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Title 29: Labor

PART 1915—OCCUPATIONAL SAFETY AND HEALTH STANDARDS FOR SHIPYARD EMPLOYMENT

Subpart P—Fire Protection in Shipyard Employment

SOURCE: 69 FR 55702, Sept. 15, 2004, unless otherwise noted.

§1915.501 General provisions.

(a) *Purpose.* The purpose of the standard in this subpart is to require employers to protect all employees from fire hazards in shipyard employment, including employees engaged in fire response activities.

(b) *Scope.* This subpart covers employers with employees engaged in shipyard employment aboard vessels and vessel sections, and on land-side operations regardless of geographic location.

(c) *Employee participation.* The employer must provide ways for employees or employee representatives, or both to participate in developing and periodically reviewing programs and policies adopted to comply with this subpart.

(d) *Multi-employer worksites—(1) Host employer responsibilities.* The host employer's responsibilities are to:

(i) Inform all employers at the worksite about the content of the fire safety plan including hazards, controls, fire safety and health rules, and emergency procedures;

(ii) Make sure the safety and health responsibilities for fire protection are assigned as appropriate to other employers at the worksite; and

(iii) If there is more than one host employer, each host employer must communicate relevant information about fire-related hazards to other host employers. When a vessel owner or operator (temporarily) becomes a host shipyard employer by directing the work of ships' crews on repair or modification of the vessel or by hiring other contractors directly, the vessel owner or operator must also comply with these provisions for host employers.

(2) *Contract employer responsibilities.* The contract employer's responsibilities are to:

(i) Make sure that the host employer knows about the fire-related hazards associated with the contract employer's work and what the contract employer is doing to address them; and

(ii) Advise the host employer of any previously unidentified fire-related hazards that the contract employer identifies at the worksite.

§1915.502 Fire safety plan.

(a) *Employer responsibilities.* The employer must develop and implement a written fire safety plan that covers all the actions that employers and employees must take to ensure employee safety in the event of a fire. (See Appendix A to this subpart for a Model Fire Safety Plan.)

(b) *Plan elements.* The employer must include the following information in the fire safety plan:

- (1) Identification of the significant fire hazards;
- (2) Procedures for recognizing and reporting unsafe conditions;
- (3) Alarm procedures;
- (4) Procedures for notifying employees of a fire emergency;
- (5) Procedures for notifying fire response organizations of a fire emergency;
- (6) Procedures for evacuation;
- (7) Procedures to account for all employees after an evacuation; and
- (8) Names, job titles, or departments for individuals who can be contacted for further information about the plan.

(c) *Reviewing the plan with employees.* The employer must review the plan with each employee at the following times:

- (1) Within 90 days of December 14, 2004, for employees who are currently working;
- (2) Upon initial assignment for new employees; and
- (3) When the actions the employee must take under the plan change because of a change in duties or a change in the plan.

(d) *Additional employer requirements.* The employer also must:

- (1) Keep the plan accessible to employees, employee representatives, and OSHA;
- (2) Review and update the plan whenever necessary, but at least annually;

(3) Document that affected employees have been informed about the plan as required by paragraph (c) of this section; and

(4) Ensure any outside fire response organization that the employer expects to respond to fires at the employer's worksite has been given a copy of the current plan.

(e) *Contract employers.* Contract employers in shipyard employment must have a fire safety plan for their employees, and this plan must comply with the host employer's fire safety plan.

§1915.503 Precautions for hot work.

(a) *General requirements—(1) Designated Areas.* The employer may designate areas for hot work in sites such as vessels, vessel sections, fabricating shops, and subassembly areas that are free of fire hazards.

(2) *Non-designated Areas.* (i) Before authorizing hot work in a non-designated area, the employer must visually inspect the area where hot work is to be performed, including adjacent spaces, to ensure the area is free of fire hazards, unless a Marine Chemist's certificate or Shipyard Competent Person's log is used for authorization.

(ii) The employer shall authorize employees to perform hot work only in areas that are free of fire hazards, or that have been controlled by physical isolation, fire watches, or other positive means.

NOTE TO PARAGRAPH (a)(2): The requirements of paragraph (a)(2) apply to all hot work operations in shipyard employment except those covered by §1915.14.

(b) *Specific requirements—(1) Maintaining fire hazard-free conditions.* The employer must keep all hot work areas free of new hazards that may cause or contribute to the spread of fire. Unexpected energizing and energy release are covered by 29 CFR 1915.181, Subpart L. Exposure to toxic and hazardous substances is covered in 29 CFR 1915.1000 through 1915.1450, subpart Z.

