#) - *Equipment procedures and checklists*; and
- [1910.420\(b\)\(2\)\(iv\)](#) - *Emergency procedures* for fire, equipment failure, adverse environmental conditions, and medical illness and injury.

1926.1081 - Pre-Dive Procedures

Scope: This [standard](#) (references [1910.421](#)) provides the requirements for pre-dive procedures.

Special Requirements: List, physician approved first aid kit, first aid handbook, assessment, employee briefing, procedures, inspections, flag, warning signal, employer inquire (physical fitness)

[1910.421\(b\)](#) - Emergency aid. A *list* shall be kept at the dive location of the telephone or call numbers of the following: [Reference [paragraph \(b\)\(1\) - \(5\)](#)].

[1910.421\(c\)\(1\)](#) - A first aid kit appropriate for the diving operation and *approved by a physician* shall be available at the dive location.

[1910.421\(c\)\(3\)](#) - In addition to any other first aid supplies, an *American Red Cross standard first aid handbook or equivalent*, and a bag-type manual resuscitator with transparent mask and tubing shall be *available* at the dive location.

[1910.421\(d\)](#) - *Planning and assessment*. Planning of a diving operation shall include an *assessment* of the safety and health aspects of the following: [Reference [paragraph \(d\)\(1\) - \(9\)](#)].

[1910.421\(f\)\(1\)](#) - Dive team members shall be *briefed* on: [Reference [paragraph \(f\)\(1\)\(i\) - \(iv\)](#)].

[1910.421\(f\)\(2\)](#) - Prior to making individual dive team member assignments, the employer shall *inquire* into the dive team member's current state of *physical fitness*, and indicate to the dive team member the *procedure* for reporting physical problems or adverse physiological effects during and after the dive.

[1910.421\(g\)](#) - *Equipment inspection*. The breathing gas supply system including reserve breathing gas supplies, masks, helmets, thermal protection, and bell handling mechanism (when appropriate) shall be *inspected prior to each dive*.

[1910.421\(h\)](#) - *Warning signal*. When diving from surfaces other than vessels in areas capable of supporting marine traffic, a rigid replica of the *international code flag "A"* at least one meter in height shall be *displayed* at the dive location in a manner which allows all-round visibility, and shall be *illuminated* during night diving operations.

1926.1082 - Procedures During Dive

Scope: This [standard](#) (references [1910.422](#)) provides the requirements pertaining to procedures during the dive.

Liveboating: The practice of supporting a surfaced-supplied air or mixed gas diver from a vessel which is underway.

Special Requirements: Procedures, communication system/communications, decompression tables, dive profiles, tests, designated person-in-charge, dive team member, references other standards

[1910.422\(b\)](#) - Water entry and exit (Procedures). [Reference [paragraph \(b\)\(1\) - \(3\)](#)].

[1910.422\(c\)\(1\)](#) - An operational two-way voice *communication system* shall be used between: [Reference [paragraph \(c\)\(1\)\(i\) - \(ii\)](#)].

[1910.422\(c\)\(2\)](#) - An operational, two-way *communication system* shall be available at the dive location to obtain emergency assistance.

[1910.422\(d\)](#) - *Decompression tables*. Decompression, repetitive, and no-decompression tables (as appropriate) shall be at the dive location.

[1910.422\(e\)](#) - *Dive profiles*. A *depth-time profile*, including when appropriate any breathing gas changes, shall be maintained for *each diver during the dive* including decompression.

[1910.422\(g\)\(1\)](#) - A current supply switch to interrupt the current flow to the welding or burning electrode shall be:

- [1910.422\(g\)\(1\)\(i\)](#) - Tended by a dive team member in *voice communication* with the diver performing the welding or burning.

[1910.422\(h\)\(1\)](#) - Employers shall transport, store, and use explosives in accordance with this section and the applicable provisions of [1910.109](#) - *explosives and blasting agents*, and [1926.912](#) - underwater blasting, of Title 29 of the Code of Federal Regulations.

[1910.422\(h\)\(2\)](#) - Electrical continuity of explosive circuits shall not be *tested* until the diver is out of the water.

[1910.422\(i\)](#) - Termination of dive. The working interval of a dive shall be terminated when:

- [1910.422\(i\)\(1\)](#) - A diver *requests* termination;
- [1910.422\(i\)\(2\)](#) - A diver fails to respond correctly to *communications or signals* from a *dive team member*;
- [1910.422\(i\)\(3\)](#) - *Communications* are lost and can not be quickly re-established between the diver and a *dive team member* at the dive location, and between the *designated person-in-charge* and the person controlling the vessel in liveboating operations.

1926.1083 - Post-Dive Procedures

Scope: This [standard](#) (references [1910.423](#)) provides the procedures to be followed after diving.

Special Requirements: Procedures, checks, instruct, alert, advise, records, evaluation (written, procedure assessment, communication system, dive team member, designated person-in-charge, information, records, investigation, corrective action

[1910.423\(b\)\(1\)](#) - Precautions. After the completion of any dive, the employer shall (*procedures*):

- [1910.423\(b\)\(1\)\(i\)](#) - *Check* the physical condition of the diver;
- [1910.423\(b\)\(1\)\(ii\)](#) - *Instruct* the diver to report any physical problems or adverse physiological effects including symptoms of decompression sickness;
- [1910.423\(b\)\(1\)\(iii\)](#) - *Advise* the diver of the location of a decompression chamber which is ready for use; and
- [1910.423\(b\)\(1\)\(iv\)](#) - *Alert* the diver to the potential hazards of flying after diving.

[1910.423\(b\)\(2\)](#) - For any dive outside the no-decompression limits, deeper than 100 fsw or using mixed gas as a breathing mixture, the employer shall *instruct* the diver to remain awake and in the vicinity of the decompression chamber which is at the dive location for at least one hour after the dive (including decompression or treatment as appropriate).

[1910.423\(c\)\(4\)\(iii\)](#) - Decompression chamber. A two-way voice *communication system* between occupants and a dive team member at the dive location.

[1910.423\(c\)\(6\)](#) - A *dive team member* shall be available at the dive location *during and for at least one hour after* the dive to operate the decompression chamber (when required or provided).

[1910.423\(d\)\(1\)](#) - The following *information* shall be *recorded and maintained* for each diving operation: [Reference [paragraph \(d\)\(1\)\(i\) - \(vi\)](#)].

[1910.423\(d\)\(2\)](#) - For each dive outside the no-decompression limits, deeper than 100 fsw or using mixed gas, the following additional *information* shall be *recorded and maintained*: [Reference [paragraph \(d\)\(2\)\(i\) - \(iii\)](#)].

[1910.423\(d\)\(3\)](#) - For each dive in which decompression sickness is suspected or symptoms are evident, the following additional *information* shall be *recorded and maintained*: [Reference [paragraph \(d\)\(3\)\(i\) - \(ii\)](#)].

[1910.423\(e\)](#) - *Decompression procedure assessment*. The employer shall:

- [1910.423\(e\)\(1\)](#) - Investigate and evaluate each incident of decompression sickness based on the *recorded information*, consideration of the past performance of decompression table used, and individual susceptibility;
- [1910.423\(e\)\(2\)](#) - Take appropriate *corrective action* to reduce the probability of recurrence of decompression sickness; and
- [1910.423\(e\)\(3\)](#) - Prepare a *written evaluation* of the decompression *procedure assessment*, including any corrective action taken, within 45 days of the incident of decompression sickness.

1926.1084 - SCUBA Diving

Scope: This [standard](#) (references [1910.424](#)) provides the requirements for SCUBA diving.

SCUBA diving: A diving mode independent of surface supply in which the diver uses open circuit self-contained underwater breathing apparatus.

Special Requirements: Procedures, standby diver

[1910.424\(c\)](#) - Procedures. [Reference [paragraph \(c\)\(\(1\) - \(5\)](#)].

1926.1085 - Surface-Supplied Air Diving

Scope: This [standard](#) (references [1910.425](#)) provides the requirements for surface-supplied air diving.

Surface-supplied air diving: A diving mode in which the diver in the water is supplied from the dive location with compressed air for breathing.

Special Requirements: Procedures, dive team members

[1910.425\(c\)](#) - Procedures. [Reference [paragraph \(c\)\(1\) - \(6\)](#)].

1926.1086 - Mixed-Gas Diving

Scope: This [standard](#) (references [1910.426](#)) provides requirements for mixed-gas diving.

Mixed-gas diving: A diving mode in which the diver is supplied in the water with a breathing gas other than air.

Special Requirements: Procedures, dive team member, standby diver

[1910.426\(c\)](#) - Procedures. [Reference [paragraph \(c\)\(1\) - \(9\)](#)].

1926.1087 – Liveboating

Scope: This [standard](#) (references [1910.427](#)) provides the requirements pertaining to liveboating.

Liveboating: The practice of supporting a surfaced-supplied air or mixed gas diver from a vessel which is underway.

Special Requirements: Procedures, standby diver, designated person-in-charge, communication

[1910.427\(c\)](#) - *Procedures*. [Reference [paragraph \(c\)\(1\) - \(5\)](#)].

1926.1090 – Equipment

Scope: This [standard](#) (references [1910.430](#)) provides the requirements for diving equipment.

Special Requirements: Tests, maintenance, calibration, records, tagging and logging system, person's initials, marked, designed, maintenance, references other standards

[1910.430\(a\)\(2\)](#) - Each equipment modification, repair, *test, calibration or maintenance* service shall be *recorded* by means of a *tagging or logging system*, and include the date and nature of work performed, and the *name or initials of the person* performing the work.

[1910.430\(b\)\(4\)](#) - The output of air compressor systems shall be *tested for air purity every 6 months* by means of samples taken at the connection to the distribution system, except that non-oil lubricated compressors need not be tested for oil mist.

[1910.430\(c\)\(1\)](#) - Breathing gas supply hoses shall:

- [1910.430\(c\)\(1\)\(iii\)](#) - Be *tested at least annually* to 1.5 times their working pressure;
- [1910.430\(c\)\(3\)\(i\)](#) - Be *marked* in 10-ft. increments to 100 feet beginning at the diver's end, and in 50 ft. increments thereafter

[1910.430\(e\)](#) - Compressed gas cylinders. Compressed gas cylinders shall:

- [1910.430\(e\)\(1\)](#) - Be *designed, constructed and maintained* in accordance with the applicable provisions of [29 CFR 1910.101](#) - *compressed gases (general requirements)* and [1910.169](#) - *air receivers, through 1910.171 (does not exist)*.

[1910.430\(f\)](#) - Decompression chambers.

- [1910.430\(f\)\(1\)](#) - Each decompression chamber manufactured after the effective date of this standard, shall be built and maintained in accordance with the *ASME Code* or equivalent.
- [1910.430\(f\)\(2\)](#) - Each decompression chamber manufactured prior to the effective date of this standard shall be *maintained in conformity with the code* requirements to which it was built, or equivalent.

1926.1091 - Recordkeeping Requirements

Scope: This [standard](#) (reference [1910.440](#)) provides the recordkeeping requirements for commercial diving operations.

Special Requirements: Records, dive team members, inspection, document, safe practices manual, medical records, exposure records, depth-time profiles, dive recordings, hospital records, procedure assessment evaluations, equipment inspections, testing records, references other standards

[1910.440\(a\)\(2\)](#) - The employer shall *record* the occurrence of any diving-related injury or illness which requires any *dive team member* to be hospitalized for 24 hours or more, specifying the circumstances of the incident and the extent of any injuries or illnesses.

[1910.440\(b\)\(1\)](#) - Upon the request of the Assistant Secretary of Labor for Occupational Safety and Health, or the Director, National Institute for Occupational Safety and Health, Department of Health and Human Services of their designees, the employer shall make available for *inspection and copying any record or document* required by this standard.

[1910.440\(b\)\(2\)](#) - *Records and documents* required by this standard shall be provided upon request to employees, designated representatives, and the Assistant Secretary in accordance with [29 CFR 1910.1020](#) - *access to employee exposure and medical records*, [\(a\)-\(e\)](#) and [\(g\)-\(i\)](#). *Safe practices manuals* ([1910.420](#) - *safe practices manual*), *depth-time profiles* ([1910.422](#) - *procedures during dive*), *recordings of dives* ([1910.423](#) - *post-dive procedures*), *decompression procedure assessment evaluations* ([1910.423](#) - *post-dive procedures*), and *records of hospitalizations* ([1910.440](#) - *recordkeeping requirements*) shall be provided in the same manner as *employee exposure records* or analyses using *exposure or medical records*. *Equipment inspections and testing records* which pertain to employees ([1910.430](#) - *equipment*) shall also be provided upon request to employees and their designated representatives.

[1910.440\(b\)\(3\)](#) - *Records and documents* required by this standard shall be retained by the employer for the following period: [Reference [paragraph \(b\)\(3\)\(i\) - \(vii\)](#)].

[1910.440\(b\)\(4\)](#) - The employer shall comply with any additional requirements set forth at [29 CFR 1910.1020](#) - *access to employee exposure and medical records*.

Subpart Z - Toxic and Hazardous Substances

[Subpart Z](#) provides requirements relating to employee exposures to air contaminants and the following health hazards: asbestos, coal tar pitch volatiles, 13 carcinogens (e.g., 4-Nitrobiphenyl, alpha-Naphthylamine, chloromethyl ether, 3,3'-Dichlorobenzidine (and its salts), bis-Chloromethyl ether, beta-Naphthylamine, Benzidine, 4-Aminodiphenyl, Ethyleneimine, beta-Propiolactone, 2-Acetylaminofluorene, 4-Dimethylaminoazo-benzene, and N-Nitrosodimethylamine), vinyl chloride, inorganic arsenic, beryllium, chromium (VI), cadmium, benzene, 1,2-dibromo-3-chloropropane, respirable crystalline silica, ethylene oxide, formaldehyde, acrylonitrile, and methylene chloride.

To learn if subpart Z applies to you, go to [Does "Subpart Z - Toxic and Hazardous Substances" Apply to You?](#)

Special Requirements

1926.1101 – Asbestos

Scope: This [standard](#) provides the requirements pertaining to asbestos.

Special Requirements: Permissible exposure limits, excursion limit, duties, supervised, regulated areas, competent person, respirators, inform, authorized person, measures, measurements, demarcation, signs, posted, labels, training, training program, accreditation plan, smoking cessation program, copy, housekeeping, medical surveillance, medical surveillance program, examinations, physician, description, written opinion, statement, recommendations, recordkeeping, records, data, barriers, exposure assessments, exposure monitoring, determinations, air samples, TWA, data, control methods, work practices, results, employee notification, observation, affected employees, notify, posting, in writing, methods of compliance, engineering controls, alternative methods, respiratory protection program, protective clothing, inspection, hygiene facilities (i.e., decontamination, showers), wet methods, procedures, job classifications, safety data sheets, hazard communication, hazard communication program, duties, convey information, determine, demonstrate, tests, notification records (written), industrial hygienist, employee participation, building owners, systems, health and safety prevention programs, references other standards

[1926.1101\(a\)](#) - Scope and application. This section regulates asbestos exposure in all work as defined in [29 CFR 1910.12\(b\)](#) - construction work, including but not limited to the following: [Reference [paragraph \(a\)\(1\) - \(8\)](#)].

1926.1101(d) - *Multi-employer worksites*. [Reference [paragraph \(d\)\(1\) - \(5\)](#)].

- [1926.1101\(d\)\(1\)](#) - On multi-employer worksites, an employer performing work requiring the establishment of a *regulated area* shall *inform* other employers on the site of the nature of the employer's work with asbestos and/or PACM, of the existence of and requirements pertaining to *regulated areas*, and the *measures* taken to ensure that employees of such other employers are not exposed to asbestos.

1926.1101(e) - *Regulated areas*. [Reference [paragraph \(e\)\(1\) - \(6\)](#)].

- [1926.1101\(e\)\(2\)](#) - *Demarcation*. The *regulated area* shall be *demarcated* in any manner that minimizes the number of persons within the area and protects persons outside the area from exposure to airborne asbestos. Where *critical barriers* or negative pressure enclosures are used, they may *demarcate the regulated area*. *Signs* shall be provided and displayed pursuant to the requirements of [paragraph \(k\)\(7\)](#) of this section.
- [1926.1101\(e\)\(3\)](#) - *Access*. Access to *regulated areas* shall be limited to *authorized persons* and to *persons authorized* by the Act or regulations issued pursuant thereto.
- [1926.1101\(e\)\(4\)](#) - *Respirators*. All persons entering a *regulated area* where employees are required pursuant to [paragraph \(h\)\(1\)](#) of this section to wear *respirators* shall be supplied with a *respirator* selected in accordance with [paragraph \(h\)\(3\)](#) of this section.
- [1926.1101\(e\)\(6\)](#) - *Competent Persons*. The employer shall ensure that all asbestos work performed within *regulated areas* is *supervised by a competent person*, as defined in [paragraph \(b\)](#) of this section. The *duties of the competent person* are set out in [paragraph \(o\)](#) of this section.

1926.1101(f) - Exposure assessments and monitoring.

- [1926.1101\(f\)\(1\)](#) - *General monitoring criteria*. [Reference [paragraph \(f\)\(1\)\(i\) - \(iii\)](#)].
- [1926.1101\(f\)\(2\)](#) - *Initial exposure assessment*. [Reference [paragraph \(f\)\(2\)\(i\) - \(iii\)](#)].
- [1926.1101\(f\)\(3\)](#) - *Periodic monitoring*. [Reference [paragraph \(f\)\(3\)\(i\) - \(iii\)](#)].
- [1926.1101\(f\)\(4\)](#) - *Termination of monitoring*. [Reference [paragraph \(f\)\(4\)\(i\) - \(ii\)](#)].
- [1926.1101\(f\)\(5\)](#) - *Employee notification of monitoring results*. The employer must, as soon as possible but no later than 5 working days after the *receipt of the results* of any monitoring performed under this section, *notify* each affected employee of these results either individually in *writing* or by *posting the results* in an appropriate location that is accessible to employees.
- [1926.1101\(f\)\(6\)](#) - *Observation of monitoring*. [Reference [paragraph \(f\)\(6\)\(i\) - \(ii\)](#)].

1926.1101(g) - *Methods of compliance*.

- [1926.1101\(g\)\(1\)](#) - *Engineering controls and work practices* for all operations covered by this section. The employer shall use the following *engineering controls and work practices* in all operations covered by this section, regardless of the levels of exposure: [Reference [paragraph \(g\)\(1\)\(i\) - \(iii\)](#)].
- [1926.1101\(g\)\(2\)](#) - In addition to the requirements of [paragraph \(g\)\(1\)](#) of this section, the employer shall use the following *control methods* to achieve compliance with the *TWA permissible exposure limit and excursion limit* prescribed by [paragraph \(c\)](#) of this section; [Reference [paragraph \(g\)\(2\)\(i\) - \(v\)](#)].
- [1926.1101\(g\)\(3\)](#) - Prohibitions. The following *work practices and engineering controls* shall not be used for work related to asbestos or for work which disturbs ACM or PACM, regardless of measured levels of asbestos exposure or the results of initial *exposure assessments*: [Reference [paragraph \(g\)\(3\)\(i\) - \(iv\)](#)].
- [1926.1101\(g\)\(4\)](#) - *Class I Requirements*. In addition to the provisions of paragraphs (g)(1) and (2) of this section, the following *engineering controls and work practices and procedures* shall be used. [Reference [paragraph \(g\)\(4\)\(i\) - \(vi\)](#)]
- [1926.1101\(g\)\(5\)](#) - *Specific control methods for Class I work*. In addition, *Class I asbestos work* shall be performed using one or more of the following *control methods* pursuant to the limitations stated below: [Reference [paragraph \(g\)\(5\)\(i\) - \(vi\)](#)]
- [1926.1101\(g\)\(6\)](#) - *Alternative control methods for Class I work*. *Class I work* may be performed using a *control method* which is not referenced in [paragraph \(g\)\(5\)](#) of this section, or which modifies a *control method* referenced in [paragraph \(g\)\(5\)](#) of this section, if the following provisions are complied with: [Reference [paragraph \(g\)\(6\)\(i\) - \(ii\)](#)]
- [1926.1101\(g\)\(7\)](#) - *Work practices and engineering controls for Class II work*. [Reference [paragraph \(g\)\(7\)\(i\) - \(iv\)](#)]
- [1926.1101\(g\)\(8\)](#) - *Additional Controls for Class II work*. *Class II asbestos work* shall also be performed by complying with the *work practices and controls* designated for each type of asbestos work to be performed, set out in this paragraph. Where more than one *control method* may be used for a type of asbestos work, the employer may choose one or a combination of designated *control methods*. *Class II work* also may be performed using a *method* allowed for *Class I work*, except that glove bags and glove boxes are allowed if they fully enclose the *Class II material* to be removed. [Reference [paragraph \(g\)\(8\)\(i\) - \(vi\)](#)]
- [1926.1101\(g\)\(9\)](#) - *Work Practices and Engineering Controls for Class III asbestos work*. *Class III asbestos work* shall be conducted using *engineering and work practice controls* which minimize the exposure to employees performing the asbestos work and to bystander employees. [Reference [paragraph \(g\)\(9\)\(i\) - \(v\)](#)]
- [1926.1101\(g\)\(10\)](#) - *Class IV asbestos work*. *Class IV asbestos jobs* shall be conducted by employees trained pursuant to the *asbestos awareness training program* set out in [paragraph \(k\)\(9\)](#) of this section. In addition, all *Class IV jobs* shall be conducted in conformity with the requirements set out in [paragraph \(g\)\(1\)](#) of this section, mandating *wet methods*, HEPA vacuums, and prompt clean up of debris containing ACM or PACM. [Reference [paragraph \(g\)\(10\)\(i\) - \(ii\)](#)]

- [1926.1101\(g\)\(11\)](#) - *Alternative methods* of compliance for installation, removal, repair, and maintenance of certain roofing and pipeline coating materials. Notwithstanding any other provision of this section, an employer who complies with all provisions of this [paragraph \(g\)\(11\)](#) when installing, removing, repairing, or maintaining intact pipeline asphaltic wrap, or roof flashings which contain asbestos fibers encapsulated or coated by bituminous or resinous compounds shall be deemed to be in compliance with this section. If an employer does not comply with all provisions of this [paragraph \(g\)\(11\)](#) or if during the course of the job the material does not remain intact, the provisions of [paragraph \(g\)\(8\)](#) of this section apply instead of this [paragraph \(g\)\(11\)](#). [Reference [paragraph \(g\)\(11\)\(i\) - \(vi\)](#)]

[1926.1101\(h\)](#) - *Respiratory protection.*

- [1926.1101\(h\)\(1\)](#) - General. For employees who use *respirators* required by this section, the employer must provide each employee an appropriate *respirator* that complies with the requirements of this paragraph. *Respirators* must be used during: [Reference [paragraph \(h\)\(1\)\(i\) - \(viii\)](#)]
- [1926.1101\(h\)\(2\)](#) - *Respirator program.* [Reference [paragraph \(h\)\(2\)\(i\) - \(ii\)](#)]
 - [1926.1101\(h\)\(2\)\(i\)](#) - The employer must implement a *respiratory protection program* in accordance with [§ 1910.134 \(b\) through \(d\) \[except \(d\)\(1\)\(iii\)\]](#), and [\(f\) through \(m\)](#), which covers each employee required by this section to use a *respirator*.
- [1926.1101\(h\)\(3\)](#) - *Respirator selection.* [Reference [paragraph \(h\)\(3\)\(i\) - \(iv\)](#)]

[1926.1101\(i\)](#) - *Protective clothing.*

- [1926.1101\(i\)\(1\)](#) - General. The employer shall provide or require the use of *protective clothing, such as coveralls or similar whole-body clothing, head coverings, gloves, and foot coverings* for any employee exposed to airborne concentrations of asbestos that exceed the TWA and/or excursion limit prescribed in [paragraph \(c\)](#) of this section, or for which a required negative exposure assessment is not produced, or for any employee performing Class I operations which involve the removal of over 25 linear or 10 square feet of TSI or surfacing ACM and PACM.
- [1926.1101\(i\)\(2\)](#) - *Laundering.* [Reference [paragraph \(i\)\(2\)\(i\) - \(ii\)](#)]
- [1926.1101\(i\)\(3\)](#) - Contaminated clothing. Contaminated clothing shall be transported in sealed impermeable bags, or other closed, impermeable containers, and be *labeled* in accordance with [paragraph \(k\)](#) of this section.
- [1926.1101\(i\)\(4\)](#) - *Inspection of protective clothing.* [Reference [paragraph \(i\)\(4\)\(i\) - \(ii\)](#)]

[1926.1101\(j\)](#) - *Hygiene facilities and practices for employees.* [Reference [paragraph \(j\)\(1\) - \(4\)](#)]

- [1926.1101\(j\)\(1\)\(i\)\(B\)](#) - *Shower area.* Shower facilities shall be provided which comply with [29 CFR 1910.141\(d\)\(3\)](#) - *sanitation*, unless the employer can *demonstrate* that

they are not feasible. The showers shall be adjacent both to the equipment room and the clean room, unless the employer can demonstrate that this location is not feasible. Where the employer can *demonstrate* that it is not feasible to locate the shower between the equipment room and the clean room, or where the work is performed outdoors, the employers shall ensure that employees: [Reference [paragraph \(j\)\(1\)\(i\)\(B\) - \(C\)](#)]

- [1926.1101\(j\)\(1\)\(ii\)](#) - *Decontamination area entry procedures*. The employer shall ensure that employees: [Reference [paragraph \(j\)\(1\)\(ii\)\(A\) - \(D\)](#)]
- [1926.1101\(j\)\(1\)\(iii\)](#) - *Decontamination area exit procedures*. The employer shall ensure that: [Reference [paragraph \(j\)\(1\)\(iii\)\(A\) - \(E\)](#)]

[1926.1101\(k\)](#) - *Communication of hazards*.

- [1926.1101\(k\)\(1\)](#) - *Hazard communication*. [Reference [paragraph \(k\)\(1\)\(i\) - \(ii\)](#)]
 - [1926.1101\(k\)\(1\)\(ii\)](#) - The employer shall include asbestos 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 asbestos and *safety data sheets*, and is trained in accordance with the provisions of HCS and [paragraphs \(k\)\(9\)](#) and [\(10\)](#) of this section. The employer shall provide *information* on at least the following hazards: Cancer and lung effects.
- [1926.1101\(k\)\(2\)](#) - *Duties of building and facility owners*. [Reference [paragraph \(k\)\(2\)\(i\) - \(ii\)](#)]
- [1926.1101\(k\)\(3\)](#) - *Duties of employers whose employees perform work subject to this standard in or adjacent to areas containing ACM and PACM*. Building/facility owners whose employees perform such work shall comply with these provisions to the extent applicable. [Reference [paragraph \(k\)\(3\)\(i\) - \(iii\)](#)]
- [1926.1101\(k\)\(4\)](#) - In addition to the above requirements, all employers who discover ACM and/or PACM on a worksite shall *convey information* concerning the presence, location and quantity of such newly discovered ACM and/or PACM to the owner and to other employers of employees working at the work site, within 24 hours of the discovery.
- [1926.1101\(k\)\(5\)](#) - *Criteria to rebut the designation of installed material as PACM*. [Reference [paragraph \(k\)\(5\)\(i\) - \(iii\)](#)]
- [1926.1101\(k\)\(6\)](#) - 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*.
- [1926.1101\(k\)\(7\)](#) - *Signs*. [Reference [paragraph \(k\)\(7\)\(i\) - \(iii\)](#)]

- [1926.1101\(k\)\(7\)\(i\)](#) - *Warning signs that demarcate the regulated area* shall be provided and displayed at each location where a regulated area is required to be established by [paragraph \(e\)](#) of this section. *Signs shall be posted at such a distance from such a location that an employee may read the signs and take necessary protective steps before entering the area marked by the signs.*
- [1926.1101\(k\)\(8\)](#) - *Labels.* [Reference [paragraph \(k\)\(8\)\(i\) - \(vii\)](#)]
- [1926.1101\(k\)\(9\)](#) - *Employee Information and Training.* [Reference [paragraph \(k\)\(9\)\(i\) - \(viii\)](#)]
 - [1926.1101\(k\)\(9\)\(i\)](#) - 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.*
- [1926.1101\(k\)\(10\)](#) - *Access to training materials.* [Reference [paragraph \(k\)\(10\)\(i\) - \(iii\)](#)]

[1926.1101\(l\)](#) - *Housekeeping.* [Reference [paragraph \(l\)\(1\) - \(4\)](#)]

[1926.1101\(m\)](#) - *Medical surveillance.* [Reference [paragraph \(m\)\(1\)\(i\)\(A\) - \(B\)](#)]

- [1926.1101\(m\)\(1\)\(i\)\(A\)](#) - The employer shall institute a *medical surveillance program* for all employees who for a combined total of 30 or more days per year are engaged in Class I, II and III work or are exposed at or above a *permissible exposure limit*. For purposes of this paragraph, any day in which a worker engages in Class II or Class III operations or a combination thereof on intact material for one hour or less (taking into account the entire time spent on the removal operation, including cleanup) and, while doing so, adheres fully to the *work practices* specified in this standard, shall not be counted.
- [1926.1101\(m\)\(1\)\(ii\)](#) - *Examination.* [Reference [paragraph \(m\)\(1\)\(ii\)\(A\) - \(B\)](#)]
- [1926.1101\(m\)\(2\)](#) - *Medical examinations and consultations.* [Reference [paragraph \(m\)\(2\)\(i\) - \(ii\)](#)]
- [1926.1101\(m\)\(3\)](#) - *Information provided to the physician.* The employer shall provide the following *information* to the examining *physician*: [Reference [paragraph \(m\)\(3\)\(i\) - \(v\)](#)]
- [1926.1101\(m\)\(4\)](#) - *Physician's written opinion.* [Reference [paragraph \(m\)\(4\)\(i\) - \(iii\)](#)]

[1926.1101\(n\)](#) - *Recordkeeping.*

- [1926.1101\(n\)\(1\)](#) - *Objective data* relied on pursuant to [paragraph \(f\)](#) to this section. [Reference [paragraph \(n\)\(1\)\(i\) - \(iii\)](#)]
- [1926.1101\(n\)\(2\)](#) - *Exposure measurements.* [Reference [paragraph \(n\)\(2\)\(i\) - \(iii\)](#)]
- [1926.1101\(n\)\(3\)](#) - *Medical surveillance.* [Reference [paragraph \(n\)\(3\)\(i\) - \(iii\)](#)]

- [1926.1101\(n\)\(4\)](#) - *Training records*. The employer shall maintain all employee *training records* for one (1) year beyond the last date of employment by that employer.
- [1926.1101\(n\)\(5\)](#) - *Data to Rebut PACM*. Where the *building owner* and employer have relied on *data to demonstrate* that PACM is not asbestos-containing, such *data* shall be maintained for as long as they are relied upon to rebut the presumption.
- [1926.1101\(n\)\(6\)](#) - *Records of required notifications*. Where the *building owner has communicated and received information* concerning the identification, location and quantity of ACM and PACM, *written records* of such *notifications* and their content shall be maintained by the building owner for the duration of *ownership* and shall be transferred to successive owners of such buildings/facilities.
- [1926.1101\(n\)\(7\)](#) - *Availability. Medical surveillance*. [Reference [paragraph \(n\)\(7\)\(i\) - \(ii\)](#)]
 - [1926.1101\(n\)\(7\)\(ii\)](#) - The employer must comply with the requirements concerning availability of *records* set forth in [29 CFR 1910.1020](#) - *access to employee exposure and medical records*.
- [1926.1101\(n\)\(8\)](#) - *Transfer of records*. The employer must comply with the requirements concerning *transfer of records* set forth in [29 CFR 1910.1020\(h\)](#) - *access to employee exposure and medical records*.

[1926.1101\(o\)](#) - *Competent person*.

- [1926.1101\(o\)\(1\)](#) - *General*. On all construction worksites covered by this standard, the employer shall designate a *competent person*, having the *qualifications and authorities* for ensuring worker safety and health required by [subpart C, General Safety and Health Provisions for Construction \(29 CFR 1926.20 through 1926.32\)](#).
- [1926.1101\(o\)\(2\)](#) - *Required inspections by the competent person*. Section [1926.20\(b\)\(2\)](#) which requires *health and safety prevention programs* to provide for *frequent and regular inspections* of the job sites, materials, and equipment to be made by *competent persons*, is incorporated.
- [1926.1101\(o\)\(3\)](#) - *Additional inspections*. In addition, the *competent person* shall make *frequent and regular inspections* of the job sites, in order to perform the *duties* set out below in [paragraph \(o\)\(3\)\(i\)](#) of this section. For Class I jobs, *on-site inspections* shall be made at least once during each work shift, and at any time at employee request. For Class II, III, and IV jobs, *on-site inspections* shall be made at intervals sufficient to assess whether conditions have changed, and at any reasonable time at employee request. [Reference [paragraph \(o\)\(3\)\(i\) - \(ii\)](#)]
- [1926.1101\(o\)\(4\)](#) - *Training for the competent person*. [Reference [paragraph \(o\)\(4\)\(i\) - \(ii\)](#)]

[1926.1101\(p\)\(1\)](#) - *Appendices A - OSHA Reference Method, D - Medical Questionnaire, and E - classification of chest x-rays*, to this section are incorporated as part of this section and the contents of these appendices are *mandatory*.

1926.1102 - Coal Tar Pitch Volatiles; Interpretation of Term

Scope: This [standard](#) provides the interpretation of term coal tar pitch volatiles. See [1910.1002](#) - coal tar pitch volatiles; interpretation of term.

Special Requirements: References other standards

Note: The requirements applicable to construction work under this section are identical to those set forth at [1910.1002](#) - coal tar pitch volatiles; interpretation of term, of this chapter.

1926.1103 - 13 Carcinogens

Scope: This [standard](#) provides the requirements for 13 carcinogens.

Special Requirements: References other standards (See [1910.1003](#) - 13 Carcinogens)

Note: The requirements applicable to construction work under this section are identical to those set forth at [§ 1910.1003](#) - 13 carcinogens, of this chapter.

1926.1104 - Alpha-Naphthylamine

Scope: This [standard](#) provides the requirements for alpha-Naphthylamine.

Special Requirements: References other standards (Refer to [13 Carcinogens](#))

Note: The requirements applicable to construction work under this section are identical to those set forth at [1910.1003](#) of this chapter.

1926.1106 - Methyl Chloromethyl Ether

Scope: This [standard](#) provides the requirements for methyl chloromethyl ether.

Special Requirements: References other standards (Refer to [13 Carcinogens](#))

Note: The requirements applicable to construction work under this section are identical to those set forth at [1910.1003](#) of this chapter.

1926.1107 - 3,4-Dichlorobenzidine (and its salts)

Scope: This [standard](#) provides the requirements for 3,4-Dichlorobenzidine (and its salts).

Special Requirements: References other standards (Refer to [13 Carcinogens](#))

Note: The requirements applicable to construction work under this section are identical to those set forth at [1910.1003](#) of this chapter.

1926.1108 - Bis-Chloromethyl Ether

Scope: This [standard](#) provides the requirements for bis-chloromethyl ether.

Special Requirements: References other standards (Refer to [13 Carcinogens](#))

Note: The requirements applicable to construction work under this section are identical to those set forth at [1910.1003](#) of this chapter.

1926.1109 - Beta-Naphthylamine

Scope: This [standard](#) provides the requirements for beta-Naphthylamine.

Special Requirements: References other standards (Refer to [13 Carcinogens](#))

Note: The requirements applicable to construction work under this section are identical to those set forth at [1910.1003](#) of this chapter.

1926.1110 – Benzidine

Scope: This [standard](#) provides the requirements for benzidine.

Special Requirements: References other standards (Refer to [13 Carcinogens](#))

Note: The requirements applicable to construction work under this section are identical to those set forth at [1910.1003](#) of this chapter.

1926.1111 - 4-Aminodiphenyl

Scope: This [standard](#) provides the requirements for 4-aminodiphenyl.

Special Requirements: References other standards (Refer to [13 Carcinogens](#))

Note: The requirements applicable to construction work under this section are identical to those set forth at [1910.1003](#) of this chapter.

1926.1112 – Ethyleneimine

Scope: This [standard](#) provides the requirements for ethyleneimine.

Special Requirements: References other standards (Refer to [13 Carcinogens](#))

Note: The requirements applicable to construction work under this section are identical to those set forth at [1910.1003](#) of this chapter.

1926.1113 - Beta-Propiolactone

Scope: This [standard](#) provides the requirements for beta-propiolactone.

Special Requirements: References other standards (Refer to [13 Carcinogens](#))

Note: The requirements applicable to construction work under this section are identical to those set forth at [1910.1003](#) of this chapter.

1926.1114 - 2-Acetylaminofluorene

Scope: This [standard](#) provides the requirements for 2-acetylaminofluorene.

Special Requirements: References other standards (Refer to [13 Carcinogens](#))

Note: The requirements applicable to construction work under this section are identical to those set forth at [1910.1003](#) of this chapter.

1926.1115 - 4-dimethylaminoazobenzene

Scope: This [standard](#) provides the requirements for 4-dimethylaminoazobenzene.

Special Requirements: References other standards (Refer to [13 Carcinogens](#))

Note: The requirements applicable to construction work under this section are identical to those set forth at [1910.1003](#) of this chapter.

1926.1116 - N-Nitrosodimethylamine

Scope: This [standard](#) provides the requirements for n-nitrosodimethylamine.

Special Requirements: References other standards (Refer to [13 Carcinogens](#))

Note: The requirements applicable to construction work under this section are identical to those set forth at [1910.1003](#) of this chapter.

1926.1117 - Vinyl Chloride

Scope: This [standard](#) provides the requirements pertaining to vinyl chloride.

Special Requirements: References other standards (Refer to [1910.1017](#) - vinyl chloride.)

Note: The requirements applicable to construction work under this section are identical to those set forth at [1910.1017](#) of this chapter.

1926.1118 - Inorganic Arsenic

Scope: This [standard](#) provides the requirements pertaining to inorganic arsenic.

Special Requirements: References other standards (Refer to [1910.1118](#) - inorganic arsenic)

Note: The requirements applicable to construction work under this section are identical to those set forth at [1910.1018](#) of this chapter.

1926.1124 – Beryllium

Scope: This [standard](#) provides the requirements pertaining to beryllium.

Special Requirements: Permissible exposure limit, time-weighted average, short-term exposure limit, exposure assessment, scheduled monitoring option, perform, assess, job classification, methods, employee notification, assessment results, corrective action (written notification), observation of monitoring, exposure monitoring, competent person, inspections, exposure control plan (written), respiratory protection, personal protective clothing and equipment, methods of compliance, engineering controls, respiratory protection program, housekeeping, medical surveillance, physician, determine, advise, examination, medical surveillance program, information, description, written medical report, statement, work practices, list, procedures, evaluate, notify, train, qualified, hazard communication, hazard communication program, labels, safety data sheets, information, records, recordkeeping, safety and health procedures, data, designate, chemical manufacturers, importers, distributors, references other standards

[1926.1124\(c\)](#) - *Permissible Exposure Limits (PELs)*. [Reference [paragraph \(c\)\(1\) - \(2\)](#)].

[1926.1124\(d\)](#) - *Exposure assessment*. [Reference [paragraph \(d\)\(1\) - \(7\)](#)].

