

**North Carolina Department of Labor  
Occupational Safety and Health Division**

**Raleigh, NC**

Chapter 7  
Subchapter 7F

CFR Revision 121C

Field Information System  
**Fire Protection in Shipyard Employment**  
**29 CFR 1915.501-.509**

Final Rule

A. **Discussion.**

On September 15, 2004, federal OSHA issued a final rule for fire protection in shipyard employment. This final rule provides increased protection for shipyard employment workers from the hazards of fire on vessels and vessel sections and at land-side facilities. The standard reflects new technologies and current consensus standards. It also gathers all fire-related safety practices for shipyard employment into a single subpart.

B. **Action.**

The N.C. Commissioner of Labor adopted this verbatim with an effective date of March 14, 2005. Refer to the September 15, 2004, *Federal Register* (Vol. 69, No. 178) for the details related to these requirements. The shipyard standards only apply to the public sector employees in North Carolina. (See 13 NCAC 7F.0501).

Signed on Original  
Allen McNeely  
Director

4/06/05  
Date of Signature

N.C. Effective Date: March 14, 2004  
NCAC Number: 13 NCAC 7F.0501



# Federal Register

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**Wednesday,  
September 15, 2004**

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## **Part II**

## **Department of Labor**

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**Occupational Safety and Health  
Administration**

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**29 CFR Part 1915  
Fire Protection in Shipyard Employment;  
Final Rule**

**DEPARTMENT OF LABOR****Occupational Safety and Health Administration****29 CFR Part 1915****[Docket No. S-051]****[RIN No. 1218-AB51]****Fire Protection in Shipyard Employment**

**AGENCY:** Occupational Safety and Health Administration (OSHA), U.S. Department of Labor.

**ACTION:** Final rule.

**SUMMARY:** By this rule, OSHA promulgates a fire protection standard for shipyard employment. The proposed rule was developed through a negotiated rulemaking process. The final standard provides increased protection for shipyard employment workers from the hazards of fire on vessels and vessel sections and at land-side facilities. The standard reflects new technologies and current national consensus standards. It also gathers all fire-related safety practices for shipyard employment into a single subpart, which will make them more accessible and understandable for employers and employees.

**DATES:** The final rule becomes effective December 14, 2004. The incorporation by reference of certain publications listed in this rule is approved by the Director of the Federal Register as of December 14, 2004. However, affected parties are not required to respond to the information collection (paperwork) requirements until OMB approves those requirements and OSHA announces that approval in the **Federal Register**.

**ADDRESSES:** In accordance with 28 U.S.C. 2112(a), the Agency designates the Associate Solicitor of Labor for Occupational Safety and Health, Office of the Solicitor of Labor, Room S4004, U.S. Department of Labor, 200 Constitution Avenue, NW., Washington, DC 20210, to receive petitions for review of the final rule.

**FOR FURTHER INFORMATION CONTACT:** For general information and press inquiries, contact the OSHA Office of Communications, Room N-3647, Occupational Safety and Health Administration, U.S. Department of Labor, 200 Constitution Avenue, NW., Washington, DC 20210; telephone: (202) 693-1999. For technical information, contact Jim Maddux, Director, Office of Maritime Standards, N-3609, Occupational Safety and Health Administration, U.S. Department of Labor, 200 Constitution Avenue, NW., Washington, DC 20210; telephone: (202)

693-2222. For additional copies of this **Federal Register** document, contact: Office of Publications, Room N-3103, Occupational Safety and Health Administration, U.S. Department of Labor, 200 Constitution Avenue, NW., Washington, DC 20210; telephone: (202) 693-1888. For electronic copies of this **Federal Register** document, as well as news releases, fact sheets, and other relevant documents, visit OSHA's homepage at <http://www.osha.gov>.

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**I. Background***Fire Hazards in Shipyard Employment*

The purpose of this standard is to increase the protection of shipyard employment workers from fire hazards. Such workers are subject to a high risk of injury and death from fires and explosions during ship repair, shipbuilding, shipbreaking, and related work activities as well as firefighting activities. Many of the basic tasks involved in shipyard employment, such as welding, grinding, and cutting metal with torches, provide an ignition source for fires. There are also many combustible materials on vessels and in shipyards, including flammable fuels, cargo, wood structures, building materials, and litter. When cutting torches are used in enclosed or confined spaces, accidentally oxygen-enriched atmospheres can cause normally fire-resistant materials to readily burn. When fires do occur, employees are often working in confined or enclosed spaces that may make escape difficult or impossible. Fires in such confined or enclosed spaces can also result in atmospheres of combustible gases, toxic fumes, or oxygen-depleted air.

Shipyard employees are therefore at risk from fires, explosions, toxic gases, and fumes that can result in burns, death, and asphyxiation from a lack of oxygen. Based on data collected by the Bureau of Labor Statistics, for a workforce totaling 97,822, there is an annual average of one fatality, 110 lost-workday "heat/burn" injuries, and more

than three times that many total injuries due to shipyard fires (Ex. 15).

Employees are also at special risk when fighting fires in shipyards. Fighting fires at land-side facilities in shipyards can be similar to traditional firefighting at typical industrial manufacturing facilities. The usual firefighting hazards encountered include compressed gas cylinders, flammable liquid processes and storage, high-voltage electric switches and transformers, and high-density combustible materials storage. Structures at shipyards can range from single-story office buildings to warehouses to massive fabrication shops. Fires can also be encountered in tunnel sections, rail cars, vessel components, and similar units under construction, repair, or demolition at the shipyard site.