(2) *Fuel gas and oxygen supply lines and torches.* The employer must make sure that:

(i) No unattended fuel gas and oxygen hose lines or torches are in confined spaces;

(ii) No unattended charged fuel gas and oxygen hose lines or torches are in enclosed spaces for more than 15 minutes; and

(iii) All fuel gas and oxygen hose lines are disconnected at the supply manifold at the end of each shift;

(iv) All disconnected fuel gas and oxygen hose lines are rolled back to the supply manifold or to open air to disconnect the torch; or extended fuel gas and oxygen hose lines are not reconnected at the supply manifold unless the lines are given a positive means of identification when they were first connected and the lines are tested using a drop test or other positive means to ensure the integrity of fuel gas and oxygen burning system.

§1915.504 Fire watches.

(a) *Written fire watch policy.* The employer must create and keep current a written policy that specifies the following requirements for employees performing fire watch in the workplace:

(1) The training employees must be given (§1915.508(c) contains detailed fire watch training requirements);

(2) The duties employees are to perform;

(3) The equipment employees must be given; and

(4) The personal protective equipment (PPE) that must be made available and worn as required by 29 CFR Part 1915, Subpart I.

(b) *Posting fire watches.* The employer must post a fire watch if during hot work any of the following conditions are present:

(1) Slag, weld splatter, or sparks might pass through an opening and cause a fire;

(2) Fire-resistant guards or curtains are not used to prevent ignition of combustible materials on or near decks, bulkheads, partitions, or overheads;

(3) Combustible material closer than 35 ft. (10.7m) to the hot work in either the horizontal or vertical direction cannot be removed, protected with flame-proof covers, or otherwise shielded with metal or fire-resistant guards or curtains;

(4) The hot work is carried out on or near insulation, combustible coatings, or sandwich-type construction that cannot be shielded, cut back, or removed, or in a space within a sandwich type construction that cannot be inerted;

(5) Combustible materials adjacent to the opposite sides of bulkheads, decks, overheads, metal partitions, or sandwich-type construction may be ignited by conduction or radiation;

(6) The hot work is close enough to cause ignition through heat radiation or conduction on the following:

(i) Insulated pipes, bulkheads, decks, partitions, or overheads; or

(ii) Combustible materials and/or coatings;

(7) The work is close enough to unprotected combustible pipe or cable runs to cause ignition; or

(8) A Marine Chemist, a Coast Guard-authorized person, or a shipyard Competent Person, as defined in 29 CFR Part 1915, Subpart B, requires that a fire watch be posted.

(c) *Assigning employees to fire watch duty.* (1) The employer must not assign other duties to a fire watch while the hot work is in progress.

(2) Employers must ensure that employees assigned to fire watch duty:

(i) Have a clear view of and immediate access to all areas included in the fire watch;

(ii) Are able to communicate with workers exposed to hot work;

(iii) Are authorized to stop work if necessary and restore safe conditions within the hot work area;

(iv) Remain in the hot work area for at least 30 minutes after completion of the hot work, unless the employer or its representative surveys the exposed area and makes a determination that there is no further fire hazard;

(v) Are trained to detect fires that occur in areas exposed to the hot work;

(vi) Attempt to extinguish any incipient stage fires in the hot work area that are within the capability of available equipment and within the fire watch's training qualifications, as defined in §1915.508;

(vii) Alert employees of any fire beyond the incipient stage; and

(viii) If unable to extinguish fire in the areas exposed to the hot work, activate the alarm.

(3) The employer must ensure that employees assigned to fire watch are physically capable of performing these duties.

§1915.505 Fire response.

(a) *Employer responsibilities.* The employer must:

(1) Decide what type of response will be provided and who will provide it; and

(2) Create, maintain, and update a written policy that:

(i) Describes the internal and outside fire response organizations that the employer will use; and

(ii) Defines what evacuation procedures employees must follow, if the employer chooses to require a total or partial evacuation of the worksite at the time of a fire.

(b) *Required written policy information—(1) Internal fire response.* If an internal fire response is to be used, the employer must include the following information in the employer's written policy:

(i) The basic structure of the fire response organization;

(ii) The number of trained fire response employees;

(iii) The fire response functions that may need to be carried out;

(iv) The minimum number of fire response employees necessary, the number and types of apparatuses, and a description of the fire suppression operations established by written standard operating procedures for each type of fire response at the employer's facility;

(v) The type, amount, and frequency of training that must be given to fire response employees; and

(vi) The procedures for using protective clothing and equipment.