- [1926.1124\(d\)\(2\)](#) - *Performance option*. The employer must assess the 8-hour TWA exposure and the 15-minute short-term exposure for each employee on the basis of any combination of *air monitoring data and objective data* sufficient to accurately characterize airborne exposure to beryllium.
- [1926.1124\(d\)\(3\)](#) - *Scheduled monitoring option*. [Reference [paragraph \(d\)\(3\)\(i\) - \(viii\)](#)].
- [1926.1124\(d\)\(4\)](#) - *Reassessment of exposure*. The employer must *reassess* airborne exposure whenever a change in the production, process, control equipment, personnel, or *work practices* may reasonably be expected to result in new or additional airborne exposure at or above the *action level or STEL*, or when the

employer has any reason to believe that new or additional airborne exposure at or above the *action level* or *STEL* has occurred.

- [1926.1124\(d\)\(5\)](#) - *Methods of sample analysis*. The employer must ensure that all air monitoring samples used to satisfy the *monitoring* requirements of [paragraph \(d\)](#) of this standard are *evaluated* by a laboratory that can measure beryllium to an accuracy of plus or minus 25 percent within a statistical confidence level of 95 percent for airborne concentrations at or above the *action level*.
- [1926.1124\(d\)\(6\)](#) - *Employee notification of assessment results*.
[Reference [paragraph \(d\)\(6\)\(i\) - \(ii\)](#)].
- [1926.1124\(d\)\(7\)](#) - *Observation of monitoring*. [Reference [paragraph \(d\)\(7\)\(i\) - \(iii\)](#)].

[1926.1124\(e\)](#) - *Competent person*. Wherever employees are, or can reasonably be expected to be, exposed to airborne beryllium at levels above the *TWA PEL* or *STEL*, the employer must *designate a competent person* to: [Reference [paragraph \(e\)\(1\) - \(4\)](#)].

- [1926.1124\(e\)\(1\)](#) - Make frequent and regular *inspections* of job sites, materials, and equipment;

[1926.1124\(f\)](#) - *Methods of compliance*. [Reference [paragraph \(f\)\(1\) - \(3\)](#)].

- [1926.1124\(f\)\(1\)](#) - *Written exposure control plan*.
 - [1926.1124\(f\)\(1\)\(i\)](#) - The employer must establish, implement, and maintain a *written exposure control plan*, which must contain: [Reference [paragraph \(f\)\(1\)\(i\)\(A\) - \(E\)](#)].
 - [1926.1124\(f\)\(1\)\(ii\)](#) - The employer must review and *evaluate the effectiveness of each written exposure control plan* at least annually and update it, as necessary, when: [Reference [paragraph \(f\)\(1\)\(ii\)\(A\) - \(C\)](#)].
 - [1926.1124\(f\)\(1\)\(iii\)](#) - The employer must make a *copy* of the *written exposure control plan* accessible to each employee who is, or can reasonably be expected to be, exposed to airborne beryllium in accordance with OSHA's *Access to Employee Exposure and Medical Records (Records Access) standard* [[29 CFR 1910.1020\(e\)](#)].
- [1926.1124\(f\)\(2\)](#) - *Engineering and work practice controls*. The employer must use *engineering and work practice controls* to reduce and maintain employee airborne exposure to beryllium to or below the *TWA PEL and STEL*, unless the employer can *demonstrate* that such controls are not feasible. Wherever the employer *demonstrates* that it is not feasible to reduce airborne exposure to or below the *PELs with engineering and work practice controls*, the employer must implement and maintain *engineering and work practice controls* to reduce airborne exposure to the lowest levels feasible and supplement these *controls* by using *respiratory protection* in accordance with [paragraph \(g\)](#) of this standard.

[1926.1124\(g\)](#) - *Respiratory protection*. [Reference [paragraph \(g\)\(1\) - \(3\)](#)].

- [1926.1124\(g\)\(2\)](#) - *Respiratory protection program*. Where this standard requires an employer to provide *respiratory protection*, the selection and use of such *respiratory protection* must be in accordance with the *Respiratory Protection standard (29 CFR 1910.134)*.

[1926.1124\(h\)](#) - *Personal protective clothing and equipment*.

- [1926.1124\(h\)\(1\)](#) - *Provision and use*. Where airborne exposure exceeds, or can reasonably be expected to exceed, the *TWA PEL or STEL*, the employer must provide at no cost, and ensure that each employee uses, appropriate *personal protective clothing and equipment* in accordance with the *written exposure control plan* required under [paragraph \(f\)\(1\)](#) of this standard and *OSHA's Personal Protective and Life Saving Equipment standards for construction (Subpart E of this part)*.
- [1926.1124\(h\)\(2\)](#) - *Removal of personal protective clothing and equipment*. [Reference [paragraph \(h\)\(2\)\(i\) - \(iii\)](#)].
- [1926.1124\(h\)\(3\)](#) - *Cleaning and replacement*. [Reference [paragraph \(h\)\(3\)\(i\) - \(iii\)](#)].

[1926.1124\(j\)](#) - *Housekeeping*. [Reference [paragraph \(j\)\(1\) - \(5\)](#)].

[1926.1124\(k\)](#) - *Medical surveillance*. [Reference [paragraph \(k\)\(1\) - \(7\)](#)].

- [1926.1124\(k\)\(2\)](#) - *Frequency*. The employer must provide a *medical examination*: [Reference [paragraph \(k\)\(2\)\(i\) - \(iii\)](#)].
- [1926.1124\(k\)\(3\)](#) - *Contents of examination*. [Reference [paragraph \(k\)\(3\)\(i\) - \(ii\)](#)].
- [1926.1124\(k\)\(4\)](#) - *Information provided to the PLHCP*. The employer must ensure that the examining *PLHCP* (and the agreed-upon *CBD diagnostic center*, if an *evaluation* is required under [paragraph \(k\)\(7\)](#) of this standard) has a *copy* of this standard and must provide the following *information*, if known: [Reference [paragraph \(k\)\(4\)\(i\) - \(iv\)](#)].
- [1926.1124\(k\)\(5\)](#) - *Licensed physician's written medical report for the employee*. The employer must ensure that the employee receives a *written medical report* from the *licensed physician* within 45 days of the examination (including any follow-up *BeLPT* required under [paragraph \(k\)\(3\)\(ii\)\(E\)](#) of this standard) and that the *PLHCP* explains the *results* of the *examination* to the employee. The *written medical report* must contain: [Reference [paragraph \(k\)\(5\)\(i\) - \(v\)](#)].
- [1926.1124\(k\)\(6\)](#) - *Licensed physician's written medical opinion for the employer*. [Reference [paragraph \(k\)\(6\)\(i\) - \(vi\)](#)].
- [1926.1124\(k\)\(7\)](#) - *CBD diagnostic center*. [Reference [paragraph \(k\)\(7\)\(i\) - \(vi\)](#)].

[1926.1124\(l\)](#) - *Medical removal*. [Reference [paragraph \(l\)\(1\) - \(4\)](#)].

[1926.1124\(m\)](#) - *Communication of hazards*. [Reference [paragraph \(m\)\(1\) - \(2\)](#)].

- [1926.1124\(m\)\(1\)\(i\)](#) - *Chemical manufacturers, importers, distributors, and employers must comply with all requirements of the HCS ([29 CFR 1910.1200](#)) for beryllium.*
- [1926.1124\(m\)\(1\)\(ii\)](#) - *Employers must include beryllium in the *hazard communication program* established to comply with the HCS. Employers must ensure that each employee has access to *labels* on containers of beryllium and to *safety data sheets*, and is *trained* in accordance with the requirements of the HCS ([29 CFR 1910.1200](#)) and [paragraph \(m\)\(4\)](#) of this standard.*

[1926.1124\(n\)](#) - *Recordkeeping.*

- [1926.1124\(n\)\(1\)](#) - *Air monitoring data.* [Reference [paragraph \(n\)\(1\)\(i\) - \(iii\)](#)].
- [1926.1124\(n\)\(2\)](#) - *Objective data.* [Reference [paragraph \(n\)\(2\)\(i\) - \(iii\)](#)].
- [1926.1124\(n\)\(3\)](#) - *Medical surveillance.* [Reference [paragraph \(n\)\(3\)\(i\) - \(iii\)](#)].
- [1926.1124\(n\)\(4\)](#) - *Training.* [Reference [paragraph \(n\)\(4\)\(i\) - \(ii\)](#)].
- [1926.1124\(n\)\(5\)](#) - *Access to records.* Upon request, the employer must make all *records* maintained as a requirement of this standard available for examination and *copying* to the Assistant Secretary, the Director, each employee, and each employee's designated representative(s) in accordance the *Records Access standard ([29 CFR 1910.1020](#))*.
- [1926.1124\(n\)\(6\)](#) - *Transfer of records.* The employer must comply with the requirements involving transfer of *records* set forth in the *Records Access standard ([29 CFR 1910.1020](#))*.

1926.1126 - Chromium (VI)

Scope: This [standard](#) provides the requirements pertaining to chromium (VI) exposures.

Special Requirements: Permissible exposure limit, exposure determination, scheduled monitoring, time-weighted average, monitoring, job classification, sampling, employee notification, results, methods, measurements, observation, regulated areas, demarcation, methods of compliance, engineering controls, work practice controls, demonstrate, respiratory protection, respiratory protection program, PPE, labels, hazard communication, hazard communication program, hygiene areas and practices (i.e., washing facilities, change rooms), housekeeping, medical surveillance, description, information, physician, written medical opinion, affected employees, records, safety data sheets, data, training, testing protocol, distributors, examinations, reference other standards

[1926.1126\(c\)](#) - *Permissible exposure limit (PEL).* The employer shall ensure that no employee is exposed to an airborne concentration of chromium (VI) in excess of 5 micrograms per cubic meter of air ($5 \mu\text{g}/\text{m}^3$), calculated as an *8-hour time-weighted average (TWA)*.

[1926.1126\(d\)](#) - *Exposure determination.* [Reference [paragraph \(d\)\(1\) - \(6\)](#)].

- [1926.1126\(d\)\(2\)](#) - *Scheduled monitoring option*. [Reference [paragraph \(d\)\(2\)\(i\) - \(vi\)](#)].
- [1926.1126\(d\)\(3\)](#) - *Performance-oriented option*. The employer shall determine the 8-hour TWA exposure for each employee on the basis of any combination of *air monitoring data, historical monitoring data, or objective data* sufficient to accurately characterize employee exposure to chromium (VI).
- [1926.1126\(d\)\(4\)](#) - *Employee notification of determination results*. [Reference [paragraph \(d\)\(4\)\(i\) - \(ii\)](#)].
- [1926.1126\(d\)\(5\)](#) - *Accuracy of measurement*. Where *air monitoring* is performed to comply with the requirements of this section, the employer shall use a *method of monitoring and analysis* that can measure chromium (VI) to within an accuracy of plus or minus 25 percent ($\pm 25\%$) and can produce accurate *measurements* to within a statistical confidence level of 95 percent for airborne concentrations at or above the action level.
- [1926.1126\(d\)\(6\)](#) - *Observation of monitoring*. [Reference [paragraph \(d\)\(6\)\(i\) - \(ii\)](#)].
 - [1926.1126\(d\)\(6\)\(ii\)](#) - When *observation of monitoring* requires entry into an area where the use of *protective clothing or equipment* is required, the employer shall provide the *observer* with *clothing and equipment* and shall assure that the *observer* uses such *clothing and equipment* and complies with all other applicable *safety and health procedures*.

[1926.1126\(e\)](#) - *Methods of compliance*.

- [1926.1126\(e\)\(1\)](#) - *Engineering and work practice controls*. [Reference [paragraph \(e\)\(1\) - \(2\)](#)].

[1926.1126\(f\)](#) - *Respiratory protection*.

- [1926.1126\(f\)\(1\)](#) - *General*. Where *respiratory protection* is required by this section, the employer must provide each employee an appropriate respirator that complies with the requirements of this paragraph. *Respiratory protection* is required during: [Reference [paragraph \(f\)\(1\)\(i\) - \(v\)](#)].
- [1926.1126\(f\)\(2\)](#) - *Respiratory protection program*. Where *respirator* use is required by this section, the employer shall institute a *respiratory protection program* in accordance with [§ 1910.134](#), which covers each employee required to use a *respirator*.

[1926.1126\(g\)](#) - *Protective work clothing and equipment*.

- [1926.1126\(g\)\(1\)](#) - *Provision and use*. Where a hazard is present or is likely to be present from skin or eye contact with chromium (VI), the employer shall provide appropriate *personal protective clothing and equipment* at no cost to employees, and shall ensure that employees use such *clothing and equipment*.
- [1926.1126\(g\)\(2\)](#) - *Removal and storage*. [Reference [paragraph \(g\)\(2\)\(i\) - \(iv\)](#)].

- [1926.1126\(g\)\(2\)\(iv\)](#) - The employer shall ensure that bags or containers of contaminated protective clothing or equipment that are removed from change rooms for laundering, cleaning, maintenance, or disposal shall be *labeled* in accordance with the requirements of the *Hazard Communication Standard*, [§ 1910.1200](#).
- [1926.1126\(g\)\(3\)](#) - *Cleaning and replacement*. [Reference [paragraph \(g\)\(3\)\(i\) - \(iii\)](#)].
 - [1926.1126\(g\)\(3\)\(iii\)](#) - The employer shall *inform* any person who launders or cleans protective clothing or equipment contaminated with chromium (VI) of the potentially harmful effects of exposure to chromium (VI) and that the clothing and equipment should be laundered or cleaned in a manner that minimizes skin or eye contact with chromium (VI) and effectively prevents the release of airborne chromium (VI) in excess of the PEL.

[1926.1126\(h\)](#) - *Hygiene areas and practices*. [Reference [paragraph \(h\)\(1\) - \(5\)](#)].

- [1926.1126\(h\)\(1\)](#) - General. Where *protective clothing and equipment* is required, the employer shall provide change rooms in conformance with [29 CFR 1926.51 - sanitation](#). Where skin contact with chromium (VI) occurs, the employer shall provide washing facilities in conformance with [29 CFR 1926.51 - sanitation](#). Eating and drinking areas provided by the employer shall also be in conformance with [29 CFR 1926.51 - sanitation](#).

[1926.1126\(i\)](#) - *Medical surveillance*. [Reference [paragraph \(i\)\(1\) - \(5\)](#)].

- [1926.1126\(i\)\(2\)](#) - *Frequency*. The employer shall provide a *medical examination*: [Reference [paragraph \(i\)\(2\)\(i\) - \(vi\)](#)].
- [1926.1126\(i\)\(3\)](#) - *Contents of examination*. A *medical examination* consists of: [Reference [paragraph \(i\)\(3\)\(i\) - \(iii\)](#)].
- [1926.1126\(i\)\(4\)](#) - *Information provided to the PLHCP*. The employer shall ensure that the examining *PLHCP has a copy* of this standard, and shall provide the following *information*: [Reference [paragraph \(i\)\(4\)\(i\) - \(iv\)](#)].
- [1926.1126\(i\)\(5\)](#) - *PLHCP's written medical opinion*. [Reference [paragraph \(i\)\(5\)\(i\) - \(iii\)](#)].

[1926.1126\(j\)](#) - *Communication of chromium (VI) hazards to employees*.

- [1926.1126\(j\)\(1\)](#) - *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.

- [1926.1126\(j\)\(2\)](#) - *Employee information and training*. [Reference [paragraph \(j\)\(2\)\(i\) - \(ii\)](#)].

[1926.1126\(k\)](#) - *Recordkeeping*.

- [1926.1126\(k\)\(1\)](#) - *Air monitoring data*. [Reference [paragraph \(k\)\(1\)\(i\) - \(iii\)](#)].
 - [1926.1126\(k\)\(1\)\(iii\)](#) - The employer shall ensure that *exposure records* are maintained and made available in accordance with [29 CFR 1910.1020 - access to employee exposure and medical records](#).
- [1926.1126\(k\)\(2\)](#) - *Historical monitoring data*. [Reference [paragraph \(k\)\(2\)\(i\) - \(iii\)](#)].
 - [1926.1126\(k\)\(2\)\(iii\)](#) - The employer shall ensure that *historical exposure records* are maintained and made available in accordance with [29 CFR 1910.1020 - access to employee exposure and medical records](#).
- [1926.1126\(k\)\(3\)](#) - *Objective data*. [Reference [paragraph \(k\)\(3\)\(i\) - \(iii\)](#)].
 - [1926.1126\(k\)\(3\)\(iii\)](#) - The employer shall ensure that *objective data* are maintained and made available in accordance with [29 CFR 1910.1020 - access to employee exposure and medical records](#).
- [1926.1126\(k\)\(4\)](#) - *Medical surveillance*. [Reference [paragraph \(k\)\(4\)\(i\) - \(iii\)](#)].
 - [1926.1126\(k\)\(4\)\(iii\)](#) - The employer shall ensure that *medical records* are maintained and made available in accordance with [29 CFR 1910.1020 - access to employee exposure and medical records](#).

1926.1127 – Cadmium

Scope: This [standard](#) provides the requirements pertaining to cadmium.

Special Requirements: Permissible exposure limit, exposure monitoring, determine, communication, reporting, hazard communication, hazard communication program, warning signs, labels, training, training program, data, post, competent person, records, reports, plans, action level, employee notification, notify, monitoring results, regulated areas, demarcation, authorized person, respirators, methods of compliance, safety data sheets, engineering controls, work practice controls, methods, measurements, procedures, compliance program (written), respirator program, examination, emergency situation (written), protective clothing and equipment, PPE, hygiene areas and practices (i.e., change rooms, showers), housekeeping, medical surveillance, medical surveillance program, physician, reassess, assess, records, recordkeeping, information, observation, written consent, safety and health procedures, description, affected employee, copy of standard, written medical opinion, medical removal protection benefits, references other standards

[1926.1127\(c\)](#) - *Permissible Exposure Limit (PEL)*. The employer shall assure that no employee is exposed to an airborne concentration of cadmium in excess of five micrograms per cubic meter of air (5 $\mu\text{g}/\text{m}^3$), calculated as an eight-hour *time-weighted average exposure (TWA)*.

1926.1127(d) - Exposure Monitoring. [Reference [paragraph \(d\)\(1\) - \(6\)](#)].

- [1926.1127\(d\)\(2\)](#) - *Specific. (Initial monitoring)*. [Reference [paragraph \(d\)\(2\)\(i\) - \(iv\)](#)].
- [1926.1127\(d\)\(3\)](#) - *Monitoring frequency (periodic monitoring)*. [Reference [paragraph \(d\)\(3\)\(i\) - \(ii\)](#)].
- [1926.1127\(d\)\(4\)](#) - *Additional monitoring*. The employer also shall institute the *exposure monitoring* required under [paragraphs \(d\)\(2\)\(i\)](#) and [\(d\)\(3\)](#) of this section whenever there has been a change in the raw materials, equipment, personnel, *work practices*, or finished products that may result in additional employees being exposed to cadmium at or above the *action level* or in employees already exposed to cadmium at or above the *action level* being exposed above the *PEL*, or whenever the employer or *competent person* has any reason to suspect that any other change might result in such further exposure.
- [1926.1127\(d\)\(5\)](#) - *Employee notification of monitoring results*. [Reference [paragraph \(d\)\(5\)\(i\) - \(ii\)](#)].
- [1926.1127\(d\)\(6\)](#) - *Accuracy of measurement*. The employer shall use a *method of monitoring and analysis* that has an accuracy of not less than plus or minus 25 percent ($\pm 25\%$), with a confidence level of 95 percent, for airborne concentrations of cadmium at or above the *action level* and the *permissible exposure limit*.

1926.1127(e) - Regulated areas. [Reference [paragraph \(e\)\(1\) - \(5\)](#)].

- [1926.1127\(e\)\(2\)](#) - *Demarcation*. *Regulated areas shall be demarcated* from the rest of the workplace in any manner that adequately establishes and *alerts employees* of the boundaries of the *regulated area*, including employees who are or may be incidentally in the *regulated areas*, and that protects persons outside the area from exposure to airborne concentrations of cadmium in excess of the *PEL*.
- [1926.1127\(e\)\(3\)](#) - *Access*. Access to *regulated areas* shall be limited to *authorized persons*.

1926.1127(f) - Methods of compliance. [Reference [paragraph \(f\)\(1\) - \(5\)](#)].

- [1926.1127\(f\)\(1\)](#) - *Compliance hierarchy*. [Reference [paragraph \(f\)\(1\)\(i\) - \(iv\)](#)].
 - [1926.1127\(f\)\(1\)\(i\)](#) - Except as specified in [paragraph \(f\)\(1\)\(ii\)](#) of this section, the employer shall implement *engineering and work practice controls* to reduce and maintain employee exposure to cadmium at or below the *PEL*, except to the extent that the employer can *demonstrate* that such *controls* are not feasible.
 - [1926.1127\(f\)\(1\)\(ii\)](#) - The requirement to implement *engineering controls* to achieve the *PEL* does not apply where the employer *demonstrates* the following: [Reference [paragraph \(f\)\(1\)\(ii\)\(A\) - \(B\)](#)].
- [1926.1127\(f\)\(2\)](#) - *Specific operations*. [Reference [paragraph \(f\)\(2\)\(i\) - \(ii\)](#)].
 - [1926.1127\(f\)\(2\)\(ii\)](#) - Heating cadmium and cadmium-containing materials. Welding, cutting, and other forms of heating of cadmium or

cadmium-containing materials shall be conducted in accordance with the requirements of [29 CFR 1926.353](#) - *ventilation and protection in welding, cutting, and heating*, and [29 CFR 1926.354](#) - *welding, cutting, and heating in way of preservative coatings*, where applicable.

- [1926.1127\(f\)\(3\)](#) - *Prohibitions*. [Reference [paragraph \(f\)\(3\)\(i\) - \(ii\)](#)].
- [1926.1127\(f\)\(4\)](#) - *Mechanical ventilation*. [Reference [paragraph \(f\)\(4\)\(i\) - \(iv\)](#)].
 - [1926.1127\(f\)\(4\)\(iv\)](#) - *Procedures* shall be developed and implemented to minimize employee exposure to cadmium when maintenance of ventilation systems and changing of filters is being conducted.
- [1926.1127\(f\)\(5\)](#) - *Compliance program*. [Reference [paragraph \(f\)\(5\)\(i\) - \(iv\)](#)].
 - [1926.1127\(f\)\(5\)\(i\)](#) - Where employee exposure to cadmium exceeds the *PEL* and the employer is required under [paragraph \(f\)\(1\)](#) of this section to implement *controls* to comply with the *PEL*, prior to the commencement of the job the employer shall establish and implement a *written compliance program* to reduce employee exposure to or below the *PEL*. To the extent that *engineering and work practice controls* cannot reduce exposures to or below the *PEL*, the employer shall include in the *written compliance program* the use of appropriate *respiratory protection* to achieve compliance with the *PEL*.
 - [1926.1127\(f\)\(5\)\(ii\)](#) - *Written compliance programs* shall be *reviewed and updated* as often and as promptly as necessary to reflect significant changes in the employer's compliance status or significant changes in the lowest air cadmium level that is technologically feasible.
 - [1926.1127\(f\)\(5\)\(iii\)](#) - A *competent person* shall review the *comprehensive compliance program* initially and after each change.

[1926.1127\(g\)](#) - *Respirator protection*.

- [1926.1127\(g\)\(1\)](#) - *General*. For employees who use *respirators* required by this section, the employer must provide each employee an appropriate *respirator* that complies with the requirements of this paragraph. *Respirators* must be used during: [Reference [paragraph \(g\)\(1\)\(i\) - \(vii\)](#)].
- [1926.1127\(g\)\(2\)](#) - *Respirator program*.
 - [1926.1127\(g\)\(2\)\(i\)](#) - The employer must implement a *respiratory protection program* in accordance with [§1910.134 \(b\) through \(d\) \(except \(d\)\(1\)\(iii\)\), and \(f\) through \(m\)](#), which covers each employee required by this section to use a *respirator*. [Reference [paragraph \(g\)\(2\)\(i\) - \(iii\)](#)].
- [1926.1127\(g\)\(3\)](#) - *Respirator selection*. [Reference [paragraph \(g\)\(3\)\(i\) - \(ii\)](#)].

[1926.1127\(h\)](#) - *Emergency situations*. The employer shall develop and implement a *written plan* for dealing with *emergency situations* involving substantial releases of airborne cadmium. The *plan* shall include provisions for the use of appropriate *respirators and personal protective equipment*. In addition, employees not essential to correcting

the *emergency situation* shall be restricted from the area and normal operations halted in that area until the emergency is abated.

1926.1127(i) - Protective work clothing and equipment. [Reference [paragraph \(i\)\(1\) - \(3\)](#)].

- 1926.1127(i)(1) - Provision and use. If an employee is exposed to airborne cadmium above the PEL or where skin or eye irritation is associated with cadmium exposure at any level, the employer shall provide at no cost to the employee, and assure that the employee uses, appropriate *protective work clothing and equipment* that prevents contamination of the employee and the employee's garments. *Protective work clothing and equipment* includes, but is not limited to: [Reference [paragraph \(i\)\(1\)\(i\) - \(iii\)](#)].
- 1926.1127(i)(2) - Removal and storage. [Reference [paragraph \(i\)\(2\)\(i\) - \(iv\)](#)].
- 1926.1127(i)(3) - Cleaning, replacement, and disposal. [Reference [paragraph \(i\)\(3\)\(i\) - \(v\)](#)].
 - 1926.1127(i)(3)(v) - The employer shall *inform* any person who launders or cleans *protective clothing or equipment* contaminated with cadmium of the potentially harmful effects of exposure to cadmium, and that the *clothing and equipment* should be laundered or cleaned in a manner to effectively prevent the release of airborne cadmium in excess of the *PEL*.

1926.1127(j) - Hygiene areas and practices. [Reference [paragraph \(j\)\(1\) - \(4\)](#)].

- 1926.1127(j)(1) - General. For employees whose airborne exposure to cadmium is above the *PEL*, the employer shall provide *clean change rooms, handwashing facilities, showers, and lunchroom facilities* that comply with [29 CFR 1926.51 - sanitation](#).

1926.1127(k) - Housekeeping. [Reference [paragraph \(k\)\(1\) - \(7\)](#)].

1926.1127(l) - Medical Surveillance. [Reference [paragraph \(l\)\(1\) - \(16\)](#)].

- 1926.1127(l)(2) - Initial Examination. [Reference [paragraph \(l\)\(2\)\(i\) - \(iii\)](#)].
- 1926.1127(l)(3) - Actions triggered by initial biological monitoring. [Reference [paragraph \(l\)\(3\)\(i\) - \(iv\)](#)].
- 1926.1127(l)(4) - Periodic medical surveillance. [Reference [paragraph \(l\)\(4\)\(i\) - \(vi\)](#)].
- 1926.1127(l)(5) - Actions triggered by medical examinations. [Reference [paragraph \(l\)\(5\)\(i\)](#)].
- 1926.1127(l)(6) - Examination for respirator use. [Reference [paragraph \(l\)\(6\)\(i\) - \(iv\)](#)].
- 1926.1127(l)(7) - Emergency Examinations. [Reference [paragraph \(l\)\(7\)\(i\) - \(ii\)](#)].
- 1926.1127(l)(8) - Termination of employment examination. [Reference [paragraph \(l\)\(8\)\(i\) - \(ii\)](#)].

- [1926.1127\(l\)\(9\)](#) - *Information provided to the physician.* The employer shall provide the following *information* to the examining *physician*: [Reference [paragraph \(l\)\(9\)\(i\) - \(v\)](#)].
- [1926.1127\(l\)\(10\)](#) - *Physician's written medical opinion.* [Reference [paragraph \(l\)\(10\)\(i\) - \(iii\)](#)].
- [1926.1127\(l\)\(11\)](#) - *Medical Removal Protection (MRP).* [Reference [paragraph \(l\)\(11\)\(i\) - \(vi\)](#)].
- [1926.1127\(l\)\(12\)](#) - *Medical removal protection benefits.* [Reference [paragraph \(l\)\(12\)\(i\) - \(iv\)](#)].
- [1926.1127\(l\)\(13\)](#) - *Multiple physician review.* [Reference [paragraph \(l\)\(13\)\(i\) - \(v\)](#)].
- [1926.1127\(l\)\(14\)](#) - *Alternate physician determination.* The employer and an employee or designated employee representative may agree upon the use of any alternate form of *physician determination* in lieu of the multiple physician review provided by [paragraph \(l\)\(13\)](#) of this section, so long as the alternative is expeditious and at least as protective of the employee.
- [1926.1127\(l\)\(15\)](#) - *Information the employer must provide the employee.* [Reference [paragraph \(l\)\(15\)\(i\) - \(iii\)](#)].
- [1926.1127\(l\)\(16\)](#) - *Reporting.* In addition to other medical events that are required to be reported on the OSHA Form No. 200, the employer shall report any abnormal condition or disorder caused by occupational exposure to cadmium associated with employment as specified in Chapter (V)(E) of the *Reporting Guidelines for Occupational Injuries and Illnesses*.

[1926.1127\(m\)](#) - *Communication of cadmium hazards to employees.*

- [1926.1127\(m\)\(1\)](#) - *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.
- [1926.1127\(m\)\(2\)](#) - *Warning signs.* [Reference [paragraph \(m\)\(2\)\(i\) - \(iv\)](#)]
 - [1926.1127\(m\)\(2\)\(i\)](#) - *Warning signs* shall be provided and displayed in *regulated areas*. In addition, *warning signs shall be posted* at all approaches to *regulated areas* so that an employee may read the *signs* and take necessary protective steps before entering the area.
- [1926.1127\(m\)\(3\)](#) - *Warning labels.* [Reference [paragraph \(m\)\(3\)\(i\) - \(iv\)](#)].
- [1926.1127\(m\)\(4\)](#) - *Employee information and training.*
 - [1926.1127\(m\)\(4\)\(i\)](#) - 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*. [Reference [paragraph \(m\)\(4\)\(i\) - \(iv\)](#)].

- [1926.1127\(m\)\(5\)](#) - *Multi-employer workplace*. In a multi-employer workplace, an employer who produces, uses, or stores cadmium in a manner that may expose employees of other employers to cadmium shall notify those employers of the potential hazard in accordance with [paragraph \(e\)](#) of the *hazard communication standard for construction*, [29 CFR 1926.59](#) (refers back to [1910.1200](#)).

[1926.1127\(n\)](#) - *Recordkeeping*.

- [1926.1127\(n\)\(1\)](#) - *Exposure monitoring*. [Reference [paragraph \(n\)\(1\)\(i\) - \(iv\)](#)].
- [1926.1127\(n\)\(2\)](#) - *Objective data for exemption from requirement for initial monitoring*. [Reference [paragraph \(n\)\(2\)\(i\) - \(ii\)](#)].
- [1926.1127\(n\)\(3\)](#) - *Medical surveillance*. [Reference [paragraph \(n\)\(3\)\(i\) - \(iv\)](#)].
 - [1926.1127\(n\)\(3\)\(iii\)](#) - The employer shall assure that this record is maintained for the duration of employment plus thirty (30) years, in accordance with [29 CFR 1910.1020](#) - *access to employee exposure and medical records*, of this chapter.
- [1926.1127\(n\)\(4\)](#) - *Availability*. [Reference [paragraph \(n\)\(4\)\(i\) - \(ii\)](#)].
 - [1926.1127\(n\)\(4\)\(i\)](#) - Except as otherwise provided for in this section, access to all *records* required to be maintained by [paragraphs \(n\)\(1\) through \(3\)](#) of this section shall be in accordance with the provisions of [29 CFR 1910.1020](#) - *access to employee exposure and medical records*.

[1926.1127\(o\)](#) - *Observation of monitoring*. [Reference [paragraph \(o\)\(1\) - \(2\)](#)].

- [1926.1127\(o\)\(2\)](#) - *Observation procedures*. When observation of *monitoring* requires entry into an area where the use of *protective clothing or equipment* is required, the employer shall provide the observer with that *clothing and equipment* and shall assure that the *observer* uses such *clothing and equipment* and complies with all other applicable *safety and health procedures*.

1926.1128 – Benzene

Scope: This [standard](#) provides the requirements pertaining to benzene.

Special Requirements: References other standards (Refer to [1910.1028](#) - benzene)

Note: The requirements applicable to construction work under this section are identical to those set forth at [1910.1028](#) of this chapter.

1926.1144 - 1,2-dibromo-3-chloropropane

Scope: This [standard](#) provides the requirements pertaining to 1,2-dibromo-3-chloropropane.

Special Requirements: References other standards (Refer to [1910.1044](#) - 1,2-dibromo-3-chloropropane)

Note: The requirements applicable to construction work under this section are identical to those set forth at [1910.1044](#) of this chapter.

1926.1145 – Acrylonitrile

Scope: This [standard](#) provides the requirements pertaining to acrylonitrile.

Special Requirements: References other standards (Refer to [1910.1045](#) - acrylonitrile)

Note: The requirements applicable to construction work under this section are identical to those set forth at [1910.1045](#) of this chapter.

1926.1147 - Ethylene Oxide

Scope: This [standard](#) provides the requirements pertaining to ethylene oxide.

Special Requirements: References other standards (Refer to [1910.1047](#) - ethylene oxide)

Note: The requirements applicable to construction work under this section are identical to those set forth at [1910.1047](#) of this chapter.

1926.1148 – Formaldehyde

Scope: This [standard](#) provides the requirements for formaldehyde.

Special Requirements: References other standards (Refer to [1910.1048](#) - formaldehyde)

Note: The requirements applicable to construction work under this section are identical to those set forth at [1910.1048](#) of this chapter.

1926.1152 - Methylene Chloride

Scope: This [standard](#) provides the requirements pertaining to methylene chloride.

Special Requirements: References other standards (Refer to [1910.1052](#) - methylene chloride)

Note: The requirements applicable to construction employment under this section are identical to those set forth at 29 CFR [1910.1052](#).

1926.1153 - Respirable Crystalline Silica

Scope: This [standard](#) provides the requirements pertaining to silica exposure.

Special Requirements: Exposure control methods, engineering controls, work practice controls, respiratory protection, assess, control measures, PEL, exposure assessment, data, scheduled monitoring, sampling, action level, reassessment, notification of results, notify, in writing, posting, written notice of corrective actions, affected employees, observation of monitoring, observe, respirators, respiratory protection program, control methods, housekeeping, written exposure control plan, description, procedures, competent person, inspections, medical surveillance, examinations, medical history, physician, pulmonary function test, information, statement, written medical report, written medical opinion, hazard communication, safety data sheets, labels, hazard communication program, training, demonstrate, recordkeeping, records, references other standards

[1926.1153\(c\)](#) - *Specified exposure control methods.*

- [1926.1153\(c\)\(1\)](#) - For each employee engaged in a task identified on [Table 1](#) - Specified Exposure Control Methods When Working With Materials Containing Crystalline Silica, the employer shall fully and properly implement the *engineering controls, work practices, and respiratory protection* specified for the task on [Table 1](#), unless the employer *assesses* and limits the exposure of the employee to respirable crystalline silica in accordance with [paragraph \(d\)](#) of this section.
- [1926.1153\(c\)\(2\)](#) - When implementing the *control measures* specified in [Table 1](#) - Specified Exposure Control Methods When Working With Materials Containing Crystalline Silica, each employer shall: [Reference [paragraph \(c\)\(2\)\(i\) - \(iii\)](#)].
- [1926.1153\(c\)\(3\)](#) - Where an employee performs more than one task on [Table 1](#) during the course of a shift, and the total duration of all tasks combined is more than four hours, the required *respiratory protection* for each task is the *respiratory protection* specified for more than four hours per shift. If the total duration of all tasks on [Table 1](#) combined is less than four hours, the required *respiratory protection* for each task is the *respiratory protection* specified for less than four hours per shift.

[1925.1153\(d\)](#) - *Alternative exposure control methods.* For tasks not listed in [Table 1](#), or where the employer does not fully and properly implement the *engineering controls, work practices, and respiratory protection* described in [Table 1](#):

- [1925.1153\(d\)\(1\)](#) - *Permissible exposure limit (PEL).* The employer shall ensure that no employee is exposed to an airborne concentration of respirable crystalline silica in excess of 50 µg/m³, calculated as an 8-hour TWA.
- [1925.1153\(d\)\(2\)](#) - *Exposure assessment.* [Reference [paragraph \(d\)\(2\)\(i\) - \(vii\)](#)].
- [1926.1153\(d\)\(3\)](#) - *Methods of compliance.*
 - [1926.1153\(d\)\(3\)\(i\)](#) - *Engineering and work practice controls.* The employer shall use *engineering and work practice controls* to reduce and maintain

employee exposure to respirable crystalline silica to or below the PEL, unless the employer can *demonstrate* that such *controls* are not feasible. Wherever such feasible *engineering and work practice controls* are not sufficient to reduce employee exposure to or below the PEL, the employer shall nonetheless use them to reduce employee exposure to the lowest feasible level and shall supplement them with the use of *respiratory protection* that complies with the requirements of [paragraph \(e\)](#) of this section.

- [1926.1153\(d\)\(3\)\(ii\)](#) - Abrasive blasting. In addition to the requirements of [paragraph \(d\)\(3\)\(i\)](#) of this section, the employer shall comply with *other OSHA standards*, when applicable, such as [29 CFR 1926.57 \(Ventilation\)](#), where abrasive blasting is conducted using crystalline silica-containing blasting agents, or where abrasive blasting is conducted on substrates that contain crystalline silica.

[1926.1153\(e\)](#) - *Respiratory protection*.

- [1926.1153\(e\)\(1\)](#) - General. Where *respiratory protection* is required by this section, the employer must provide each employee an appropriate *respirator* that complies with the requirements of this paragraph and [29 CFR 1910.134](#). *Respiratory protection* is required: [Reference [paragraph \(e\)\(1\)\(i\) - \(ii\)](#)].
- [1926.1153\(e\)\(2\)](#) - *Respiratory protection program*. Where respirator use is required by this section, the employer shall institute a *respiratory protection program* in accordance with [29 CFR 1910.134](#).
- [1926.1153\(e\)\(3\)](#) - *Specified exposure control methods*. For the tasks listed in [Table 1](#) in [paragraph \(c\)](#) of this section, if the employer fully and properly implements the *engineering controls, work practices, and respiratory protection* described in [Table 1](#), the employer shall be considered to be in compliance with [paragraph \(e\)\(1\)](#) of this section and the requirements for selection of respirators in [29 CFR 1910.134\(d\)\(1\)\(iii\)](#) and [\(d\)\(3\)](#) with regard to exposure to respirable crystalline silica.

[1926.1153\(f\)](#) - *Housekeeping*. [Reference [paragraph \(f\)\(1\) - \(2\)](#)].

[1926.1153\(g\)](#) - *Written exposure control plan*. [Reference [paragraph \(g\)\(1\) - \(4\)](#)].

- [1926.1153\(g\)\(1\)](#) - The employer shall establish and implement a *written exposure control plan* that contains at least the following elements:
- [1926.1153\(g\)\(4\)](#) - The employer shall designate a *competent person* to make frequent and *regular inspections* of job sites, materials, and equipment to implement the *written exposure control plan*.

[1926.1153\(h\)](#) - *Medical surveillance*. [Reference [paragraph \(h\)\(1\) - \(4\)](#)].