However, firefighting on board vessels is considerably different from structural firefighting. When traditional structural firefighting techniques are used on a vessel fire, the result can be ineffective and even catastrophic. The potential is much greater for serious injury to firefighting personnel when tactics do not reflect the unique nature of firefighting on vessels. Typically, in structural firefighting, immediate steps are taken to open up the structure, vertically and horizontally, to remove smoke and heat. Hose lines are then used to attack the fire. When fighting a vessel fire, there may be little or no ability to ventilate the heat, smoke, and gases produced by a fire. One of the first steps that may be taken is to shut down ventilation systems to close off the fire's progression and starve it of oxygen. Hose lines are used to cool down surrounding metal decks and bulkheads. For large or intense structural fires, a defensive fire-fighting option is to "surround and drown." This means that hose lines are positioned outside the structure and voluminous amounts of water are applied until the fire goes out. Strategic options for vessel fires, on the other hand, are very limited and nearly always require an aggressive interior attack.

While larger shipyards may have their own fire responders, smaller shipyards use outside fire responders, typically the local fire department. These municipal or other fire departments may have little experience in fighting fires in shipyards, especially on vessels. Proper coordination, familiarization, and training are necessary to ensure the safety of outside firefighters who respond to shipyard fires.

Fighting vessel fires may also be more complicated than traditional firefighting because outside firefighters seldom have

the opportunity to learn the layout of the vessel. Vessels under construction or modification may have constantly changing structures. Firefighters operating on vessels under adverse conditions caused by heat and smoke can easily become disoriented or confused. Access to the vessel may be restricted by its location, such as within a dry dock, causing firefighters boarding the ship to converge on one or two access locations. This can lead to congestion of personnel and delay in locating and extinguishing the fire. Equipment, tools, and vessel components and structures can also restrict access. Staging platforms, scaffolding, rigging, cranes, and even mooring lines can hamper deploying hose lines and positioning firefighting apparatus, again causing delays and confusion. Even with unrestricted access to the vessel, deploying hose lines can be time consuming and labor intensive. To attack a fire deep within a ship, firefighting hoses may have to be stretched hundreds of feet, a task that requires time and many trained personnel.

Maintaining an adequate supply of air is another tactical problem for firefighting operations on ships. Firefighters are usually equipped with self-contained breathing apparatus (SCBA) that optimally provide a 30-minute supply, after which the compressed air bottle has to be refilled or replaced. Vessel firefighting operations can last many hours so firefighters have to be rotated frequently to resupply their SCBA and counteract fatigue.

Vessel fires may also present a problem firefighters do not often have to think about—introducing a large amount of water into the vessel, so much so that the vessel may become unstable and possibly capsize or sink. This potential problem may require consultation with experts, such as naval architects or U.S. Coast Guard engineers, to assure vessel stability.

Radio communication is another complicating factor common to fighting vessel fires. Steel bulkheads and compartments in ships block or limit radio signal transmissions. To compensate, firefighters have to relay messages from within the ship by stationing personnel with radios close enough to allow transmissions. Other alternatives include using runners or deploying hard-wire communications systems. All possible solutions to this problem involve additional personnel and delays in establishing command and control, which may increase the potential for mishaps.

Fires in shipyards present serious hazards to those who work to control them. Fire response employees are exposed to dangers such as heat, flame, smoke, explosion, structural collapse, and hazardous materials. These hazards can be found in shipbuilding, as well as in shipbreaking and ship repair. Because firefighters must function on both land-side and on board vessels, they need a single standard to cover both these situations. Likewise, other shipyard employees can benefit from a single fire protection standard for all aspects of shipyard employment by having fires extinguished more rapidly and effectively.

OSHA's general industry standards for fire protection are in Subpart L, 29 CFR Part 1910.155 through 1910.165, but § 1910.155(b) exempts maritime employments from coverage. Subpart L addresses fire prevention and firefighting methods typically used by general industry. OSHA compliance policy, set out in OSHA Instruction CPL 02-00-133, addresses typical land-side fire hazards in shipyards. Since the Agency has no specific standards that address the risks of fire on board vessels and vessel sections (also referred to as just "vessels" hereafter), OSHA has used the General Duty Clause Section 5(a)(1) of the Occupational Safety and Health Act (OSH Act or Act) to cite fire safety hazards at land-side facilities at shipyards and on board vessels and vessel sections. Because enforcement under the General Duty Clause requires OSHA to show, on a case by case basis, the existence of a hazard, that the hazard is recognized, that the hazard is causing or likely to cause serious physical harm to employees, and that a feasible means exists to abate the hazard, employers have not been given clear regulatory requirements to follow and enforcement has been difficult.

The Agency has concluded that codifying relevant issues for fire protection in shipyards into a single subpart in 29 CFR Part 1915 will substantially clarify an employer's responsibilities in protecting shipyard employees from fire hazards. The Agency believes that this in turn will lead to better protection for these employees.

Simply extending the application of the current general industry standards to shipyards would not be appropriate. First, most of the provisions in the general industry standards have been in effect since 1980. They would need revision to take into account technological advances that could improve fire protection in shipyard employment. Secondly, shipyard employment encompasses many tasks

and worksites that are unique to the maritime industry. Employers, labor representatives, and professional and trade associations have repeatedly asked OSHA to allow all shipyard employment to be covered by a single set of standards. They point out that the work situations found within shipyard employment have more in common with each other than with those in general industry and that the hazards and methods of controlling the hazards are similar throughout the shipyard. Finally, they point out that work at land-side facilities and aboard vessels is located within the same general area and performed by the same workforce. Fire protection services are usually provided by the same in-yard plant or out-of-yard fire crews to all areas of shipyard employment. The Fire Protection in Shipyard Employment Negotiated Rulemaking Advisory Committee concluded that when fire response crews find shipyards following a single fire protection standard on vessels and land-side facilities, the crews are more effective in their fire response activities. OSHA agrees and has concluded that a single new standard addressing fire hazards for all shipyard employment, land-side and on board vessels, is reasonably necessary and appropriate to protect shipyard employees.