(2) *Outside fire response.* If an outside fire response organization is used, the employer must include the following information in the written policy:

(i) The types of fire suppression incidents to which the fire response organization is expected to respond at the employer's facility or worksite;

(ii) The liaisons between the employer and the outside fire response organizations; and

(iii) A plan for fire response functions that:

(A) Addresses procedures for obtaining assistance from the outside fire response organization;

(B) Familiarizes the outside fire response organization with the layout of the employer's facility or worksite, including access routes to controlled areas, and site-specific operations, occupancies, vessels or vessel sections, and hazards; and,

(C) Sets forth how hose and coupling connection threads are to be made compatible and includes where the adapter couplings are kept; or

(D) States that the employer will not allow the use of incompatible hose connections.

(3) *A combination of internal and outside fire response.* If a combination of internal and outside fire response is to be used, the employer must include the following information, in addition to the requirements in paragraphs (b)(1) and (2) of this section, in the written policy:

(i) The basic organizational structure of the combined fire response;

(ii) The number of combined trained fire responders;

(iii) The fire response functions that may need to be carried out;

(iv) The minimum number of fire response employees necessary, the number and types of apparatuses, and a description of the fire suppression operations established by written standard operating procedures for each particular type of fire response at the worksite; and

(v) The type, amount, and frequency of joint training with outside fire response organizations if given to fire response employees.

(4) *Employee evacuation.* The employer must include the following information in the employer's written policy:

(i) Emergency escape procedures;

(ii) Procedures to be followed by employees who may remain longer at the worksite to perform critical shipyard employment operations during the evacuation;

(iii) Procedures to account for all employees after emergency evacuation is completed;

(iv) The preferred means of reporting fires and other emergencies; and

(v) Names or job titles of the employees or departments to be contacted for further information or explanation of duties.

(5) *Rescue and emergency response.* The employer must include the following information in the employer's written policy:

(i) A description of the emergency rescue procedures; and

(ii) Names or job titles of the employees who are assigned to perform them.

(c) *Medical requirements for shipyard fire response employees.* The employer must ensure that:

(1) All fire response employees receive medical examinations to assure that they are physically and medically fit for the duties they are expected to perform;

(2) Fire response employees, who are required to wear respirators in performing their duties, meet the medical requirements of §1915.154;

(3) Each fire response employee has an annual medical examination; and

(4) The medical records of fire response employees are kept in accordance with §1915.1020.

(d) *Organization of internal fire response functions.* The employer must:

(1) Organize fire response functions to ensure enough resources to conduct emergency operations safely;

(2) Establish lines of authority and assign responsibilities to ensure that the components of the internal fire response are accomplished;

(3) Set up an incident management system to coordinate and direct fire response functions, including:

(i) Specific fire emergency responsibilities;

(ii) Accountability for all fire response employees participating in an emergency operation; and

(iii) Resources offered by outside organizations; and

(4) Provide the information required in this paragraph (d) to the outside fire response organization to be used.

(e) *Personal protective clothing and equipment for fire response employees—(1) General requirements.* The employer must:

(i) Supply to all fire response employees, at no cost, the appropriate personal protective clothing and equipment they may need to perform expected duties; and

(ii) Ensure that fire response employees wear the appropriate personal protective clothing and use the equipment, when necessary, to protect them from hazardous exposures.

(2) *Thermal stability and flame resistance.* The employer must:

(i) Ensure that each fire response employee exposed to the hazards of flame does not wear clothing that could increase the extent of injury that could be sustained; and

(ii) Prohibit wearing clothing made from acetate, nylon, or polyester, either alone or in blends, unless it can be shown that:

(A) The fabric will withstand the flammability hazard that may be encountered; or

(B) The clothing will be worn in such a way to eliminate the flammability hazard that may be encountered.

(3) *Respiratory protection.* The employer must:

(i) Provide self-contained breathing apparatus (SCBA) to all fire response employees involved in an emergency operation in an atmosphere that is immediately dangerous to life or health (IDLH), potentially IDLH, or unknown;

(ii) Provide SCBA to fire response employees performing emergency operations during hazardous chemical emergencies that will expose them to known hazardous chemicals in vapor form or to unknown chemicals;

(iii) Provide fire response employees who perform or support emergency operations that will expose them to hazardous chemicals in liquid form either:

(A) SCBA, or

(B) Respiratory protective devices certified by the National Institute for Occupational Safety and Health (NIOSH) under 42 CFR Part 84 as suitable for the specific chemical environment;

(iv) Ensure that additional outside air supplies used in conjunction with SCBA result in positive pressure systems that are certified by NIOSH under 42 CFR Part 84;

(v) Provide only SCBA that meet the requirements of NFPA 1981-2002 Standard on Open-Circuit Self-Contained Breathing Apparatus for Fire and Emergency Services (incorporated by reference, see §1915.5); and

(vi) Ensure that the respiratory protection program and all respiratory protection equipment comply with §1915.154.