- [1926.1153\(h\)\(2\)](#) - *Initial examination*. The employer shall make available an initial (baseline) *medical examination* within 30 days after initial assignment, unless the

employee has received a *medical examination* that meets the requirements of this section within the last three years. The examination shall consist of:

[Reference [paragraph \(h\)\(2\)\(i\) - \(vi\)](#)].

- [1926.1153\(h\)\(3\)](#) - *Periodic examinations*. The employer shall make available *medical examinations* that include the procedures described in [paragraph \(h\)\(2\)](#) of this section (except [paragraph \(h\)\(2\)\(v\)](#)) at least every three years, or more frequently if recommended by the *PLHCP*.
- [1926.1153\(h\)\(4\)](#) - *Information provided to the PLHCP*. The employer shall ensure that the examining *PLHCP has a copy* of this standard, and shall provide the *PLHCP* with the following *information*: [Reference [paragraph \(h\)\(4\)\(i\) - \(iv\)](#)].
- [1926.1153\(h\)\(5\)](#) - *PLHCP's written medical report for the employee*. The employer shall ensure that the *PLHCP explains* to the employee the results of the *medical examination* and provides each employee with a *written medical report* within 30 days of each *medical examination* performed. The *written report* shall contain: [Reference [paragraph \(h\)\(5\)\(i\) - \(iv\)](#)].
- [1926.1153\(h\)\(6\)](#) - *PLHCP's written medical opinion for the employer*. [Reference [paragraph \(h\)\(6\)\(i\) - \(iii\)](#)].
- [1926.1153\(h\)\(7\)](#) - *Additional examinations*. [Reference [paragraph \(h\)\(7\)\(i\) - \(iv\)](#)].

[1926.1153\(i\)](#) - *Communication of respirable crystalline silica hazards to employees*.

- [1926.1153\(i\)\(1\)](#) - *Hazard communication*. The employer shall include respirable crystalline silica in the *program* established to comply with the *hazard communication standard (HCS) (29 CFR 1910.1200)*. The employer shall ensure that each employee has access to *labels* on containers of crystalline silica and *safety data sheets*, and is trained in accordance with the provisions of HCS and [paragraph \(i\)\(2\)](#) of this section. The employer shall ensure that at least the following hazards are addressed: Cancer, lung effects, immune system effects, and kidney effects.
- [1926.1153\(i\)\(2\)](#) - *Employee information and training*. [Reference [paragraph \(i\)\(2\)\(i\) - \(ii\)](#)].

[1926.1153\(j\)](#) - *Recordkeeping*.

- [1926.1153\(j\)\(1\)](#) - *Air monitoring data*. [Reference [paragraph \(j\)\(1\)\(i\) - \(iii\)](#)].
 - [1926.1153\(j\)\(1\)\(iii\)](#) - The employer shall ensure that *exposure records* are maintained and made available in accordance with [29 CFR 1910.1020 - access to employee exposure and medical records](#).
- [1926.1153\(j\)\(2\)](#) - *Objective data*. [Reference [paragraph \(j\)\(2\)\(i\) - \(iii\)](#)].
 - [1926.1153\(j\)\(2\)\(iii\)](#) - The employer shall ensure that *objective data* are maintained and made available in accordance with [29 CFR 1910.1020 - access to employee exposure and medical records](#).
- [1926.1153\(j\)\(3\)](#) - *Medical surveillance*. [Reference [paragraph \(j\)\(3\)\(i\) - \(iii\)](#)].

- [1926.1153\(j\)\(3\)\(iii\)](#) - The employer shall ensure that *medical records* are maintained and made available in accordance with [29 CFR 1910.1020](#) - *access to employee exposure and medical records*.

Subpart AA - [Confined Spaces in Construction](#)

[Subpart AA](#) provides the standards for confined spaces in the construction industry.

[Confined space](#) means a space that:

- Is large enough and so configured that an employee can bodily enter it;
- Has limited or restricted means for entry and exit; and
- Is not designed for continuous employee occupancy.

[Permit-required confined space](#) (permit space) means a confined space that has one or more of the following characteristics:

- Contains or has a potential to contain a hazardous atmosphere;
- Contains a material that has the potential for engulfing an entrant;
- Has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor which slopes downward and tapers to a smaller cross section; *or*
- Contains any other recognized serious safety or health hazard.

To learn if subpart AA applies to you, go to [Does "Subpart AA - Confined Spaces in Construction" Apply to You?](#)

Special Requirements

1926.1203 - General Requirements

Scope: This [standard](#) provides the general requirements for confined spaces in construction.

Special Requirements: Competent person, identify spaces, testing, determine, authorized employees, evaluation, evaluate, measures, written certification, verify, inform, written program, alternate procedures, monitoring, debrief, permit space program, employer demonstrates, approved, permit-required, registered professional engineer, approved (writing), sign (post), notice, inspection, controlling contractor, information, entry employer, references other standards

[1926.1203\(a\)](#) - Before it begins work at a worksite, each employer must ensure that a *competent person identifies* all confined spaces in which one or more of the employees it directs may work, and *identifies* each space that is a permit space, through consideration and *evaluation* of the elements of that space, including *testing* as necessary.

[1926.1203\(b\)](#) - If the workplace contains one or more permit spaces, the employer who *identifies*, or who receives *notice* of, a permit space must:

- [1926.1203\(b\)\(1\)](#) - *Inform* exposed employees by *posting danger signs* or by any other equally effective means, of the existence and location of, and the danger posed by, each permit space; and

Note to [paragraph \(b\)\(1\)](#). A *sign* reading “DANGER—PERMIT-REQUIRED CONFINED SPACE, DO NOT ENTER” or using other similar language would satisfy the requirement for a *sign*.

- [1926.1203\(b\)\(2\)](#) - *Inform*, in a timely manner and in a manner other than *posting*, its employees' *authorized* representatives and the *controlling contractor* of the existence and location of, and the danger posed by, each permit space.

[1926.1203\(c\)](#) - Each employer who *identifies*, or *receives notice* of, a permit space and has not *authorized employees* it directs to work in that space must take effective *measures* to prevent those employees from entering that permit space, in addition to complying with all other applicable requirements of this standard.

[1926.1203\(d\)](#) - If any employer decides that employees it directs will enter a permit space, that employer must have a *written permit space program* that complies with [1926.1204 - permit required confined space program](#), implemented at the construction site. The *written program* must be made available prior to and during entry operations for *inspection* by employees and their authorized representatives.

[1926.1203\(e\)](#) - An employer may use the *alternate procedures* specified in [paragraph \(e\)\(2\)](#) of this section for entering a permit space only under the conditions set forth in [paragraph \(e\)\(1\)](#) of this section.

- [1926.1203\(e\)\(1\)](#) - An employer whose employees enter a permit space need not comply with [1926.1204 through 1206 and 1926.1208 through 1211](#), provided that all of the following conditions are met: [Reference [paragraph \(e\)\(1\)\(i\) - \(vi\)](#)].

[1926.1203\(e\)\(2\)](#) - The following requirements apply to entry into permit spaces that meet the conditions set forth in [paragraph \(e\)\(1\)](#) of this section:

- [1926.1203\(e\)\(2\)\(iii\)](#) - Before an employee enters the space, the internal atmosphere must be *tested, with a calibrated direct-reading instrument*, for oxygen content, for flammable gases and vapors, and for potential toxic air contaminants, in that order.

Any employee who enters the space, or that employee's authorized representative, must be provided an opportunity to observe the *pre-entry testing* required by this paragraph.

- [1926.1203\(e\)\(2\)\(vi\)](#) - The atmosphere within the space must be *continuously monitored* unless the entry employer can *demonstrate* that equipment for *continuous monitoring* is not commercially available or *periodic monitoring* is sufficient. If *continuous monitoring* is used, the employer must ensure that the *monitoring equipment* has an alarm that will *notify* all entrants if a specified atmospheric threshold is achieved, or that an employee will check the *monitor* with sufficient frequency to ensure that entrants have adequate time to escape. If *continuous monitoring* is not used, *periodic monitoring* is required. All *monitoring* must ensure that the continuous forced air ventilation is preventing the accumulation of a hazardous atmosphere. Any employee who enters the space, or that employee's *authorized* representative, must be provided with an opportunity to observe the *testing* required by this [paragraph \(e\)\(2\)\(vi\)](#).
- [1926.1203\(e\)\(2\)\(vii\)](#) - If a hazard is detected during entry:
 - [1926.1203\(e\)\(2\)\(vii\)\(B\)](#) - The space must be *evaluated to determine* how the hazard developed; and
 - [1926.1203\(e\)\(2\)\(vii\)\(C\)](#) - The employer must implement *measures* to protect employees from the hazard before any subsequent entry takes place.
- [1926.1203\(e\)\(2\)\(viii\)](#) - The employer must ensure a *safe method* of entering and exiting the space. If a hoisting system is used, it must be designed and manufactured for personnel hoisting; however, a job-made hoisting system is permissible if it is *approved* for personnel hoisting by a *registered professional engineer, in writing*, prior to use.
- [1926.1203\(e\)\(2\)\(ix\)](#) - The employer must *verify* that the space is safe for entry and that the *pre-entry measures* required by [paragraph \(e\)\(2\)](#) of this section have been taken, through a *written certification* that contains the date, the location of the space, and the *signature* of the person providing the *certification*. The *certification* must be made before entry and must be made *available* to each employee entering the space or to that employee's *authorized* representative.

[1926.1203\(f\)](#) - When there are changes in the use or configuration of a non-permit confined space that might increase the hazards to *entrants*, or some indication that the initial evaluation of the space may not have been adequate, each entry employer must have a *competent person reevaluate* that space and, if necessary, *reclassify* it as a *permit-required* confined space.

[1926.1203\(g\)](#) - A space *classified* by an employer as a *permit-required* confined space may only be *reclassified* as a non-permit confined space when a *competent person determines* that all of the applicable requirements in [paragraphs \(g\)\(1\) through \(4\)](#) of this section have been met: [Reference [paragraph \(g\)\(1\)-\(4\)](#)].

[1926.1203\(h\)\(1\)](#) - Before entry operations begin, the host employer must *provide* the following *information*, if it has it, to the *controlling contractor*: {Reference [paragraph \(h\)\(1\)\(i\) - \(iii\)](#)}.

[1926.1204\(h\)\(2\)](#) - Before entry operations begin, the *controlling contractor* must: [Reference [paragraph \(h\)\(2\)\(i\) - \(ii\)](#)].

[1926.1203\(h\)\(3\)](#) - Before entry operations begin, each *entry employer* must: [Reference [paragraph \(h\)\(3\)\(i\) - \(ii\)](#)].

[1926.1203\(h\)\(4\)](#) - The *controlling contractor* and *entry employer(s)* must *coordinate* entry operations when: [Reference [paragraph \(h\)\(4\)\(i\) - \(ii\)](#)].

[1926.1203\(h\)\(5\)](#) - After entry operations:

- [1926.1203\(h\)\(5\)\(i\)](#) - The *controlling contractor* must *debrief* each entity that entered a permit space regarding the *permit space program* followed and any hazards confronted or created in the permit space(s) during entry operations;
- [1926.1203\(h\)\(5\)\(ii\)](#) - The *entry employer* must *inform* the *controlling contractor* in a timely manner of the *permit space program* followed and of any hazards confronted or created in the permit space(s) during entry operations; and
- [1926.1203\(h\)\(5\)\(iii\)](#) - The *controlling contractor* must apprise the *host employer* of the *information* exchanged with the entry entities pursuant to this subparagraph.

Note to [paragraph \(h\)](#). Unless a *host employer* or *controlling contractor* has or will have employees in a confined space, it is not required to enter any confined space to collect the *information* specified in this [paragraph \(h\)](#).

[1926.1203\(i\)](#) - If there is no *controlling contractor* present at the worksite, the requirements for, and role of, *controlling contractors* in this section must be fulfilled by the *host employer* or other employer who arranges to have employees of another employer perform work that involves permit space entry.

1926.1204 - Permit-required Confined Space Program

Scope: This [standard](#) provides the requirements for a permit space program.

Special Requirements: Measures, identify, evaluate, review, procedures, practices, develop, implement, testing, monitoring, maintain, communications, personal protective equipment, engineering controls, single annual review, work-practice controls, rescue, planned, complaints, system, entry permits, designate, training, approved, attendant, authorized, references other standards

Each entry employer must:

- [1926.1204\(a\)](#) - Implement the *measures* necessary to prevent unauthorized entry;
- [1926.1204\(b\)](#) - *Identify and evaluate* the hazards of permit spaces before employees enter them;
- [1926.1204\(c\)](#) - *Develop and implement* the means, *procedures, and practices* necessary for safe permit space entry operations, including, but not limited to, the following: [Reference [paragraph \(c\)\(1\) - \(8\)](#)].

[1926.1204\(d\)](#) - Provide the following equipment (specified in [paragraphs \(d\)\(1\) through \(9\)](#) of this section) at no cost to each employee, *maintain* that equipment properly, and ensure that each employee uses that equipment properly: (Reference [paragraph \(d\)\(1\) - \(9\)](#)).

- [1926.1204\(d\)\(5\)](#) - Lighting equipment that meets the minimum illumination requirements in [1926.56](#) - *illumination*, that is *approved* for the ignitable or combustible properties of the specific gas, vapor, dust, or fiber that will be present, and that is sufficient to enable employees to see well enough to work safely and to exit the space quickly in an emergency.

[1926.1204\(e\)](#) - *Evaluate* permit space conditions in accordance with the following [paragraphs \(e\)\(1\) through \(6\)](#) of this section when entry operations are conducted: [Reference [paragraph \(e\)\(1\) - \(6\)](#)].

[1926.1204\(f\)](#) - Provide at least one *attendant* outside the permit space into which entry is *authorized* for the duration of entry operations: [Reference [paragraph \(f\)\(1\) - \(2\)](#)].

[1926.1204\(g\)](#) - If multiple spaces are to be assigned to a single *attendant*, include in the *permit program* the means and *procedures* to enable the attendant to respond to an emergency affecting one or more of those permit spaces without distraction from the *attendant's* responsibilities under [1926.1209](#) - *duties of attendants*.

[1926.1204\(h\)](#) - *Designate* each person who is to have an active role (as, for example, *authorized entrants, attendants, entry supervisors, or persons who test or monitor* the atmosphere in a permit space) in entry operations, identify the duties of each such employee, and *provide* each such employee with the *training* required by [1926.1207](#) - *training*.

[1926.1204\(i\)](#) - *Develop and implement procedures* for summoning *rescue and emergency services* (including *procedures* for summoning emergency assistance in the event of a failed non-entry rescue), for rescuing *entrants* from permit spaces, for providing necessary *emergency services* to rescued employees, and for preventing unauthorized personnel from attempting a *rescue*.

[1926.1204\(j\)](#) - *Develop and implement a system* for the preparation, issuance, use, and cancellation of *entry permits* as required by this standard, including the safe termination of entry operations under both *planned* and emergency conditions.

[1926.1204\(k\)](#) - *Develop and implement procedures to coordinate entry operations, in consultation with the controlling contractor, when employees of more than one employer are working simultaneously in a permit space or elsewhere on the worksite where their activities could, either alone or in conjunction with the activities within a permit space, foreseeably result in a hazard within the confined space, so that employees of one employer do not endanger the employees of any other employer.*

[1926.1204\(l\)](#) - *Develop and implement procedures (such as closing off a permit space and canceling the permit) necessary for concluding the entry after entry operations have been completed.*

[1926.1204\(m\)](#) - *Review entry operations when the measures taken under the permit space program may not protect employees and revise the program to correct deficiencies found to exist before subsequent entries are authorized; and*

Note to [paragraph \(m\)](#). Examples of circumstances requiring the review of the *permit space program* include, but are not limited to: Any unauthorized entry of a permit space, the detection of a permit space hazard not covered by the *permit*, the detection of a condition prohibited by the *permit*, the occurrence of an injury or near-miss during entry, a change in the use or configuration of a permit space, and *employee complaints* about the effectiveness of the *program*.

[1926.1204\(n\)](#) - *Review the permit space program, using the canceled permits retained under [1926.1205\(f\)](#) - permitting process, within 1 year after each entry and revise the program as necessary to ensure that employees participating in entry operations are protected from permit space hazards.*

Note to [paragraph \(n\)](#). Employers may perform a *single annual review* covering all entries performed during a *12-month period*. If no entry is performed during a 12-month period, *no review* is necessary.

1926.1205 - Permitting Process

Scope: This [standard](#) provides the requirements for the permitting process.

Special Requirements: Authorized, entry employer, revision, noted, review, document, measures, authorized entrants, confirm, entry permits, posting, retain, permit-required confined space program, entry supervisor, reference other standards

[1926.1205\(a\)](#) - *Before entry is authorized, each entry employer must document the completion of measures required by [1926.1204\(c\)](#) - Permit-required confined space program, by preparing an entry permit.*

[1926.1205\(b\)](#) - Before entry begins, the *entry supervisor* identified on the *permit* must sign the *entry permit* to authorize entry.

[1926.1205\(c\)](#) - The *completed permit* must be made *available* at the time of entry to all *authorized entrants* or their *authorized* representatives, by *posting* it at the entry portal or by any other equally effective means, so that the entrants can *confirm* that pre-entry preparations have been completed.

[1926.1205\(d\)](#) - The duration of the *permit* may not exceed the time required to complete the assigned task or job identified on the *permit* in accordance with [1926.1206\(b\)](#) - *entry permits*.

[1926.1205\(e\)](#) - The *entry supervisor* must terminate entry and take the following action when any of the following apply: [Reference [paragraph \(e\)\(1\) - \(3\)](#)].

[1926.1205\(f\)](#) - The *entry employer* must *retain each canceled entry permit* for at least 1 year to facilitate the review of the *permit-required confined space program* required by [1926.1204\(n\)](#) - *permit-required confined space program*. Any problems encountered during an entry operation must be *noted* on the pertinent *permit* so that appropriate *revisions* to the *permit space program* can be made.

1926.1206 - Entry Permit

Scope: This [standard](#) provides the requirements for entry permits.

Special Requirements: Entry permit, documents, authorize, measures, authorized entrants, personal protective equipment, testing, communication procedures, attendants, monitoring, tests, lockout, tagging

The *entry permit* that *documents* compliance with this section and *authorizes* entry to a permit space must identify: [Reference [paragraph \(a\) - \(p\)](#)].

1926.1207 – Training

Scope: This [standard](#) provides the training requirements.

Special Requirements: Training, authorized, duties assigned, affected employees, training records, documentation, methods, inspection, procedures, references other standards

[1926.1207\(a\)](#) - 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.

[1926.1207\(b\)](#) - *Training* required by this section must be provided to each *affected employee*: [Reference [paragraph \(b\)\(1\) - \(5\)](#)].

- [1926.1207\(b\)\(5\)](#) - Whenever there is any evidence of a deviation from the *permit space entry procedures* required by [1926.1204\(c\)](#) - *permit-required confined space program*, or there are inadequacies in the employee's knowledge or use of these *procedures*.

[1926.1207\(c\)](#) - 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.

[1926.1207\(d\)](#) - The employer must *maintain training records* to show that the *training* required by [paragraphs \(a\) through \(c\)](#) of this section 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.

1926.1208 - Duties of Authorized Entrants

Scope: This [standard](#) provides the requirements for the duties of the authorized entrants.

Special Requirements: Entry employer, authorized entrants, alert, information, attendant, familiar, communicate, entrants, references other standards

The *entry employer* must ensure that all *authorized entrants*:

- [1926.1208\(a\)](#) - Are *familiar* with and understand the hazards that may be faced during entry, including *information* on the mode, signs or symptoms, and consequences of the exposure.
- [1926.1208\(b\)](#) - Properly use equipment as required by [1926.1204\(d\)](#) - *permit-required confined space program*.
- [1926.1208\(c\)](#) - *Communicate* with the attendant as necessary to enable the attendant to assess *entrant* status and to enable the *attendant* to alert *entrants* of the need to evacuate the space as required by [1926.1209\(f\)](#) - *Duties of attendants*.
- [1926.1208\(d\)](#) - *Alert* the *attendant* whenever: [Reference [paragraph \(d\)\(1\) - \(2\)](#) and [\(e\)\(1\) - \(4\)](#)].

1926.1209 - Duties of Attendants

Scope: This [standard](#) provides the requirements for the duties of attendants.

Special Requirements: Entry employer, attendant, familiar, authorized, identifies, orders, summons, action, assess, alert, permit space program, communicates, accurate count, trained, rescue operations, references other standards

The *entry employer* must ensure that each *attendant*:

[1926.1209\(a\)](#) - Is *familiar* with and understands the hazards that may be faced during entry, including *information* on the mode, signs or symptoms, and consequences of the exposure;

[1926.1209\(b\)](#) - Is aware of possible behavioral effects of hazard exposure in *authorized entrants*;

[1926.1209\(c\)](#) - Continuously *maintains an accurate count* of *authorized entrants* in the permit space and ensures that the means used to *identify authorized entrants* under [1926.1206\(d\)](#) - *entry permit*, accurately *identifies* who is in the permit space;

[1926.1209\(d\)](#) - Remains outside the permit space during entry operations until relieved by another *attendant*;

Note to [paragraph \(d\)](#). Once an *attendant* has been relieved by another *attendant*, the relieved *attendant* may enter a permit space to attempt a rescue when the employer's *permit space program* allows *attendant* entry for rescue and the *attendant* has been *trained* and equipped for *rescue operations* as required by [1926.1211\(a\)](#) - *Rescue and emergency services*.

[1926.1209\(e\)](#) - *Communicates with authorized entrants* as necessary to *assess entrant* status and to *alert entrants* of the need to *evacuate* the space under [1926.1208\(e\)](#) - *duties of authorized entrants*;

[1926.1209\(f\)](#) - *Assesses activities and conditions* inside and outside the space to determine if it is safe for *entrants* to remain in the space and *orders the authorized entrants* to evacuate the permit space immediately under any of the following conditions: [References [paragraph \(f\)\(1\) - \(4\)](#)].

[1926.1209\(g\)](#) - *Summons* rescue and other emergency services as soon as the *attendant determines* that *authorized entrants* may need assistance to escape from permit space hazards;

[1926.1209\(h\)](#) - Takes the following *actions* when unauthorized persons approach or enter a permit space while entry is underway: [References [paragraph \(h\)\(1\) - \(3\)](#)].

[1926.1209\(i\)](#) - Performs non-entry rescues as specified by the employer's *rescue procedure*; and

[1926.1209\(j\)](#) - Performs no duties that might interfere with the *attendant's* primary duty to assess and protect the *authorized entrants*.

1926.1210 - Duties of Entry Supervisors

Scope: This [standard](#) provides the requirements for the duties of entry supervisors.

Special Requirements: Entry employer, familiar, information, checking, tests, permit, removes, procedures, verifies, notified, determines, references other standards

The *entry employer* must ensure that each *entry supervisor*:

[1926.1210\(a\)](#) - Is *familiar* with and understands the hazards that may be faced during entry, including *information* on the mode, signs or symptoms, and consequences of the exposure;

[1926.1210\(b\)](#) - *Verifies, by checking* that the appropriate entries have been made on the *permit*, that all *tests* specified by the *permit* have been conducted and that all *procedures* and equipment specified by the *permit* are in place before endorsing the *permit* and allowing entry to begin;

[1926.1210\(c\)](#) - Terminates the entry and cancels or suspends the *permit* as required by [1926.1205\(e\)](#) - *permitting process*;

[1926.1210\(d\)](#) - *Verifies* that rescue services are available and that the means for summoning them are operable, and that the employer will be *notified* as soon as the services become unavailable;

[1926.1210\(e\)](#) - *Removes unauthorized* individuals who enter or who attempt to enter the permit space during entry operations; and

[1926.1210\(f\)](#) - *Determines*, whenever responsibility for a permit space entry operation is transferred, and at intervals dictated by the hazards and operations performed within the space, that entry operations remain consistent with terms of the *entry permit* and that acceptable entry conditions are maintained.

1926.1211 - Rescue and Emergency Services

Scope: This [standard](#) provides the requirements for rescue and emergency services.

Special Requirements: Designates, designated, rescuer, emergency services, medical facility, summons, rescue team, evaluate, authorized entrants, notify, inform, written information, safety data sheets, demonstrates, rescue, retrieval systems or methods, affected employees, PPE (respiratory protection), train, rescue plans, practice, references other standards

1926.1211(a) - An employer who *designates rescue and emergency services*, pursuant to 1926.1204(i) - *permit-required confined space program*, must:

- 1926.1211(a)(1) - *Evaluate a prospective rescuer's ability to respond to a rescue summons in a timely manner, considering the hazard(s) identified;*

Note to paragraph (a)(1). What will be considered timely will vary according to the specific hazards involved in each entry. For example, 1926.103 (*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.

- 1926.1211(a)(2) - *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;*
- 1926.1211(a)(3) - *Select a rescue team or service from those evaluated that:* [Reference paragraph (a)(3)(i) - (iii)].
- 1926.1211(a)(4) - *Inform each rescue team or service of the hazards they may confront when called on to perform rescue at the site; and*
- 1926.1211(a)(5) - *Provide the rescue team or service selected with access to all permit spaces from which rescue may be necessary so that the rescue team or service can develop appropriate rescue plans and practice rescue operations.*

1926.1211(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: [Reference paragraph (b)(1) - (4)].

1926.1211(c) - Non-entry rescue is required unless the retrieval equipment would increase the overall risk of entry or would not contribute to the rescue of the *entrant*. The employer must *designate an entry rescue service* whenever non-entry rescue is not selected. Whenever non-entry rescue is selected, the *entry employer* must ensure that *retrieval systems or methods* are used whenever an *authorized entrant* enters a permit space, and must confirm, prior to entry, that emergency assistance would be available in the event that non-entry rescue fails. *Retrieval systems* must meet the following requirements: [Reference paragraph (c)(1) - (3)].

[1926.1211\(d\)](#) - If an injured *entrant* is exposed to a substance for which a *Safety Data Sheet (SDS)* or other similar *written information* is required to be kept at the worksite, that *SDS* or *written information* must be made *available* to the *medical facility* treating the exposed *entrant*.

1926.1212 - Employee Participation

Scope: This [standard](#) provides for employee participation.

Special Requirements: Affected employees, available, consult, authorized, implementation, development, information, permit space program, references other standards

[1926.1212\(a\)](#) - Employers must *consult* with *affected employees* and their *authorized* representatives on the *development and implementation* of all aspects of the *permit space program* required by [1926.1203](#) - *general requirements*.

[1926.1212\(b\)](#) - Employers must make *available* to each *affected employee* and his/her *authorized* representatives all *information* required to be *developed* by this standard.

1926.1213 - Provision of Documents to Secretary

Scope: This [standard](#) provides for the provision of documents.

Special Requirements: Document, retaining, available, retaining employer

For each *document* required to be *retained* in this standard, the *retaining employer* must make the *document available* on request to the Secretary of Labor or the Secretary's designee.

Subpart CC - [Cranes and Derricks in Construction](#)

[Subpart CC](#) provides the requirements for cranes and derricks used in construction.

[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.

[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.

To learn if subpart CC applies to you, go to [Does "Subpart CC - Cranes and Derricks in Construction" Apply to You?](#)

Special Requirements

1926.1402 - Ground Conditions

Scope: This [standard](#) provides the requirements pertaining to ground conditions.

"[Ground conditions](#)" means the ability of the ground to support the equipment (including slope, compaction, and firmness).

Special Requirements: Controlling entity, manufacturer specifications, site drawings, soil analyses, site authority, discussion, A/D director, determines, references other standards

[1926.1402\(b\)](#) - The equipment must not be assembled or used unless ground conditions are firm, drained, and graded to a sufficient extent so that, in conjunction (if necessary) with the use of supporting materials, the equipment *manufacturer's specifications* for adequate support and degree of level of the equipment are met. The requirement for the ground to be drained does not apply to marshes/wetlands.

[1926.1402\(c\)](#) - The *controlling entity* must: {Reference [paragraph \(c\)\(1\) - \(2\)](#)}.

[1926.1402\(d\)](#) - If there is no *controlling entity* for the project, the requirement in [paragraph \(c\)\(1\)](#) of this section must be met by the employer that has *authority* at the site to make or arrange for ground preparations needed to meet [paragraph \(b\)](#) of this section.

[1926.1402\(e\)](#) - If the *A/D director or the operator* determines that ground conditions do not meet the requirements in [paragraph \(b\)](#) of this section, that person's employer must have a discussion with the *controlling entity* regarding the ground preparations that are needed so that, with the use of suitable supporting materials/devices (if necessary), the requirements in [paragraph \(b\)](#) of this section can be met.

[1926.1402\(f\)](#) - This section does not apply to cranes designed for use on railroad tracks when used on railroad tracks that are part of the general railroad system of transportation that is regulated pursuant to the *Federal Railroad Administration under 49 CFR part 213* and that comply with applicable *Federal Railroad Administration requirements*.

1926.1403 - Assembly/Disassembly--Selection of Manufacturer or Employer Procedures

Scope: This [standard](#) provides the procedures for assembly/disassembly--selection of manufacturer or employer procedures.

Special Requirements: Manufacturer procedures, employer procedures, demonstrate, references other standards

When assembling or disassembling equipment (or attachments), the employer must comply with all applicable *manufacturer* prohibitions and must comply with either:

- [1926.1403\(a\)](#) - *Manufacturer procedures* applicable to assembly and disassembly, or
- [1926.1403\(b\)](#) - *Employer procedures* for assembly and disassembly. *Employer procedures* may be used only where the employer can *demonstrate* that the *procedures* used meet the requirements in [1926.1406](#) - *assembly/disassembly--employer procedures--general requirements*.

Note: The employer must follow *manufacturer procedures* when an employer uses synthetic slings during assembly or disassembly rigging. [See [1926.1404\(r\)](#) - *assembly/disassembly--general requirements (applies to all assembly and disassembly operations), rigging.*]

1926.1404 - Assembly/Disassembly--General Requirements (Applies to all Assembly and Disassembly Operations)

Scope: This [standard](#) provides the requirements for assembly/disassembly--general requirements (applies to all assembly and disassembly operations).

Special Requirements: Supervision, competent person, qualified person, procedures, criteria, directed, crew instructions, crew members, A/D director, review of procedures, inform, verifying, demonstrates, supervising, rated capacity limits, operator, system of communication, manufacturer limitations, determines, writing, registered professional engineer, familiar, weight components available, manufacturer instructions, manufacturer prohibitions, manufacturer procedures, manufacturer specifications, approved modifications, inspection, signal person, understand, review, references other standards

[1926.1404\(a\)\(1\)](#) - 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").

[1926.1404\(a\)\(2\)](#) - 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*.

[1926.1404\(b\)](#) - *Knowledge of procedures.* The A/D director must *understand* the applicable assembly/disassembly *procedures*.

[11926.1404\(c\)](#) - *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).

[1926.1404\(d\)](#) - *Crew instructions.*

- [1926.1404\(d\)\(1\)](#) - Before commencing assembly/disassembly operations, the A/D director must ensure that the *crew members* understand all of the following: [Reference [paragraph \(d\)\(1\) - \(2\)](#)].

[1926.1404\(e\)\(1\)](#) - Before a *crew member* goes to a location that is out of view of the *operator* and is either in, on, or under the equipment, or near the equipment (or load) where the *crew member* could be injured by movement of the equipment (or load), the *crew member* must *inform the operator* that he/she is going to that location.

[1926.1404\(e\)\(2\)](#) - Where the *operator* knows that a *crew member* went to a location covered by [paragraph \(e\)\(1\)](#) of this section, the operator must not move any part of the equipment (or load) until the *operator is informed* in accordance with a pre-arranged system of communication that the *crew member* is in a safe position.

[1926.1404\(f\)\(1\)](#) - When pins (or similar devices) are being removed, employees must not be under the boom, jib, or other components, except where the requirements of [paragraph \(f\)\(2\)](#) of this section are met.

[1926.1404\(f\)\(2\)](#) - *Exception.* Where the employer *demonstrates* that site constraints require one or more employees to be under the boom, jib, or other components when pins (or similar devices) are being removed, the A/D director must implement *procedures* that minimize the risk of unintended dangerous movement and minimize the duration and extent of exposure under the boom. (See *Non-mandatory [appendix B - Assembly/Disassembly: Sample Procedures for Minimizing the Risk of Unintended Dangerous Boom Movement](#)*, of this subpart for an example.)

[1926.1404\(g\)](#) - *Capacity limits.* During all phases of assembly/disassembly, *rated capacity limits* for loads imposed on the equipment, equipment components (including rigging), lifting lugs and equipment accessories, must not be exceeded for the equipment being assembled/disassembled.

[1926.1404\(h\)](#) - Addressing specific hazards. The *A/D director supervising* the assembly/disassembly operation must address the hazards associated with the operation, which include: [Reference [paragraph \(h\)\(1\) - \(12\)](#)].

[1926.1404\(j\)](#) - Cantilevered boom sections. *Manufacturer limitations* on the maximum amount of boom supported only by cantilevering must not be exceeded. Where these are unavailable, a *registered professional engineer familiar* with the type of equipment involved must *determine in writing* this limitation, which must not be exceeded.

[1926.1404\(k\)](#) - *Weight of components*. The *weight* of each of the components must be readily *available*.

[1926.1404\(m\)\(1\)](#) - The selection of components, and configuration of the equipment, that affect the *capacity* or safe operation of the equipment must be in accordance with:

- [1926.1404\(m\)\(1\)\(i\)](#) - *Manufacturer instructions, prohibitions, limitations, and specifications*. Where these are unavailable, a *registered professional engineer familiar* with the type of equipment involved must *approve, in writing*, the selection and configuration of components; or
- [1926.1404\(m\)\(1\)\(ii\)](#) - *Approved modifications* that meet the requirements of [1926.1434](#) (*Equipment modifications*).

[1926.1404\(m\)\(2\)](#) - *Post-assembly inspection*. Upon completion of assembly, the equipment must be *inspected* to ensure compliance with [paragraph \(m\)\(1\)](#) of this section (see [1926.1412\(c\)](#) for *post-assembly inspection requirements*).

[1926.1404\(q\)](#) - Outriggers and stabilizers. When the load to be handled and the operating radius require the use of outriggers or stabilizers, or at any time when outriggers or stabilizers are used, all of the following requirements must be met (except as otherwise indicated): [Reference [paragraph \(q\)\(1\) - \(6\)](#)].

- [1926.1404\(q\)\(4\)](#) - Each outrigger or stabilizer must be visible to the operator or to a *signal person* during extension and setting.
- [1926.1404\(q\)\(6\)](#) - For locomotive cranes, when using outriggers or stabilizers to handle loads, the *manufacturer's procedures* must be followed. When lifting loads without using outriggers or stabilizers, the *manufacturer's procedures* must be met regarding truck wedges or screws.

[1926.1404\(r\)](#) - Rigging. In addition to following the requirements in [29 CFR 1926.251](#) - *rigging equipment for material handling*, and other requirements in this and other standards applicable to rigging, when rigging is used for assembly/disassembly, the employer must ensure that: [Reference [paragraph \(r\)\(1\) - \(3\)](#)].

1926.1405 - Disassembly--Additional Requirements for Dismantling of Booms and Jibs (Applies to Both the use of Manufacturer Procedures and Employer

Scope: This [standard](#) provides the requirements for disassembly--additional requirements for dismantling of booms and jibs (applies to both the use of manufacturer procedures and employer.

Special Requirements: Procedures

Dismantling (including dismantling for changing the length of) booms and jibs.
[Reference [paragraph \(a\) - \(d\)](#)].

1926.1406 - Assembly/Disassembly--Employer Procedures--General Requirements

Scope: This [standard](#) provides the general requirements for assembly/disassembly--employer procedures.

Special Requirements: Employer procedures, manufacturer procedures, qualified person

[1926.1406\(a\)](#) - When using *employer procedures* instead of *manufacturer procedures* for assembly/disassembly, the employer must ensure that the *procedures*: [Reference [paragraph \(a\)\(1\) - \(3\)](#)].

[1926.1406\(b\)](#) - *Qualified person. Employer procedures must be developed by a qualified person.*

1926.1407 - Power Line Safety (up to 350 kV)--Assembly and Disassembly

Scope: This [standard](#) provides the requirements for power line safety (up to 350 kV)--assembly and disassembly.

Special Requirements: Determine, confirm, utility owner/operator, posted warnings, voltage information, measures, tag lines, dedicated spotter, planning meeting, precautions, employer's request, references other standards

[1926.1407\(a\)](#) - Before assembling or disassembling equipment, the employer must *determine* if any part of the equipment, load line, or load (including rigging and lifting accessories) could get, in the direction or area of assembly/disassembly, closer than 20 feet to a power line during the assembly/disassembly process. If so, the employer must meet the requirements in Option (1), Option (2), or Option (3) of this section, as follows: [Reference [paragraph \(a\)\(1\) - \(3\)](#)].

[1926.1407\(b\)](#) - Preventing encroachment/electrocution. Where encroachment *precautions* are required under Option (2), or Option (3) of this section, all of the following requirements must be met: [Reference [paragraph \(b\)\(1\) - \(3\)](#)].

[1926.1407\(c\)](#) - Assembly/disassembly below power lines prohibited. No part of a crane/derrick, load line, or load (including rigging and lifting accessories), whether partially or fully assembled, is allowed below a power line unless the employer has *confirmed* that the utility *owner/operator* has deenergized and (at the worksite) visibly grounded the power line.

[1926.1407\(d\)](#) - Assembly/disassembly inside [Table A](#) clearance prohibited. No part of a crane/derrick, load line, or load (including rigging and lifting accessories), whether partially or fully assembled, is allowed closer than the minimum approach distance under [Table A](#) (see [1926.1408](#)) to a power line unless the employer has *confirmed* that the utility *owner/operator* has deenergized and (at the worksite) visibly grounded the power line.

[1926.1407\(e\)](#) - *Voltage information*. Where [Option \(3\)](#) of this section is used, the utility *owner/operator* of the power lines must *provide* the requested *voltage information* *within two working days* of the *employer's request*.

[1926.1407\(f\)](#) - Power lines presumed energized. The employer must assume that all power lines are energized unless the utility *owner/operator* *confirms* that the power line has been and continues to be deenergized and visibly grounded at the worksite.

[1926.1407\(g\)](#) - *Posting of electrocution warnings*. There must be at least one electrocution *hazard warning conspicuously posted* in the cab so that it is in view of the operator and (except for overhead gantry and tower cranes) at least two on the outside of the equipment.

1926.1408 - Power Line Safety (up to 350 kV)--Equipment Operations

Scope: This [standard](#) provides the requirements for power line safety (up to 350 kV)--equipment operations.

Special Requirements: Hazard assessments, identify work zones, precautions, information, warning, operators, employer demonstrates, demarcating boundaries, determine, owner/operator, dedicated spotters, confirm, measures, planning meetings, tag lines, warning lines, crew member, training, employer's request, voltage information, manufacturer's procedures, references other standards

[1926.1408\(a\)](#) - *Hazard assessments and precautions inside the work zone*. Before beginning equipment operations, the employer must: [Reference [paragraph \(a\)\(1\) - \(2\)](#)].

[1926.1408\(b\)](#) - Preventing encroachment/electrocution. Where *encroachment precautions* are required under [Option \(2\)](#) or [Option \(3\)](#) of this section, all of the following requirements must be met: [Reference [paragraph \(b\)\(1\) - \(5\)](#)].