The Agency has concluded that fire and firefighting activities in shipyard employment pose a significant risk to employees that can result in death, burns and other serious fire-related injuries. OSHA further concludes that the standard's requirements relating to fire hazards will help save lives and prevent injuries. The Agency has also concluded that the standard is technologically and economically feasible as well as cost-effective. It will substantially reduce the risk from fire hazards by recognizing and, in some cases, requiring new fire protection technologies.

#### *Advisory Committees and Procedural History*

OSHA relied on the involvement of several advisory committees to develop this shipyard fire protection standard. The committees are the Shipyard Employment Standards Advisory Committee (SESAC), the predecessor of the Maritime Advisory Committee on Occupational Safety and Health (MACOSH), which, after reviewing pertinent federal regulations and guidelines issued by professional associations, drafted a shipyard employment fire protection standard (SESAC, Ex. 9); MACOSH, which urged OSHA to proceed with a fire protection

standard in 1995; and the Fire Protection in Shipyard Employment Negotiated Rulemaking Advisory Committee (hereafter referred to as "the Committee"), formed in 1996 under the Federal Advisory Committee Act and the Negotiated Rulemaking Act (61 FR 28824).

The members of the Committee were: Chris Myskowski, U.S. Coast Guard; Paul Jensen, National Institute for Occupational Safety and Health (NIOSH); Joseph V. Daddura, Office of Maritime Standards, OSHA; G. F. Hurley, Norfolk Naval Shipyard; Richard Duffy, International Association of Firefighters (AFL-CIO, CLC); E.P. Kaiser, South Tidewater Association of Ship Repairs, Inc.; Guy Colonna, National Fire Protection Association (NFPA); Russ Sill, Portland Fire Bureau; Alton Glass, United Steel Workers of America (AFL-CIO, CLC), who was later replaced by John Molovich; George Broussard, Bollinger's Shipbuilding and Ship Repair, who was later replaced by Mark Duley, Walker Boat Yard, Inc.; Glenn Harris, Ingalls Shipbuilding; Donald Mozick, Atlantic Marine, who was later replaced by Terry Guidry, Bollinger's Shipbuilding and Ship Repair; Michael Buchet, United Brotherhood of Carpenters and Joiners of America, who was later replaced by Joseph Durst; Jim Paulson, National Steel & Shipbuilding Co.; and Peter Schmidt, Office of Specialty Compliance Programs, Washington State Department of Labor and Industry. The Agency wishes to thank all of the Committee members for their time, effort, and patience in helping to develop the draft proposed standard.

The Committee met nine times between October 1996 and February 2002 (Ex. 5). At its final meeting, the Committee unanimously approved a recommended standard for fire protection in shipyards. With minor editorial revisions, the Agency published the recommendations as a proposed standard on December 11, 2002 (67 FR 76213). A comment period to the proposed rule of 90 days ended on March 11, 2003. OSHA received 31 comments. The final standard continues to reflect most of the Committee's recommendations, with minor modifications made in response to the comments received from the public. The comments and modifications are discussed in the Summary and Explanation of the final standard below.

Some commenters expressed support for the proposed standard. Shipbuilders Council of America (SCA), Southwest Shipyard, Detyens Shipyards, Inc., and Gladding-Hearn Shipbuilding commended "OSHA for recognizing the

fact that day-to-day shipyard operations differ considerably from general industry and that an industry specific guideline is needed to address shipyard fire hazards" (Exs. 21-5; 21-6; 21-7; 21-13). In addition, these commenters stated "[t]hat the Negotiated Rulemaking Committee (Neg Reg) process that was used to draft the Shipyard Fire Protection NPRM was overall beneficial" (Exs. 21-4; 21-5; 21-6; 21-7; 21-13). SCA, Detyens Shipyards, and Gladding-Hearn went further to state that they "[R]ecommend using the Neg Reg for industry-specific issues that may develop in the future." (Exs. 21-5; 21-7; 21-13). Trinity Industries also stated that it was "[p]leased with the Shipyard Fire Protection NPRM" (Ex. 21-4). Puget Sound Shipbuilders Association stated:

With a few exceptions, I find this document follows what the Seattle Fire Department Administrative Regulation 49.1 mandates for hotwork in shipyard, boatyard, and water front operations. The Seattle Fire Department regulation has made a major and positive impact on the overall safety of hot-work operations within their areas of responsibility". Areas of Incident Command, interagency training and communication are key elements to successfully resolve issues prior to an emergency at a facility. These issues may be new to some facilities and I would encourage those who need assistance to contact the local Fire or Emergency Services Department. Many of these agencies will provide training at little or no expense. We in Puget Sound Shipyard are fortunate to have Safety Staff experienced in these elements and conduct annual training with the Seattle Fire Department. Areas of Confined Space Rescue, Pre-fire tours/planning, as well as the annual facility inspection enhance our report with the fire department. Complying with the PPE requirements should be of no strain to any maritime industry. Respirator fit testing and such is an ongoing event. Those facilities that have an "in house" Fire Department or Fire Brigade should already be complying with the current OSHA regulations as well as NFPA recommendations (Ex. 21-2).

## II. Pertinent Legal Authority

The purpose of the OSH Act, 29 U.S.C. 651 *et seq.*, is to "assure so far as possible every working man and woman in the nation safe and healthful working conditions and to preserve our human resources" (29 U.S.C. 651(b)). To achieve this goal, Congress authorized the Secretary of Labor to issue and enforce occupational safety and health standards. (See 29 U.S.C. 655(a) authorizing summary adoption of existing consensus and federal standards within two years of the Act's enactment, 655(b) authorizing promulgation of standards pursuant to notice and comment, and 654(b)

requiring employers to comply with OSHA standards).

A safety or health standard is a standard "which requires conditions, or the adoption or use of one or more practices, means, methods, operations, or processes, reasonably necessary or appropriate to provide safe or healthful employment or places of employment." 29 U.S.C. 652(8).