(4) *Interior structural firefighting operations.* The employer must:

(i) Supply at no cost to all fire response employees exposed to the hazards of shipyard fire response, a helmet, gloves, footwear, and protective hoods, and either a protective coat and trousers or a protective coverall; and

(ii) Ensure that this equipment meets the applicable recommendations in NFPA 1971-2000 Standard on Protective Ensemble for Structural Fire Fighting (incorporated by reference, see §1915.5).

(5) *Proximity firefighting operations.* The employer must provide, at no cost, to all fire response employees who are exposed to the hazards of proximity firefighting, appropriate protective proximity clothing meets the applicable recommendations in NFPA 1976-2000 Standard on Protective Ensemble for Proximity Fire Fighting (incorporated by reference, see §1915.5).

(6) *Personal Alert Safety System (PASS) devices.* The employer must:

(i) Provide each fire response employee involved in firefighting operations with a PASS device; and

(ii) Ensure that each PASS device meets the recommendations in NFPA 1982-1998 Standard on Personal Alert Safety Systems (PASS), (incorporated by reference, see §1915.5).

(7) *Life safety ropes, body harnesses, and hardware.* The employer must ensure that:

(i) All life safety ropes, body harnesses, and hardware used by fire response employees for emergency operations meet the applicable recommendations in NFPA

1983-2001, Standard on Fire Service Life Safety Rope and System Components (incorporated by reference, see §1915.5);

(ii) Fire response employees use only Class I body harnesses to attach to ladders and aerial devices; and

(iii) Fire response employees use only Class II and Class III body harnesses for fall arrest and rappelling operations.

(f) *Equipment maintenance*—(1) *Personal protective equipment*. The employer must inspect and maintain personal protective equipment used to protect fire response employees to ensure that it provides the intended protection.

(2) *Fire response equipment*. The employer must:

(i) Keep fire response equipment in a state of readiness;

(ii) Standardize all fire hose coupling and connection threads throughout the facility and on vessels and vessel sections by providing the same type of hose coupling and connection threads for hoses of the same or similar diameter; and

(iii) Ensure that either all fire hoses and coupling connection threads are the same within a facility or vessel or vessel section as those used by the outside fire response organization, or supply suitable adapter couplings if such an organization is expected to use the fire response equipment within a facility or vessel or vessel section.

[69 FR 55702, Sept. 15, 2004, as amended at 71 FR 60847, Oct. 17, 2006]

§1915.506 Hazards of fixed extinguishing systems on board vessels and vessel sections.

(a) *Employer responsibilities*. The employer must comply with the provisions of this section whenever employees are exposed to fixed extinguishing systems that could create a dangerous atmosphere when activated in vessels and vessel sections, regardless of geographic location.

(b) *Requirements for automatic and manual systems*. Before any work is done in a space equipped with fixed extinguishing systems, the employer must either:

(1) Physically isolate the systems or use other positive means to prevent the systems' discharge; or

(2) Ensure employees are trained to recognize:

(i) Systems' discharge and evacuation alarms and the appropriate escape routes; and

(ii) Hazards associated with the extinguishing systems and agents including the dangers of disturbing system components and equipment such as piping, cables, linkages, detection devices, activation devices, and alarm devices.

(c) *Sea and dock trials.* During trials, the employer must ensure that all systems shall remain operational.

(d) *Doors and hatches.* The employer must:

(1) Take protective measures to ensure that all doors, hatches, scuttles, and other exit openings remain working and accessible for escape in the event the systems are activated; and

(2) Ensure that all inward opening doors, hatches, scuttles, and other potential barriers to safe exit are removed, locked open, braced, or otherwise secured so that they remain open and accessible for escape if systems' activation could result in a positive pressure in the protected spaces sufficient to impede escape.

(e) *Testing the system.* (1) When testing a fixed extinguishing system involves a total discharge of extinguishing medium into a space, the employer must evacuate all employees from the space and assure that no employees remain in the space during the discharge. The employer must retest the atmosphere in accordance with §1915.12 to ensure that the oxygen levels are safe for employees to enter.