[1926.1408\(c\)](#) - *Voltage information*. Where [Option \(3\)](#) of this section is used, the *utility owner/operator* of the power lines must provide the requested *voltage information within two working days of the employer's request*.

[1926.1408\(d\)\(1\)](#) - No part of the equipment, load line, or load (including rigging and lifting accessories) is allowed below a power line unless the employer has confirmed that the *utility owner/operator* has deenergized and (at the worksite) visibly grounded the power line, except where one of the exceptions in [paragraph \(d\)\(2\)](#) of this section applies.

[1926.1408\(d\)\(2\)](#) - *Exceptions*. [Paragraph \(d\)\(1\)](#) of this section is inapplicable where the *employer demonstrates* that one of the following applies: [Reference [paragraph \(d\)\(2\)\(i\) - \(iv\)](#)].

[1926.1408\(e\)](#) - *Power lines presumed energized*. The employer must assume that all power lines are energized unless the *utility owner/operator confirms* that the power line has been and continues to be deenergized and visibly grounded at the worksite.

[1926.1408\(g\)\(1\)](#) - The employer must *train each operator and crew member* assigned to work with the equipment on all of the following: [Reference [paragraph \(g\)\(1\)\(i\) - \(v\)](#)].

[1926.1408\(g\)\(2\)](#) - 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.

[1926.1408\(g\)\(3\)](#) - *Training* under this section must be administered in accordance with [1926.1430\(g\)](#) - *training, training administration*.

[1926.1408\(h\)](#) - Devices originally *designed by the manufacturer* for use as: A safety device (see [1926.1415](#)), operational aid, or a means to prevent power line contact or electrocution, when used to comply with this section, must meet the *manufacturer's procedures* for use and conditions of use.

1926.1409 - Power Line Safety (over 350 kV)

Scope: This standard provides the requirements for power line safety (over 350 kV).

Special Requirements: Registered professional engineer, clearance, utility owner/operator, qualified person, references other standards

The requirements of [1926.1407](#) - Power line safety (up to 350 kV)--assembly and disassembly and [1926.1408](#) - Power line safety (up to 350 kV)--equipment operations apply to power lines over 350 kV except:

- [1926.1409\(a\)](#) - For power lines at or below 1000 kV, wherever the distance “20 feet” is specified, the distance “50 feet” must be substituted; and
- [1926.1409\(b\)](#) - For power lines over 1000 kV, the *minimum clearance distance* must be established by the *utility owner/operator or registered professional engineer* who is a *qualified person* with respect to electrical power transmission and distribution.

1926.1410 - Power Line Safety (all voltages)--Equipment Operations Closer than the Table A Zone

Scope: This [standard](#) provides the requirements for power line safety (all voltages)--equipment operations closer than the Table A zone.

Special Requirements: Planning meeting, review, minimum approach distances, employer determines, employer demonstrates, utility owner/operator, qualified person, registered professional engineer, consultation, person identified, authority, manufacturer's procedures, equipment operator, trained, documented, dedicated spotter, procedures, references other standards

Equipment operations in which any part of the equipment, load line, or load (including rigging and lifting accessories) is closer than the *minimum approach distance* under [Table A of 1926.1408](#) - Power line safety (up to 350 kV)--equipment operations, to an energized power line is prohibited, except where the employer *demonstrates* that all of the following requirements are met:

- [1926.1410\(a\)](#) - The *employer determines* that it is infeasible to do the work without breaching the *minimum approach distance* under [Table A of 1926.1408](#) - Power line safety (up to 350 kV)--equipment operations,.
- [1926.1410\(b\)](#) - The *employer determines* that, after *consultation with the utility owner/operator*, it is infeasible to deenergize and ground the power line or relocate the power line.
- [1926.1410\(c\)\(1\)](#) - The *power line owner/operator or registered professional engineer* who is a *qualified person* with respect to electrical power transmission and distribution determines the *minimum clearance distance* that must be maintained to prevent electrical contact in light of the on-site conditions. The factors that must be considered in making this *determination* include, but are not limited to: Conditions affecting atmospheric conductivity; time necessary to bring the equipment, load line, and load (including rigging and lifting accessories) to a complete stop; wind conditions; degree of sway in the power line; lighting conditions, and other conditions affecting the ability to prevent electrical contact.

- [1926.1410\(c\)\(2\)](#) - [Paragraph \(c\)\(1\)](#) of this section does not apply to work covered by [subpart V - electric power transmission and distribution](#), of this part; instead, for such work, the *minimum approach distances* established by the employer under [1926.960\(c\)\(1\)\(i\)](#) - *Working on or near exposed energized parts*, apply.

[1926.1410\(d\)](#) - A *planning meeting* with the employer and *utility owner/operator* (or *registered professional engineer* who is a *qualified person* with respect to electrical power transmission and distribution) is held to *determine* the *procedures* that will be followed to prevent electrical contact and electrocution. At a minimum these *procedures* must include: [Reference [paragraph \(d\)\(1\) - \(12\)](#)].

[1926.1410\(e\)](#) - The *procedures* developed to comply with paragraph (d) of this section are *documented* and immediately available on-site.

[1926.1410\(f\)](#) - The *equipment user and utility owner/operator* (or *registered professional engineer*) meet with the *equipment operator* and the other workers who will be in the area of the equipment or load to *review* the *procedures* that will be implemented to prevent breaching the *minimum approach distance* established in paragraph (c) of this section and prevent electrocution.

[1926.1410\(g\)](#) - The *procedures* developed to comply with paragraph (d) of this section are implemented.

[1926.1410\(h\)](#) - The *utility owner/operator* (or *registered professional engineer*) and all employers of employees involved in the work must *identify one person* who will direct the implementation of the *procedures*. The *person identified* in accordance with this paragraph must direct the implementation of the *procedures* and must have the *authority* to stop work at any time to ensure safety.

[1926.1410\(j\)](#) - If a problem occurs implementing the *procedures* being used to comply with [paragraph \(d\)](#) of this section, or indicating that those *procedures* are inadequate to prevent electrocution, the employer must safely stop operations and either develop new *procedures* to comply with [paragraph \(d\)](#) of this section or have the *utility owner/operator* deenergize and visibly ground or relocate the power line before resuming work.

[1926.1410\(k\)](#) - Devices originally *designed by the manufacturer* for use as a *safety device* (see [1926.1415](#)), operational aid, or a means to prevent power line contact or electrocution, when used to comply with this section, must comply with the *manufacturer's procedures* for use and conditions of use.

[1926.1410\(m\)](#) - The employer must *train* each operator and crew member assigned to work with the equipment in accordance with [1926.1408\(g\)](#) - *power line safety (up to 350 kV)-- equipment operations*.

1926.1411 - Power Line Safety—While Traveling Under or Near Power Lines With No Load

Scope: This [standard](#) provides the requirements for power line safety—while traveling under or near power lines with no load.

Special Requirements: Clearances, procedures, dedicated spotter, measures, references other standards

[1926.1411\(a\)](#) - This section establishes *procedures* and criteria that must be met for equipment traveling under or near a power line on a construction site with no load. Equipment traveling on a construction site with a load is governed by [1926.1408](#) - Power line safety (up to 350 kV)--equipment operations, [1926.1409](#) - Power line safety (over 350 kV) or [1926.1410](#) - Power line safety (all voltages)--equipment operations closer than the *Table A* zone, whichever is appropriate, and [1926.1417\(u\)](#) - operation, traveling with load.

[1926.1411\(b\)\(2\)](#) - The *clearances* specified in [Table T](#) of this section are maintained.

[1926.1411\(b\)\(3\)](#) - The effects of speed and terrain on equipment movement (including movement of the boom/mast) are considered so that those effects do not cause the *minimum clearance distances* specified in [Table T](#) of this section to be breached.

[1926.1411\(b\)\(4\)](#) - *Dedicated spotter*. If any part of the equipment while traveling will get closer than 20 feet to the power line, the employer must ensure that a *dedicated spotter* who is in continuous contact with the driver/operator is used. The *dedicated spotter* must: [Reference [paragraph \(b\)\(4\)\(i\) - \(iii\)](#)].

[1926.1411\(b\)\(5\)](#) - *Additional precautions* for traveling in poor visibility. When traveling at night, or in conditions of poor visibility, in addition to the *measures* specified in [paragraphs \(b\)\(1\) through \(4\)](#) of this section, the employer must ensure that: [Reference [paragraph \(b\)\(5\)\(i\) - \(ii\)](#)].

1926.1412 – Inspections

Scope: This [standard](#) provides the requirements for inspections.

Special Requirements: Inspections, inspect, rated capacity, qualified person, documented, monitored, information, warning labels, name and signature, manufacturer procedures, manufacturer equipment criteria, checked, corrective action, demonstrates, competent person, approval, testing, references other standards

[1926.1412\(a\)\(1\)](#) - Equipment that has had modifications or additions which affect the safe operation of the equipment (such as modifications or additions involving a safety device or operational aid, critical part of a control system, power plant, braking system, load-

sustaining structural components, load hook, or in-use operating mechanism) or capacity must be *inspected by a qualified person* after such modifications/additions have been completed, *prior to initial use*. The *inspection* must meet all of the following requirements:

- [1926.1412\(a\)\(1\)\(i\)](#) - The *inspection* must assure that the modifications or additions have been done in accordance with the *approval* obtained pursuant to [1926.1434](#) (*Equipment modifications*).
- [1926.1412\(a\)\(1\)\(ii\)](#) - The *inspection* must include *functional testing* of the equipment.

[1926.1412\(a\)\(2\)](#) - Equipment must not be used until an *inspection* under this paragraph *demonstrates* that the requirements of [paragraph \(a\)\(1\)\(i\)](#) of this section have been met.

[1926.1412\(b\)\(1\)](#) - Equipment that has had a repair or adjustment that relates to safe operation (such as: A repair or adjustment to a safety device or operator aid, or to a critical part of a control system, power plant, braking system, load-sustaining structural components, load hook, or in-use operating mechanism), must be *inspected by a qualified person* after such a repair or adjustment has been completed, prior to initial use. The *inspection* must meet all of the following requirements: [Reference [paragraph \(b\)\(1\)\(i\) - \(iii\)](#)].

[1926.1412\(b\)\(4\)](#) - Equipment must not be used until an *inspection* under this paragraph *demonstrates* that the repair/adjustment meets the requirements of [paragraph \(b\)\(1\)\(i\)](#) of this section (or, where applicable, [paragraph \(b\)\(1\)\(ii\)](#) of this section).

[1926.1412\(c\)\(1\)](#) - Upon completion of assembly, the equipment must be *inspected by a qualified person* to assure that it is configured in accordance with *manufacturer equipment criteria*.

[1926.1412\(c\)\(2\)](#) - Where manufacturer equipment criteria are unavailable, a *qualified person* must: [Reference [paragraph \(c\)\(2\)\(i\) - \(ii\)](#)].

[1926.1412\(c\)\(3\)](#) - Equipment must not be used until an *inspection* under this paragraph *demonstrates* that the equipment is configured in accordance with the applicable criteria.

[1926.1412\(d\)\(1\)](#) - A *competent person* must begin a *visual inspection prior to each shift* the equipment will be used, which must be completed before or during that shift. The *inspection* must consist of observation for apparent deficiencies. Taking apart equipment components and booming down is not required as part of this inspection unless the results of the *visual inspection* or trial operation indicate that further investigation necessitating taking apart equipment components or booming down is needed. *Determinations* made in conducting the *inspection* must be *reassessed* in light of

observations made during operation. At a minimum the *inspection* must include all of the following: [Reference [paragraph \(d\)\(1\)\(i\) - \(xiv\)](#)].

[1926.1412\(d\)\(2\)](#) - If any deficiency in [paragraphs \(d\)\(1\)\(i\) through \(xiii\)](#) of this section (or in additional *inspection items* required to be *checked* for specific types of equipment in accordance with other sections of this standard) is identified, an immediate *determination* must be made by the *competent person* as to whether the deficiency constitutes a safety hazard. If the deficiency is *determined* to constitute a safety hazard, the equipment must be taken out of service until it has been corrected. See [1926.1417 - operation](#).

[1926.1412\(d\)\(3\)](#) - If any deficiency in [paragraph \(d\)\(1\)\(xiv\)](#) of this section (safety devices/operational aids) is identified, the action specified in [1926.1415 - safety devices](#), and [1926.1416 - operational aids](#) must be taken prior to using the equipment.

[1926.1412\(e\)\(1\)](#) - Each month the equipment is in service it must be *inspected* in accordance with [paragraph \(d\)](#) of this section (each shift).

[1926.1412\(e\)\(2\)](#) - Equipment must not be used until an *inspection* under this paragraph *demonstrates* that no corrective action under [paragraphs \(d\)\(2\)](#) and [\(3\)](#) of this section is required.

[1926.1412\(e\)\(3\)\(i\)](#) - The following *information* must be *documented and maintained* by the employer that conducts the *inspection*: [Reference [paragraph \(e\)\(3\)\(i\) - \(ii\)](#)].

[1926.1412\(f\)\(1\)](#) - At least every 12 months the equipment must be *inspected by a qualified person* in accordance with [paragraph \(d\)](#) of this section (each shift) except that the *corrective action* set forth in [paragraphs \(f\)\(4\)](#), [\(f\)\(5\)](#), and [\(f\)\(6\)](#) of this section must apply in place of the *corrective action* required by [paragraphs \(d\)\(2\)](#) and [\(d\)\(3\)](#) of this section.

[1926.1412\(f\)\(2\)](#) - In addition, at least every 12 months, the equipment must be *inspected by a qualified person*. Disassembly is required, as necessary, to complete the *inspection*. The equipment must be *inspected* for all of the following: [Reference [paragraph \(f\)\(2\)\(i\) - \(xxi\)](#)].

[1926.1412\(f\)\(3\)](#) - This *inspection* must include *functional testing* to determine that the equipment as configured in the inspection is functioning properly.

[1926.1412\(f\)\(4\)](#) - If any deficiency is identified, an immediate *determination* must be made by the *qualified person* as to whether the deficiency constitutes a safety hazard or, though not yet a safety hazard, needs to be *monitored in the monthly inspections*.

[1926.1412\(f\)\(5\)](#) - If the qualified person determines that a deficiency is a safety hazard, the equipment must be taken out of service until it has been corrected, except when temporary alternative measures are implemented as specified in [1926.1416\(d\)](#) - *operational aids*, or [1926.1435\(e\)](#) - *tower cranes*. See [1926.1417](#) - *operation*.

[1926.1412\(f\)\(6\)](#) - If the *qualified person determines* that, though not presently a safety hazard, the deficiency needs to be *monitored*, the employer must ensure that the deficiency is *checked in the monthly inspections*.

[1926.1412\(f\)\(7\)](#) - *Documentation of annual/comprehensive inspection*. The following *information* must be *documented, maintained, and retained* for a minimum of 12 months, by the employer that conducts the *inspection*: [Reference [paragraph \(f\)\(7\)\(i\) - \(ii\)](#)].

[1926.1412\(g\)](#) - *Severe service*. Where the severity of use/conditions is such that there is a reasonable probability of damage or excessive wear (such as loading that may have exceeded *rated capacity*, shock loading that may have exceeded *rated capacity*, prolonged exposure to a corrosive atmosphere), the employer must stop using the equipment and a *qualified person* must: [Reference [paragraph \(g\)\(1\) - \(3\)](#)].

[1926.1412\(h\)](#) - *Equipment not in regular use*. Equipment that has been idle for 3 months or more must be *inspected by a qualified person* in accordance with the requirements of [paragraph \(e\)](#) (Monthly) of this section before initial use.

[1926.1412\(j\)](#) - Any part of a *manufacturer's procedures regarding inspections* that relate to safe operation (such as to a safety device or operational aid, critical part of a control system, power plant, braking system, load-sustaining structural components, load hook, or in-use operating mechanism) that is more comprehensive or has a more frequent *schedule of inspection* than the requirements of this section must be followed.

[1926.1412\(k\)](#) - All *documents* produced under this section must be available, during the applicable *document retention* period, to all persons who conduct *inspections* under this section.

1926.1413 - Wire Rope – Inspection

Scope: This [standard](#) provides the requirements for inspecting wire ropes.

Special Requirements: Shift inspections, competent person, documented, documents, corrective action, visual inspections, determination, qualified person, demonstrates, references other standards

[1926.1413\(a\)](#) - *Shift inspection*.

- [1926.1413\(a\)\(1\)](#) - A *competent person* must begin a *visual inspection* prior to each *shift* the equipment is used, which must be completed before or during that shift. The *inspection* must consist of observation of wire ropes (running and standing) that are likely to be in use during the shift for apparent deficiencies, including those listed in [paragraph \(a\)\(2\)](#) of this section. Untwisting (opening) of wire rope or booming down is not required as part of this *inspection*. [Reference [paragraph \(a\)\(1\) - \(3\)](#)].
- [1926.1413\(a\)\(4\)\(i\)](#) - If a deficiency in Category I (see [paragraph \(a\)\(2\)\(i\)](#) of this section) is identified, an immediate *determination* must be made by the *competent person* as to whether the deficiency constitutes a safety hazard. If the deficiency is *determined* to constitute a safety hazard, operations involving use of the wire rope in question must be prohibited until: [Reference [paragraph \(a\)\(4\)\(i\) - \(iv\)](#)].

[1926.1413\(b\)](#) - *Monthly inspection*.

- [1926.1413\(b\)\(1\)](#) - Each month an *inspection* must be conducted in accordance with [paragraph \(a\)](#) (*shift inspection*) of this section.
- [1926.1413\(b\)\(2\)](#) - The *inspection* must include any deficiencies that the *qualified person* who conducts the *annual inspection* determines under [paragraph \(c\)\(3\)\(ii\)](#) of this section must be *monitored*.
- [1926.1413\(b\)\(3\)](#) - Wire ropes on equipment must not be used until an *inspection* under this paragraph *demonstrates* that no *corrective action* under [paragraph \(a\)\(4\)](#) of this section is required.
- [1926.1413\(b\)\(4\)](#) - The *inspection* must be *documented* according to [1926.1412\(e\)\(3\)](#) (*monthly inspection documentation*).

[1926.1413\(c\)](#) - *Annual/comprehensive*.

- [1926.1413\(c\)\(1\)](#) - At least every 12 months, wire ropes in use on equipment must be *inspected* by a *qualified person* in accordance with [paragraph \(a\)](#) of this section (*shift inspection*).
- [1926.1413\(c\)\(2\)](#) - In addition, at least every 12 months, the wire ropes in use on equipment must be *inspected* by a *qualified person*, as follows: [Reference [paragraph \(c\)\(2\)\(i\) - \(iii\)](#)].
- [1926.1413\(c\)\(3\)](#) - If a deficiency is identified, an immediate *determination* must be made by the *qualified person* as to whether the deficiency constitutes a safety hazard. [Reference [paragraph \(c\)\(3\)\(i\) - \(ii\)](#)].
- [1926.1413\(c\)\(4\)](#) - The *inspection* must be *documented* according to [1926.1412\(f\)\(7\)](#) (*annual/comprehensive inspection documentation*).

[1926.1413\(e\)](#) - All *documents* produced under this section must be available, during the applicable *document retention period*, to all persons who conduct *inspections* under this section.

1926.1414 - Wire Rope - Selection and Installation Criteria

Scope: This [standard](#) provides the requirements for wire rope selection and criteria.

Special Requirements: Qualified person, wire rope manufacturer, design factor, rated capacity, inspect, approves (in writing), inspection documents, recorded, recommendations, determines, manufacturer instructions, references other standards

[1926.1414\(a\)](#) - Original equipment wire rope and replacement wire rope must be selected and installed in accordance with the requirements of this section. Selection of replacement wire rope must be in accordance with the *recommendations* of the *wire rope manufacturer, the equipment manufacturer, or a qualified person*.

[1926.1414\(e\)\(2\)\(iii\)](#) - Type I must have an *operating design factor* of no less than 5, except where the *wire rope manufacturer and the equipment manufacturer approves the design factor, in writing*.

[1926.1414\(e\)\(3\)](#) - When Types II and III with an *operating design factor* of less than 5 are used (for non-duty cycle, non-repetitive lifts), the following requirements must be met for each lifting operation:

- [1926.1414\(e\)\(3\)\(i\)](#) - A *qualified person* must *inspect* the rope in accordance with [1926.1413\(a\)](#). The rope must be used only if the *qualified person determines* that there are no deficiencies constituting a hazard. In making this *determination*, more than one broken wire in any one rope lay must be considered a hazard.
- [1926.1414\(e\)\(3\)\(iii\)](#) - Each lift made under [1926.1414\(e\)\(3\)](#) must be *recorded* in the *monthly and annual inspection documents*. Such prior uses must be considered by the *qualified person* in *determining* whether to use the rope again.

[1926.1414\(e\)\(4\)](#) - Additional requirements for rotation resistant ropes for boom hoist reeving.

- [1926.1414\(e\)\(4\)\(ii\)\(B\)](#) - The requirements in [1926.1426\(a\)](#) - *operational aids*, (irrespective of the date of manufacture of the equipment), and [1926.1426\(b\)](#) - *operational aids*.
- [1926.1414\(e\)\(4\)\(ii\)\(C\)](#) - The requirements in ASME B30.5-2004 sections 5-1.3.2(a), (a)(2) through (a)(4), (b) and (d) [incorporated by reference, see [1926.6](#)] except that the minimum pitch diameter for sheaves used in multiple rope reeving is 18 times the nominal diameter of the rope used (instead of the value of 16 specified in section 5-1.3.2(d)).
- [1926.1414\(e\)\(4\)\(ii\)\(F\)](#) - The *operating design factor* for these ropes must be the total minimum breaking force of all parts of rope in the system divided by the load

imposed on the rope system when supporting the static weights of the structure and the load within the equipment's *rated capacity*.

- [1926.1414\(e\)\(4\)\(ii\)\(G\)](#) - When provided, a power-controlled lowering system must be capable of handling *rated capacities* and speeds as *specified by the manufacturer*.

[1926.1414\(g\)](#) - Socketing must be done in the manner *specified by the manufacturer* of the wire rope or fitting.

[1926.1414\(h\)](#) - Prior to cutting a wire rope, seizings must be placed on each side of the point to be cut. The length and number of seizings must be in accordance with the wire rope *manufacturer's instructions*.

1926.1415 - Safety Devices

Scope: This [standard](#) provides the requirements for safety devices.

Special Requirements: Tagged-out, taken out of service, alternative measures, references other standards

[1926.1415\(a\)\(1\)\(ii\)](#) - If a built-in crane level indicator is not working properly, it must be *tagged-out* or removed. If a removable crane level indicator is not working properly, it must be removed.

[1926.1415\(a\)\(7\)\(ii\)](#) - If a built-in horn is not working properly, it must be *tagged-out* or removed. If a removable horn is not working properly, it must be removed.

[1926.1415\(b\)](#) - Proper operation required. Operations must not begin unless all of the devices listed in this section are in proper working order. If a device stops working properly during operations, the operator must safely stop operations. If any of the devices listed in this section are not in proper working order, the equipment must be *taken out of service* and operations must not resume until the device is again working properly. See [1926.1417](#) (Operation). *Alternative measures* are not permitted to be used.

1926.1416 - Operation Aids

Scope: This [standard](#) provides the requirements for operational aids.

Special Requirements: Measures, mark, spotter, methods, determined, manufacturer procedures, operator, verify, measuring, calculate, rated capacity, information, references other standards

[1926.1416\(b\)](#) - Operations must not begin unless the listed operational aids are in proper working order, except where an operational aid is being repaired the employer uses the specified temporary *alternative measures*. The time periods permitted for repairing

defective operational aids are specified in [paragraphs \(d\)](#) and [\(e\)](#) of this section. More protective *alternative measures* specified by the crane/derrick manufacturer, if any, must be followed.

[1926.1416\(c\)](#) - If a listed operational aid stops working properly during operations, the operator must safely stop operations until the temporary *alternative measures* are implemented or the device is again working properly. If a replacement part is no longer available, the use of a substitute device that performs the same type of function is permitted and is not considered a modification under [1926.1434](#) - equipment modifications.

[1926.1416\(d\)](#) - Category I operational aids and *alternative measures*. Operational aids listed in this paragraph that are not working properly must be repaired no later than 7 calendar days after the deficiency occurs. *Exception*: If the employer documents that it has ordered the necessary parts within 7 calendar days of the occurrence of the deficiency, the repair must be completed within 7 calendar days of receipt of the parts. See [1926.1417\(j\)](#) - operation, for additional requirements.

- [1926.1416\(d\)\(1\)\(i\)](#) - For equipment manufactured after December 16, 1969, a boom hoist limiting device is required. *Temporary alternative measures (use at least one)*. One or more of the following *methods* must be used: [Reference [paragraph \(d\)\(1\)\(i\) - \(ii\)](#)].
- [1926.1416\(d\)\(2\)](#) - Luffing jib limiting device. Equipment with a luffing jib must have a luffing jib limiting device. Temporary *alternative measures* are the same as in paragraph (d)(1)(i) of this section, except to limit the movement of the luffing jib rather than the boom hoist.
- [1926.1416\(d\)\(3\)\(i\)](#) - Telescopic boom cranes manufactured after February 28, 1992, must be equipped with a device which automatically prevents damage from contact between the load block, overhaul ball, or similar component, and the boom tip (or fixed upper block or similar component). The device(s) must prevent such damage at all points where two-blocking could occur.

Temporary alternative measures: Clearly *mark* the cable (so that it can easily be seen by the *operator*) at a point that will give the *operator* sufficient time to stop the hoist to prevent two-blocking, and use a *spotter* when extending the boom.

- [1926.1416\(d\)\(3\)\(ii\)\(D\)](#) - *Temporary alternative measures*. Clearly *mark* the cable (so that it can easily be seen by the *operator*) at a point that will give the operator sufficient time to stop the hoist to prevent two-blocking, or use a *spotter*.

[1926.1416\(e\)\(1\)](#) - *Boom angle or radius indicator*. The equipment must have a boom angle or radius indicator readable from the operator's station. *Temporary alternative measures*: Radii or boom angle must be *determined by measuring* the radii or boom angle with a *measuring device*.

1926.1416(e)(3) - Boom length indicator if the equipment has a telescopic boom, except where the *rated capacity* is independent of the boom length. *Temporary alternative measures*. One or more of the following *methods* must be used:

- 1926.1416(e)(3)(i) - *Mark* the boom with *measured marks* to calculate boom length,
- 1926.1416(e)(3)(ii) - *Calculate* boom length from boom angle and radius measurements,
- 1926.1416(e)(3)(iii) - *Measure* the boom with a *measuring device*.

1926.1416(e)(4)(i) - Equipment (other than derricks and articulating cranes) manufactured after March 29, 2003 with a rated capacity over 6,000 pounds must have at least one of the following: load weighing device, load moment (or rated capacity) indicator, or load moment (or rated capacity) limiter. *Temporary alternative measures*: The weight of the load must be *determined* from a source recognized by the industry (such as the load's manufacturer) or by a *calculation method* recognized by the industry (such as *calculating* a steel beam from measured dimensions and a known per foot weight). This *information* must be provided to the operator prior to the lift.

1926.1416(e)(4)(ii) - Articulating cranes manufactured after November 8, 2011 must have at least one of the following: automatic overload prevention device, load weighing device, load moment (or *rated capacity*) indicator, or load moment (rated capacity) limiter. *Temporary alternative measures*: The weight of the load must be determined from a source recognized by the industry (such as the load's manufacturer) or by a *calculation method* recognized by the industry (such as *calculating* a steel beam from measured dimensions and a known per foot weight). This *information* must be provided to the *operator* prior to the lift.

1926.1416(e)(5)(i) - Outrigger/stabilizer position (horizontal beam extension) sensor/monitor if the equipment has outriggers or stabilizers. *Temporary alternative measures*: The operator must *verify* that the position of the outriggers or stabilizers is correct (in accordance with *manufacturer procedures*) before beginning operations requiring outrigger or stabilizer deployment.

1926.1416(e)(5)(ii) - Hoist drum rotation indicator if the equipment has a hoist drum not visible from the operator's station. *Temporary alternative measures*: Mark the drum to indicate the rotation of the drum. In addition, install mirrors or remote video cameras and displays if necessary for the *operator* to see the *mark*.

1926.1417 – Operation

Scope: This standard provides operation requirements.

Special Requirements: Procedures, capacity, registered professional engineer, develop, notices, tags/tagged, verify, manufacturer specifications, manufacturer recommendations, competent person, qualified person, operator, writing, inform, designated, information, warnings, instructions, operator's manual, signal communications, person authorized, sign, storm warning, determine, professional judgement, signal person, alternative measures, notify, references other standards

1926.1417(a) - The employer must comply with all *manufacturer procedures* applicable to the operational functions of equipment, including its use with attachments.

1926.1417(b)(1) - Where the *manufacturer procedures* are unavailable, the employer must *develop* and ensure compliance with all *procedures* necessary for the safe operation of the equipment and attachments.

1926.1417(b)(2) - *Procedures* for the operational controls must be *developed* by a *qualified person*.

1926.1417(b)(3) - *Procedures* related to the *capacity* of the equipment must be *developed* and *signed* by a *registered professional engineer* familiar with the equipment.

1926.1417(c)(1) - The *procedures* applicable to the operation of the equipment, including *rated capacities* (load charts), recommended operating speeds, special hazard i, must be *readily available* in the cab at all times for use by the *operator*.

1926.1417(c)(2) - Where *rated capacities* are available in the cab only in electronic form: In the event of a failure which makes the *rated capacities* inaccessible, the operator must immediately cease operations or follow safe shut-down *procedures* until the *rated capacities* (in electronic or other form) are available.

1926.1417(d) - The *operator* must not engage in any practice or activity that diverts his/her attention while actually engaged in operating the equipment, such as the use of cellular phones (other than when used for *signal communications*).

1926.1417(e)(1) - The *operator* must not leave the controls while the load is suspended, except where all of the following are met:

- 1926.1417(e)(1)(i) - The *operator* remains adjacent to the equipment and is not engaged in any other duties.
- 1926.1417(e)(1)(iii) - The *competent person determines* that it is safe to do so and implements *measures* necessary to restrain the boom hoist and telescoping, load, swing, and outrigger or stabilizer functions.
- 1926.1417(e)(1)(iv) - Barricades or *caution lines, and notices*, are erected to prevent all employees from entering the fall zone. No employees, including those listed

in [1926.1425\(b\)\(1\)](#) - *keeping clear of the load, through (3), [1926.1425\(d\)](#) or [1926.1425\(e\)](#)*, are permitted in the fall zone.

[1926.1417\(e\)\(2\)](#) - The provisions in [1926.1417\(e\)\(1\)](#) do not apply to working gear (such as slings, spreader bars, ladders, and welding machines) where the weight of the working gear is negligible relative to the lifting *capacity* of the equipment as positioned, and the working gear is suspended over an area other than an entrance or exit.

[1926.1417\(f\)\(1\)](#) - *Tagging out of service equipment/functions*. Where the employer has taken the equipment out of service, a *tag* must be placed in the cab stating that the equipment is out of service and is not to be used. Where the employer has taken a function(s) out of service, a *tag* must be placed in a conspicuous position stating that the function is out of service and is not to be used.

[1926.1417\(f\)\(2\)\(i\)](#) - If there is a *warning (tag-out or maintenance/do not operate) sign* on the equipment or starting control, the operator must not activate the switch or start the equipment until the *sign* has been removed by a *person authorized* to remove it, or until the *operator* has *verified* that: [Reference [paragraph \(f\)\(2\)\(i\)\(A\) - \(B\)](#)].

[1926.1417\(f\)\(2\)\(ii\)](#) - If there is a *warning (tag-out or maintenance/do not operate) sign* on any other switch or control, the operator must not activate that switch or control until the *sign* has been removed by a *person authorized* to remove it, or until the operator has *verified* that the requirements in [paragraphs \(f\)\(2\)\(i\)\(A\) and \(B\)](#) of this section have been met.

[1926.1417\(g\)](#) - Before starting the engine, the *operator must verify* that all controls are in the proper starting position and that all personnel are in the clear.

[1926.1417\(h\)](#) - *Storm warning*. When a local *storm warning* has been issued, the *competent person* must *determine* whether it is necessary to implement *manufacturer recommendations* for securing the equipment.

[1926.1417\(j\)\(1\)](#) - The *operator* must, in *writing*, promptly *inform* the person *designated* by the employer to receive such *information* and, where there are successive shifts, to the next *operator*; and

[1926.1417\(j\)\(2\)](#) - The employer must *notify* all affected employees, at the *beginning of each shift*, of the necessary adjustments or repairs and all *alternative measures*.

[1926.1417\(k\)](#) - Safety devices and operational aids must not be used as a substitute for the exercise of *professional judgment by the operator*.

[1926.1417\(m\)](#) - If the *competent person determines* that there is a slack rope condition requiring re-spooling of the rope, it must be *verified* (before starting to lift) that the rope is seated on the drum and in the sheaves as the slack is removed.

[1926.1417\(n\)](#) - The *competent person* must adjust the equipment and/or operations to address the effect of wind, ice, and snow on equipment stability and *rated capacity*.

[1926.1417\(o\)\(1\)](#) - The equipment must not be operated in excess of its *rated capacity*.

[1926.1417\(o\)\(2\)](#) - The *operator* must not be required to operate the equipment in a manner that would violate [paragraph \(o\)\(1\)](#) of this section.

[1926.1417\(o\)\(3\)](#) - *Load weight*. The *operator must verify* that the load is within the *rated capacity* of the equipment by at least one of the following *methods*: [Reference [paragraph \(o\)\(3\)\(i\) - \(ii\)](#)].

[1926.1417\(u\)\(1\)](#) - Traveling with a load is prohibited if the practice is *prohibited by the manufacturer*.

[1926.1417\(u\)\(2\)](#) - Where traveling with a load, the employer must ensure that:

- [1926.1417\(u\)\(2\)\(i\)](#) - A *competent person supervises* the operation, determines if it is necessary to reduce *rated capacity*, and makes determinations regarding load position, boom location, ground support, travel route, overhead obstructions, and speed of movement necessary to ensure safety.
- [1926.1417\(u\)\(2\)\(ii\)](#) - The *determinations of the competent person* required in [paragraph \(u\)\(2\)\(i\)](#) of this section are implemented.
- [1926.1417\(u\)\(2\)\(iii\)](#) - For equipment with tires, tire pressure *specified by the manufacturer* is maintained.

[1926.1417\(y\)](#) - Anyone who becomes aware of a safety problem must alert the *operator or signal person* by giving the stop or emergency stop signal. (Note: [1926.1417\(y\)](#) requires the operator to obey a stop or emergency stop signal).

[1926.1417\(z\)](#) - Swinging locomotive cranes. A locomotive crane must not be swung into a position where railway cars on an adjacent track could strike it, until it is *determined* that cars are not being moved on the adjacent track and that *proper flag protection* has been established.

[1926.1417\(aa\)\(1\)\(i\)](#) - Equipment must not be operated without the counterweight or ballast in place as *specified by the manufacturer*.

[1926.1417\(aa\)\(1\)\(ii\)](#) - The maximum counterweight or ballast *specified by the manufacturer* for the equipment must not be exceeded.

[1926.1417\(aa\)\(2\)](#) - Counterweight/ballast requirements for tower cranes are specified in [1926.1435\(b\)\(8\)](#) - *tower cranes, counterweight/ballast*.

1926.1418 - Authority to Stop Operation

Scope: This [standard](#) provides the authority to stop operation.

Special Requirements: Operator, authority, qualified person, determined

Whenever there is a concern as to safety, the *operator* must have the *authority* to stop and refuse to handle loads until a *qualified person has determined* that safety has been assured.

1926.1419 - Signals - General Requirements

Scope: This [standard](#) provides the general requirements for signals.

Special Requirements: Signal person, signals, operator, lift director, standard method, non-standard hand signals, employer demonstrates, directions, communication, system, method

[1926.1419\(a\)](#) - A *signal person* must be provided in each of the following situations:[Reference [paragraph \(a\)\(1\) - \(3\)](#)].

[1926.1419\(b\)](#) - *Types of signals. Signals to operators must be by hand, voice, audible, or new signals.*

[1926.1419\(c\)\(1\)](#) - When using *hand signals*, the *Standard Method* must be used (see [appendix A](#) of this subpart). *Exception:* Where use of the *Standard Method* for *hand signals* is infeasible, or where an operation or use of an attachment is not covered in the *Standard Method*, *non-standard hand signals* may be used in accordance with [paragraph \(c\)\(2\)](#) of this section.

[1926.1419\(c\)\(2\)](#) - *Non-standard hand signals. 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.*

[1926.1419\(d\)](#) - *New signals. Signals other than hand, voice, or audible signals may be used where the employer demonstrates that:* [Reference [paragraph \(d\)\(1\) - \(2\)](#)].

[1926.1419\(e\)](#) - *Suitability. The signals used (hand, voice, audible, or new), and means of transmitting the signals to the operator (such as direct line of sight, video, radio, etc.), must be appropriate for the site conditions.*

[1926.1419\(f\)](#) - During operations requiring *signals*, the ability to transmit *signals* between the *operator and signal person* must be maintained. If that ability is interrupted at any time, the operator must safely stop operations requiring *signals* until it is reestablished and a proper *signal* is given and understood.

[1926.1419\(g\)](#) - If the *operator* becomes aware of a safety problem and needs to *communicate with the signal person*, the *operator* must safely stop operations. Operations must not resume until the *operator and signal person* agree that the problem has been resolved.

[1926.1419\(h\)](#) - Only one person may give *signals* to a crane/derrick at a time, except in circumstances covered by [paragraph \(j\)](#) of this section.

[1926.1419\(j\)](#) - Anyone who becomes aware of a safety problem must alert the *operator or signal person* by giving the stop or emergency stop signal. (NOTE: [1926.1417\(y\)](#) - operation, requires the operator to obey a stop or emergency stop signal).

[1926.1419\(k\)](#) - All *directions* given to the *operator* by the *signal person* must be given from the *operator's direction* perspective.

[1926.1419\(m\)](#) - *Communication* with multiple cranes/derricks. Where a *signal person(s)* is *in communication* with more than one crane/derrick, a *system* must be used for identifying the crane/derrick each *signal* is for, as follows:

- [1926.1419\(m\)\(1\)](#) - for each *signal*, prior to giving the function/direction, the *signal person* must identify the crane/derrick the *signal* is for, or
- [1926.1419\(m\)\(2\)](#) - must use an equally effective *method* of identifying which crane/derrick the *signal* is for.

1926.1420 - Signals - Radio, Telephone or Other Electronic Transmission of Signals

Scope: This [standard](#) provides for radio, telephone or other electronic transmission of signals.

Special Requirements: Signals, tested, operator, hands-free system

[1926.1420\(a\)](#) - The device(s) used to transmit *signals* must be *tested* on site before beginning operations to ensure that the *signal transmission* is effective, clear, and reliable.

[1926.1420\(b\)](#) - *Signal transmission* must be through a dedicated channel, except: [Reference [paragraph \(b\)\(1\) - \(2\)](#)].

[1926.1420\(c\)](#) - The *operator's* reception of *signals* must be by a *hands-free system*.

1926.1421 - Signals - Voice Signals - Additional Requirements

Scope: This [standard](#) provides additional requirements for voice signals.