A standard is reasonably necessary or appropriate within the meaning of section 652(8) if it substantially reduces or eliminates significant risk; is economically feasible; technologically feasible; cost effective; is consistent with prior Agency action or is a justified departure; is supported by substantial evidence; and is better able to effectuate the Act's purposes than any national consensus standard it supersedes. See 58 FR 16612-16616 (March 30, 1993).

A standard is technologically feasible if the protective measures it requires already exist, can be brought into existence with available technology, or can be created with technology that can reasonably be expected to be developed. *American Textile Mfrs. Institute v. OSHA* 452 U.S. 490, 513 (1981) ("ATMI"), *American Iron and Steel Institute v. OSHA*, 939 F.2d 975, 980 (D.C. Cir 1991) ("AISI").

A standard is economically feasible if industry can absorb or pass on the cost of compliance without threatening its long term profitability or competitive structure. See ATMI, 452 U.S. at 530 n.55; AISI, 939 F.2d at 980. A standard is cost effective if the protective measures it requires are the least costly of the available alternatives that achieve the same level of protection. ATMI, 453 U.S. at 514 n.32; *International Union, UAW v. OSHA*, 37 F.3d 665, 668 (D.C. Cir. 1994) ("LOTO II").

Section 6(b)(7) authorizes OSHA to include among a standard's requirements labeling, monitoring, medical testing and other information gathering and transmittal provisions. 29 U.S.C. 655(b)(7).

All standards must be highly protective. See 58 FR 16614-16615; LOTO II, 37 F.3d at 668. Finally, whenever practical, standards shall "be expressed in terms of objective criteria and of the performance desired." 29 U.S.C. 655(b)(5).

## III. Summary and Explanation of the Final Standard

The comments OSHA received on the proposed standard supported the Committee's general approach to the issues, as well as the need for the standard. There were suggestions related to specific provisions, and these are addressed below in the discussion of

each section. OSHA has revised the proposed regulatory text where appropriate in response to comments, and has also made minor editorial revisions to better clarify the final regulatory text.

In this rule, OSHA is incorporating by reference 19 National Fire Protection Association (NFPA) consensus standards. In keeping with past practice, the consensus standards are listed in § 1915.5, Incorporation by Reference (IBR). There are ten additional NFPA standards referenced in the preamble,

but they are not incorporated by reference. Reliance on national consensus standards such as those referenced in Subpart P is a longstanding U.S. government policy. The U.S. Office of Management and Budget, in Circular A-119, directs federal agencies to use voluntary consensus standards in lieu of government-unique standards except where inconsistent with law or otherwise impractical. The majority of these consensus standards are referenced in § 1915.505, Fire Response,

and § 1915.507, Land-side Fire Protection systems.

In the proposed rule, there were several incorrect references to NFPA standards that OSHA has identified and corrected in this final rule. These errors were minor and the correct referenced versions of the NFPA standards can be found in OSHA docket S-051. The following table lists the NFPA standards incorrectly cited in the proposal along with the correct citation used in the final rule:

Incorrect citations	Correct citations	NPRM page location
NFPA 10-2002 Standard for Portable Fire Extinguishers ....	NFPA 10-1998 Standard for Portable Fire Extinguishers ..	76250 (2 locations).
NFPA 11-2000 Standard for Low-Expansion Foam .....	NFPA 11-1998 Standard for Low-Expansion Foam .....	76236, 76250.
NFPA 15-2002 Standard for Water Spray Fixed Systems for Fire Protection (Ex. 20-19).	NFPA 15-2001 Standard for Water Spray Fixed Systems for Fire Protection (Ex. 19-19).	76236.
NFPA 17-1998 Standard for Dry Chemical Extinguishing Systems (Ex. 19-20).	NFPA 17-2002 Standard for Dry Chemical Extinguishing Systems (Ex. 19-20).	76237, 76250.

In the NPRM, OSHA proposed to delete section 1915.52, Fire prevention, which is located in Subpart D Welding, Cutting and Heating, because it is superseded by the comprehensive fire protection requirements in the new Subpart P. Section 1915.52 included the fire prevention standards for welding and burning in shipyard employment, and was the basis for many of the requirements now found in Subpart P, Section 1915.503—Precautions for hot work. No comments were received and OSHA is therefore deleting this section as proposed. Section 1915.52 will be listed as “reserved” to avoid any need to renumber subsequent sections, and it will be available for future use, if needed.

OSHA also proposed to delete paragraphs (d), (f), and (g) of § 1915.55, Gas welding and heating, in the NPRM. These paragraphs included provisions for the “Use of fuel gas,” “Hose,” and “Torches,” respectively. After re-examining this proposed deletion, OSHA has found it is necessary to retain these paragraphs. Without them, the final standard would not address potentially hazardous situations. Thus, to ensure the continued protection of workers while welding, cutting, and heating, OSHA will not delete the paragraphs.

#### *Section 1915.501 General Provisions* Purpose

In § 1915.501(a), OSHA states the purpose of the standard is to require employers to protect all employees from fire hazards in shipyard employment, including employees engaged in fire response activities.

#### Scope

Paragraph (b) of § 1915.501 describes the scope of the final standard, which is all shipyard employment work, including work on vessels and vessel sections and at land-side operations, regardless of geographic location. The final requirement is nearly identical to the proposed requirement. The only change is to replace “and/or” with “and.” The scope of this subpart is consistent with that in Subpart B, Confined and Enclosed Spaces and Other Dangerous Atmospheres in Shipyard Employment, and Subpart I, Personal Protective Equipment for Shipyard Employment. It is also consistent with OSHA’s previous policy concerning the scope of the Part 1915 standards.