(2) When testing a fixed extinguishing system does not involve a total discharge of the systems extinguishing medium, the employer must make sure that the system's extinguishing medium is physically isolated and that all employees not directly involved in the testing are evacuated from the protected space.

(f) *Conducting system maintenance.* Before conducting maintenance on a fixed extinguishing system, the employer must ensure that the system is physically isolated.

(g) *Using fixed manual extinguishing systems for fire protection.* If fixed manual extinguishing systems are used to provide fire protection for spaces in which the employees are working, the employer must ensure that:

(1) Only authorized employees are allowed to activate the system;

(2) Authorized employees are trained to operate and activate the systems; and

(3) All employees are evacuated from the protected spaces, and accounted for, before the fixed manual extinguishing system is activated.

§1915.507 Land-side fire protection systems.

(a) *Employer responsibilities.* The employer must ensure all fixed and portable fire protection systems needed to meet an OSHA standard for employee safety or employee protection from fire hazards in land-side facilities, including, but not limited to, buildings, structures, and equipment, meet the requirements of this section.

(b) *Portable fire extinguishers and hose systems.* (1) The employer must select, install, inspect, maintain, and test all portable fire extinguishers according to NFPA 10-2002 Standard for Portable Fire Extinguishers (incorporated by reference, see §1915.5).

(2) The employer is permitted to use Class II or Class III hose systems, in accordance with NFPA 10-2002 (incorporated by reference, see §1915.5), as portable fire extinguishers if the employer selects, installs, inspects, maintains, and tests those systems according to the specific recommendations in NFPA 14-2003 Standard for the Installation of Standpipe and Hose Systems (incorporated by reference, see §1915.5).

(c) *General requirements for fixed extinguishing systems.* The employer must:

(1) Ensure that any fixed extinguishing system component or extinguishing agent is approved by an OSHA Nationally Recognized Testing Laboratory, meeting the requirements of 29 CFR 1910.7, for use on the specific hazards the employer expects it to control or extinguish;

(2) Notify employees and take the necessary precautions to ensure employees are safe from fire if for any reason a fire extinguishing system stops working, until the system is working again;

(3) Ensure all repairs to fire extinguishing systems and equipment are done by a qualified technician or mechanic;

(4) Provide and ensure employees use proper personal protective equipment when entering discharge areas in which the atmosphere remains hazardous to employee safety or health, or provide safeguards to prevent employees from entering those areas. See §1915.12 for additional requirements applicable to safe entry into spaces containing dangerous atmospheres;

(5) Post hazard warning or caution signs at both the entrance to and inside of areas protected by fixed extinguishing systems that use extinguishing agents in concentrations known to be hazardous to employee safety or health; and

(6) Select, install, inspect, maintain, and test all automatic fire detection systems and emergency alarms according to NFPA 72-2002 National Fire Alarm Code (incorporated by reference, see §1915.5)

(d) *Fixed extinguishing systems.* The employer must select, install, maintain, inspect, and test all fixed systems required by OSHA as follows:

(1) Standpipe and hose systems according to NFPA 14-2003 Standard for the Installation of Standpipe and Hose Systems (incorporated by reference, see §1915.5);

(2) Automatic sprinkler systems according to NFPA 25-2002 Standard for the Inspection, Testing, and Maintenance of Water-based Fire Protection Systems, (incorporated by reference, see §1915.5), and either (i) NFPA 13-2002 Standard for the Installation of Sprinkler Systems (incorporated by reference, see §1915.5), or (ii) NFPA 750-2003 Standard on Water Mist Fire Protection Systems (incorporated by reference, see §1915.5);

(3) Fixed extinguishing systems that use water or foam as the extinguishing agent according to NFPA 15-2001 Standard for Water Spray Fixed Systems for Fire Protection (incorporated by reference, see §1915.5) and NFPA 11-2005 Standard for Low-, Medium-, and High-Expansion Foam (incorporated by reference, see §1915.5);

(4) Fixed extinguishing systems using dry chemical as the extinguishing agent according to NFPA 17-2002 Standard for Dry Chemical Extinguishing Systems (incorporated by reference, see §1915.5); and

(5) Fixed extinguishing systems using gas as the extinguishing agent according to NFPA 12-2005 Standard on Carbon Dioxide Extinguishing Systems (incorporated by reference, see §1915.5); NFPA 12A-2004 Standard on Halon 1301 Fire Extinguishing Systems (incorporated by reference, see §1915.5); and NFPA 2001-2004 Standard on Clean Agent Fire Extinguishing Systems (incorporated by reference, see §1915.5).