Special Requirements: Operator, signal person, lift director, voice signals, communicate

[1926.1421\(a\)](#) - Prior to beginning operations, the *operator, signal person and lift director* (if there is one), must contact each other and agree on the *voice signals* that will be used. Once the *voice signals* are agreed upon, these workers need not meet again to discuss *voice signals* unless another worker is added or substituted, there is confusion about the *voice signals*, or a *voice signal* is to be changed.

[1926.1421\(b\)](#) - Each *voice signal* must contain the following three elements, given in the following order: function (such as hoist, boom, etc.), direction; distance and/or speed; function, stop command.

[1926.1421\(c\)](#) - The *operator, signal person and lift director* (if there is one), must be able to effectively *communicate* in the language used.

1926.1422 - Signals - Hand Signal Chart

Scope: This [standard](#) provides signals using a hand signal chart.

Special Requirements: Hand signal charts, posted

[Hand signal charts](#) must be either *posted* on the equipment or conspicuously *posted* in the vicinity of the hoisting operations.

1926.1423 - Fall Protection

Scope: This [standard](#) provides the requirements for fall protection.

Special Requirements: Fall protection equipment, equipment operator, personal fall arrest system, fall restraint systems, competent person, inspection, maximum load, informed, determination, qualified person, engineering analysis, training, references other standards

[1926.1423\(c\)\(1\)](#) - Section [1926.502\(b\)](#) - *Fall protection systems criteria and practices, guardrail systems*, does not apply to equipment covered by this subpart.

[1926.1423\(c\)\(3\)\(i\)](#) - Steps, handholds, ladders and guardrails/railings/grabrails must meet the criteria of [SAE J185](#) (May 2003) (*incorporated by reference, see [1926.6](#)*) or

[ISO 11660-2:1994\(E\)](#) (*incorporated by reference, see [1926.6](#)*) except where infeasible.

[1926.1423\(c\)\(4\)\(i\)](#) - Steps, handholds, ladders, and guardrails/railings/grabrails must meet the criteria of *ISO 11660-1:2008(E)* (incorporated by reference, see [1926.6](#)) and

ISO 11660-3:2008(E) (incorporated by reference, see [1926.6](#)) or *SAE J185* (May 2003) (incorporated by reference, see [1926.6](#)) except where infeasible.

[1926.1423\(d\)](#) - *Personal fall arrest and fall restraint systems. Personal fall arrest system components must be used in personal fall arrest and fall restraint systems and must conform to the criteria in [1926.502\(d\)](#) - personal fall arrest system, except that [1926.502\(d\)\(15\)](#) does not apply to components used in personal fall arrest and fall restraint systems. Either body belts or body harnesses must be used in personal fall arrest and fall restraint systems.*

[1926.1423\(e\)](#) - For non-assembly/disassembly work, the employer must provide and ensure the use of *fall protection equipment* for employees who are on a walking/working surface with an unprotected side or edge more than 6 feet above a lower level as follows: [Reference [paragraph \(e\)\(1\) - \(2\)](#)].

[1926.1423\(f\)](#) - For assembly/disassembly work, the employer must provide and ensure the use of *fall protection equipment* for employees who are on a walking/working surface with an unprotected side or edge more than 15 feet above a lower level, except when the employee is at or near draw-works (when the equipment is running), in the cab, or on the deck.

[1926.1423\(g\)\(1\)](#) - Sections [1926.502\(d\)\(15\)](#) and [1926.502\(e\)\(2\)](#) apply to equipment covered by this subpart only to the extent delineated in [paragraph \(g\)\(2\)](#) of this section.

[1926.1423\(g\)\(2\)\(i\)](#) - Personal fall arrest systems must be anchored to any apparently substantial part of the equipment unless a *competent person*, from a *visual inspection*, without an *engineering analysis*, would conclude that the criteria in [1926.502\(d\)\(15\)](#) would not be met.

[1926.1423\(g\)\(2\)\(ii\)](#) - *Positioning device systems* must be anchored to any apparently substantial part of the equipment unless a *competent person*, from a *visual inspection*, without an *engineering analysis*, would conclude that the criteria in [1926.502\(e\)\(2\)](#) would not be met.

[1926.1423\(g\)\(2\)\(iii\)](#) - Attachable anchor devices (portable anchor devices that are attached to the equipment) must meet the anchorage criteria in [1926.502\(d\)\(15\)](#) for *personal fall arrest systems* and [1926.502\(e\)\(2\)](#) for *positioning device systems*.

[1926.1423\(g\)\(3\)](#) - *Anchorage for fall restraint systems. Fall restraint systems must be anchored to any part of the equipment that is capable of withstanding twice the maximum load that an employee may impose on it during reasonably anticipated conditions of use.*

[1926.1423\(h\)\(1\)](#) - For work other than erecting, climbing, and dismantling, the employer must provide and ensure the use of *fall protection equipment* for employees who are on a walking/working surface with an unprotected side or edge more than *6 feet above a lower level*, except when the employee is at or near draw-works (when the equipment is running), in the cab, or on the deck.

[1926.1423\(h\)\(2\)](#) - For erecting, climbing, and dismantling work, the employer must provide and ensure the use of *fall protection equipment* for employees who are on a walking/working surface with an unprotected side or edge more than *15 feet above a lower level*.

[1926.1423\(j\)](#) - *Anchoring to the load line*. A *personal fall arrest system* is permitted to be anchored to the crane/derrick's hook (or other part of the load line) where all of the following requirements are met:

- [1926.1423\(j\)\(1\)](#) - A *qualified person* has determined that the set-up and *rated capacity* of the crane/derrick (including the hook, load line and rigging) meets or exceeds the requirements in [1926.502\(d\)\(15\)](#).
- [1926.1423\(j\)\(2\)](#) - The *equipment operator* must be at the work site and *informed* that the equipment is being used for this purpose.
- [1926.1423\(j\)\(3\)](#) - No load is suspended from the load line when the *personal fall arrest system* is anchored to the crane/derrick's hook (or other part of the load line).

[1926.1423\(k\)](#) - *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: [Reference [paragraph \(k\)\(1\) - \(2\)](#)].

1926.1424 - Work Area Control

Scope: This [standard](#) provides the requirements for work area control.

Special Requirements: Train, authorized personnel, control lines, warning lines, operator, demonstrate, controlling entity, system of communication, mark/markings, warning signs, instruct, inform, system (coordinate operations)

[1926.1424\(a\)\(2\)](#) - To prevent employees from entering these hazard areas, the employer must:

- [1926.1424\(a\)\(2\)\(i\)](#) - *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.
- [1926.1424\(a\)\(2\)\(ii\)](#) - 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.

[1926.1424\(a\)\(3\)\(i\)](#) - 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.

[1926.1424\(a\)\(3\)\(ii\)](#) - 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.

[1926.1424\(b\)](#) - 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

Scope: This [standard](#) provides the requirements for keeping clear of the load.

Special Requirements: Fall zone, needed (essential), qualified rigger, monitor, instructions, demonstrate, references other standards

[1926.1425\(c\)\(3\)](#) - The materials must be rigged by a *qualified rigger*.

[1926.1425\(d\)](#) - *Receiving a load*. Only *employees needed* to receive a load are permitted to be within the *fall zone* when a load is being landed.

[1926.1425\(e\)\(2\)](#) - Only *employees essential* to the operation are permitted in the fall zone (but not directly under the load). An *employee is essential* to the operation if the employee is conducting one of the following operations and the employer can *demonstrate* it is infeasible for the employee to perform that operation from outside the *fall zone*: (1) Physically guide the load; (2) closely *monitor and give instructions* regarding the load's movement; or (3) either detach it from or initially attach it to another component or structure (such as, but not limited to, making an initial connection or installing bracing).

Note: Boom free fall is prohibited when an employee is in the fall zone of the boom or load, and load line free fall is prohibited when an employee is directly under the load; see [1926.1426](#) - *free fall and controlled load lowering*.

1926.1426 - Free Fall and Controlled Load Lowering

Scope: This [standard](#) provides the requirements for free fall and controlled load lowering.

Special Requirements: References other standards

[1926.1426\(a\)\(1\)\(iii\)](#) - The load or boom is directly over a power line, or over any part of the area extending the [Table A of 1926.1408 - power line safety \(up to 350 kV\)--equipment operations](#), clearance distance to each side of the power line; or any part of the area extending the [Table A](#) clearance distance to each side of the power line is within the radius of vertical travel of the boom or the load.

1926.1427 - Operator Training, Certification, and Evaluation

Scope: This [standard](#) provides the requirements for operator training, certification, and evaluation.

Special Requirements: Operators, trained, certified/licensed, audited, lifting capacity, evaluated, retrain, operator-in-training, testing, certification, supervision, crane operator testing organization, qualification, trainer, communication, instruction, document, assess, operation manuals, load charts, language, equipment operators, tests, employer program, military, certificates, demonstration, demonstrate, testing procedures, requalification, determination, competency, references other standards

[1926.1427\(a\)](#) - General requirements for *operators*. The employer must ensure that each operator is *trained, certified/licensed, and evaluated* in accordance with this section before operating any equipment covered under subpart CC, except for the equipment listed in [paragraph \(a\)\(2\)](#) of this section.

[1926.1427\(a\)\(1\)](#) - Operation during *training*. An employee who has not been *certified/licensed and evaluated* to operate assigned equipment in accordance with this section may only operate the equipment as an *operator-in-training* under *supervision* in accordance with the requirements of [paragraph \(b\)](#) of this section.

[1926.1427\(a\)\(2\)](#) - Exceptions. Operators of derricks (see [1926.1436 - derricks](#)), sideboom cranes (see [1926.1440](#)), or equipment with a maximum *manufacturer-rated hoisting/lifting capacity* of 2,000 pounds or less (see [1926.1441](#)) are not required to comply with [1926.1427](#). **Note:** The *training* requirements in those other sections continue to apply [for the training requirement for operators of sideboom cranes, follow section [1926.1430\(c\) - training, operators](#)].

[1926.1427\(a\)\(3\)\(i\)](#) - For purposes of this section, an operator who is an employee of the *U.S. military* meets the requirements of this section if he/she has a current *operator qualification* issued by the *U.S. military* for operation of the equipment. An employee of the *U.S. military* is a Federal employee of the Department of Defense or Armed Forces and does not include employees of private contractors.

[1926.1427\(a\)\(3\)\(ii\)](#) - A *qualification* under this paragraph is: [Reference [paragraph \(a\)\(3\)\(ii\)\(A\) - \(B\)](#)].

[1927.1427 \(b\)](#) - *Operator training*. The employer must provide each *operator-in-training* with sufficient *training, through a combination of formal and practical instruction*, to ensure that the *operator-in-training* develops the skills, knowledge, and ability to recognize and avert risk necessary to operate the equipment safely for assigned work. [Reference [paragraph \(b\)\(1\) - \(4\)](#)].

[1926.1427\(b\)\(5\)](#) - *Retraining*. The employer must provide *retraining* in relevant topics for each *operator* when, based on the *performance of the operator or an evaluation* of the operator's knowledge, there is an indication that *retraining* is necessary.

[1926.1427\(c\)](#) - *Operator certification and licensing*. The employer must ensure that each *operator* is *certified or licensed* to operate the equipment as follows: [Reference [paragraph \(c\)\(1\) - \(4\)](#)].

[1926.1427\(d\)\(1\)](#) - For a *certification* to satisfy the requirements of this section, the *crane operator testing organization* providing the *certification* must: [Reference [paragraph \(d\)\(1\) - \(4\)](#)].

[1926.1427\(e\)](#) - *Audited employer program*. The *employer's certification* of its employee must meet the following requirements: [Reference [paragraph \(e\)\(1\)\(i\) - \(ii\)](#)].

[1926.1427\(e\)\(2\)](#) - *Administration of tests*. [Reference [paragraph \(e\)\(2\)\(i\) - \(iv\)](#)].

[1926.1427\(e\)\(3\)](#) - *Timing of audit*. The *employer program* must be *audited within 3 months* of the beginning of the *program* and at least *every 3 years* thereafter.

[1926.1427\(e\)\(4\)](#) - *Requalification*. The *employer program* must have *testing procedures for re-qualification* designed to ensure that the *operator* continues to meet the technical knowledge and skills requirements in [paragraphs \(j\)\(1\) and \(2\)](#) of this section. The *re-qualification procedures* must be *audited* in accordance with [paragraphs \(e\)\(1\) and \(2\)](#) of this section.

[1926.1427\(e\)\(5\)](#) - *Deficiencies*. If the *auditor determines* that there is a significant deficiency (“deficiency”) in the *program*, the employer must ensure that: [Reference [paragraph \(e\)\(5\)\(i\) - \(iv\)](#)].

[1926.1427\(e\)\(6\)](#) - *Audited-program certificates*. A *certification* under this paragraph is: [Reference [paragraph \(e\)\(6\)\(i\) - \(ii\)](#)].

[1926.1427\(f\)\(1\)](#) - Through an *evaluation*, the employer must ensure that each *operator is qualified* by a *demonstration* of: [Reference [paragraph \(f\)\(1\)\(i\) - \(ii\)](#)].

[1926.1427\(f\)\(3\)](#) - The definition of “*qualified*” in [1926.32 - definitions](#), does not apply to [paragraph \(f\)\(1\)](#) of this section: Possession of a *certificate or degree* cannot, by itself, cause a person to be *qualified* for purposes of [paragraph \(f\)\(1\)](#).

[1926.1427\(f\)\(4\)](#) - The *evaluation* required under [paragraph \(f\)\(1\)](#) of this section must be conducted by an individual who has the knowledge, *training*, and experience necessary to *assess equipment operators*.

[1926.1427\(f\)\(5\)](#) - The *evaluator* must be an employee or agent of the employer. Employers that *assign evaluations* to an agent retain the duty to ensure that the requirements in [paragraph \(f\)](#) are satisfied. Once the *evaluation* is completed successfully, the employer may allow the *operator* to operate other equipment that the employer can *demonstrate* does not require substantially different skills, knowledge, or ability to recognize and avert risk to operate.

[1926.1427\(f\)\(6\)](#) - The employer must *document* the completion of the *evaluation*. This *document* must provide: The operator's name; the *evaluator's name and signature*; the date; and the make, model, and configuration of equipment used in the *evaluation*. The employer must make the *document* available at the worksite while the *operator* is employed by the employer. For *operators* assessed per [paragraph \(f\)\(2\)](#) of this section, the *documentation* must reflect the date of the *employer's determination* of the *operator's* abilities and the make, model and configuration of equipment on which the operator has previously *demonstrated competency*.

[1926.1427\(f\)\(7\)](#) - When an employer is required to provide an *operator* with *retraining* under [paragraph \(b\)\(5\)](#) of this section, the employer must *re-evaluate* the *operator* with respect to the subject of the *retraining*.

[1926.1427\(h\)\(1\)](#) - Tests under this section may be *administered verbally*, with answers given verbally, where the *operator candidate*: [Reference [paragraph \(h\)\(1\)\(i\) - \(iii\)](#)].

[1926.1427\(h\)\(2\)](#) - Tests under this section may be administered in any *language the operator candidate* understands, and the *operator's certification documentation* must note the language in which the *test* was given. The *operator* is only permitted to operate equipment that is furnished with *materials* required by this subpart, such as *operations manuals and load charts*, that are *written* in the *language* of the *certification*.

[1926.1427\(j\)](#) - *Certification* criteria. *Certifications* must be based on the following: [Reference [paragraph \(j\)\(1\) - \(2\)](#)].

1926.1428 - Signal Person Qualifications

Scope: This [standard](#) provides the requirements for signal person qualifications.

Special Requirements: Qualifications, signal person, demonstrate, (qualified) evaluator, retraining, assesses/assessment, documentation, confirms, determination, competent, hand signals. references other standards

1926.1428(a) - The employer of the *signal person* must ensure that each *signal person* meets the *Qualification Requirements* (paragraph (c) of this section) prior to giving any *signals*. This requirement must be met by using either Option (1) or Option (2) of this section.

- 1926.1428(a)(1) - *Option (1)—Third party qualified evaluator*. The *signal person* has *documentation* from a *third party qualified evaluator* (see *Qualified Evaluator (third party)*, 1926.1401 for definition) showing that the *signal person* meets the *Qualification Requirements* (see paragraph (c) of this section).
- 1926.1428(a)(2) - *Option (2)—Employer's qualified evaluator*. The employer's *qualified* (see *Qualified Evaluator (not a third party)*, 1926.1401 for definition) *evaluator* assesses the individual and *determines* that the individual meets the *Qualification Requirements* (see paragraph (c) of this section) and provides *documentation* of that *determination*. An *assessment* by an employer's *qualified evaluator* under this option is not portable—other employers are not permitted to use it to meet the requirements of this section.
- 1926.1428(a)(3) - The employer must make the *documentation* for whichever option is used available at the site while the *signal person* is employed by the employer. The *documentation* must specify each type of signaling (e.g. hand signals, radio signals, etc.) for which the *signal person* meets the requirements of paragraph (c) of this section.

1926.1428(b) - If subsequent actions by the *signal person* indicate that the individual does not meet the *Qualification Requirements* (see paragraph (c) of this section), the employer must not allow the individual to continue working as a *signal person* until *re-training* is provided and a *re-assessment* is made in accordance with paragraph (a) of this section that *confirms* that the individual meets the *Qualification Requirements*.

1926.1428(c) - *Qualification Requirements*. Each *signal person* must: {Reference paragraph (c)(1)-(5)}.

1926.1429 - Qualifications of Maintenance & Repair Employees

Scope: This standard provides requirements for the qualifications of maintenance and repair employees.

Special Requirements: Inspect, maintenance, maintenance, inspection and repair personnel, qualified person, references other standards

[1926.1429\(a\)](#) - *Maintenance, inspection and repair personnel* are permitted to operate the equipment only where all of the following requirements are met:

- [1926.1429\(a\)\(1\)](#) - The operation is limited to those functions necessary to perform *maintenance, inspect* the equipment, or verify its performance.
- [1926.1429\(a\)\(2\)](#) - The personnel either: {Reference [paragraph \(a\)\(2\)\(i\) - \(ii\)](#)}.

[1926.1429\(b\)](#) - *Maintenance and repair personnel* must meet the definition of a *qualified person* with respect to the equipment and maintenance/repair tasks performed.

1926.1430 – Training

Scope: This [standard](#) provides the requirements for training.

Special Requirements: Train, practices, operators, signal persons, tag out, authorized, practices, refresher (retrain), evaluate, maintenance and repair personnel, competent person, procedures, qualified person, references other standards

The employer must provide training as follows:

[1926.1430\(a\)](#) - Overhead powerlines. The employer must *train* each employee specified in [1926.1408\(g\)](#) - *power line safety (up to 350 kV)--equipment operations, training*, and [1926.1410\(m\)](#) - *power line safety (all voltages)--equipment operations closer than the Table A zone*, in the topics listed in [1926.1408\(g\)](#).

[1926.1430\(b\)](#) - *Signal persons*. The employer must *train* each employee who will be assigned to work as a *signal persons* who does not meet the requirements of [1926.1428\(c\)](#) - *signal person qualifications*, in the areas addressed in that paragraph.

[1926.1430\(c\)\(1\)](#) - The employer must *train* each operator in accordance with [1926.1427\(a\)](#) and [\(b\)](#) - *operator training, certification, and evaluation*, on the safe operation of the equipment the operator will be using.

[1926.1430\(c\)\(2\)](#) - The employer must *train* each operator covered under the exception of [1926.1427\(a\)\(2\)](#) on the safe operation of the equipment the operator will be using.

[1926.1430\(c\)\(3\)](#) - The employer must *train* each operator of the equipment covered by this subpart in the following *practices*: {Reference [paragraph \(c\)\(3\)\(i\) - \(ii\)](#)}.

[1926.1430\(d\)](#) - *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.

[1926.1430\(e\)](#) - 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*).

[1926.1430\(f\)](#) - *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\(f\)](#) - *tagout*, and [\(g\)](#) - *operation*.

[1926.1430\(g\)\(1\)](#) - 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*.

[1926.1430\(g\)\(2\)](#) - 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.

[1926.1430\(g\)\(3\)](#) - Whenever *training* is required under [subpart CC](#), the employer must provide the *training* at no cost to the employee.

1926.1431 - Hoisting Personnel

Scope: This [standard](#) provides the requirements for hoisting personnel.

Special Requirements: Demonstrates, qualified person, PPE (PFAS, hard hats), determined, measuring marks, markings, posted, alternative measures, tagout, manufacturer procedures, load charts, rated capacity, proof testing, certified welder, maximum intended load, signal person, work practices, maximum number, operator, competent person, trial lift, pre-lift meeting, floatation device, spotter, direct communication, inspections, references other standards

[1926.1431\(a\)](#) - The use of equipment to hoist employees is prohibited except where the *employer demonstrates* that the erection, use, and dismantling of conventional means of reaching the work area, such as a personnel hoist, ladder, stairway, aerial lift, elevating work platform, or scaffold, would be more hazardous, or is not possible because of the project's structural design or worksite conditions. This paragraph does not apply to work covered by [subpart R](#) (*Steel Erection*) of this part and also does not apply to routine personnel access to an underground worksite via shaft as covered by [1926.800](#) (*Underground Construction*) of this part.

[1926.1431\(c\)\(1\)](#) - The equipment must be uniformly level, within one percent of level grade, and located on footing that a *qualified person* has *determined* to be sufficiently firm and stable.

[1926.1431\(c\)\(2\)](#) - Equipment with outriggers or stabilizers must have them all extended and locked. The amount of extension must be the same for all outriggers and stabilizers and in accordance with *manufacturer procedures and load charts*.

[1926.1431\(d\)\(1\)](#) - *Capacity*: Use of suspended personnel platforms. The total load (with the platform loaded, including the hook, load line and rigging) must not exceed 50 percent of the *rated capacity* for the radius and configuration of the equipment, except during *proof testing*.

[1926.1431\(d\)\(2\)](#) - *Capacity*: Use of boom-attached personnel platforms. The total weight of the loaded personnel platform must not exceed 50 percent of the *rated capacity* for the radius and configuration of the equipment (except during *proof testing*).

[1926.1431\(d\)\(3\)](#) - *Capacity*: Hoisting personnel without a personnel platform. When hoisting personnel without a personnel platform pursuant to [paragraph \(b\)\(2\)](#) of this section, the total load (including the hook, load line, rigging and any other equipment that imposes a load) must not exceed 50 percent of the *rated capacity* for the radius and configuration of the equipment, except during *proof testing*.

[1926.1431\(d\)\(5\)\(iv\)](#) - Equipment with telescoping booms must be equipped with a device to indicate the boom's extended length clearly to the *operator*, or must have *measuring marks* on the boom.

[1926.1431\(d\)\(5\)\(vii\)](#) - Proper operation required. Personnel hoisting operations must not begin unless the devices listed in this section are in proper working order. If a device stops working properly during such operations, the operator must safely stop operations. Personnel hoisting operations must not resume until the device is again working properly. *Alternative measures* are not permitted. (See [1926.1417](#) - *operation*, for *tag-out* and related requirements.)

[1926.1431\(e\)\(1\)](#) - A *qualified person* familiar with *structural design* must design the personnel platform and attachment/suspension system used for hoisting personnel.

[1926.1431\(e\)\(4\)](#) - The personnel platform itself (excluding the *guardrail system and personal fall arrest system anchorages*), must be capable of supporting, without failure, its own weight and at least five times the *maximum intended load*.

[1926.1431\(e\)\(5\)](#) - All welding of the personnel platform and its components must be performed by a *certified welder* familiar with the weld grades, types and material specified in the platform design.

[1926.1431\(e\)\(6\)](#) - The personnel platform must be equipped with a *guardrail system* which meets the requirements of subpart M of this part, and must be enclosed at least from the toeboard to mid-rail with either solid construction material or expanded metal having

openings no greater than ½ inch (1.27 cm). Points to which *personal fall arrest systems* are attached must meet the anchorage requirements in [Subpart M – fall protection](#), of this part.

[1926.1431\(e\)\(10\)](#) - In addition to the use of *hard hats*, employees must be protected by overhead protection on the personnel platform when employees are exposed to falling objects. The platform overhead protection must not obscure the view of the *operator* or platform occupants (such as wire mesh that has up to ½ inch openings), unless full protection is necessary.

[1926.1431\(e\)\(12\)](#) - The weight of the platform and its *rated capacity* must be conspicuously *posted* on the platform with a *plate or other permanent marking*.

[1926.1431\(f\)\(1\)](#) - The personnel platform must not be loaded in excess of its *rated capacity*.

[1926.1431\(f\)\(4\)](#) - The number of employees occupying the personnel platform must not exceed the *maximum number* the platform was designed to hold or the number required to perform the work, whichever is less.

[1926.1431\(g\)\(3\)](#) - Rigging hardware (including wire rope, shackles, rings, master links, and other rigging hardware) and hooks must be capable of supporting, without failure, at least five times the *maximum intended load* applied or transmitted to that component. Where rotation resistant rope is used, the slings must be capable of supporting without failure at least ten times the *maximum intended load*.

[1926.1431\(h\)\(1\)](#) - A *trial lift* with the unoccupied personnel platform loaded at least to the anticipated lightweight must be made from ground level, or any other location where employees will enter the platform, to each location at which the platform is to be hoisted and positioned. Where there is more than one location to be reached from a single set-up position, either individual trial lifts for each location, or a single trial lift, in which the platform is moved sequentially to each location, must be performed; the method selected must be the same as the method that will be used to hoist the personnel.

[1926.1431\(h\)\(2\)](#) - The *trial lift* must be performed immediately prior to each shift in which personnel will be hoisted. In addition, the *trial lift* must be repeated prior to hoisting employees in each of the following circumstances:

- [1926.1431\(h\)\(2\)\(ii\)](#) - The lift route is changed, unless the *competent person determines* that the new route presents no new factors affecting safety.

[1926.1431\(h\)\(3\)](#) - The *competent person must determine* that: [Reference [paragraph \(h\)\(3\)\(i\) - \(iv\)](#)].

[1926.1431\(h\)\(4\)](#) - Immediately after the *trial lift*, the *competent person* must: [Reference [paragraph \(h\)\(4\)\(i\) - \(ii\)](#)].

[1926.1431\(h\)\(5\)\(i\)](#) - The platform must be hoisted a few inches with the personnel and materials/tools on board and *inspected by a competent person* to ensure that it is secure and properly balanced.

[1926.1431\(h\)\(5\)\(ii\)](#) - The following conditions must be *determined by a competent person* to exist before the lift of personnel proceeds: [Reference [paragraph \(h\)\(5\)\(ii\)\(A\) - \(D\)](#)].

[1926.1431\(h\)\(6\)](#) - Any condition found during the *trial lift* and subsequent *inspection(s)* that fails to meet a requirement of this standard or otherwise creates a safety hazard must be corrected before hoisting personnel. (See [1926.1417 - operation](#), for *tag-out* and related requirements.)

[1926.1431\(j\)\(1\)](#) - At each jobsite, prior to hoisting employees on the personnel platform, and after any repair or modification, the platform and rigging must be proof tested to 125 percent of the platform's *rated capacity*. *The proof test* may be done concurrently with the *trial lift*.

[1926.1431\(j\)\(3\)](#) - After *proof testing*, a *competent person* must *inspect* the platform and rigging to *determine* if the *test* has been passed. If any deficiencies are found that pose a safety hazard, the platform and rigging must not be used to hoist personnel unless the deficiencies are corrected, the *test* is repeated, and a *competent person determines* that the *test* has been passed. (See [1926.1417 - operation](#), for *tag-out* and related requirements.)

[1926.1431\(j\)\(4\)](#) - Personnel hoisting must not be conducted until the *competent person determines* that the platform and rigging have successfully passed the *proof test*.

[1926.1431\(k\)](#) - *Work practices*. [Reference [paragraph \(k\)\(1\) - \(10\)](#)].

[1926.1431\(k\)\(10\)\(i\)](#) - Except over water, employees occupying the personnel platform must be provided and use a *personal fall arrest system*. *The system* must be attached to a structural member within the personnel platform. When working over or near water, the requirements of [1926.106 - Working over or near water](#) apply.

[1926.1431\(k\)\(10\)\(ii\)](#) - The *fall arrest system*, including the attachment point (anchorage) used to comply with [paragraph \(i\)](#) of this section, must meet the requirements in [1926.502 - fall protection systems criteria and practices](#).

[1926.1431\(k\)\(11\)\(ii\)](#) - Factory-produced boom-mounted personnel platforms that incorporate a winch as original equipment. Loads are permitted to be hoisted by such a winch while employees occupy the personnel platform only where the load on the winch line does not exceed 500 pounds and does not exceed the *rated capacity* of the winch and platform.

[1926.1431\(k\)\(12\)\(i\)](#) - Hoisting of employees while the equipment is traveling is prohibited, except for:

- [1926.1431\(k\)\(12\)\(i\)\(A\)](#) - Equipment that travels on fixed rails; or
- [1926.1431\(k\)\(12\)\(i\)\(B\)](#) - Where the *employer demonstrates* that there is no less hazardous way to perform the work.

[1926.1431\(k\)\(12\)\(ii\)\(E\)](#) - A complete *trial run* must be performed to test the route of travel before employees are allowed to occupy the platform. This *trial run* can be performed at the same time as the *trial lift* required by [paragraph \(h\)](#) of this section which tests the lift route.

[1926.1431\(m\)](#) - *Pre-lift meeting*. A *pre-lift meeting* must be:

[1926.1431\(n\)](#) - *Hoisting personnel near power lines*. Hoisting personnel within 20 feet of a power line that is up to 350 kV, and hoisting personnel within 50 feet of a power line that is over 350 kV, is prohibited, except for work covered by [subpart V](#) of this part (*Power Transmission and Distribution*).

[1926.1431\(o\)\(3\)](#) - If using a boatswain's chair:

- [1926.1431\(o\)\(3\)\(ii\)](#) - A *signal person* must be stationed at the shaft opening.
- [1926.1431\(o\)\(3\)\(iv\)](#) - The employee must use *personal fall protection equipment*, including a *full body harness*, attached independent of the crane/derrick.
- [1926.1431\(o\)\(3\)\(v\)](#) - The *fall protection equipment* must meet the applicable requirements in [1926.502](#).
- [1926.1431\(o\)\(3\)\(vi\)](#) - The boatswain's chair itself (excluding the *personal fall arrest system anchorages*), must be capable of supporting, without failure, its own weight and at least five times the *maximum intended load*.

[1926.1431\(p\)\(2\)](#) - For lattice boom cranes: *Clearly mark* the cable (so that it can easily be seen by the operator) at a point that will give the operator sufficient time to stop the hoist to prevent two-blocking, or use a *spotter who is in direct communication* with the operator to inform the operator when this point is reached. For telescopic boom cranes: *Clearly mark* the cable (so that it can be easily seen by the operator) at a point that will give the operator sufficient time to stop the hoist to prevent two-blocking, and use a *spotter who is in direct communication* with the operator to *inform the operator* when this point is reached.

[1926.1431\(p\)\(4\)\(iv\)](#) - The *fall protection equipment* must meet the applicable requirements in [1926.502 - fall protection systems and practices](#).

[1926.1431\(p\)\(4\)\(v\)](#) - The boatswain's chair itself (excluding the *personal fall arrest system anchorages*), must be capable of supporting, without failure, its own weight and at least five times the *maximum intended load*.

[1926.1431\(r\)\(3\)\(iii\)](#) - The number of workers occupying the transfer device must not exceed the *maximum number* it was designed to hold.

[1926.1431\(r\)\(3\)\(iv\)](#) - Each employee must wear a *U.S. Coast Guard personal flotation device approved* for industrial use.

[1926.1431\(s\)\(3\)](#) - If using a boatswain's chair:

- [1926.1431\(s\)\(3\)\(iii\)](#) - The employee must use *personal fall protection equipment*, including a full body harness, attached independent of the crane/derrick. When there is no adequate structure for attachment of *personal fall arrest equipment* as required in [1926.502\(d\)\(15\)](#), the attachment must be to the lower load block or overhaul ball.
- [1926.1431\(s\)\(3\)\(iv\)](#) - The *fall protection equipment* must meet the applicable requirements in [1926.502](#).
- [1926.1431\(s\)\(3\)\(v\)](#) - The boatswain's chair itself (excluding the *personal fall arrest system anchorages*), must be capable of supporting, without failure, its own weight and at least five times the *maximum intended load*.

1926.1432 - Multiple-Crane/Derrick Lifts--Supplemental Requirements

Scope: This [standard](#) provides the requirements for multiple-crane/derrick lifts--supplemental requirements.

Special Requirements: Plan development, plan, plan review, qualified person, designed, determines, engineering expertise, competent person, lift director, meeting

[1926.1432\(a\)](#) - *Plan development*. Before beginning a crane/derrick operation in which more than one crane/derrick will be supporting the load, the operation must be *planned*. The *planning* must meet the following requirements:

- [1926.1432\(a\)\(1\)](#) - The *plan* must be *developed* by a *qualified person*.
- [1926.1432\(a\)\(2\)](#) - The *plan* must be *designed* to ensure that the requirements of this subpart are met.
- [1926.1432\(a\)\(3\)](#) - Where the *qualified person determines* that *engineering expertise* is needed for the *planning*, the employer must ensure that it is provided.

[1926.1432\(b\)](#) - *Plan implementation*.

- [1926.1432\(b\)\(1\)](#) - The multiple-crane/derrick lift 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 (lift director)*.
- [1926.1432\(b\)\(2\)](#) - The *lift director* must review the *plan* in a *meeting* with all workers who will be involved with the operation.

1926.1433 - Design, Construction and Testing

Scope: This [standard](#) provides the design, construction and testing requirements.

Special Requirements: Rated capacity, prototype testing, documentation, marked, fire extinguisher, posted warnings, qualified person, references other standards

The following requirements apply to equipment that has a *manufacturer-rated hoisting/lifting capacity* of more than 2,000 pounds.

[1926.1433\(a\)](#) - Crawler, truck and locomotive cranes manufactured prior to November 8, 2010 must meet the applicable requirements for design, construction, and testing as prescribed in *ANSI B30.5-1968 (incorporated by reference, see [1926.6](#))*, *PCSA Std. No. 2 (1968) (incorporated by reference, see [1926.6](#))*, the requirements in [paragraph \(b\)](#) of this section, or the applicable DIN standards that were in effect at the time of manufacture.

[1926.1433\(b\)](#) - Mobile (including crawler and truck) and locomotive cranes manufactured on or after November 8, 2010 must meet the following portions of *ASME B30.5-2004 (incorporated by reference, see [1926.6](#))* as applicable: [Reference [paragraph \(b\)\(1\) - \(16\)](#)].

[1926.1433\(c\)](#) - *Prototype testing*: mobile (including crawler and truck) and locomotive cranes manufactured on or after November 8, 2010 must meet the *prototype testing* requirements in [Test Option A](#) or [Test Option B](#) of this section. Tower cranes manufactured on or after November 8, 2010 must meet the *prototype testing* requirements in BS EN 14439:2006 (*incorporated by reference, see [1926.6](#)*). [Reference [paragraph \(c\)\(1\) - \(2\)](#)].

[1926.1433\(d\)\(1\)](#) - *Rated capacity and related information*. The information available in the cab [see [1926.1417\(c\)](#) - *operation, accessibility of procedures,*] regarding "*rated capacity and related information*" must include, at a minimum, the following *information*: [Reference [paragraph \(d\)\(1\)\(i\) - \(xvi\)](#)].

[1926.1433\(d\)\(3\)](#) - Hook and ball assemblies and load blocks must be *marked* with their *rated capacity and weight*.

[1926.1433\(d\)\(4\)\(ii\)](#) - Hooks without latches, or with latches removed or disabled, must not be used unless:

- [1926.1433\(d\)\(4\)\(ii\)\(A\)](#) - A *qualified person* has determined that it is safer to hoist and place the load without latches (or with the latches removed/tied-back).
- [1926.1433\(d\)\(4\)\(ii\)\(B\)](#) - Routes for the loads are *pre-planned* to ensure that no employee is required to work in the fall zone except for employees necessary for the hooking or unhooking of the load.

[1926.1433\(d\)\(5\)](#) - *Posted warnings*. *Posted warnings* required by this subpart as well as those originally supplied with the equipment by the manufacturer must be maintained in legible condition.

[1926.1433\(d\)\(6\)](#) - An *accessible fire extinguisher* must be on the equipment.

[1926.1433\(e\)](#) - The employer's obligations under [paragraphs \(a\) through \(c\)](#) and [\(d\)\(7\) through \(13\)](#) of this section are met where the equipment has not changed [except in accordance with [1926.1434 \(Equipment modifications\)](#)] and it can refer to *documentation* from the manufacturer showing that the equipment has been *designed, constructed and tested* in accordance with those paragraphs.

1926.1434 - Equipment Modifications

Scope: This [standard](#) provides the requirements for equipment modifications.

Special Requirements: Manufacturer approves, writing, load charts, procedures, instruction plates/tags/decals, instruction manuals, registered professional engineer, qualified person, detailed description, written response, request, review

[1926.1434\(a\)\(1\)\(i\)](#) - The *manufacturer approves* the modifications/additions in *writing*.

[1926.1434\(a\)\(1\)\(ii\)](#) - The *load charts, procedures, instruction manuals and instruction plates/tags/decals* are modified as necessary to accord with the modification/addition.

[1926.1434\(a\)\(2\)](#) - *Manufacturer refusal to review request*. The manufacturer is provided a *detailed description* of the proposed modification/addition, is asked to *approve* the modification/addition, but it declines to *review* the technical merits of the proposal or fails, within 30 days, to *acknowledge the request* or initiate the *review*, and all of the following are met:

- [1926.1434\(a\)\(2\)\(i\)](#) - A *registered professional engineer* who is a *qualified person* with respect to the equipment involved:
 - [1926.1434\(a\)\(2\)\(i\)\(A\)](#) - *Approves* the modification/addition and specifies the equipment configurations to which that *approval* applies, and
 - [1926.1434\(a\)\(2\)\(i\)\(B\)](#) - Modifies *load charts, procedures, instruction manuals and instruction plates/tags/decals* as necessary to accord with the modification/addition.

[1926.1434\(a\)\(4\)](#) - *Manufacturer does not complete the review within 120 days of the request.* The manufacturer is provided a *detailed description* of the proposed modification/addition, is asked to *approve* the modification/addition, agrees to *review* the technical merits of the proposal, but fails to complete the *review* of the proposal within 120 days of the date it was provided the *detailed description* of the proposed modification/addition, and the requirements of [paragraphs \(a\)\(2\)\(i\)](#) and [\(ii\)](#) of this section are met.

[1926.1434\(a\)\(5\)](#) - *Multiple manufacturers of equipment designed for use on marine work sites.* The equipment is designed for marine work sites, contains major structural components from more than one manufacturer, and the requirements of [paragraphs \(a\)\(2\)\(i\)](#) and [\(ii\)](#) of this section are met.

[1926.1434\(b\)](#) - Modifications or additions which affect the capacity or safe operation of the equipment are prohibited where the manufacturer, after a *review* of the technical safety merits of the proposed modification/addition, rejects the proposal and explains the reasons for the rejection in a *written response*. If the manufacturer rejects the proposal but does not explain the reasons for the rejection in *writing*, the employer may treat this as a manufacturer refusal to *review* the request under [paragraph \(a\)\(2\)](#) of this section.