The scope of this standard includes all fire response provided by the employers’ workers, whether they are part of a fire brigade, shipyard fire department, or simply designated by the employer. Shipyard employment includes shipbuilding, ship conversion, ship repairing, shipbreaking, and related employments. It also includes operations performed during the final outfitting of vessels under construction or repair. Examples of such operations include technical support from the providers of shipboard electronic equipment as well as suppliers of internal furnishings.

The scope of the standard has broad coverage because shipyard employers are increasingly engaged in non-traditional shipyard employment such as steel fabrication of products not directly related to ships. This could include work such as construction of

railroad cars, bridges, tunnel sections, smoke stacks, and boilers.

Shipyard employment also includes support operations necessary for vessel construction and repair. Such support operations include metal fabrication, machine shops, electrical shops, and paint shops, which are facilities typically found within a shipyard. Many vessel sections and vessel components are built in these shops more easily than they can be built on board a vessel. The materials are the same and often the hazards encountered are similar to fabrication on a vessel.

OSHA has included the phrase “regardless of geographic location” in the scope so that protection is afforded to employees wherever they engage in shipyard employment: on vessels, on vessel sections, at land-side facilities, or at any other location where they perform shipyard employment. This has been the Agency’s long-standing policy on shipyard employment, and is the scope of both Subparts B and I.

Shipyard employment also occurs on vessels and vessel sections within the navigable waters of the United States, and includes work on a vessel or part of a vessel that is being constructed, repaired, or broken up, or whether it is in the shipyard or dockside, at anchor, or underway for testing. The requirements in this subpart will apply to all vessels within OSHA’s jurisdictional boundaries.

Several commenters recommended a revision of paragraph (b) (Exs. 21-10; 21-15; 21-16; 22-1; 22-2; 22-3; 22-4; 22-5; 22-6; 22-7; 22-8; 22-9; 22-10; 22-11; 22-13). They suggested that the phrase “or on land-side operations regardless of geographic location” be

replaced with “or at facilities where vessels or vessel sections are located.” The commenters were concerned about the application of the standard to off-site suppliers and contractors, such as a metal shop not engaged in shipyard employment that supplies duct work to a shipyard. The commenters did not think it would be appropriate for Subpart P to apply to such establishments that only supply materials or subcomponents to be installed on a vessel or used in a shipyard.

OSHA has carried forward the proposed scope language in the final rule. However, in order to address the concerns raised, the Agency wants to clarify the degree to which it intends to regulate contract employers at shipyards. Contractors who engage in work outside of shipyards do not have to follow Subpart P within their own facilities. For example, Subpart P would not cover the metal shop described above. However, when the metal shop employees are engaged in shipyard activities within the shipyard, they must comply with Subpart P. The scope of Subpart P does not include shore side support services, such as those provided by vending equipment and mail delivery companies.

The scope of the final rule includes all employees doing shipyard-related work wherever that work takes place. For instance, whether the work is in the employers’ shipyard, on a ship at anchor, or at a ship at a dock several miles away, it is considered shipyard employment. When subcontractors perform work in a shipyard, they must follow the standards of 29 CFR Part 1915.

#### Employee Involvement

In § 1915.501(c), OSHA requires employee participation in shipyard safety and health program activities. OSHA requires the employer to provide for the participation of employees and employee representatives in the development and review of programs and policies adopted to comply with this standard. The Committee also recommended that such employee participation and involvement be included in the standard.

Several commenters suggested that OSHA replace the word “and” with “and/or” in § 1915.501(c).

In large companies it may not be feasible to include employees as well as employee representatives in the development of programs and policies. It is more likely that the employee representatives will participate in the development process and solicit input from their respective constituents. A large company may depend on labor union

stewards or safety committee members to represent the labor force. In either case employee input is obtained. Recommendation: Make this an “and/or” situation. “The employer must provide ways for the employees and/or employee representatives \* \* \*” (Exs. 21–3; 21–10; 21–15; 21–16; 22–1; 22–6; 22–7; 22–8; 22–9; 22–10; 22–11; 22–14).

Naval Sea Systems Command (NAVSEA) commented that

The size of the organization/facility may limit its ability to include employees and employee representatives in the development of programs and policies. Employee representatives and/or safety boards/committees will be more likely to participate in the development process, and solicit input from their respective constituents (Ex. 22–15).

The comments raised the issue that it may not be practical for both employees and their representative to participate. The Committee and OSHA viewed the employee involvement requirement as crucial. However, the Agency agrees with these commenters that the participation of either employees or employee representatives in the development or review of programs or policies is sufficient. Examples of employee representatives include employee safety boards and committees or labor union stewards. The Agency has altered the final language will read “employees, employee representatives, or both to participate” to allow for employees, their representatives, or both to participate in developing and periodically reviewing programs and policies.

#### Multi-Employer Worksites

Paragraph (d) of § 1915.501 sets minimum requirements for exchanging information and coordinating responsibilities for fire protection among host and contract employers. These requirements are fundamental to any effective fire safety program on a multi-employer worksite. A multi-employer workplace is defined for the purposes of this rule as a workplace where there is a host employer and at least one contract employer.

The multi-employer requirements are necessary because the existence of additional employers and their employees at a workplace makes addressing safety and health conditions at the workplace more complex. For example, at a multi-employer worksite, one employer may introduce hazards into the workplace about which employees of other employers are unaware. All employers need information about relevant hazards present at the worksite to enable them to fulfill their obligations to protect

workers. For these reasons, communication and coordination among employers are essential.

Failure to communicate about hazards between employers can be tragic. For example, the 1989 explosion at a Phillips 66 chemical complex in Houston, which killed 23 people and injured more than 100 workers, resulted largely from the failure to coordinate safety and health activities on a multi-employer worksite. Such tragic events and the increased reliance on contractors throughout the shipyard industry have led OSHA to conclude that responsibility for fire safety must be specifically assigned to all employers, who must then be held accountable for discharging those responsibilities. In the shipyard industry, it is common practice to hire contractors for non-routine or specialized work situations. For example, painting, joining, carpentry, and scaffolding contractors are routinely used in shipyard employment.