[69 FR 55702, Sept. 15, 2004, as amended at 71 FR 60847, Oct. 17, 2006]

§1915.508 Training.

(a) The employer must train employees in the applicable requirements of this section:

- (1) Within 90 days of December 14, 2004, for employees currently working;
- (2) Upon initial assignment for new employees; and
- (3) When necessary to maintain proficiency for employees previously trained.

(b) *Employee training.* The employer must ensure that all employees are trained on:

(1) The emergency alarm signals, including system discharge alarms and employee evacuation alarms; and

(2) The primary and secondary evacuation routes that employees must use in the event of a fire in the workplace. While all vessels and vessel sections must have a primary evacuation route, a secondary evacuation route is not required when impracticable.

(c) *Additional training requirements for employees expected to fight incipient stage fires.* The employer must ensure that employees expected to fight incipient stage fires are trained on the following:

(1) The general principles of using fire extinguishers or hose lines, the hazards involved with incipient firefighting, and the procedures used to reduce these hazards;

(2) The hazards associated with fixed and portable fire protection systems that employees may use or to which they may be exposed during discharge of those systems; and

(3) The activation and operation of fixed and portable fire protection systems that the employer expects employees to use in the workplace.

(d) *Additional training requirements for shipyard employees designated for fire response.* The employer must:

(1) Have a written training policy stating that fire response employees must be trained and capable of carrying out their duties and responsibilities at all times;

(2) Keep written standard operating procedures that address anticipated emergency operations and update these procedures as necessary;

(3) Review fire response employee training programs and hands-on sessions before they are used in fire response training to make sure that fire response employees are protected from hazards associated with fire response training;

(4) Provide training for fire response employees that ensures they are capable of carrying out their duties and responsibilities under the employer's standard operating procedures;

(5) Train new fire response employees before they engage in emergency operations;

(6) At least quarterly, provide training on the written operating procedures to fire response employees who are expected to fight fires;

(7) Use qualified instructors to conduct the training;

(8) Conduct any training that involves live fire response exercises in accordance with NFPA 1403-2002 Standard on Live Fire Training Evolutions (incorporated by reference, see §1915.5);

(9) Conduct semi-annual drills according to the employer's written procedures for fire response employees that cover site-specific operations, occupancies, buildings, vessels and vessel sections, and fire-related hazards; and

(10) Prohibit the use of smoke generating devices that create a dangerous atmosphere in training exercises.

(e) *Additional training requirements for fire watch duty.* (1) The employer must ensure that each fire watch is trained by an instructor with adequate fire watch knowledge and experience to cover the items as follows:

(i) Before being assigned to fire watch duty;

(ii) Whenever there is a change in operations that presents a new or different hazard;

(iii) Whenever the employer has reason to believe that the fire watch's knowledge, skills, or understanding of the training previously provided is inadequate; and

(iv) Annually.

(2) The employer must ensure that each employee who stands fire watch duty is trained in:

(i) The basics of fire behavior, the different classes of fire and of extinguishing agents, the stages of fire, and methods for extinguishing fires;

(ii) Extinguishing live fire scenarios whenever allowed by local and federal law;

(iii) The recognition of the adverse health effects that may be caused by exposure to fire;

(iv) The physical characteristics of the hot work area;

(v) The hazards associated with fire watch duties;

(vi) The personal protective equipment (PPE) needed to perform fire watch duties safely;

(vii) The use of PPE;

(viii) The selection and use of any fire extinguishers and fire hoses likely to be used by a fire watch in the work area;

(ix) The location and use of barriers;

(x) The means of communication designated by the employer for fire watches;

(xi) When and how to start fire alarm procedures; and

(xii) The employer's evacuation plan.

(3) The employer must ensure that each fire watch is trained to alert others to exit the space whenever:

(i) The fire watch perceives an unsafe condition;

(ii) The fire watch perceives that a worker performing hot work is in danger;

(iii) The employer or a representative of the employer orders an evacuation; or

(iv) An evacuation signal, such as an alarm, is activated.

(f) *Records.* The employer must keep records that demonstrate that employees have been trained as required by paragraphs (a) through (e) of this section.

(1) The employer must ensure that the records include the employee's name; the trainer's name; the type of training; and the date(s) on which the training took place.

(2) The employer must keep each training record for one year from the time it was made or until it is replaced with a new training record, whichever is shorter, and make it available for inspection and copying by OSHA on request.