[1926.1434\(c\)](#) - The provisions in [paragraphs \(a\)](#) and [\(b\)](#) of this section do not apply to modifications made or *approved by the U.S. military*.

1926.1435 - Tower Cranes

Scope: This [standard](#) provides the requirements for tower cranes.

Tower crane is a type of lifting structure which utilizes a vertical mast or tower to support a working boom (jib) in an elevated position. Loads are suspended from the working boom. While the working boom may be of the fixed type (horizontal or angled) or have luffing capability, it can always rotate to swing loads, either by rotating on the top of the tower (top slewing) or by the rotation of the tower (bottom slewing). The tower base may be fixed in one location or ballasted and moveable between locations. Mobile cranes that are configured with luffing jib and/or tower attachments are not considered tower cranes under this section.

Special Requirements: Competent person, manufacturer procedures, designed, manufacturer instructions, determine, registered professional engineer, A/D director, climbing procedures, signs, post, posting notice, notifying, inspections, documentation, qualified person, load test procedures, certificate of calibration, tests, certified weights, operational aids, documents, operator, approve in writing, measures, manufacturer's tolerance, recommended, specify, spotter, manufacturer specifications, references other standards

[1926.1435\(b\)\(1\)](#) - Section [1926.1403](#) (*Assembly/Disassembly--selection of manufacturer or employer procedures*), [1926.1404](#) (*Assembly/Disassembly--general requirements [applies to all assembly and disassembly operations]*), [1926.1405](#) [*Disassembly--additional requirements for dismantling of booms and jibs (applies to both the use of manufacturer procedures and employer procedures)*], and [1926.1406](#) (*Assembly/Disassembly--employer procedures--general requirements*), apply to tower cranes (except as otherwise specified), except that the term "assembly/disassembly" is replaced by "erecting, climbing and dismantling," and the term "disassembly" is replaced by "dismantling."

[1926.1435\(b\)\(2\)](#) - Dangerous areas (self-erecting tower cranes). In addition to the requirements in [1926.1404\(e\)](#) - *assembly/disassembly--general requirements*, for self-erecting tower cranes, the following applies: Employees must not be in or under the tower, jib, or rotating portion of the crane during erecting, climbing and dismantling operations until the crane is secured in a locked position and the *competent person in charge* indicates it is safe to enter this area, unless the *manufacturer's instructions* direct otherwise and only the necessary personnel are permitted in this area.

[1926.1435\(b\)\(3\)](#) - Foundations and structural supports. Tower crane foundations and structural supports (including both the portions of the structure used for support and the means of attachment) must be *designed by the manufacturer or a registered professional engineer*.

[1926.1435\(b\)\(4\)](#) - Addressing specific hazards. The requirements in [1926.1404\(h\)\(1\) through \(9\)](#) apply. In addition, the *A/D director* must address the following:

[1926.1435\(b\)\(4\)\(i\)](#) - *Foundations and structural supports*. The *A/D director* must *determine* that tower crane foundations and structural supports are installed in accordance with their *design*.

[1926.1435\(b\)\(4\)\(iii\)](#) - Wind speed. Wind must not exceed the speed *recommended* by the manufacturer or, where manufacturer does not specify this *information*, the speed *determined by a qualified person*.

[1926.1435\(b\)\(5\)](#) - Plumb tolerance. Towers must be erected plumb to the *manufacturer's tolerance* and *verified by a qualified person*. Where the manufacturer does not *specify* plumb tolerance, the crane tower must be plumb to a tolerance of at least 1:500 (approximately 1 inch in 40 feet).

[1926.1435\(b\)\(7\)](#) - *Climbing procedures*. Prior to, and during, all *climbing procedures* (including inside climbing and top climbing), the employer must: [Reference [paragraph \(b\)\(7\)\(i\) - \(ii\)](#)]

[1926.1435\(c\)](#) - *Signs*. The size and location of *signs* installed on tower cranes must be in accordance with *manufacturer specifications*. Where these are unavailable, a *registered professional engineer* familiar with the type of equipment involved must *approve in writing* the size and location of any *signs*.

[1926.1435\(d\)\(1\)](#) - Section [1926.1415](#) - *safety devices*, does not apply to tower cranes.

[1926.1435\(d\)\(3\)](#) - Proper operation required. Operations must not begin unless the devices listed in this section are in proper working order. If a device stops working properly during operations, the *operator* must safely stop operations. The equipment must be taken out of service, and operations must not resume until the device is again working properly. See [1926.1417\(f\)](#) - *operation, tag-out*. *Alternative measures* are not permitted to be used.

[1926.1435\(e\)\(1\)](#) - Section [1926.1416](#) - *operational aids*, does not apply to tower cranes.

[1926.1435\(e\)\(3\)](#) - Operations must not begin unless the operational aids are in proper working order, except where the employer meets the specified temporary *alternative measures*. More protective alternative measures specified by the tower crane manufacturer, if any, must be followed. See [1926.1417\(j\)](#) - *operation*, for additional requirements.

[1926.1435\(e\)\(4\)](#) - If an *operational aid* stops working properly during operations, the *operator* must safely stop operations until the temporary *alternative measures* are implemented or the device is again working properly. If a replacement part is no longer available, the use of a substitute device that performs the same type of function is permitted and is not considered a modification under [1926.1434](#) - *equipment modifications*.

[1926.1435\(e\)\(5\)](#) - *Category I operational aids and alternative measures*. *Operational aids* listed in this paragraph that are not working properly must be repaired no later than 7 calendar days after the deficiency occurs. *Exception*: If the employer *documents* that it has ordered the necessary parts within 7 calendar days of the occurrence of the deficiency, the repair must be completed within 7 calendar days of receipt of the parts.
[Reference [paragraph \(e\)\(5\)\(i\) - \(viii\)](#)].

[1926.1435\(e\)\(6\)](#) - *Category II operational aids and alternative measures*. *Operational aids* listed in this paragraph that are not working properly must be repaired no later than 30 calendar days after the deficiency occurs. *Exception*: If the employer *documents* that it has ordered the necessary parts within 7 calendar days of the occurrence of the deficiency, and the part is not received in time to complete the repair in 30 calendar days, the repair must be completed within 7 calendar days of receipt of the parts.

[1926.1435\(e\)\(6\)\(i\)\(C\)](#) - *Temporary alternative measures*: Hook radii or boom angle must be *determined* by measuring the hook radii or boom angle with a measuring device.

[1926.1435\(e\)\(6\)\(ii\)](#) - Trolley travel deceleration device. The trolley speed must be automatically reduced prior to the trolley reaching the end limit in both directions. *Temporary alternative measure*: The employer must *post a notice* in the cab of the crane *notifying the operator* that the trolley travel deceleration device is malfunctioning and *instructing the operator* to take special care to reduce the trolley speed when approaching the trolley end limits.

[1926.1435\(e\)\(6\)\(vi\)](#) - Load indicating device. Cranes manufactured after November 8, 2011 must have a device that displays the magnitude of the load on the hook. Displays that are part of load moment limiting devices that display the load on the hook meet this requirement. *Temporary alternative measures*: The weight of the load must be *determined* from a source recognized by the industry (such as the load's manufacturer), or by a calculation method recognized by the industry (such as calculating a steel beam from measured dimensions and a known per foot weight), or by other equally reliable means. This *information* must be provided to the *operator* prior to the lift.

[1926.1435\(f\)\(1\)](#) - Section [1926.1412 \(Inspections\)](#) applies to tower cranes, except that the term "assembly" is replaced by "erection." Section [1926.1413 \(Wire rope-- inspection\)](#) applies to tower cranes.

[1926.1435\(f\)\(2\)](#) - *Pre-erection inspection*. Before each crane component is erected, it must be *inspected by a qualified person* for damage or excessive wear. [Reference [paragraph \(f\)\(2\)\(i\) - \(iii\)](#)].

[1926.1435\(f\)\(3\)](#) - *Post-erection inspection*. In addition to the requirements in [1926.1412\(c\) - inspections, post assembly](#), the following requirements must be met: [Reference [paragraph \(f\)\(3\)\(i\) - \(ii\)](#)].

[1926.1435\(f\)\(4\)](#) - *Monthly (inspections)*. The following additional items must be included: [Reference [paragraph \(f\)\(4\)\(i\) - \(ii\)](#)].

[1926.1435\(f\)\(5\)](#) - *Annual*. In addition to the items that must be *inspected* under [1926.1412\(f\) - inspections, annual/comprehensive](#), all turntable and tower bolts must be *inspected* for proper condition and torque.

1926.1436 – Derricks

Scope: This [standard](#) provides the requirements for derricks.

A **derrick** is powered equipment consisting of a mast or equivalent member that is held at or near the end by guys or braces, with or without a boom, and its hoisting mechanism.

Special Requirements: Procedures, inspections, training, qualifications, determine, competent person, tested, load anchoring data, load chart, qualified person, posted, manufacturer procedures, calculation method, information, communication, derrick manufacturer approves, evaluated, rated capacity, load test, operator, spotter, stop marks, document, references other standards

[1926.1436\(b\)\(1\)](#) - Section [1926.1417](#) (*Operation*) applies except for [1926.1417\(c\)](#) (*Accessibility of procedures*).

[1926.1436\(b\)\(2\)](#) - *Load chart contents. Load charts* must contain at least the following *information*: [Reference [paragraph \(b\)\(2\)\(i\) - \(iv\)](#)].

[1926.1436\(b\)\(3\)\(i\)](#) - *Permanent installations*. For permanently installed derricks with fixed lengths of boom, guy, and mast, a *load chart must be posted* where it is visible to personnel responsible for the operation of the equipment.

[1926.1436\(b\)\(3\)\(ii\)](#) - *Non-permanent installations*. For derricks that are not permanently installed, the *load chart must be readily available* at the job site to personnel responsible for the operation of the equipment.

[1926.1436\(c\)\(1\)\(i\)](#) - Derricks must be constructed to meet all stresses imposed on members and components when installed and operated in accordance with the *manufacturer's/builder's procedures* and within its *rated capacity*.

[1926.1436\(c\)\(1\)\(ii\)](#) - Welding of load sustaining members must conform to recommended practices in *ANSI/AWS D14.3-94 (incorporated by reference, see [1926.6](#))* or *AWS D1.1/D1.1M:2002 (incorporated by reference, see [1926.6](#))*.

[1926.1436\(c\)\(2\)\(i\)](#) - The minimum number of guys must be 6, with equal spacing, except where a *qualified person* or *derrick manufacturer approves* variations from these requirements and *revises the rated capacity* to compensate for such variations.

[1926.1436\(c\)\(2\)\(ii\)](#) - Guy derricks must not be used unless the employer has the following guy information from the manufacturer or a qualified person, when not available from the manufacturer: [Reference [paragraph \(c\)\(2\)\(i\) - \(v\)](#)].

[1926.1436\(c\)\(5\)\(iii\)](#) - Chicago boom derricks - Withstand the forces applied when configured and operated in accordance with the *manufacturer's/builder's procedures* and within its *rated capacity*.

[1926.1436\(d\)\(1\)](#) - *Load anchoring data* developed by the manufacturer or a *qualified person* must be used.

[1926.1436\(d\)\(2\)\(iii\)](#) - Guy derricks - The anchorage and guying must be designed to withstand maximum horizontal and vertical forces encountered when operating within *rated capacity* with the particular guy slope and spacing specified for the application.

[1926.1436\(d\)\(3\)\(ii\)](#) - Stiffleg derricks - The mast base and stifflegs must be *designed* to withstand maximum horizontal and vertical forces encountered when operating within *rated capacity* with the particular stiffleg spacing and slope specified for the application.

[1926.1436\(e\)\(2\)\(i\)](#) - Base mounted drum hoists must meet the requirements in the following sections of *ASME B30.7-2001 (incorporated by reference, see § 1926.6)*: [Reference [paragraph \(e\)\(2\)\(i\)\(A\) - \(D\)](#)].

[1926.1436\(e\)\(2\)\(ii\)](#) - *Load tests for new hoists*. The employer must ensure that new hoists are load tested to a minimum of 110% of *rated capacity*, but not more than 125% of *rated capacity*, unless otherwise *recommended by the manufacturer*. This requirement is met where the manufacturer has conducted this *testing*.

[1926.1436\(e\)\(2\)\(iii\)](#) - Repaired or modified hoists. Hoists that have had repairs, modifications or additions affecting their capacity or safe operation must be evaluated by a *qualified person to determine* if a *load test* is necessary. If it is, *load testing* must be conducted in accordance with [paragraphs \(e\)\(2\)\(ii\)](#) and [\(iv\)](#) of this section.

[1926.1436\(e\)\(2\)\(iv\)](#) - *Load test procedure*. *Load tests* required by [paragraphs \(e\)\(2\)\(ii\)](#) or [\(e\)\(2\)\(iii\)](#) of this section must be conducted as follows: [Reference [paragraph \(e\)\(2\)\(iv\)\(A\) - \(C\)](#)].

[1926.1436\(f\)\(1\)](#) - Section [1926.1416 \(Operational aids\)](#) applies, except for [1926.1416\(d\)\(1\) \(Boom hoist limiting device\)](#), [1926.1416\(e\)\(1\) \(Boom angle or radius indicator\)](#), and [1926.1416\(e\)\(4\) \(Load weighing and similar devices\)](#).

[1926.1436\(f\)\(2\)](#) - Boom angle aid. A boom angle indicator is not required but if the derrick is not equipped with a functioning one, the employer must ensure that either:

- [1926.1436\(f\)\(2\)\(i\)](#) - The boom hoist cable must be *marked* with caution and stop marks. The stop marks must correspond to maximum and minimum allowable boom angles. The caution and *stop marks* must be in view of the *operator*, or a *spotter* who is in *direct communication* with the operator.

[1926.1436\(f\)\(3\)\(i\)](#) - Derricks manufactured more than one year after November 8, 2010 with a maximum *rated capacity* over 6,000 pounds must have at least one of the following: load weighing device, load moment indicator, *rated capacity* indicator, or *rated capacity* limiter. *Temporary alternative measures*: The weight of the load must be determined from a

source recognized by the industry (such as the load's manufacturer), or by a *calculation method* recognized by the industry (such as *calculating* a steel beam from measured dimensions and a known per foot weight), or by other equally reliable means. This *information* must be provided to the operator prior to the lift. See [1926.1417\(j\)](#) for additional requirements.

[1926.1436\(f\)\(3\)\(ii\)](#) A *load weight/capacity* device that is not working properly must be repaired no later than 30 days after the deficiency occurs. *Exception:* If the employer *documents* that it has ordered the necessary parts within 7 days of the occurrence of the deficiency, and the part is not received in time to complete the repair in 30 days, the repair must be completed within 7 days of receipt of the parts.

[1926.1436\(g\)\(1\)\(i\)](#) - Anchorages, including the structure to which the derrick is attached (if applicable), must be *approved by a qualified person*.

[1926.1436\(g\)\(1\)\(ii\)](#) - If using a rock or hairpin anchorage, the *qualified person must determine* if any special testing of the anchorage is needed. If so, it must be *tested* accordingly.

[1926.1436\(g\)\(2\)](#) - *Functional test*. Prior to initial use, new or reinstalled derricks must be *tested by a competent person* with no hook load to verify proper operation. This *test* must include: [Reference [paragraph \(g\)\(2\)\(i\) - \(v\)](#)].

[1926.1436\(g\)\(3\)](#) - *Load test*. Prior to initial use, new or reinstalled derricks must be *load tested by a competent person*. The *test load* must meet the following requirements: [Reference [paragraph \(g\)\(3\)\(i\) - \(ii\)](#)].

[1926.1436\(g\)\(4\)](#) - *Documentation*. *Tests* conducted under this paragraph must be documented. The *document* must contain the date, test results and the name of the *tester*. The *document* must be *retained* until the derrick is *re-tested* or dismantled, whichever occurs first. All such *documents* must be available, during the applicable *document retention period*, to all persons who conduct *inspections* in accordance with [1926.1412 - inspections](#).

[1926.1436\(h\)](#) - *Load testing* repaired or modified derricks. Derricks that have had repairs, modifications or additions affecting the derrick's capacity or safe operation must be *evaluated by a qualified person* to determine if a *load test* is necessary. If it is, *load testing* must be conducted and *documented* in accordance with [paragraph \(g\)](#) of this section.

[1926.1436\(j\)](#) - *Power failure procedures*. If power fails during operations, the derrick operator must safely stop operations. This must include: [Reference [paragraph \(j\)\(1\) - \(2\)](#)].

[1926.1436\(o\)](#) - Derrick operations must be *supervised by a competent person*.

[1926.1436\(p\)](#) - *Inspections*. In addition to the requirements in [1926.1412](#) - *inspections*, the following additional items must be included in the inspections: [Reference [paragraph \(p\)\(1\)-\(2\)](#)].

[1926.1436\(q\)](#) - *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.

1926.1437 - Floating Cranes/Derricks and Land Cranes/Derricks on Barges

Scope: This [standard](#) provides the requirements for floating cranes/derricks and land cranes/derricks on barges.

Special Requirements: Warning lines, control lines, procedures, divers, rated capacities (posted), surveyors, documentation, competent person, determines, qualified person, marine engineer, inspections, markings, employer demonstrates, train, manufacturer's specifications and limitations, warning signs, special hazard warnings, instructions, registered professional engineer, plan, procedures, recommended, crane/derrick manufacturer, signed, load charts, operators manual, references other standards

[1926.1437\(c\)\(1\)](#) - The requirements of [§ 1926.1424](#) - *work area control*, apply, except for [§ 1926.1424\(a\)\(2\)\(ii\)](#).

[1926.1437\(c\)\(2\)](#) - The employer must either:

- [1926.1437\(c\)\(2\)\(i\)](#) - Erect and maintain *control lines, warning lines, railings* or similar barriers to *mark* the boundaries of the hazard areas; or
- [1926.1437\(c\)\(2\)\(ii\)](#) - 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.

[1926.1437\(d\)](#) - Keeping clear of the load. Section [1926.1425](#) - *keeping clear of the load*, does not apply.

[1926.1437\(e\)](#) - Additional safety devices. In addition to the safety devices listed in [§ 1926.1415](#) - *safety devices*, the following safety devices are required: [Reference [paragraph \(e\)\(1\)-\(3\)](#)].

[1926.1437\(f\)\(2\)](#) - Section [1926.1416\(e\)\(4\)](#) - *operational aids, (Load weighing and similar devices)* does not apply to dragline, clamshell (grapple), magnet, drop ball, container handling, concrete bucket, and pile driving work performed under this section.

[1926.1437\(g\)](#) - Accessibility of *procedures applicable to equipment operation*. If the crane/derrick has a cab, the requirements of [§ 1926.1417\(c\)](#) - *operation*, apply. If the crane/derrick does not have a cab, the employer must ensure that:

- [1926.1437\(g\)\(1\)](#) - *Rated capacities (load charts) are posted at the operator's station*. If the operator's station is moveable (such as with pendant-controlled equipment), the *load charts are posted on the equipment*.
- [1926.1437\(g\)\(2\)](#) - *Procedures applicable to the operation of the equipment (other than load charts), recommended operating speeds, special hazard warnings, instructions and operators manual, must be readily available on board the vessel/flotation device*.

[1926.1437\(h\)](#) - *Inspections*. In addition to meeting the requirements of [§ 1926.1412](#) - *inspections, for inspecting the crane/derrick*, the employer must *inspect* the barge, pontoons, vessel or other means of flotation used to support a floating crane/derrick or land crane/derrick, and ensure that: [Reference [paragraph \(h\)\(1\) - \(5\)](#)].

- [1926.1437\(h\)\(6\)](#) - *Documentation*. The *monthly and annual inspections* required in [paragraphs \(h\)\(2\) and \(h\)\(4\)](#) of this section are *documented* in accordance with [§§ 1926.1412 \(e\)\(3\) and 1926.1412\(f\)\(7\)](#), respectively, and that the *four-year inspection* required in [paragraph \(h\)\(5\)](#) of this section is *documented* in accordance with [§ 1926.1412\(f\)\(7\)](#), except that the *documentation* for that *inspection* must be *retained for a minimum of 4 years*. All such *documents* must be made available, during the applicable *document retention* period, to all persons who conduct *inspections* in accordance with [§ 1926.1412](#).

[1926.1437\(j\)\(3\)](#) - In addition to the requirements in [§§ 1926.1419 through 1926.1422](#) (*Signals*), either: [Reference [paragraph \(j\)\(3\)\(i\) - \(ii\)](#)].

[1926.1437\(k\)\(1\)](#) - The employer must ensure that the barge, pontoons, vessel, or other means of flotation must be capable of withstanding imposed environmental, operational and in-transit loads when used in accordance with the *manufacturer's specifications and limitations*.

[1926.1437\(k\)\(2\)](#) - The employer must ensure that the *manufacturer's specifications and limitations* with respect to environmental, operational, and in-transit loads for a barge, pontoon, vessel, or other means of flotation are not exceeded or violated.

[1926.1437\(k\)\(3\)](#) - When the *manufacturer's specifications and limitations* are unavailable, the employer must ensure that the *specifications and limitations* established by a *qualified person* with respect to environmental, operational and in-transit loads for the barge, pontoons, vessel, or other means of flotation are not exceeded or violated.

[1926.1437\(m\)\(1\)\(i\)](#) - The employer must not exceed the *manufacturer load charts* applicable to operations on water. When using these *charts*, the employer must comply with all parameters and limitations (such as dynamic and environmental parameters) applicable to the use of the charts.

[1926.1437\(m\)\(1\)\(ii\)](#) - The employer must ensure that *load charts* take into consideration a minimum wind speed of 40 miles per hour.

[1926.1437\(m\)\(4\)](#) - If the equipment is employer-made, it must not be used unless the employer has *documents demonstrating* that the *load charts* and applicable parameters for use meet the requirements of [paragraphs \(m\)\(1\) through \(3\)](#) of this section. Such *documents* must be *signed by a registered professional engineer* who is a *qualified person* with respect to the *design* of this type of equipment (including the means of flotation).

[1926.1437\(m\)\(5\)\(i\)](#) - Are structurally sufficient to withstand the static and dynamic loads of the crane/derrick when operating at the crane/derrick's maximum *rated capacity* with all planned and actual deck loads and ballasted compartments.

[1926.1437\(m\)\(5\)\(iii\)](#) - Have access to void compartments to allow for *inspection* and pumping.

[1926.1437\(n\)](#) - *Land cranes/derricks*. For land cranes/derricks used on barges, pontoons, vessels or other means of flotation, the employer must ensure that:

- [1926.1437\(n\)\(1\)](#) - The *rated capacity* of the equipment (including but not limited to modification of *load charts*) applicable for use on land is reduced to: [Reference [paragraph \(n\)\(1\)\(i\) - \(iii\)](#)].
- [1926.1437\(n\)\(2\)](#) - The *rated capacity* modification required in [paragraph \(n\)\(1\)](#) of this section is performed by the *equipment manufacturer*, or a *qualified person* who has expertise with respect to both land crane/derrick capacity and the stability of vessels/flotation devices.
 - [1926.1437\(n\)\(3\)\(i\)](#) - The maximum allowable list and the maximum allowable trim for the barge, pontoon, vessel or other means of flotation must not exceed the amount necessary to ensure that the conditions in [paragraph \(n\)\(4\)](#) of this section are met. In addition, the maximum allowable list and the maximum allowable trim does not exceed the least of the following: 5 degrees, the amount specified by the *crane/derrick manufacturer*, or, when, an amount is not so specified, the amount specified by the *qualified person*.
 - [1926.1437\(n\)\(3\)\(ii\)](#) - The maximum allowable list and the maximum allowable trim for the land crane/derrick does not exceed the amount specified by the *crane/derrick manufacturer*, or, when, an amount is not so specified, the amount specified by the *qualified person*.

- [1926.1437\(n\)\(5\)\(iv\)](#) - *Option (4)—Centerline cable system*. The crane/derrick is prevented from shifting by being mounted to a wire rope system. The employer must ensure that the wire rope system meets the following requirements: [Reference [paragraph \(n\)\(5\)\(iv\)\(A\) - \(E\)](#)].
- [1926.1437\(n\)\(5\)\(v\)](#) - The systems/means used to comply with [Option \(1\)](#), [Option \(2\)](#), [Option \(3\)](#), or [Option \(4\)](#) of this section are designed by a *marine engineer, registered professional engineer familiar with floating crane/derrick design, or qualified person familiar with floating crane/derrick design*.
- [1926.1437\(n\)\(6\)](#) - *Exception*. For mobile auxiliary cranes used on the deck of a floating crane/derrick, the requirement specified by [paragraph \(n\)\(5\)](#) of this section to use [Option \(1\)](#), [Option \(2\)](#), [Option \(3\)](#), or [Option \(4\)](#) does not apply when the *employer demonstrates* implementation of a *plan and procedures* that meet the following requirements: [Reference [paragraph \(n\)\(6\)\(i\) - \(vi\)](#)].
- [1926.1437\(n\)\(7\)](#) - The barge, pontoons, vessel or other means of flotation used:
 - [1926.1437\(n\)\(7\)\(iii\)](#) - Have access to void compartments to allow for *inspection* and pumping.

1926.1438 - Overhead and Gantry Cranes

Scope: This [standard](#) provides the requirements for overhead and gantry cranes.

Special Requirements: References other standards

[1926.1438\(a\)](#) - *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.

[1926.1438\(b\)\(2\)](#) - The following requirements apply to equipment identified in [paragraph \(b\)\(1\)](#) of this section:

- [1926.1438\(b\)\(2\)\(i\)](#) - *Sections [1926.1400 through 1926.1414](#); §§ [1926.1417 through 1926.1425](#); § [1926.1426\(d\)](#), §§ [1926.1427 through 1926.1434](#); § [1926.1437](#) (floating cranes/derricks), § [1926.1439](#) (dedicated pile drivers), and § [1926.1441](#) (rated hoisting/lifting capacity of 2,000 pounds)*
- [1926.1438\(b\)\(2\)\(ii\)](#) - The following portions of § [1910.179](#) - *overhead and gantry cranes*:
 - [1926.1438\(b\)\(2\)\(ii\)\(A\)](#) - *Paragraphs [\(b\)\(5\), \(6\), \(7\)](#); [\(e\)\(1\), \(3\), \(5\), \(6\)](#); [\(f\)\(1\), \(4\)](#); [\(g\)](#); [\(h\)\(1\), \(3\)](#); [\(k\)](#); and [\(n\)](#) of § [1910.179](#).*
 - [1926.1438\(b\)\(2\)\(ii\)\(B\)](#) - The definitions in § [1910.179\(a\)](#) except for "hoist" and "load." For those words, the *definitions in [1926.1401](#)* apply.

- [1926.1438\(b\)\(2\)\(ii\)\(C\)](#) - Section [1910.179\(b\)\(2\)](#), but only where the equipment identified in [paragraph \(b\)\(1\)](#) of this section ([1926.1438](#)) was manufactured before September 19, 2001.

[1926.1438\(b\)\(2\)\(iii\)](#) - For equipment manufactured on or after September 19, 2001, the following sections of

[ASME B30.2-2005](#) (incorporated by reference, see § [1926.6](#)) apply: 2-1.3.1; 2-1.3.2; 2-1.4.1; 2-1.6; 2-1.7.2; 2-1.8.2; 2-1.9.1; 2-1.9.2; 2-1.11; 2-1.12.2; 2-1.13.7; 2-1.14.2; 2-1.14.3; 2-1.14.5; 2-1.15.; 2-2.2.2; 2-3.2.1.1. In addition, 2-3.5 applies, except in 2-3.5.1(b), "[29 CFR 1910.147](#) - the control of hazardous energy," is substituted for "ANSI Z244.1."

1926.1439 - Dedicated Pile Drivers

Scope: This [standard](#) provides the requirements for dedicated pile drivers.

Special Requirements: References other standards

[1926.1439\(a\)](#) - The provisions of [subpart CC](#) apply to dedicated pile drivers, except as specified in this section.

[1926.1439\(b\)](#) - Section [1926.1416\(d\)\(3\)](#) - *operational aids, (Anti two-blocking device)* does not apply.

[1926.1439\(c\)](#) - Section [1926.1416\(e\)\(4\)](#) - *operational aids, (Load weighing and similar devices)* applies only to dedicated pile drivers manufactured after November 8, 2011.

[1926.1439\(d\)](#) - In § [1926.1433](#) - *design, construction and testing, only §§ [1926.1433\(d\)](#) and [\(e\)](#)* apply to dedicated pile drivers.

1926.1440 - Sideboom Cranes

Scope: This [standard](#) provides the requirements for sideboom cranes.

Special Requirements: References other standards

[1926.1440\(a\)](#) - The provisions of this standard apply, except § [1926.1402](#) (*Ground conditions*), § [1926.1415](#) (*Safety devices*), § [1926.1416](#) (*Operational aids*), and § [1926.1427](#) (*Operator qualification and certification*).

[1926.1440\(b\)](#) - Section [1926.1426](#) (*Free fall and controlled load lowering*) applies, except § [1926.1426\(a\)\(2\)\(i\)](#). Sideboom cranes in which the boom is designed to free fall (live boom) are permitted only if manufactured prior to November 8, 2010.

[1926.1440\(c\)](#) - Sideboom cranes mounted on wheel or crawler tractors must meet all of the following requirements of [ASME B30.14-2004](#) (incorporated by reference, see [§ 1926.6](#)): {Reference [paragraph \(c\)\(1\) - 12](#)}.

1926.1441 - Equipment with a Rated Hoisting/Lifting Capacity of 2,000 Pounds or Less

Scope: This [standard](#) provides the requirements for equipment with a rated hoisting/lifting capacity of 2,000 pounds or less.

Special Requirements: Manufacturer prohibitions, inspections, training, qualifications, operator, signal person, hazard warnings, rated capacity, operator's manual, instructions, manufacturer instructions, qualified engineer, load chart, registered professional engineer, approved (in writing), procedures, references other standards

[1926.1441\(a\)](#) - The employer using this equipment must comply with the following provisions of this subpart: [§ 1926.1400](#) (Scope); [§ 1926.1401](#) (Definitions); [§ 1926.1402](#) (Ground conditions); [§ 1926.1403](#) (Assembly/disassembly—selection of manufacturer or employer procedures); [§ 1926.1406](#) (Assembly/disassembly—employer procedures); [§§ 1926.1407 through 1926.1411](#) (Power line safety); [§ 1926.1412\(c\)](#) (Post-assembly); [§§ 1926.1413 through 1926.1414](#) (Wire rope); [§ 1926.1418](#) (Authority to stop operation); [§§ 1926.1419 through 1926.1422](#) (Signals); [§ 1926.1423](#) (Fall protection); [§ 1926.1425](#) (Keeping clear of the load) (except for [§ 1926.1425\(c\)\(3\)](#) (qualified rigger)); [§ 1926.1426](#) (Free fall and controlled load lowering); [§ 1926.1432](#) (Multiple crane/derrick lifts—supplemental requirements); [§ 1926.1434](#) (Equipment modifications); [§ 1926.1435](#) (Tower cranes); [§ 1926.1436](#) (Derricks); [§ 1926.1437](#) (Floating cranes/derricks and land cranes/derricks on barges); [§ 1926.1438](#) (Overhead & gantry cranes).

[1926.1441\(b\)\(1\)](#) - In addition to compliance with [§§ 1926.1403](#) (Assembly/disassembly—selection of manufacturer or employer procedures) and [1926.1406](#) (Assembly/disassembly—employer procedures), the employer must also comply with [§ 1926.1441\(b\)\(2\)–\(3\)](#).

[1926.1441\(b\)\(2\)\(i\)](#) - The selection of components, and the configuration of the equipment, that affect the *capacity* or safe operation of the equipment complies with either the:

- [1926.1441\(b\)\(2\)\(i\)\(A\)](#) - *Manufacturer instructions, recommendations, limitations, and specifications*. When these documents and information are unavailable, a *registered professional engineer* familiar with the type of equipment involved must *approve, in writing*, the selection and configuration of components; or
- [1926.1441\(b\)\(2\)\(i\)\(B\)](#) - *Approved modifications* that meet the requirements of [§ 1926.1434](#) (Equipment modifications).

[1926.1441\(b\)\(2\)\(ii\)](#) - *Post-assembly inspection*. Upon completion of assembly, the equipment is *inspected* to ensure that it is in compliance with [paragraph \(b\)\(2\)\(i\)](#) of this section (see [§ 1926.1412\(c\)](#) for *post-assembly inspection requirements*).

[1926.1441\(b\)\(3\)](#) - *Manufacturer prohibitions*. The employer must comply with applicable *manufacturer prohibitions*.

[1926.1441\(c\)\(1\)](#) - The employer must comply with all *manufacturer procedures* applicable to the operational functions of the equipment, including its use with attachments.

[1926.1441\(c\)\(2\)](#) - *Unavailable operation procedures*. The employer must:
[Reference [paragraph \(c\)\(2\)\(i\) - \(iii\)](#)].

[1926.1441\(c\)\(3\)\(i\)](#) - The *load chart* is available to the operator at the control station;

[1926.1441\(c\)\(3\)\(ii\)](#) - *Procedures* applicable to the operation of the equipment, recommended operating speeds, *special hazard warnings, instructions, and operator's manual* are *readily available* for use by the operator.

[1926.1441\(c\)\(3\)\(iii\)](#) - When *rated capacities* are available at the control station only in *electronic form* and a failure occurs that makes the *rated capacities* inaccessible, the operator immediately ceases operations or follows *safe shut-down procedures* until the *rated capacities* (in electronic or other form) are available.

[1926.1441\(d\)\(1\)](#) - The employer must ensure that safety devices and *operational aids* that are part of the original equipment are maintained in accordance with *manufacturer procedures*.

[1926.1441\(d\)\(2\)](#) - Anti two-blocking. The employer must ensure that equipment covered by this section manufactured more than one year after November 8, 2010 have either an anti two-block device that meets the requirements of [§ 1926.1416\(d\)\(3\)](#) - *operational aids*, or is designed so that, in the event of a two-block situation, no damage or load failure will occur (for example, by using a power unit that stalls in response to a two-block situation).

[1926.1441\(e\)](#) - *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.

[1926.1441\(f\)](#) - *Signal person qualifications*. The employer must *train each signal person* in the proper use of signals applicable to the use of the equipment.

[1926.1441\(h\)](#) - *Inspections*. The employer must ensure that equipment is *inspected* in accordance with *manufacturer procedures*.

[1926.1441\(k\)](#) - *Design*. The employer must ensure that the equipment is *designed by a qualified engineer*.

1926.1442 - Railroad Roadway Maintenance Machines

Scope: This [standard](#) provides the requirements for railroad roadway maintenance machines.

Special Requirements: Federal Railroad Administration, manufacturer guidance, references other standards

[1926.1442\(a\)](#) - General rule. Employers using equipment covered by this subpart that meets the definition of “roadway maintenance machine,” as defined in [49 CFR 214.7](#), must comply with the requirements in this subpart, except as provided in [paragraphs \(b\)\(1\) through \(7\)](#) of this section when subject to the authority of the *Federal Railroad Administration*.

[1926.1442\(b\)](#) - Exceptions

- [1926.1442\(b\)\(1\)](#) - *Operator certification, training, and evaluation*. The requirements in [§§1926.1427](#) (*Operator qualification and certification*) and [1926.1430](#) (*Training*) do not apply. The *qualification and training* requirements contained in [§§1926.1436\(q\)](#) (*Qualification and training for derricks*), [1926.1440\(a\)](#) (*Sideboom cranes*), and [1926.1441\(a\)](#) (*equipment with a rated hoisting/lifting capacity of 2,000 pounds or less*) do not apply.
- [1926.1442\(b\)\(2\)](#) - Rail clamps, rail stops, and work-area controls.
 - [1926.1442\(b\)\(2\)\(i\)](#) - The requirement for rail clamps in [§1926.1415\(a\)\(6\)](#) - *safety devices*, does not apply;
 - [1926.1442\(b\)\(2\)\(ii\)](#) - The requirement for rail stops in [§1926.1415\(a\)\(6\)](#) - *safety devices*, does not apply; and
 - [1926.1442\(b\)\(2\)\(iii\)](#) - The work-area controls specified by [§1926.1424\(a\)\(2\)](#) - *work area control*, do not apply.
- [1926.1442\(b\)\(3\)](#) - Out-of-level work. The restrictions on out-of-level work, and the requirements for crane-level indicators and inspections of those indicators [including the requirements in [§§1926.1402\(b\)](#) - *ground conditions*, [1926.1412\(d\)\(1\)\(xi\)](#) - *inspections*, and [1926.1415\(a\)\(1\)](#) - *safety devices*], do not apply.
- [1926.1442\(b\)\(4\)](#) - Dragging a load sideways. The prohibition in [§1926.1417\(q\)](#) - *operation*, on dragging a load sideways does not apply.
- [1926.1442\(b\)\(5\)](#) - Boom-hoist limiting device. The requirement in [§1926.1416\(d\)\(1\)](#) - *operational aids*, for a boom-hoist limiting device does not apply to roadway maintenance machines when the cranes use hydraulic cylinders to raise the booms.
- [1926.1442\(b\)\(6\)](#) - *Manufacturer guidance* for modifications covered by [§1926.1434](#) - *equipment modifications*. The requirements to follow the *manufacturer’s*

guidance set forth in [§1926.1434](#) - *equipment modifications*. do not apply if the employer is subject to the requirements of [49 CFR part 214](#).

- [1926.1442\(b\)\(7\)](#) - Other *manufacturer guidance*. The requirements to follow the *manufacturer's guidance, instructions, procedures, prohibitions, limitations, or specifications*, set forth in [§1926.1404\(j\), \(m\), or \(q\)](#) - A/D; [§1926.1415\(a\)\(6\)](#) - *safety devices*; [§1926.1417\(a\), \(r\), \(u\), or \(aa\)](#); [§1926.1433\(d\)\(1\)\(i\)](#) - *design, construction and testing*, or [§1926.1441](#) - *railroad roadway maintenance*, do not apply if the employer is subject to the requirements of [49 CFR part 214](#).

[Additional Assistance for Construction](#)

If the employer still has questions regarding the OSHA standards or North Carolina state-specific standards, they can submit an inquiry about safety and health requirements to Ask OSH through the [online form](#) or by phone at 919-707-7876.

Resource information can be found on the [safety and health topics pages](#) including [Construction Resources \(Scan QR Code\)](#) and [Construction Program - Small Business](#). These resources should be used with the webpages for [Which OSHA Standards Apply](#) and [OSHA Standards With Special Requirements](#).

Example safety and health [programs](#) ([table](#) of standards requiring programs, plans and procedures in construction, [table](#) of standards requiring inspections in construction) and [presentations](#) ([table](#) of standards requiring training in construction), [pre-recorded webinars](#) along with [publications](#) are available to assist the employer in meeting standards requirements. Specifically, the brochure on [top ten most frequently cited serious violations](#) can be useful in identifying frequently cited violations by industry. For more information regarding the required state and federal workplace posters, go to the [NCDOL State and Federal workplace posters](#) webpage.

The [NCDOL Library](#) also offers free safety and health videos and related research assistance on consensus standards (i.e., ANSI, NFPA, NEC). The education, training and technical assistance bureau provides [free online safety and health training](#) and [outreach services](#) (i.e., speaker's bureau requests, safety booths) upon request. In addition, the [consultative services bureau](#) provides free confidential on-site employer assistance.