In the final standard, OSHA has retained in paragraph (d)(1)(i) and (ii) the proposed provisions that host employers must inform all employers at the work site about the contents of the host’s fire safety plan, including hazards, controls, and emergency procedures, and assign any appropriate responsibilities for fire safety to other employers.

OSHA specifically requested input from the public on the use of the terms “host employer” and “contract employer” and whether it is clear which employer is responsible under the provisions, and whether there is another way to define or clarify which employer is responsible for implementing the requirements. Northrop Grumman/Newport News Shipyard (NGNN) submitted the only comment on this issue:

The rule should be clarified to reflect the fact that there is typically more than one host employer at a shipyard work site or on board a vessel. For example, a ship owner may conduct work on its own vessel, or hire other contractors that are not under contract to or supervised by the shipyard where the vessel is temporarily located. Additionally, each “host employer” will have its own subcontractors and its specific work for the safety of which it should be responsible. The various host employers should be able to allocate among themselves in manners suitable to the individual circumstances (Ex. 21–8).

It was the clear intent of the proposal that a single shipyard employer have responsibility for acquainting every employer on site of the contents of the fire safety plan and emergency procedures. However, OSHA agrees

with Newport News Shipyard that there may be circumstances where a vessel owner may also be a host employer. Therefore, OSHA is adding a new provision, paragraph (d)(1)(iii), which also has a clarifying sentence to ensure that all employers are communicating and following their fire safety plans (see discussion below).

The definition of "host employer" in § 1915.509 Definitions is an employer who is in charge of coordinating work or who hires other employers to perform work at a multi-employer workplace. The definition of "contract employer" is an employer who performs work under contract to a host employer or to another employer under contract to the host employer at the worksite. This definition specifically excludes employers who provide incidental services that do not influence shipyard employment (such as mail delivery or office supply services).

The responsibilities of host employers are established in § 1915.501(d)(1). In paragraph (d)(1)(i), OSHA requires the host employers to ensure that information about fire hazards, controls, safety and health rules, and emergency procedures is given to all contract employers. The information includes whatever a contract employer must have to carry out its own duties as an employer under this rule.

OSHA is requiring in paragraph (d)(1)(ii) that the host employer make sure that fire protection responsibilities are specifically assigned to the various employers and contractors working at a multi-employer worksite. Some of these responsibilities include fire hazard abatement, informing employees of fire hazards before exposure, and stopping work because of an imminent danger situation. The host employer must, in conjunction with the contract employers, decide who is to train employees and control which hazards.

Contract employers must know (from the host employer) about other hazards related to fire which their employees might encounter at the workplace. Such knowledge allows contract employers to plan effectively, safely carry out their work, and understand procedures, such as what to do when a fire alarm is sounded to evacuate a vessel. Contract employers also need to inform employees of the fire hazards to which they are exposed at that worksite, the controls in place to reduce or eliminate those fire hazards, the safety and health procedures to be followed, and the steps to be taken in a fire emergency. This information lessens the likelihood that accidents will occur.

To further clarify the roles of the host employer, the Agency has added a new

provision, § 1915.501(d)(1)(iii), to ensure that when there is more than one host employer, each host employer must communicate to other host employers relevant information about fire-related hazards. In addition, OSHA is adding a clarifying sentence as follows: "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 hiring other contractors directly, the vessel owner or operator must also comply with these provisions for host employers."

Paragraph (d)(2) of § 1915.501 states the responsibilities for contract employers. The contract employer must inform the host employer of any fire hazards that could be created by the work being performed by its employees, and what steps the contract employer must take to address those hazards. In addition, OSHA requires that any hazards that were not previously identified by the host employer, but were identified by the contract employer, must be shared with the host employer. No comments were received on paragraph (d)(2) and OSHA has carried it forward in the final standard.

#### *Section 1915.502 Fire Safety Plan*

The final standard includes requirements for an overall program that would establish the location, type, and capacity of firefighting equipment such as extinguishers, fire hose and stand pipes, smoke detectors, automatic sprinklers, and other fixed firefighting systems in accordance with applicable fire codes. The plan must provide for the routine inspection, maintenance, and replacement of this equipment and mandate training for new workers and refresher training for all shipyard employment workers. The plan must include procedures for the control of fire hazards, such as flammable and non-flammable compressed gases, ignition sources, combustible materials, and welding and hot work operations, and must include procedures for evacuation.

#### *Employer Responsibilities*

In § 1915.502(a), OSHA is requiring the employer to 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. A written plan enables employers and employees to see how the employer intends to protect workers; enables employers to readily exchange information; provides continuity of procedures; and provides a practical means of communication to fire

response organizations. Updating the plan to reflect changing fire control technology or changing the plan to reflect different fire hazards in different work situations is readily accomplished with a written plan.

In § 1915.502(a), OSHA refers readers to an outline for a model fire safety plan, Appendix A, a non-mandatory appendix to this subpart. The purpose of Appendix A is to give guidance to any employers who may not have the expertise available to develop their own plan. If an employer chooses to use the model plan for a specific worksite, the employer meets the minimum requirements of this section, provided the employer's plan correctly follows the model outline and appropriately addresses the particular conditions at the employer's specific worksite.

Several comments were received regarding § 1915.502(a) (Exs. 21-4; 21-5; 21-6; 21-7; 21-13; 22-2). They questioned whether an employer that already has an integrated emergency action plan has to also have a separate fire safety plan. And if so, they wanted to know if the "fire safety plan" is meant to supersede all provisions under §§ 1910.38 and 1910.39 (Emergency Action Plans and Fire Prevention Plans). Atlantic Marine recommended that a provision be added which would accept an existing emergency action plan in place of a fire safety plan if it already met the requirements of both § 1910.38 and § 1915.502(a) (Ex. 21-17-1-1).

OSHA notes that while the Agency was developing the Part 1915 subpart F standard, OSHA also revised Part 1910, Subpart E, Exit Routes, Emergency Action Plans, and Fire Prevention Plans (67 FR 67949-67965 (11/07/2002)), which apply to general industry workplaces as well as shipyard employers. In the Part 1910 Subpart E rulemaking, OSHA revised the previous requirements for exit routes using clearer language so they are easier to understand by employers, employees, and others who use them. In addition, these revisions reorganized the text, removed inconsistencies among sections, and eliminated duplicative requirements.

The employee emergency plans and fire prevention plans that are covered by §§ 1910.38 and .39 are similar to the fire safety plans required by § 1915.502. However, there are a few key differences. Section 1910.38 requires the employer to plan for all emergencies, not just fire emergencies. Therefore, the § 1915.502 fire safety plan provisions do not adequately replace the § 1910.38 requirements and shipyard employers will still be required to comply with § 1910.38. For § 1910.39 Fire protection



plans, OSHA has determined that paragraphs (a), (b), and (d) are covered by § 1915.502, and shipyard employers are no longer required to comply with these provisions of § 1910.39. However, paragraph § 1910.39(c) contains provisions requiring employers to identify and control certain fire hazards. These provisions are not adequately addressed by § 1915.502, so OSHA has determined that shipyard employers will continue to be required to comply with the § 1910.39(c) provisions.

The Agency understands that shipyard employers who are currently complying with §§ 1910.38 and 1910.39 will now also be required to comply with the additional requirements of § 1915.502. However, there is no need to produce three separate plans, unless the employer wishes to do so. OSHA does not require employers to have separate plans as long as the unified plan covers the applicable general industry employee emergency plan and fire prevention plan provisions, as well as the shipyard employment fire safety plan. OSHA will accept one unified plan that meets all of the requirements in §§ 1910.38, 1910.39, and 1915.502.

#### Plan Elements

In § 1915.502(b), OSHA sets forth the elements that the employer must include in the fire safety plan. These are the identification of significant fire hazards; procedures for recognizing and reporting unsafe conditions; alarm procedures; procedures for notifying employees of a fire emergency; procedures for notifying fire response organizations of a fire emergency; procedures for evacuation; procedures to account for all employees after an evacuation; and the names, job titles, and departments for individuals who can be contacted for further information about the plan.

#### Reviewing the Plan With Employees

In § 1915.502(c), OSHA requires the employer to review the fire safety plan with each employee within 90 days of the effective date of this standard for employees who are currently working. It also requires employers to review the fire safety plan with new employees upon initial assignment and whenever the actions the employee must take under the plan change because of a change in duties or a change in the plan. Employees include those employees who perform hot work and fire watches, fire responders, and all other employees who are in the shipyard.

#### Additional Employer Requirements

In § 1915.502(d), OSHA requires the employer to keep the plan readily

accessible for review by employees, their representatives, and OSHA; review and update the plan whenever necessary but at least annually; document that affected employees have been informed of the plan; and give a copy of the plan to any outside fire response organization that the employer expects may respond to fires at a worksite.

NAVSEA commented on this paragraph:

The standard requiring a “readily accessible” “updated” fire safety plan is vague. For example, will maintenance of training records suffice as a fire safety plan? Recommend revising the standard to better define the requirements of the fire safety plan. (Ex. 22–15).

The Agency has used the terms “readily accessible” and “updated” in numerous OSHA standards. Definitions of “readily accessible” include that in § 1910.1200(f)(8) (“as long as no barriers to immediate employee access exist”) and § 1910.399 (“Capable of being reached quickly for operation, renewal, or inspections, without requiring those to whom ready access is requisite to climb over or remove obstacles or to resort to portable ladders, chairs, etc.”). Employees must be able to access the fire safety plan at any time during the work shift. The plan may be in a notebook, on a computer, or in any other appropriate format. The employer may have one or more locations for all safety plans and related information. Employees must know where to go to access this information and must be able to obtain the information in a timely manner. The Agency believes that the term “readily accessible” both in its plain meaning and other applications in OSHA regulations is sufficiently clear that no additional definition in § 1915.509 is necessary.

Updating the plan when necessary would include when there is a change in the system, the process, or in technology. This ensures that the fire safety plan will be effective for the work that is being performed at any given facility at any given time. OSHA understands that a shipyard may be working on several types of vessels during a year, and that each vessel may involve different hazards. The plan may need to be updated to cover those changes as well. For instance, if a shipyard only repairs barges, employees should be aware of the hazards associated with that particular vessel. However, if a ferry is in the shipyard for modifications or repair, the elements of the fire safety plan may need revision to address the different fire hazards associated with such a vessel. The employer must review and update the

plan when necessary but at least annually. Should the process, system, and technology remain the same after one year, no update is needed. However, the employer must review the plan to ensure that no changes are needed. OSHA believes that the meaning of “update the plan” in § 1915.502(d)(2) is clear and this provision has been included in the final standard.

In § 1915.502(d)(3) of the proposed rule, OSHA proposed that employers certify in writing that each employee has been informed about the plan. Numerous commenters replied that this paragraph was not justified. In addition, they believed that adding a certification requirement adds no substantive protection for employees and is inconsistent with the recommendation of the Committee, which specifically approved a “recordkeeping” mechanism for ensuring compliance (Exs. 21–10; 21–15; 21–16; 22–1; 22–6; 22–7; 22–8; 22–9; 22–10; 22–11). Bath Iron Works stated that: “The request for a company to ‘certify in writing \* \* \*’ is unclear. Is the standard calling for a record to be maintained and does an electronic data base of training records meet the intent of the standards?” (Ex. 21–3). All of these commenters recommended revising this paragraph and using terms such as “maintain records,” “maintain training documentation,” or “document training records.”