[Special Emphasis Programs](#)

The North Carolina Special Emphasis Programs (SEPs) are part of the NC OSH Division's five year strategic management plan for which its two principal goals are: 1) to reduce the state's workplace fatality rate by at least 2%; and 2) to reduce the state's non-fatal injury

and illness rate by at least 5%. For each SEP that applies to a specific industrial sector, similar goals for reducing the fatality rate and/or non-fatal injury and illness rate are applied.

Special Emphasis Programs

What is a Special Emphasis Program?

From the context of occupational safety and health, a special emphasis program (SEP) is a concerted effort for which the goals are:

- To reduce or eliminate fatalities overall and within specific industry sectors;
- To reduce injury and illness rates in specific business sectors to levels below the national average for those sectors; and
- To reduce or eliminate employee exposure to specific types of hazards.

What SEPs are currently in effect in North Carolina?

The special emphasis programs in effect in North Carolina are part of the OSH Division five-year strategic management plan. The SEPs currently in effect or added as part of the next five-year strategic management plan are listed below with links provided to the corresponding safety and health topic page:

- [Amputations Special Emphasis Program](#)
- [Construction Special Emphasis Program](#)
- [Food Manufacturing Special Emphasis Program](#)
- [Health Hazards Special Emphasis Program](#) (see [Lead](#), [Isocyanates](#), [Hexavalent Chromium](#), [Silica](#), [Beryllium](#))
- [Long Term Care Special Emphasis Program](#)
- [Logging and Arboriculture Special Emphasis Program](#)
- *New!* [Struck-By Special Emphasis Program](#)
- [Warehousing and Storage and Related Product Distribution Special Emphasis Program](#)

How does the OSH Division conduct a Special Emphasis Program?

Each of the bureaus in the OSH Division has designated responsibilities within each SEP.

- The East and West Compliance Bureaus conduct [enforcement activity](#) targeted at covered industries to ensure compliance with occupational safety and health rules and regulations towards the goal of reducing or eliminating employee exposure to the focus hazards of that SEP.

- The [Consultative Services Bureau](#) (CSB) conducts on-site visits and audits to assist employers that voluntarily seek help in identifying and eliminating hazards and improving their overall safety and health programs.
- The Education, Training and Technical Assistance (ETTA) Bureau provides [outreach training](#) for each SEP to assist employers to identify and abate hazards in the workplace and to learn the requirements of applicable OSH standards.
- The Planning, Statistics and Information Management (PSIM) Bureau develops targeting schedules for each SEP to better allocate compliance resources and provides the SEP team leaders with updated injury and illness incidence rates to assist them in determining the impact of that focus.

What are the various types of emphasis programs?

- National Emphasis Program ([NEP](#))
 - Apply to all Federal OSHA Regions
 - State Plan States required to implement the same or equally effective emphasis programs
- Local Emphasis Program ([LEP](#))
 - Administered by Federal OSHA
 - Designed and implemented at regional office and/or area office level
 - Intended to address hazards or industries that pose a particular risk to workers in the office's jurisdiction
 - Accompanied by outreach
 - Apply only to states under Federal OSHA jurisdiction
- North Carolina Special Emphasis Program ([SEP](#))
 - May be identical to OSHA NEP or LEP
 - Often unique to circumstances in North Carolina (OSHA state plan state)

North Carolina State-Specific Standards

These webpages are designed to assist employers in complying with standards that have "**special requirements**". For the purpose of this technical guidance, special requirements includes programs, plans, procedures, policies, inspections, certifications, competent persons, qualified persons, training, medical surveillance, exposure monitoring, signs, tags, markings, tests, records and recordkeeping requirements that are applicable in meeting the requirements of OSHA standards by industry. *If a standard or subpart are not listed, it did not have one of these types of special requirements.*

Note: *While all attempts have been made to ensure the accuracy of the content and completeness in the information provided, it may not include all the specific standards that have special requirements that may be required by an OSHA standard. To ensure*

completeness in meeting each standard's requirement, the specific standard should be referenced.

To learn more about these special requirements, click on the tabs below.

Special Requirements

This webpage is to be used in conjunction with the [Which OSHA Standards Apply](#) webpages for [North Carolina State-Specific Standards](#).

- NCGS 95-129(1) - [General Duty Clause](#)
- NCGS 95-173 through 95-218 - [Hazardous Chemical Right To Know Act](#)
- 13 NCAC 7A .0600 through .0606 - [Safety and Health Programs and Committees](#)
- 13 NCAC 07F .0202 - [General Safety and Health Provisions](#)
- 13 NCAC 07F .0203 - [Occupational Health and Environmental Controls](#)
- 13 NCAC 07F .0204 - [Personal Protective and Life Saving Equipment](#)
- 13 NCAC 07F .0205 - [Steel Erection](#)
- 13 NCAC 07F .0207 - [Toxic and Hazardous Substances](#)
- 13 NCAC 07F .0600 through .0609 - [Communication Tower Standards](#)
- 13 NCAC 07F .0701 through .0716 - [Blasting and Use of Explosives](#)
- [Additional Assistance on North Carolina State-Specific Standards](#)

NCGS 95-129(1) - [General Duty Clause](#)

The [NCGS 95-129\(1\)](#) - General Duty Clause is used when there isn't a standard for a recognized hazard that can cause death or serious injury or serious physical harm.

To learn if NCGS 95-129(1) applies to you, go to [Does the "General Duty Clause" Apply to You?](#)

Special Requirements

NCGS 95-129(1) - General Duty Clause

Scope: This [standard](#) is used when there isn't a standard for a recognized hazard that can cause death or serious injury or serious physical harm.

Special Requirements: Rights and duties, recognized

Rights and duties of employers shall include but are not limited to the following provisions:
[Reference [NCGS 95-129\(1\) - \(8\)](#)].

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

NCGS 95-173 through 95-218 - [Hazardous Chemical Right To Know Act](#)

[NCGS 95-173 through 95-218](#) - Hazardous Chemical Right To Know Act provides the standards for the Hazardous Chemicals Right to Know Act applicable in North Carolina.

To learn if NCGS 95-173 through 95-218 applies to you, go to [Does the "Hazardous Chemical Right To Know Act" Apply to You?](#)

Special Requirements

NCGS 95-173 through 95-218 - Hazardous Chemical Right To Know Act

Scope: This [standard](#) provides the standards for the right to know about hazardous chemicals.

Special Requirements: Label, list, information, notify, emergency response plan, evacuation procedures, safety data sheet, updated quarterly/annually, fire chief, fire department, inspection, chemical manufacturers and distributors, in writing, written request, contingency plan, testify, prefire plan, request, written notification, inspect, commissioner of labor, complaints, investigations, credentials, administrative hearings, healthcare provider, determines, written statement, posting, confidentiality agreement, references other standards

§ 95-191. *Hazardous Substance List.*

- (a) All employers who manufacture, process, use, store, or produce hazardous chemicals, shall compile and maintain a *Hazardous Substance List* which shall contain all of the following *information* for each hazardous chemical stored in the facility in quantities of 55 gallons or 500 pounds, whichever is greater:
[Reference [95-191 - paragraph \(a\)\(1\) - \(3\)](#)]
 - (1) The chemical name or the common name used on the *SDS or container label*.
- (b) The *Hazardous Substance List* shall be *updated quarterly* if necessary, but not less often than annually; however, if a chemical is deleted from, or added to, the *Hazardous Substance List*, or if the quantity changes sufficiently to cause the

chemical to be in a different class as defined in subsection (a) of this section, the employer shall update the *Hazardous Substance List* to reflect those changes as soon as practicable, but in any event within 30 days of such change.

- (b1) In lieu of the *information* required by subdivisions (a)(1) through (a)(3), employers may substitute the *information* specified in [section 312\(d\)\(2\) of the Superfund Amendments and Reauthorization Act of 1986, P.L. 99-499.](#)
- (c) The *Hazardous Substance List* may be prepared for the facility as a whole, or for each area in a facility where hazardous chemicals are stored, at the option of the employer but shall include only chemicals used or stored in North Carolina.

§ 95-192. *Safety data sheets.*

- (a) *Chemical manufacturers and distributors* shall provide *safety data sheets (SDSs)* to manufacturing and nonmanufacturing purchasers of hazardous chemicals in North Carolina for each hazardous chemical purchased.
- (b) Employers shall *maintain* the most current *SDS* received from *manufacturers or distributors* for each hazardous chemical purchased. If an *SDS* has not been provided by the *manufacturer or distributor* for chemicals on the *Hazardous Substance List* at the time the chemicals are received at the facility, the employer shall *request* one *in writing* from the *manufacturer or distributor* within 30 days after receipt of the chemical. If the employer does not receive an *SDS* within 30 days after his *written request*, he shall *notify the Commissioner of Labor* of the failure by *manufacturer or distributor* to provide the *SDS*.

§ 95-193. *Labels.*

- Existing *labels* on incoming containers of hazardous chemicals shall not be removed or defaced. All containers of hazardous substances must be clearly designated as hazardous.

§ 95-194. *Emergency information.*

- (a) An employer who normally stores at a facility any hazardous chemical in an amount of at least 55 gallons or 500 pounds, whichever is greater, shall provide the *Fire Chief* of the *Fire Department* having jurisdiction over the facility, *in writing*, (i) the name(s) and telephone number(s) of knowledgeable representative(s) of the employer who can be contacted for further *information* or in case of an emergency and (ii) a *copy of the Hazardous Substance List*.
- (b) Each employer shall provide a *copy of the Hazardous Substance List* to the *Fire Chief*. The employer shall *notify the Fire Chief in writing* of any updates that occur in the previously submitted *Hazardous Substance List* as provided in G.S. 95-191(b).
- (c) The *Fire Chief* or his representative, upon request, shall be permitted on-site *inspections* at reasonable times of the chemicals located at the facility on the *Hazardous Substance List* for the sole purpose of preplanning *Fire*

Department activities in the case of an emergency and insuring by *inspection* the usefulness and accuracy of the *Hazardous Substance List and labels*.

- (d) Employers shall provide to the *Fire Chief, upon written request of the Fire Chief, a copy of the SDS for any chemical on the Hazardous Substance List.*
- (e) Upon *written request of the Fire Chief*, an employer shall prepare an *emergency response plan* for the facility that includes *facility evacuation procedures, a list of emergency equipment available at the facility, and copies of other emergency response plans, such as the contingency plan required under rules governing the management of hazardous waste adopted pursuant to Article 9 of Chapter 130A of the General Statutes.* A *copy of the emergency response plan or any prefire plan or emergency response plan* required under applicable North Carolina or federal *statute or rule or regulation* shall, upon *written request by the Fire Chief*, be given to the *Fire Chief*.
- (f) The *Fire Chief* shall make *information* from the *Hazardous Substance List, the emergency response plan, and SDSs* available to members of the *Fire Department* having jurisdiction over the facility and to personnel responsible for preplanning emergency response, police, medical or fire activities, but shall not otherwise distribute or disclose (or allow the disclosure of) *information* not available to the public under G.S. 95-208. Such persons receiving such *information* shall not disclose the *information* received and shall use such *information* only for the purpose of preplanning emergency response, police, medical or fire activities.
- (g) Any knowing distribution or disclosure (or permitted disclosure) of any *information* referred to in subsection (f) of this section in any manner except as specifically permitted under that subsection (f) shall be punishable as a Class 1 misdemeanor. Restrictions concerning confidentiality or nondisclosure of information under this Article 18 shall be exemptions from the *Public Records Act contained in Chapter 132 of the General Statutes*, and such *information* shall not be disclosed notwithstanding the provisions of *Chapter 132 of the General Statutes*.

§ 95-195. Complaints, investigations, penalties.

- (a) *Complaints* of violations of this Part shall be *filed in writing* with the Commissioner of Labor. Such complaints received *in writing from any Fire Chief* relating to alleged violations of this Part shall be *investigated* in a timely manner by the *Commissioner of Labor* or his designated representative.
- (b) Duly designated representatives of the *Commissioner of Labor*, upon presentation of appropriate *credentials* to the employer, shall have the right of entry into any facility at reasonable times to *inspect and investigate complaints* within reasonable limits, and in a reasonable manner. Following the investigation, the *Commissioner* shall make appropriate findings. Either the employer or the person complaining of a violation may request an *administrative hearing* pursuant to *Chapter 150B of the General Statutes*. This request for an administrative hearing shall be submitted to the *Commissioner of Labor* within 14 days following the *Commissioner* making his findings. The *Commissioner* shall within 30 days of

receiving the request hold an *administrative hearing* in accordance with [Article 3 of Chapter 150B of the General Statutes](#).

- (c) If the *Commissioner of Labor* finds that the employer violated this Article, the *Commissioner* shall order the employer to comply within 14 days following *receipt of written notification* of the violation. Employers not complying within 14 days following *receipt of written notification* of a violation shall be subject to civil penalties of not more than one thousand dollars (\$1,000) per violation imposed by the *Commissioner of Labor*. There shall be a separate offense for each day the violation continues. The clear proceeds of civil penalties provided for in this section shall be remitted to the Civil Penalty and Forfeiture Fund in accordance with [G.S. 115C-457.2](#).
- (d) Any order by the *Commissioner* under subsection (b) or (c) of this section shall be subject to judicial review as provided under [Article 4 of Chapter 150B of the General Statutes](#).

§ 95-196. Employee rights.

- No employer shall discharge, or cause to be discharged, or otherwise discipline or in any manner discriminate against an employee at the facility because the employee has assisted the *Commissioner of Labor* or his representative or the *Fire Chief* or his representative who may make or is making an *inspection* under [G.S. 95-194\(c\)](#) or [G.S. 95-195\(b\)](#), or has *testified or is about to testify* in any proceeding under this Article, or has used the provisions of [G.S. 95-208](#).

§ 95-197. Withholding hazardous substance trade secret *information*. [Reference [95-197, paragraph \(a\) - \(d\)](#)].

§ 95-198. Medical emergency and nonemergency situations.

- (a) Where a treating *health care provider determines* that a medical emergency exists and the specific chemical identity of a hazardous chemical is necessary for emergency or first-aid treatment, the *chemical manufacturer, importer, or employer* shall immediately disclose the specific chemical identity of a hazardous substance trade secret substance to that treating physician or nurse, regardless of the existence of *written statement of need* or a *confidentiality agreement*. The *chemical manufacturer, importer, or employer* may require a *written statement of need* and a *confidentiality agreement* as soon as circumstances permit.
 - The *confidentiality agreement* (i) may restrict the use of the *information* to the health purposes indicated in a *written statement of need*; (ii) may provide for appropriate legal remedies in the event of a breach of the *agreement*, including stipulation of a reasonable pre-estimate of likely damages; and (iii) may not include requirements for the *posting* of a penalty bond. The parties are not precluded from pursuing noncontractual remedies to the extent permitted by law.

- (b) In nonemergency situations, a *chemical manufacturer, importer, or employer* shall, upon request, disclose a specific chemical identity, otherwise permitted to be withheld under this section, to a responsible party, as defined in the standards adopted in Title 13, Subchapter 7F of the [North Carolina Administrative Code \(13 NCAC 7F\)](#), providing medical or other occupational health services to exposed persons if the request is *in writing* and states the medical need for the *information*. The employer may require that the responsible party sign a *confidentiality agreement* prior to release of the *information*. The parties are not precluded from pursuing noncontractual remedies to the extent permitted by law.
- (c) If the *chemical manufacturer, importer or employer* denies a *written request for hazardous substance trade secret release*, or does not provide this *information* within 30 days, the Department of Labor shall initiate the *trade secret claim determination* process under G.S. 95-197.

§ 95-208. *Community information* on hazardous chemicals.[Reference 95-208, [paragraph \(a\) - \(b\)](#)].

§ 95-217. Preemption of *local regulations*. [Reference [95-217](#)].

13 NCAC 7A .0600 through .0606 - [Safety and Health Programs and Committees](#)

[13 NCAC 7A .0600 through .0606](#) - Safety and Health Programs and Committees establishes programs which promote safety and health for all North Carolina employers with a workers' compensation experience rate modifier of 1.5 or above.

To learn if 13 NCAC 7A .0600 through .0606 applies to you, go to [Does "Safety and Health Programs and Committees" Apply to You?](#)

Special Requirements

13 NCAC 07A .0603 - Safety and Health Programs

Scope: This [standard](#) provides requirements for safety and health programs.

Special Requirements: Safety and health programs, committee, participation, communicated, corrective action, controls, investigated, record, compliance plans, inspected, affected employees, safety committee, checklist (written), investigation, self-audit, safe work practices, marked, enforced, analyze, rules, informed, safety data sheets, statement, written findings, measured, written program, copy, retained, references other standards

(a) All *Safety and Health programs* established under [G.S. 95-251](#) for both fixed locations and non-fixed locations shall meet or exceed the requirements of [G.S. 95-251\(b\)\(1\)-\(9\)](#).

(b) The *written program* shall also include:

- (1) The manner in which managers, supervisors, and employees are responsible for implementing the *program* and how the continued *participation* of management will be established, *measured*, and maintained including specifically what the leadership role of the top employer official at the worksite shall be in regard to the *program*.
- (2) The manner in which the *plan* will be communicated to all *affected employees* so that they are *informed* of work-related hazards and *controls*.
- (3) The manner in which *safe work practices and rules* will be enforced.
- (4) The manner in which workplace accidents will be *investigated and corrective action* implemented. The employer shall keep a *comprehensive record* of accident *investigations*, findings, and corresponding *corrective action taken*.
- (5) The manner in which near-miss incidents will be *investigated*. Special emphasis will be placed on identifying all contributing factors to any near-miss incident. The employer shall keep a *comprehensive record* of each such incident and the findings relating to it, and shall keep a *record* of all corresponding *corrective action* taken.
- (6) The *methods* used to identify, *analyze* and control new or existing hazards, conditions and operations, and the manner in which changes will be incorporated into the *safety program, safety committee checklist, and communicated* to all *affected employees*.
- (7) *Written compliance plans* as required by either the *Mine Safety laws or OSHA standards*, whichever is applicable to the employer. *Written compliance plans* shall include, the following *OSHA standards*, when applicable: Excavations, Hazard Communication, Occupational Noise Exposure, Control of Hazardous Energy Sources (Lockout/Tagout), Respiratory Protection, Process Safety Management of Highly Hazardous Chemicals, Bloodborne Pathogens, Life Safety Code, Cotton Dust, and Confined Spaces.
- (8) A *written checklist* of all potential hazards to be *inspected* during the *quarterly inspections* required pursuant to [G.S. 95-252\(c\)\(4\)d](#), if applicable, including, but not limited to, checking for properly *marked* doors (including exit doors and doors not leading to an exit); properly working fire extinguishers; unlisted hazardous substances, improperly located hazardous substances, or hazardous substances for which there are no *material safety data sheets*; doorways or exit pathways that are cluttered; improperly grounded equipment and exposed live wiring and parts; and unguarded machinery. Each item on the aforementioned *written checklist* shall be *checked* during the *quarterly inspections* and a *copy of the list* shall be *retained* by the employer for not less than two years. All conditions or items deemed to be out of compliance shall be immediately abated, unless circumstances beyond the control of the employer requires a longer period of time.
- (9) The employer shall conduct an *annual self-audit* of all required *safety and health programs*. *Written findings and a statement* of remedial actions taken shall be

retained for not less than two years. Companies with less than 11 employees that are not required to have *safety and health committees* shall appoint a company safety officer to conduct the *annual self-audit*.

- (10) The purpose and operation of the *Safety and Health Committee* where such *committee* exists.
- (11) The *methods* used to *communicate* requirements of the *program* to other employers or subcontractors and their employees who may be present at the same site.

13 NCAC 07A .0604 - Selection of Safety Committees

Scope: This [standard](#) provides the requirements for safety and health committees.

Special Requirements: Safety and health committees, determined, certified collective bargaining agent, nomination, ballots, employee meeting, statute, written documentation, processes, retain, collective bargaining process, election process, approved methods, references other standards

(a) An employer may elect to implement any one of the following selection processes as a means of meeting the requirements for selection of representatives to employee *Safety and Health committees* pursuant to [G.S. 95-252\(d\)](#). The employer shall *retain written documentation* outlining any utilized *selection process*. An employer whose employees are represented by a *collective bargaining* representative must utilize either subsection 8, 9, or 10 for *committee* selection purposes. Any non-management employees who choose not to participate in the *collective bargaining process* are still considered to be represented by the *collective bargaining* representative for purposes of this Rule for *committee* selection purposes.

- (1) The employer may devise and implement any means of employee selection so long as: (A) the employee representatives are selected "by and from among the employer's nonmanagement employees" as specified in the *statute*, (B) minimum numbers are met, and (C) the intent of the statute is satisfied.
- (2) The employer may require that all non-management employees serve on a *Safety and Health Committee*. In the instance of a small employer, there may be one committee comprised of all nonmanagement employees which serves the entire organization. In a larger organization, there may be *several committees*, each addressing one or more of the responsibilities of the *safety committee* as outlined in [G.S. 95-252](#), with employees divided among the *committees*.
- (3) The employer may conduct an election at either a *meeting* or through the distribution of *ballots*. The *election process* shall provide for the *nomination* by non-management employees (including self-nominations) of non-management employees in the numbers specified by the employer, but shall not be less than one nor more than the number of non-management members specified by *statute*. The

number of non-management employees specified by *statute* receiving the most *nominations* shall serve on the *Safety and Health Committee*.

- (4) The employer may conduct an *employee meeting* at which open nominations are held and secret *ballots* are used to elect employee representatives. The meeting may be for all non-management employees or by working unit.
- (5) The employer may conduct an employee meeting at which non-management employees nominate one peer by *listing* that employee's name on a *ballot*. The *ballots* shall be tallied and the appropriate number of representatives, in the numbers required by *statute*, shall be *determined* by those employees named on the most *ballots*.
- (6) The employer may solicit *nominations* from all non-management employees for employee representatives to serve on the committee, then select representatives by lottery from among those *nominated* to obtain the statutorily appropriate number of employee representatives for the *safety and health committee*.
- (7) The employer may solicit volunteers and nominations from among the non-management employees for a pool of applicants to serve as employee representatives on the *safety committee*. (If no volunteers or nominations are received, the employer shall require that nominations be submitted from a cross section of employee work units within the establishment.) The members of the *applicant pool* shall select from among its ranks the initial employee representatives necessary to meet minimum numbers as specified in the *statute*.
- (8) Employees shall be selected to serve on a *safety and health committee(s)* in accordance with any contract that exists between a *collective bargaining* unit and the employer. Should the contract not otherwise specify selection of a *safety and health committee*, non-management members shall be selected in a manner approved by the *certified collective bargaining agent*.
- (9) Employers having more than one *collective bargaining unit* shall devise and implement a means of employee selection utilizing the provisions of the existing contracts or *methods approved* by the *certified collective bargaining agents*. *Safety committee* members shall be selected in proportionate numbers to the number of employees represented by the *certified collective bargaining agents*.
- (10) Employers having some non-management employees represented by a *collective bargaining agent or agents* and some not represented shall devise a means that utilizes language in the contract or *methods approved* by the *certified collective bargaining agent(s)* for selection of bargaining unit representatives, and one or more of the above means for selecting non-management employee members not represented by the bargaining agent(s). *Safety committee* members shall be selected in proportion to the number of employees represented by the *certified collective bargaining agent(s)* and the number of employees not represented.

13 NCAC 07A .0605 - Safety and Health Committee Requirements

Scope: This [standard](#) provides the requirements for safety committees.

Special Requirements: Safety and health committee, notify(ing), chairperson, general contractor, distribute information, meetings, designate, legislation, references other standards

(a) Multi-Site Employers:

- (1) Employers with 11 or more employees who do not report to a fixed or regular location worksite are required to have a *Safety and Health Committee* to represent those employees. The employer must have a separate *Safety and Health Committee* for each mobile work crew consisting of 11 or more employees.
- (2) Employers with employees who report to a fixed or regular location worksite must have a separate *safety and health committee* for each location with 11 or more employees.
 - (b) Multi-Employer Worksites: (1) At multi-employer fixed or regular location worksites, any employer required to establish a *Safety and Health Committee pursuant to G.S. 95-252* shall *notify* the *general contractor* or equivalent of the requirements of this *legislation and of the chairpersons* of their *committee*. (2) The *general contractor* or equivalent shall *designate* a representative to attend the *Safety and Health Committee meetings* of the *notifying* employer(s). (3) The *notifying* employer shall work with the *general contractor* or equivalent to distribute information as required by [G.S. 95-251\(b\)\(9\)](#).

13 NCAC 07A .0606 - Training and Education

Scope: This [standard](#) provides the requirements for training and education.

Special Requirements: Safety and health committee, training, affected employees, frequently cited violations, education, committee's duties, accident investigation, recordkeeping, procedures, system, PPE, hazard identification, safety and health programs, work practice, references other standards

(a) All *safety and health committee* members shall receive *training and education* based on the type of business activity in which the employer is involved and the scope of the *committee's duties*. At a minimum, employers shall provide *training* regarding the following: [Reference [paragraph \(a\)\(1\) - \(6\)](#)].

- (2) Principles regarding effective accident and incident *investigations*.
- (3) Employee and employer rights and responsibilities under the *Safety and Health Programs and Committees Act (G.S. 95-250 et al.)* and the *Mine Safety laws* or *OSHANC*.
- (4) *Recordkeeping* requirements of the *North Carolina Workers' Compensation Act (G.S. 97-1 et seq.)* and the *Mine Safety laws* or *OSHANC*. (5) The most common causes of on-the-job accidents.

- (6) The most *frequently cited violations* of either the *Mine Safety laws* or *OSHANC*.

(b) There shall also be established for employees whether or not a *safety and health committee* is required:

- (1) A *system for training and education* of all employees in occupational safety and health hazards at the worksite. The *system* shall contain specific requirements that new employees not be allowed to begin work, except when participating in *carefully supervised on-the-job training*, until thoroughly *trained* in the safe use of all applicable equipment and substances, and *procedures* relating to their workplace environment.
- (2) A *system of training and education* for any existing employee given a new work assignment.
- (3) A *system of training and education* for all *affected employees* when a new substance, process, *procedure* or piece of equipment is introduced into the workplace and presents a new hazard to safety or health.
- (4) A *system of training and education* for all *affected employees* when any new *personal protective equipment* or different *work practice* is used on existing hazards.
- (5) *Training* to comply with all applicable *OSHA employee training* requirements, including, but not limited within General Industry to Means of Egress; Powered Platforms, Manlifts, and Vehicle- Mounted Work Platforms; Occupational Health and Environmental Control; Hazardous Materials; Personal Protective Equipment; General Environmental Controls; Medical and First Aid; Fire Protection; Materials Handling and Storage; Machinery and Machine Guarding; Welding, Cutting and Brazing; Special Industries; Electrical; Commercial Diving Operations; Toxic and Hazardous Substances, and Occupational Exposure to Hazardous Chemicals in Laboratories; including, but not limited within the Construction Industry to General Safety and Health Provisions; Occupational Health and Environmental Controls; Personal Protective and Life Saving Equipment; Fire Protection and Prevention; Signs, Signals, and Barricades; Tools - Hand and Power; Welding and Cutting; Electrical; Ladders and Scaffolding; Cranes, Derricks, Hoists, Elevators and Conveyors; Motor Vehicles, Mechanized Equipment, and Marine Operations; Excavations; Concrete and Masonry Construction; Underground Construction, Caissons, Cofferdams and Compressed Air; Demolitions; Blasting and Use of Explosives; Power Transmission Distribution; Stairways and Ladders; including, but not limited within Agriculture to Roll-Over Protective Structures, and Safety for Agricultural Equipment; and including, but not limited to the Process Safety Management Standard, the Confined Spaces Standard, Hazard Communication Standard, and the Bloodborne Pathogens Standard.

(c) The required *safety and health training* shall be provided by someone trained to recognize, evaluate and control safety and health hazards. The *training* may be provided on-site or off-site.

13 NCAC 07F .0202 - [General Safety and Health Provisions](#)

[13 NCAC 07F .0202](#) - General Safety and Health Provisions adds to paragraph (a) of the construction standard on [personal protective equipment](#) applicable in North Carolina.

To learn if 13 NCAC 07F .0202 applies to you, go to [Does "General Safety and Health Provisions" Apply to You?](#)

Special Requirements

13 NCAC 07F .0202 - General Safety and Health Provisions

Scope: This [standard](#) applies to personal protective equipment.

Special Requirements: PPE, references other standards

Subpart C - General Safety and Health Provisions - *Personal protective equipment*, [1926.28\(a\)](#) is amended to read as follows: "[\(a\)](#) The employer is responsible for requiring the wearing of appropriate *personal protective equipment* (as described in [1926.28](#)) in all operations where there is an exposure to hazardous conditions or where this part indicates the need for using such equipment to reduce the hazards to the employees."

13 NCAC 07F .0203 - [Occupational Health and Environmental Controls](#)

[13 NCAC 07F .0203](#) - Occupational Health and Environmental Controls provides an addition to [29 CFR 1926.54](#), Nonionizing radiation applicable in North Carolina.

To learn if 13 NCAC 07F .0203 applies to you, go to [Does "Occupational Health and Environmental Controls" Apply to You?](#)

Special Requirements

13 NCAC 07F .0203 - Occupational Health and Environmental Controls

Scope: This [standard](#) applies to nonionizing radiation.

Special Requirements: Manufacturer recommendations, references other standards

Addition to [29 CFR 1926.54](#), *Nonionizing radiation*, after subpart (a) to read: "(a1) This standard shall apply to all direct or reflected laser equipment except unmodified Class I equipment maintained in accordance with the *manufacturer's recommendations*. Class I equipment is defined as intrinsically safe lasers having less than 0.001 milliwatt power and lasers which cannot create eye damage if viewed accidentally or which present no direct ocular hazard, diffuse ocular hazard or fire hazards."

13 NCAC 07F .0204 - [Personal Protective and Life Saving Equipment](#)

[13 NCAC 07F .0204](#) - Personal Protective and Life Saving Equipment added a paragraph to [1926.104](#) - Safety belts, lifelines, and lanyards applicable in North Carolina.

To learn if 13 NCAC 07F .0204 applies to you, go to [Does "Personal Protective and Life Saving Equipment" Apply to You?](#)

Special Requirements

13 NCAC 07F .0204 - Personal Protective and Life Saving Equipment

Scope: This [standard](#) applies to safety belts, lifelines and lanyards.

Special Requirements: References other standards

Subpart E - Personal Protective and Life Saving Equipment -- addition of [\(g\)](#) to [1926.104 Safety belts, lifelines, and lanyards](#), as follows: "(g) Snaphooks shall be a locking type designed and used to prevent disengagement of the snaphook keeper by the connected member. Locking type snaphooks have self-closing, self-locking keepers which remain closed and locked until unlocked and pressed open for connection or disconnection."

13 NCAC 07F .0205 - [Steel Erection](#)

13 NCAC 07F .0205 - Steel Erection

[13 NCAC 07F .0205](#) - Steel Erection adds to the scope of the Steel Erection standard, [Subpart R](#), and adds to the paragraph on tripping hazards.

To learn if 13 NCAC 07F .0205 applies to you, go to [Does "Steel Erection" Apply to You?](#)

Special Requirements

13 NCAC 07F .0205 - Steel Erection

Scope: This [standard](#) applies to steel erection.

Special Requirements: Determine, protective measures, fall protection methods, fall protection system, references other standards

[Subpart R - Steel Erection](#) – additions and amendments to [29 CFR 1926.750 Scope, through 1926.754 Structural steel assembly](#), are applicable as follows:

[Reference [paragraph \(b\)\(1\) - \(2\)](#)].

[\(b\)\(2\)](#) There may be activities that occur during and are part of steel erection where conventional *fall protection methods* may not offer adequate protection for employees. The employer shall establish and *determine* when to implement employee *fall protection measures* as described in [1926.760 - fall protection](#), or the more *protective measures* described in [1926.502 "Fall Protection Systems Criteria and Practices"](#). Where non-traditional steel or iron workers [employees not meeting requirements of [1926.761\(c\) - training](#)] are engaged in leading edge work activities six (6) feet or more above lower levels, those employees shall be protected from falling by guardrail systems, *personal fall arrest systems or safety nets*. Such leading edge work activities include off loading, stacking, laying out and fastening steel floor decking and metal and non-metal roof decking; positioning and securing exterior curtain walls, window walls, exterior siding systems; and moving from point to point while performing these activities.

[1926.754\(c\)\(1\) - Tripping hazards](#). Employees shall be protected from falls due to tripping hazards created by shear connectors (including headed steel studs, steel bars or steel lugs), reinforcing bars, deformed anchors, or threaded studs attached to the top flanges of beams, joists or beam attachments. Such *protection* from falls may be accomplished by any of the following: [Reference [paragraph \(c\)\(1\) - \(3\)](#)].

(2) Providing all employees that are exposed to falling hazards greater than six feet with a suitable *fall protection system*, as defined in [1926.32\(s\) - definitions](#), including *guardrail systems, personal fall arrest systems, or safety nets*.

13 NCAC 07F .0207 - [Toxic and Hazardous Substances](#)

[13 NCAC 07F .0207](#) - Toxic and Hazardous Substances incorporates the standard for Bloodborne Pathogens, into the Safety & Health Regulations for *Construction at 29 CFR 1926.1130* in North Carolina.

To learn if 13 NCAC 07F .0207 applies to you, go to [Does "Toxic and Hazardous Substances" Apply to You?](#)

Special Requirements

13 NCAC 07F .0207 - Toxic and Hazardous Substances

Scope: This [standard](#) applies to bloodborne pathogens for the construction industry.

Special Requirements: References other standards

Subpart Z - Toxic and Hazardous Substances -- incorporation of the existing standard for Bloodborne Pathogens, [29 CFR 1910.1030](#), excluding [subparagraph \(e\)](#) HIV and HBV Research Laboratories and Production Facilities, into the Safety & Health Regulations for *Construction at 29 CFR 1926.1130*. [Reference [Special Requirements](#) for 1910.1030 - Bloodborne Pathogens]

13 NCAC 07F .0600 through .0609 - [Communication Tower Standards](#)

[13 NCAC 07F .0600 through .0609](#) - Communication Tower Standards provides requirements for policies, procedures, and safe work practices to protect employees throughout North Carolina from the hazards of working on communication towers during construction, alteration, repair, operation, inspection, and maintenance activities.

To learn if 13 NCAC 07F .0600 through .0609 applies to you, go to [Does the "Communication Tower Standards" Apply to You?](#)

Special Requirements

13 NCAC 07F .0603 - Employer Responsibilities

Scope: This [standard](#) provides the requirements pertaining to employer responsibilities.

Special Requirements: Competent person, inspect, references other standards

(a) The employer shall require employees to adhere to acceptable conditions for access, as defined by [13 NCAC 07F .0602\(1\) - definitions](#), prior to climbing the tower at heights above six feet.

(b) The employer shall ensure that at least two employees, including at least one *competent person*, are on site at all times when employees are exposed to fall hazards above six feet, provided however, an employer shall not be required to have more than two employees on site at any given time.

(c) A *competent person* shall visually *inspect* the tower base for damage, deterioration, structural deficiencies and functionality of safety features and anchorages before employees are allowed to climb the tower at heights above six feet. Additionally, the employer shall ensure that the tower is *visually inspected* for these items, as it is ascended, to the elevation point where work is being performed.

13 NCAC 07F .0604 - Hazard Identification and Assessment

Scope: This [standard](#) provides for hazard identification and assessment.

Special Requirements: Hazard assessment, identify meteorological conditions, inspections, competent person, controls, evaluate, assess, document, information, rule, PPE, references other standards

(a) In addition to the *inspections* required by [13 NCAC 07F .0603\(c\)](#) - *employer responsibilities*, and [13 NCAC 07F .0605\(b\)](#) - *fall protection*, the employer shall conduct a *hazard assessment* to identify, assess, and control employee exposure to hazards as required by the rules in this Section and any other applicable *state or federal statutes, rules or regulations*.

(b) The employer shall perform and *document the hazard assessments* required by this *Rule*:

- (1) Initially and daily for each site prior to permitting employees to climb the structure; and
- (2) When *safety and health information* or change in workplace conditions indicates that a new or increased hazard may be present.

(c) The *hazard assessments* required by this *Rule* shall:

- (1) Be performed by a *competent person*;
- (2) *Evaluate* new equipment, materials, and processes for hazards before they are introduced into the workplace; and
- (3) *Identify meteorological conditions* that could affect work at heights above six feet on a tower, such as wind, rain, snow or ice.

(d) If hazards are *identified*, the employer shall *assess* the severity of identified hazards and implement means to *control* such hazards, including providing employees with *personal protective equipment (PPE)* designed to control the identified hazards and ensuring the proper use of the *PPE* by the employees.

13 NCAC 07F .0605 - Fall Protection

Scope: This [standard](#) provides the fall protection requirements.

Special Requirements: Fall protection systems, inspection, rescue team, verify, rescue plans, competency, simulated rescue operations, communicate (documented), available, tested, alternative means, inspect, competent person, planning, documentation, documented, fall protection equipment, trained, procedures (documented), designate, qualified climber, demonstrate, fall protection plan, PFAS, manufacturer's recommendations, American Red Cross, first aid/CPR certification, first aid supplies, training, references other standards

(a) General. Prior to employees climbing the tower at heights above six feet, the employer shall ensure that *100% fall protection systems* compatible with the tasks assigned are provided, used, and maintained. The *rules* in this Section shall not require the retrofitting of communication towers; provided, that employees who are exposed to fall hazards above six feet while performing work on communication towers are protected from such hazards by means of a *100% fall protection system*.

(b) *Pre-Climb Planning and Inspection*. In addition to the criteria for *pre-climb planning and inspection* included in Paragraph (g) of this *Rule*, the employer shall ensure that the following items occur prior to employees climbing the tower at heights above six (6) feet:

- (1) All climbing jobs shall be *planned by a competent person*;
- (2) All climbing facilities shall be *visually inspected daily* at the tower base by a *competent person* for rust, corrosion, deterioration, or other hazards. Additionally, the employer shall ensure that the climbing facilities are *visually inspected* for these items, as it is ascended, to the elevation point where work is being performed. If any such hazard is identified during this *inspection*, employees shall not use the climbing facility until such hazards are abated;
- (3) A *competent person* shall ensure that all *fall protection equipment is inspected prior to each use* for wear, damage, defect or other deterioration by employees who have been trained in accordance with [13 NCAC 07F .0609 - training](#). Defective equipment shall be identified as defective and immediately removed from service;
- (4) Components of a fall protection system and the *fall protection equipment* utilized by employees shall be compatible with one another and shall be utilized in accordance with the *manufacturer's recommendations*; and
- (5) The employer shall ensure that the *planning and inspections* are performed and *documented*. The *documentation* shall be *maintained* on site while work is being performed, and thereafter by the employer at its place of business. The *documentation* shall include the date of the *planning and inspection*, the name of the *competent person* performing the *planning and inspection*, and the site location.

(c) *Fall Protection Systems*. In order to comply with the requirements of Subparagraph (a)(1) of this *Rule*, the employer may permit employees to utilize the *100% fall protection systems* described in Paragraphs (d) through (g) of this *Rule*. If the *fall protection*

systems described therein are not present on the tower, the employer shall not permit employees to climb the tower at heights above six feet unless:

- (1) an *alternative means of 100% fall protection* is utilized that is at least as effective as the *fall protection systems* described in Paragraphs (d) through (g) of this Rule;
- (2) an *alternative means of access to the work area* is utilized such as an aerial lift or elevated work platform; or
- (3) the employer can *demonstrate* that the requirements for a fall protection plan under Paragraph (i) of this Rule have been met.

(d) *Guardrail Systems*. The employer shall ensure that guard rail systems and their components that are utilized by employees as a means of *100% fall protection* conform to the criteria in [29 CFR 1926.502\(b\)](#) - *fall protection systems and criteria*

(e) *Personal Fall Arrest Systems (PFAS)*. The employer shall ensure that personal fall arrest systems and their components that are utilized by employees as a means of *100% fall protection* conform to the criteria in [29 CFR 1926.502\(d\)](#) - *fall protection systems and criteria*, and are utilized according to the manufacturer's recommendations. When utilized by employees as an anchorage as part of a PFAS, the employer shall ensure that step bolts and the attachment point to the structure are designed to meet the requirements of an approved anchorage in accordance with [29 CFR 1926.502\(d\)](#), and are designed to ensure the connector will not slip off the end of the step bolt.

(f) *Positioning Device System*. The employer shall ensure that *positioning device systems* and their components that are utilized by employees as a means of *100% fall protection* conform to the criteria in [29 CFR 1926.502\(e\)](#).

(g) *Ladder Safety Systems*. The employer shall ensure that, in addition to the applicable criteria in 29 CFR 1926, [Subpart X](#) - *stairways and ladders, ladder safety systems* and related support systems for fixed ladders that are utilized by employees as a means of *100% fall protection* conform to the following criteria: [Reference [paragraph \(g\)\(1\) - \(3\)](#)].

(h) *Fall Protection Plan*. This Paragraph applies when employees are working on a structure where no adequate tie-off anchorage point(s) exist, the *fall protection systems* described in Paragraph (c) of this Rule are not feasible or create a greater hazard, and the work can not be completed utilizing an *alternative means of access to the work area* such as an aerial lift or elevated work platform. If an employer *demonstrates* the foregoing conditions are present, then in addition to the criteria in [29 CFR 1926.502\(k\)](#), the employer shall conform to the following provisions:

- (1) The employer shall ensure that each employee under the *fall protection plan* has been *trained as a qualified climber*;

- (2) The *fall protection plan* shall be made *available and communicated* to exposed employee(s) prior to the employee(s) beginning work, and such *communication* shall be *documented*; and
- (3) The *fall protection plan* shall identify each location on the tower structure where *fall protection methods* as described in Paragraph (c) of this *Rule* cannot be used. As soon as adequate tie-off anchorage points or other *fall protection systems* can be established, the employer shall utilize any of the *fall protection systems* described in Paragraph (c) of this *Rule*.

(i) *Emergency and Rescue Procedures*. [Reference [paragraph \(i\)\(1\) - \(3\)](#)].

(j) *First Aid/CPR Training and Supplies*. In addition to the requirements of [29 CFR 1910.151](#) - *medical services and first aid*, and [29 CFR 1926.50](#) - *medical services and first aid*, the employer shall ensure that at least two employees on site are *trained* and hold current *certifications* in basic *first aid and cardiopulmonary resuscitation (CPR)* issued by the *American Red Cross* or any other organization whose standards are equivalent to the *American Red Cross*; provided, however, where there are only two employees on site, then an employer may comply with the requirements of this Paragraph if one employee is *trained* and holds current *certifications* in basic *first aid and CPR* and one employee has been *designated* by the employer as a probationary employee and has been employed for less than six months.

13 NCAC 07F .0606 - Nonionizing Radiation

Scope: This [standard](#) provides the requirements pertaining to nonionizing radiation.

Special Requirements: Federal Communications Commission (FCC), engineering controls, administrative controls, tagged out, locked out, LOTO devices, method, notified, checked, competent person, written control procedures, exposure, assess, exposure levels, written safety and health program, RF Safety Program, post temporary signage, RF protective clothing, PPE, references other standards

(a) General. Employers shall ensure that employees performing work on communication towers are not exposed to Radio Frequency (RF) Electromagnetic Fields in excess of the *Federal Communications Commission (FCC)* maximum permissible exposure (MPE) limits for *exposure* as prescribed in 47 CFR 1.1310.

(b) Protection from Radiation *Exposure*.

- (1) Employees shall not enter areas where *RF exposure levels* are above the general population/uncontrolled MPE's described in 47 CFR 1.1310 unless they understand the potential for exposure and can exercise control over the *exposure*.
- (2) *Control Procedures*. Prior to employees performing work in areas on a communication tower where *RF exposure levels* exceed the

occupational/controlled MPE values stated in 47 CFR 1.1310, the employer shall enact and enforce *written control procedures* that provide for the reduction, elimination, avoidance or protection from such RF levels. These *written control procedures* shall include the following:

- (A) Reducing the transmitter power to a level that ensures *RF exposure levels* in areas where employees are working do not exceed the occupational/controlled MPE values stated in 47 CFR 1.1310, and that the transmitter power level is not increased until all employees have ceased working in those areas. If this method is chosen, the transmitter power shall be *locked out and tagged out* at the reduced level by a *competent person* in accordance with [29 CFR 1910.147 - the control of hazardous energy](#). Prior to removing *lock out/tag out devices* and restoring the original transmitter power level, all employees shall be *notified* and the work area shall be *checked* to ensure that all employees have been safely positioned and removed;
- (B) If the transmitter power level in areas where employees are working cannot be reduced and maintained at a level that ensures RF exposure levels do not exceed the occupational/controlled MPE values stated in 47 CFR 1.1310, the transmitter power shall be *locked out and tagged out by a competent person* in accordance with [29 CFR 1910.147 - the control of hazardous energy](#). Prior to removing *lock out/tag out devices* and restoring the transmitter power level, all employees shall be *notified* and the work area shall be *checked* to ensure that all employees have been safely positioned and removed;
- (C) If the transmitter power level can not be reduced or eliminated, an employer may permit its employees to access areas where the occupational/controlled MPE values stated in 47 CFR 1.1310 are exceeded if it implements *engineering or administrative controls* that comply with the *FCC's regulations* concerning such *exposure*, including limiting the duration of the exposure and utilizing monitoring equipment, *RF protective clothing* and other related *PPE*; or
- (D) If an employer cannot ensure that the conditions in Parts (A), (B) or (C), of this Subparagraph, are met, employees shall not be permitted to access areas where *RF exposure levels* exceed the occupational/controlled MPE values stated in 47 CFR 1.1310.

(c) Use of *Controls*. Prior to commencing work on a communication tower, a *competent person* shall assess potential RF hazards of areas which may be accessed by employees in the course of their work, and *post temporary signage* to indicate areas where the RF hazard exceeds the general population/uncontrolled MPE limits for exposure set forth in 47 CFR 1.1310. *Temporary signage* shall remain in place while work is performed and the hazard exists.

(d) *RF Safety Program*. When employees are exposed to RF fields in excess of the general population/uncontrolled MPE limits established in 47 CFR 1.1310 as a consequence of their employment, the employer shall develop, implement, and maintain a *written safety and health program* with site specific *procedures* and elements based on the electromagnetic radiation hazards present, in accordance with [13 NCAC 07F .0609\(g\)](#) - *training*.

13 NCAC 07F .0607 - Hoists and Gin Poles

Scope: This [standard](#) provides the requirements for hoists and gin poles.

Special Requirements: Marked, inspection (documented), testing, design, competent person, qualified person, maintenance, manufacturer, licensed professional engineer, documentation, training certification, operating manual, gin pole load chart, manufacturer specifications, stamped, monitoring, load limits, documentation, references other standards

(a) Hoists. Hoists used during the construction, alteration, repair, maintenance, or demolition of communication towers shall meet the following requirements:

[Reference [paragraph \(a\)\(1\) - \(4\)](#)].

- (1) All hoists shall meet the requirements set forth in this rule, 29 CFR 1910, [Subpart N - materials handling and storage](#), and 29 CFR 1926, [Subpart N - helicopters, hoists, elevators, and conveyors](#), where applicable.
- (2) All hoists shall meet applicable requirements for *design*, construction, installation, *testing, inspection, maintenance*, and operation as prescribed by the manufacturer, or a *licensed professional engineer*.
- (3) Employers shall maintain at the work site the *operating manual* developed by the manufacturer for the specific make and model hoist being used, as well as *documentation* for any *inspection, testing, and operator training certification* required by the rules in this Section,

(b) Gin Poles.

- (1) Rigging Equipment. [Reference [paragraph \(b\)\(1\)\(A\) - \(E\)](#)].
 - (A) Wire rope, slings, chains, shackles, turnbuckles, links, hooks, sheaves, rotating rooster heads, blocks, and hoists, used in a gin pole lifting arrangement shall meet the *manufacturer's safe working load limits*. In addition, each component shall have a nominal breaking strength of no less than five times the static load applied. Consideration for end fitting losses and actual positioning of connecting parts shall be given;
 - (B) Lugs or other devices for lifting or attaching the gin pole in position shall be *designed* with load and resistance factors appropriate for their intended use;

- (C) Only alloy chains *marked* by the manufacturer with an 8, T, or an A, *rated* for lifting, shall be used;
- (D) Only quenched and tempered hooks and shackles shall be used. The *manufacturer's load rating shall be stamped* on the product; and
- (2) Gin Pole Use.
 - (A) A user's *gin pole load chart shall be provided* for each pole; [Reference [paragraph \(b\)\(2\)\(A\) - \(D\)](#)].
 - (B) Any special engineered pick, which is outside of the *load chart*, shall only be allowed at the direction of a *licensed professional engineer*. *Monitoring and measuring conditions, as specified by a licensed professional engineer, shall be provided and used during all special engineered picks;*
 - (C) Modifications or repairs of a gin pole shall be made with like or similar materials to meet or exceed the original *specifications*. Modifications or repairs shall be *recertified by a licensed professional engineer*; and
- (3) Wire Rope. Wire rope used for rigging shall be as follows: [Reference [paragraph \(b\)\(3\)\(A\) - \(E\)](#)].
 - (B) Lubricated in accordance to *manufacturer specifications* to prevent corrosion and wear;
 - (C) End connections shall be terminated per industry and *manufacturer's specifications*;
- (4) Inspections.
 - (A) Gin poles shall have a *documented inspection annually by a qualified person*;
 - (B) In addition to the *annual inspection*, the employer shall *designate a competent person* who shall *visually inspect* the gin pole and rigging *prior to each use, and during use*, to make sure it is in safe operating condition. Any deficiencies shall be repaired before use continues;
 - (C) During each *inspection, the qualified or competent person shall inspect* the legs and bracing members for bends or distortion;
 - (D) During each *inspection, the qualified or competent person shall inspect* the straightness tolerances for the overall assembly (including leg and bracing members);
 - (E) During each *inspection, the qualified or competent person shall visually inspect* the welds for quality, deformation, cracks, rust, or pitting or loss of cross sectional area;
 - (F) During each *inspection, the qualified or competent person shall inspect* the members for excessive rust or pitting or loss of cross sectional area;
 - (G) During each *inspection, the qualified or competent person shall inspect* the sling attachment points for distortion, wear, cracks, and rust;
 - (H) During each *inspection, the qualified or competent person shall ensure* that proper bolts are utilized and all associated hardware is in good condition;

- (I) During each *inspection*, the *qualified or competent person shall inspect* side plates on rooster heads for distortion or other damage;
- (J) During each *inspection*, the *qualified or competent person shall inspect* all attachment hardware, including rigging and parts such as cables, slings, and sling attachment points, shackles, hooks, and sockets for wear, distortion, cracks, and rust; and
- (K) During *each inspection*, the *qualified or competent person shall ensure* that all problems identified during the *inspection* are corrected before placing the gin pole into service.

13 NCAC 07F .0608 – Recordkeeping

Scope: This [standard](#) provides the requirements for recordkeeping.

Special Requirements: Records, tests, maintenance, calibration, analysis, material, program, references other standards

In order to fulfill responsibilities under the provisions of the *rules* in this Section, the employer shall, upon request, provide the *Deputy Commissioner of Labor* for Occupational Safety and Health or his designee access to the following *records*:

- (1) *Training Records*. All material related to the employer’s *training and education program*, pursuant to [13 NCAC 07F .0609 - training](#).
- (2) *Medical Records and Non-Ionizing Radiation Exposure Records*. All medical records [in accordance to [29 CFR 1910.1020\(d\)\(1\)\(i\)](#) - access to employee exposure and medical records] and material related to each *analysis using exposure or medical records* (in accordance with [29 CFR 1910.1020\(d\)\(1\)\(iii\)](#)).
- (3) *Equipment Inspections and Testing Records*. All material related to the modification, repair, *test, calibration or maintenance* service of all equipment.

13 NCAC 07F .0609 – Training

Scope: This [standard](#) provides the training requirements.

Special Requirements: Approved, qualified person, training, retraining, training records, competency, written work procedures, manufacturers' operating manuals, operating procedures, instructed, fall protection training, inspecting, PPE, fall protection systems, materials, pictures, symbols, supervision, training program, instruction, references other standards

(a) In order for employees to work at heights above six feet on a communication tower, they must be *approved* for such work by a *qualified person*.

(b) *Competency of the Trainer.* Training of employees in communication tower work shall be performed by or under the supervision of a qualified person.

(c) *Written Work Procedures.*

- (1) The employer's *written work procedures* shall be provided to employees as part of their *training*.
- (2) *Pictures and symbols* may be used as a means of *instruction* if employee understanding is improved using this method.
- (3) *Manufacturers' operating manuals* for personnel hoisting systems satisfy the requirement for *operating procedures* for the respective equipment, or can serve as the basis for these *procedures*.

(d) *Hazardous Materials Training.* 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 [29 CFR 1926.55](#) - *Gases, vapors, fumes, dusts, and mists*, and [29 CFR 1910.1200](#) - *hazard communication*, as applicable.

(e) *Fall Protection Training.*

- (1) The employer shall provide a *training program* for each employee who might be exposed to fall hazards.
- (2) 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.
- (3) The employer shall ensure that each employee has been *trained* by or under the *supervision of a qualified person* in the following areas: [Reference [paragraph \(e\)\(3\)\(A\) - \(H\)](#)].

(f) *Hoist Operator Training.* The employer shall maintain *documentation* that the hoist operator has practical *training* on the hoist he is operating. *Training* of hoist operators shall meet the requirements of [29 CFR 1910.179](#) - *overhead and gantry cranes*, and [29 CFR 1926, Subpart N](#) - *helicopters, hoists, elevators, and conveyors*.

(g) *RF Training.* [Reference [paragraph \(g\)\(1\) - \(2\)](#)].

(h) *Retraining.* Unless stated otherwise in this *Rule*, when the employer or *qualified person* has reason to believe that any employee who has already been *trained* does not have the understanding and skill required to safely perform the work assigned, the employer shall *retrain* each such employee. Circumstances where *retraining* is required include situations where: [Reference [paragraph \(h\)\(1\) - \(3\)](#)].

(i) *Training Records.* [Reference [paragraph \(i\)\(1\) - \(5\)](#)].

13 NCAC 07F .0701 through .0716 - [Blasting and Use of Explosives](#)

[13 NCAC 07F .0701 through .0716](#) - Blasting and Use of Explosives provides additional requirements to those in 1926, [subpart U - blasting and use of explosives](#) applicable to North Carolina.

To learn if 13 NCAC 07F .0701 through .0716 applies to you, go to [Does "Blasting and Use of Explosives" Apply to You?](#)

Special Requirements

13 NCAC 07F .0703 - General Provisions

Scope: This [standard](#) provides the general provisions for blasting.

Special Requirements: Blaster, in charge, certified, in writing, qualified, consulted, evaluate, inventory, alternative provisions, competent person, signs, flags, directions, record, methods, notification, authorized person, notified, posted, flagged, measures, precautions, manufacturer's recommendations, supervised, safety guide, recommendations, references other standards

Additions and amendments to [29 CFR 1926.900](#) - *General Provisions* apply throughout the Rules in this Section as follows: [Reference .0703, [paragraph \(a\) - \(v\)](#)].

- (a) The employer shall permit only persons *qualified* pursuant to [§1926.901](#) - *blaster qualifications*, to handle and use explosives. A *blaster* shall be in *charge* of each blasting operation; hereafter, referred to as the Blaster-in-Charge.
- (c) See [1926.901\(b\)](#).
- (d) All explosives shall be accounted for at all times. Explosives not being used and not attended shall be kept in a magazine or container that meets the *U.S. Bureau of Alcohol, Tobacco and Firearms (hereafter, ATF)* storage and access requirements contained in [27 CFR Part 55](#), which is incorporated herein by reference, including any subsequent amendments and editions. Each employer shall maintain an *inventory and use record* of all explosives in that employer's possession. The employer, or employer *authorized person*, shall comply with all applicable *local, State and federal laws and regulations* requiring *notification* of any loss, theft, or unauthorized entry into a magazine or container.
- (g) Original containers, *ATF Type 2, Type 3, Type 4 or Type 5* magazines or Institute of *Makers of Explosives (hereafter, IME) - 22 containers*, shall be used for taking detonators and other explosives from storage magazines to the blast site.
- (h) In proximity to people, a structure, railway, highway or any other installation, the *blaster* shall take additional *precautions* to control the throw of fragments and to

prevent bodily injury to employees and people not working directly on the blasting operation. Such additional *precautions* shall be taken in the loading, delaying, initiation and confinement of each blast and shall include confinement with mats or with mats and other *methods*.

- (i) All blast site employees shall follow the *directions of the Blaster-in-Charge*. All blast site employees shall use and adhere to every *precaution* to ensure employee safety including, but not limited to, visual and audible *warning signals, flags, or barricades*.
- (k) *Precautions* shall be taken to prevent accidental discharge of electric detonators from current induced by radar, radio transmitters including 2-way radios and mobile telephones, lightning, adjacent powerlines, dust storms, or other sources of extraneous electricity. These *precautions* shall include: [Reference .0703, [paragraph \(k\)\(1\) - \(5\)](#)].
 - (1) See Section [1926.906\(a\) and \(b\)](#) - *initiation of explosive charges - electric blasting*.
 - (3)(i) The prominent display of adequate *signs, warning* against the use of mobile radio transmitters, (e.g., telephones and 2-way radios) on all roads within 1,000 feet of electric blasting operations. If adherence to the 1,000-foot distance would create an operational handicap, then a *competent person* (as defined in 29 CFR 1926 [Subpart L - scaffolds](#) and [Subpart P - excavations](#)) shall be consulted to *evaluate* the particular situation, and *alternative provisions* may be made which are designed to prevent any premature firing of electric detonators. A *description* of any such *alternatives* shall be reduced to *writing* and shall be *certified* by the *competent person consulted* as meeting the purposes of this subdivision. The *description* shall be maintained at the construction during the duration of the work, and shall be available for *inspection* by representatives of the Commissioner of Labor. (ii) Examples of *signs* which would meet the requirements of paragraphs (i) and (k)(3) of this section are the following:
 - (5) The *Blaster-in-Charge* shall comply with the *recommendations of IME* with regard to blasting in the vicinity of radio transmitters as stipulated in [Safety Guide for the Prevention of Radio Frequency Radiation Hazards in the Use of Commercial Electric Detonators \(Blasting Caps\)](#), [IME Safety Library Publication No. 20, 2000](#), which is incorporated herein by reference, including any subsequent amendments and editions.
- (l) Empty boxes and associated paper and fiber packing materials, which have previously contained explosives, shall not be used for any purpose, other than that associated with the blasting operation. Such boxes, paper and packing materials shall be disposed of in a manner that prevents reuse and does not constitute a hazard. Disposal may include but shall not be limited to burning. The *method* used for disposal shall comply with all applicable *local, State or federal laws*.

- (n) Delivery and issue of explosives shall only be made by and to *authorized persons* (as defined in [27 CFR Part 55](#)) and into magazines or temporary storage or handling areas that meet the ATF storage requirements contained in [27 CFR Part 55](#).
- (o) Blasting operations in the proximity of overhead power lines, communication lines, utility services, or other services and structures shall not commence until the operators or owners have been *notified and measures* for safe control have been taken.
- (q) All loading and firing shall be directed and *supervised by the Blaster-in-Charge*.
- (r) All blasts shall be fired under the control of a *blaster*, with an initiation system in accordance with *manufacturer's recommendations*. All blasts shall be fired in accordance with the *manufacturer's recommendations*.
- (t) See [.900\(s\)](#). (1) See [.900\(s\)\(1\)](#). (2) See [.900\(s\)\(2\)](#). (3) See [.900\(s\)\(3\)](#). (4) See [.900\(s\)\(4\)](#). (5) See [.900\(s\)\(5\)](#). (6) See [.900\(s\)\(6\)](#).
- (u) To guard against unauthorized entry or initiation of a blast, a blast site shall be attended if loading is suspended or loaded holes are awaiting firing. Additionally, the blast site shall be barricaded, *posted, and flagged* as necessary to prevent unauthorized access.

13 NCAC 07F .0704 - Blaster Qualification

Scope: This [standard](#) provides the requirements for blaster qualifications.

Special Requirements: Oral orders, written orders, blasters, evidence, authorized, qualified, blasting methods, instruct, competency, physical condition, references other standards

Additions and amendments to [29 CFR 1926.901](#) - *Blaster Qualifications* apply throughout the Rules in this Section as follows:

- (a) *Blasters* shall be able to understand and *give written and oral orders*.
- (b) *Blasters and others authorized* to handle or transport explosive materials or conduct blast site activities shall be in sufficiently good *physical condition* to perform the work safely and not be addicted to, or under the influence of, narcotics, intoxicants, or similar types of drugs.
- (c) *Blasters* 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, federal and local laws and regulations* which pertain to explosives.
- (d) *Blasters* shall be required by the employer to furnish *evidence* satisfactory to the employer of *competency* in handling explosives and performing in a safe manner the type of blasting that will be required.
- (e) *Blasters* shall be knowledgeable in the use of each type of *blasting method* used.

- (f) Pursuant to [29 CFR 1926.21\(b\)](#) - *safety training and education*, the employer shall *instruct* each employee in the recognition and avoidance of unsafe conditions and the *regulations* applicable to the employee's work and work environment.

13 NCAC 07F .0705 - Surface Transportation of Explosives

Scope: This [standard](#) provides the requirements for surface transportation of explosives.

Special Requirements: DOT, licensed driver, publications, red flag, ABC rating, marked, approved, trained, laboratory, fire extinguisher, placarded, references other standards

Additions and amendments to [29 CFR 1926.902](#) - *Surface Transportation of Explosives* apply throughout the Rules in this Section as follows: [Reference .0705, [paragraph \(a\) - \(l\)](#)].

- (a) Surface transportation of explosives and blasting agents shall be in accordance with applicable *U.S. Department of Transportation (hereafter, DOT) regulations*. Where *DOT regulations* do not normally apply (e.g., off-road vehicles), compliance shall be in accordance with either the directly related *DOT regulation* or [1926.902\(b\) through 1926.902\(1\)](#), as applicable. Where *DOT regulations* do not exist, [1926.902\(b\) through 1926.902\(k\)](#) apply.
- (b) Motor vehicles or conveyances transporting explosives shall only be driven by, and be in the charge of, a *licensed driver*. The driver shall be familiar with the *local, State, and Federal regulations* governing the transportation of explosives.
- (d) Explosives, blasting agents, and blasting supplies shall not be transported with other materials or cargoes. Blasting caps and detonators shall not be transported in the same vehicle with other explosives unless the provisions of the [IME Safety Publication No. 22, "Recommendations for the Safe Transportation of Detonators in a Vehicle with other Explosive Materials,"](#) which is incorporated herein by reference including subsequent amendments and editions, are followed.
- (f) When explosives are transported by a vehicle with an open body, an *ATF Type 2, ATF Type 3, IME 22* or original manufacturer's container shall be securely attached to the vehicle to contain the cargo.
- (h) Every motor vehicle or conveyance used for transporting explosives shall be *marked or placarded* on both sides, the front, and the rear with the word "*Explosives*" in red letters, not less than 4 inches in height, on white background. The motor vehicle or conveyance may also display, in such a manner that it will be readily visible from all directions, a *red flag* 18 inches by 30 inches, with the word "*Explosives*" painted, stamped, or sewed thereon, in white letters, at least 6 inches in height. (i) Each vehicle used for transportation of explosives shall be equipped with a fully charged *fire extinguisher*, in good condition (as described in [29 CFR 1926.150](#) - *fire protection*). An extinguisher, *approved by a nationally recognized testing laboratory*, of not less than *10-ABC rating* will meet the minimum requirement. The driver shall be *trained* in the use of the extinguisher on the vehicle.

13 NCAC 07F .0706 - Underground Transportation of Explosives

Scope: This [standard](#) provides the requirements for underground transportation of explosives.

Special Requirements: Blaster-in-charge, signs, references other standards

Additions and amendments to [29 CFR 1926.903](#) - *Underground Transportation of Explosives* apply throughout the Rules in this Section as follows: [Reference .0706, [paragraph \(a\) - \(q\)](#)].

- (b) The quantity of explosives or blasting agents taken to an underground loading area shall not exceed the amount estimated by the *Blaster-in-Charge* to be necessary for the blast.
- (m) Any powder car or conveyance used for transporting explosives or blasting agents shall bear a *reflecting sign* on each side with the word "*Explosives*". The *sign's letters* shall be a minimum of 4 inches in height and shall be on a background of sharply contrasting color.
- (n) Compartments for transporting detonators and explosives in the same car or conveyance shall meet *IME-22 container specifications* or shall be physically separated by a distance of 24 inches or by a solid partition at least 6 inches thick.

13 NCAC 07F .0707 - Storage of Explosives and Blasting Agents

Scope: This [standard](#) provides the requirements for storage of explosives and blasting agents.

Special Requirements: References other standards

Additions and amendments to [29 CFR 1926.904](#) - *Storage of Explosives and Blasting Agents* apply throughout the Rules in this Section as follows: [Reference .0707, [paragraph \(a\) - \(f\)](#)].

- (a) Explosives and blasting agents shall be stored in magazines or containers that meet the applicable provisions of the regulations contained in [27 CFR Part 55](#), *Commerce in Explosives*.

13 NCAC 07F .0708 - Loading of Explosives or Blasting Agents

Scope: This [standard](#) provides the requirements for loading of explosives or blasting agents.

Special Requirements: Procedures, blaster-in-charge, inventory, records, posted, flagged, MSHA, fume class, blaster, locked out, checked, determine, references other standards

Additions and amendments to [29 CFR 1926.905](#) - *Loading of Explosives or Blasting Agents* apply throughout the Rules in this Section as follows: [Reference .0708, [paragraph \(a\) - \(w\)](#)].

- (a) *Procedures* that permit safe and efficient loading shall be established by the *Blaster-in-Charge* or the employer before loading is started.
- (d) No holes shall be loaded except those to be fired in the next round of blasting. After loading, remaining explosives and detonators shall be promptly moved to a safe location and attended or stored pursuant to ATF storage requirements contained in [27 CFR Part 55](#).
- (e) Drilling shall not be started until all visible butts of old holes are examined for unexploded charges, and if any are found, they shall be disposed of in accordance with [1926.911](#) - *misfires*, before work proceeds.
- (j) Power lines and portable electric cables for equipment being used shall be kept a safe distance from explosives or blasting agents. The *blaster* shall assure that cables in the proximity of loaded holes are deenergized and *locked out*. Additionally, when using electric detonators, the provisions of [1926.906\(b\)](#) - *Initiation of Explosive Charges*, apply.
- (k) Holes shall be *checked* prior to loading to *determine* depth and conditions. Only those holes *determined by the Blaster-in-Charge* to be satisfactory shall be loaded.
- (m) No explosive shall be loaded or used underground in the presence of combustible gases or combustible dusts, unless the work is performed in accordance with the *Mine Safety and Health Administration (MSHA) standards at 30 CFR 75 related to such environments, which are incorporated herein by reference, including subsequent amendments and editions, and unless the explosives have been approved as permissible explosives for use in gassy or dusty environments by *MSHA*.*
- (n) No explosives other than those in *IME Fume Class 1* shall be used. However, explosives complying with the requirements of *IME Fume Class 2 and IME Fume Class 3* may be used if adequate ventilation has been provided to prevent explosive or hazardous substance hazards to employees.
- (s) Areas in which loading is suspended or loaded holes are awaiting firing shall be attended, and barricaded, *posted, or flagged* as needed to guard against unauthorized entry or initiation.
- (t) The *blaster* shall keep an accurate, up-to-date *record* of explosives, blasting agents, and blasting supplies used in each blast and shall keep an accurate running *inventory* of all explosives and blasting agents in the *blaster's* custody.

13 NCAC 07F .0709 - Initiation of Explosive Charges-Electric Blasting

Scope: This [standard](#) provides the requirements for the initiation of explosive charges for electric blasting.

Special Requirements: Blaster, survey, blaster-in-charge, manufacturer's recommendations, firing system, qualified person, rated capacity, tests, references other standards

Additions and amendments to [29 CFR 1926.906](#) - *Initiation of Explosive Charges-Electric Blasting* apply throughout the Rules in this Section as follows: [Reference .0709, [paragraph \(a\) - \(s\)](#)].

- (c) In any single blast using electric detonators, all detonators shall be of the same style or function, and of the *same manufacture*.
- (d) Electric initiation shall be carried out by using blasting machines or power circuits in accordance with the *manufacturer's recommendations*.
- (e) When firing a circuit of electric detonators, an adequate quantity of delivered current must be available, in accordance with the *manufacturer's recommendations*.
- (n) When firing with blasting machines, the connections shall be made as *recommended by the manufacturer* of the electric detonators used.
- (o) The number of electric detonators connected to a blasting machine shall not be in excess of its *rated capacity*. A series circuit shall contain no more detonators than the limits *recommended by the manufacturer* of the electric detonators in use.
- (p) A *blaster* shall be *in charge* of the blasting machines.
- (q) A *blaster* shall test blasting circuits for: [Reference .0709, [paragraph \(q\)\(1\) - \(4\)](#)].
- (s) The *blaster* shall assure that all connections are made from the bore hole back to the source of firing current, and that the leading wires remain shorted, except during testing, and not connected to the blasting machine or other source of current until the blast is to be fired. Only the *blaster*, or a *qualified person* (as described in [1926.900\(a\)](#) - *general provisions*, and [1926.901](#) - *blaster qualifications*) under the direct control of the blaster, shall make lead wire connections or fire the shot.

13 NCAC 07F .0710 - Use of Safety Fuse

Scope: This [standard](#) provides the requirements for the use of a safety fuse.

Special Requirements: hand lighting methods, references other standards

Additions and amendments to [29 CFR 1926.907](#) - *Use of Safety Fuse* apply throughout the Rules in this Section as follows: [Reference .0710, [paragraph \(a\)\(- \(i\)\)](#)].

- (i) At least two people shall be present when multiple cap and fuse blasting is done by *hand lighting methods*.

13 NCAC 07F .0711 - Use of Detonating Cord and Shock Tube

Scope: This [standard](#) provides the requirements for the use of detonating cord and shock tube.

Special Requirements: Competent, manufacturer's recommendations, practice, inspected, references other standards

Additions and amendments to [29 CFR 1926.908 - Use of Detonating Cord and Shock Tube](#) apply throughout the Rules in this Section as follows: [Reference .0711, [paragraph \(a\) - 9k](#)].

- (e) Detonating cord connections, shock tube connections and splices shall be competent and positive in accordance with the *manufacturer's recommendations*. Knot-type or other cord-to-cord connections shall be made only with detonating cord in which the explosive core is dry. Down-the-hole shock tube splices are prohibited.
- (g) All detonating cord connections, shock tube connections and splices shall be *inspected* before firing the blast.
- (h) When detonating cord or shock tube millisecond-delay connectors or short-interval-delay electric detonators are used with detonating cord or shock tube, the *practice* shall conform strictly to the *manufacturer's recommendations*.

13 NCAC 07F .0712 - Firing the Blast

Scope: This [standard](#) provides the requirements for firing the blast.

Special Requirements: Blaster-in-charge, signals, code, guards, flagman, danger signs, posting, authorized employees, blaster, checked, familiarize, references other standards

Additions and amendments to [29 CFR 1926.909 - Firing the Blast](#) apply throughout the Rules in this Section as follows:

- (a) The *Blaster-in-Charge* shall establish a *code of blasting signals* and all blast site employees shall *familiarize* themselves with and conform to the *code*. As a minimum, the *code* shall:
 - (1) contain audible pre-blast and audible all clear *signals*, and
 - (2) contain an emergency method for *guards, flagmen, or other authorized employees* to signal "do not fire", and
 - (3) prohibit sounding of the all clear *signal* until the *blaster* has *checked* the blast site for misfires. [Table U-1](#) is an example of a *code of blasting signals* that would meet these requirements. Further, the *Blaster-in-Charge* shall require the placement of *Danger signs and posting of the blasting signals* when personnel not associated with the blasting operation are within the blast area.

- (b) Before a blast is fired, the *Blaster-in-Charge* shall make certain that all surplus explosives are in an area meeting the ATF explosive storage requirements contained in [27 CFR 55](#) and that all persons are at a safe distance, or under sufficient cover.
- (c) *Flagmen* shall be safely stationed on highways which pass through the blast area so as to stop traffic during blasting.
- (d) The *Blaster-in-Charge* shall fix the time of blasting.
- (e) Before firing an underground blast, *warning* shall be given, and all possible entries into the blast area, and any entrances to any working place where a drift, raise, or other opening is about to hole through, shall be carefully guarded to prevent entry into the area. The *Blaster-in-Charge* shall make sure that all surplus employees have been removed from the blast area and that all personnel are out of the blast area.

13 NCAC 07F .0713 - Inspection After Blasting

Scope: This [standard](#) provides the requirements for inspecting after blasting.

Special Requirements: Inspect, blaster, references other standards

Additions and amendments to [29 CFR 1926.910](#) - *Inspection After Blasting* apply throughout the Rules in this Section as follows:

- (b) Sufficient time shall be allowed, not less than 15 minutes in tunnels, for the smoke and fumes to dissipate before returning to the blast site. Subsequently, the *blaster* shall *inspect* the blast site and surrounding rubble for signs of misfires. If a misfire is found, employee access to the blast area shall be controlled pursuant to [1926.911](#) - *misfires*. Where fumes, fire, or dust are a potential hazard (e.g., in tunnels), the muck pile shall be wetted down prior to general employees returning to the blast site.

13 NCAC 07F .0714 – Misfires

Scope: This [standard](#) provides the requirements for misfires.

Special Requirements: Blaster-in-charge, assess, approves, determine, inspect, manufacturer's recommendations, guidelines, competent, references other standards

Additions and amendments to [29 CFR 1926.911](#) - *Misfires* apply throughout the Rules in this Section as follows:

- (a) If a misfire is found, the *Blaster-in-Charge* shall invoke sufficient safeguards to exclude all employees from the potential blast area.
- (b) No work shall be done except that necessary to remove the hazard of the misfire. Only those employees necessary to do the work shall enter the potential blast area.

Only the *Blaster-in-Charge*, and the absolute minimum number of *competent*, personnel (as defined in 29 CFR 1926 [subpart L](#) - scaffolds, and [subpart P](#) - excavations), necessary to assess the situation shall approach the hole to *inspect* the misfire.

- (c) The *Blaster-in-Charge* shall determine the safest steps for removing the hazard of the misfire. During development and implementation of these steps, the *Blaster-in-Charge* shall comply with the *manufacturer's recommendations*. Further, the [guidelines of the Safety in the Transportation, Storage, Handling and Use of Explosive Materials, IME Safety Library Publication No. 17](#), which is incorporated herein by reference, including any subsequent amendments and editions, shall be utilized.
- (d) If there are any misfires while using safety fuse and blasting cap, all employees shall remain out of the potential blast area for at least 30 minutes. If electric detonators, shock tube, gas tube or detonating cord systems or materials were used and a misfire occurred, the waiting period may be reduced to 15 minutes. In either case, the *Blaster-in-Charge* shall assess the circumstances and invoke a safe waiting period before allowing any personnel to enter the potential blast area. All lines shall be carefully traced and a search made for unexploded charges.
- (e) No drilling, digging, or picking shall be permitted until all misfires have been detonated or the *Blaster-in-Charge* approves the work.

13 NCAC 07F .0715 - Underwater Blasting

Scope: This [standard](#) provides the requirements for underwater blasting.

Special Requirements: Approval, blaster-in-charge, methods, warning signals, notified, blaster, determine, references other standards

Additions and amendments to [29 CFR 1926.912](#) - *Underwater Blasting* apply throughout the Rules in this Section as follows: [Reference .0715, [paragraph \(a\) - \(h\)](#)].

- (a) In underwater blasting, no shot shall be fired without the *approval of the Blaster-in-Charge*.
- (d) No blast shall be fired while any vessel under way is closer than 1,500 feet to the blast site. Those on board vessels or craft moored or anchored within 1,500 feet shall be *notified* before a blast is fired. Note: The *warning signals* and personnel safety provisions of [1926.909](#) - *firing the blast*, also apply.
- (h) Prior to firing the blast, the *blaster* shall *determine* the *method(s)* that will be used for detecting misfires and take preparatory steps (e.g., noting obvious indications of misfire, attaching float(s) that will be released by the firing, staging underwater cameras, or other appropriate means). Misfires shall be handled in accordance with the requirements of [1926.911](#) - *misfires*.

13 NCAC 07F .0716 - Blasting in Excavation Work Under Compressed Air

Scope: This [standard](#) provides the requirements for blasting in excavation work under compressed air.

Special Requirements: References other standards

Additions and amendments to [29 CFR 1926.913 - Blasting in Excavation Work Under Compressed Air](#) apply throughout the *Rules* in this Section as follows: [Reference .0716, [paragraph \(b\)](#)].

- (d) See [1926.900\(a\)](#) - *general provisions*, and [1926.901](#) - *blaster qualifications*.

Additional Assistance on North Carolina State-Specific Standards

If the employer still has questions regarding the OSHA standards or North Carolina state-specific standards, they can submit an inquiry about safety and health requirements to Ask OSH through the [online form](#) or by phone at 919-707-7876.

Resource information can be found on the [safety and health topics pages](#). In addition, the webpages for [Which OSHA Standards Apply](#) and [OSHA Standards With Special Requirements](#) can assist the employer with applicable OSHA standards and special requirements.

Example safety and health [programs](#) ([table](#) of standards requiring programs, plans and procedures in general industry; [table](#) of standards requiring inspections in general industry; [table](#) of standards requiring programs, plans and procedures in construction; [table](#) of standards requiring inspections in construction) and [presentations](#) ([table](#) of standards requiring training in general industry; [table](#) of standards requiring training in construction); [pre-recorded webinars](#); along with [publications](#) are available to assist the employer in meeting standards requirements. Specifically, the brochure on [top ten most frequently cited serious violations](#) can be useful in identifying frequently cited violations by industry. For more information regarding the required state and federal workplace posters, go to the [NCDOL State and Federal workplace posters](#) webpage.

The [NCDOL Library](#) also offers free safety and health videos and related research assistance on consensus standards (i.e., ANSI, NFPA, NEC). The education, training and technical assistance bureau provides [free online safety and health training](#) and [outreach services](#) (i.e., speaker's bureau requests, safety booths) upon request. In addition, the [consultative services bureau](#) provides free confidential on-site employer assistance.