Additionally, NGNN stated that:

We do not believe that electronic media or other equally effective means should be excluded as methods that an employer may use to demonstrate to OSHA that all affected employees are informed or trained on the fire safety plan. It is impractical for the employer to be continually issuing a new “certification” each time an employee is hired. Training records or other means may be used more efficiently and without creating a redundant need for a separate “certification.” OSHA should not dictate the method but rather make it incumbent upon the employer to demonstrate that employees have been informed of the plan. (Ex. 21–8).

It recommended that the paragraph read: “[A]ssure that each affected employee has been informed about the plan as required by paragraph (c) of this section; and \* \* \*.” (Id.)

OSHA’s intent was to require the employer to certify that its employees have been informed, not to require a new certification for each employee. However, OSHA agrees with the commenters that the proposed language was unclear, and has changed the language to require that the employer: “[D]ocument that affected employees have been informed \* \* \*.” Many employers have developed databases that track the training that each

employee has completed. This form of documentation is acceptable, as is any other effective method of documenting that all affected employees have received the training.

In paragraph (d)(4), OSHA requires that the employer provide a copy of the plan to any outside fire response organization that the employer expects to respond to fires at its worksite. No comments were received on this requirement. OSHA made minor editorial changes to this paragraph in the final standard.

#### Contract Employers

In § 1915.502(e), OSHA requires a contract employer's fire safety plan to be in compliance with the host employer's fire safety program. Because of the nature of the work at any given time, there may be many employers within one particular shipyard. Safety and health hazards may increase at such multi-employer worksites. OSHA's intent with this paragraph is that all employers take responsible actions to reduce these hazards when possible, and to alert other employers when hazards exist. The successful recognition of fire hazards and response to fire emergencies requires all employers on the site to follow the host employer's fire safety plan.

Several identical comments were received on this paragraph. The concern was that the wording implied that there must be two distinct and separate plans. "The same degree of contractor safety can be achieved if the contractor agrees, in writing if necessary, to comply with the host employer's fire safety plan. This would ease the burden on the contractor and promote consistency within the shipyard." (Exs. 21-3; 21-10; 21-15; 21-16; 22-1; 22-6; 22-7; 22-8; 22-9; 22-10; 22-11; 22-14). OSHA agrees with these comments. If the host employer's plan includes the fire hazards the contract employer's employees will encounter, it is acceptable for a sub-contractor to simply adopt or follow the host employer's fire safety plan.

The Agency's intent was for contractor and sub-contractor employees to be provided the same level of protection as the host employer's employees while on site. It is also important that contractor employees respond as effectively as other employees to evacuations. For example, to follow the host employer's fire safety plan would include following all of § 1915.502, including reviewing the plan with employees, keeping the plan accessible and updated, and certifying that all employees have been informed of the plan. Recognizing hazards,

communicating about developing hazards and responding to emergencies in a safe manner require all employers on the site to follow the host employer's fire safety plan.

#### Section 1915.503 Precautions for Hot Work

The purpose of this section is to reduce the potential of fire hazards and to reduce the frequency and severity of any fires resulting from hot work. Three elements are normally present for a fire to occur: An ignition source, oxygen, and a fuel source. If one element is removed, then a fire will not occur. The final rule focuses on reducing the hazards associated with fuel sources and ignition sources by removing any fuel source from the area where hot work is to be performed. If that is not possible, then isolating the fuels by using protection (shielding), posting a fire watch, or other positive means can be used to comply with the provision. These requirements reflect current industry practices and the requirements associated with § 1915.14 for flammable and combustible materials within confined and enclosed spaces and other dangerous atmospheres. Other materials may also be present that have properties that may increase the hazards associated with a fire, such as oxidizers and water reactive chemicals. The Agency concludes that fires resulting from hot work can be prevented through an authorization procedure and proper inspection of the worksite before hot work. This involves identifying fire hazards and implementing appropriate control measures that include removing hazards, inerting spaces, shielding combustibles, or posting fire watches. The Agency believes this approach will better protect shipyard workers from fire hazards associated with hot work while also reflecting the best practices of the industry.

The purpose of OSHA's requirement is to make sure that the employer identifies all fire hazards in a hot work area and takes appropriate action to prevent fires. This section relies heavily upon requirements adapted from the existing §§ 1915.52 Fire Prevention, § 1910.252 Welding, Cutting and Brazing, and from an industry consensus standard, NFPA 51B-1998 *Standard for Fire Prevention in Use of Cutting and Welding Processes* (Ex. 19-3).

#### General Requirements

Paragraph (a) makes clear that the requirements cover all hot work except for operations covered by Subpart B Confined and Enclosed Spaces and Other Dangerous Atmospheres in

Shipyard Employment. Subpart B already covers the hazards of performing hot work in these areas. Addressing them again in Subpart P would be duplicative and unnecessary.

Paragraph (a)(1) allows the employer to designate certain areas for hot work. In designating such areas, the employer must determine through an inspection, that they are free from fire hazards. These areas are typically designed for hot work, and include fabricating shops, sub-assembly areas, and welding and burning areas within shops, such as pipe, boiler, and sheet metal shops. In "designated areas," hot work operations are regular and continuous as opposed to incidental hot work operations occurring throughout the yard. Nonetheless, such areas must be initially inspected to establish them as "designated areas" and then maintained as such, as required in paragraph (b)(1) of this section.

OSHA received comments relating to paragraph (a)(1). One group of commenters argued that the word "only" should be removed from: "[t]he employer may only designate areas for hot work" because it implies that an employer is limited to designating areas for hot work (Exs. 21-4; 21-5; 21-6; 21-8; 21-13). OSHA agrees with these commenters and has deleted "only" from the requirement.

Several comments were received objecting to the term "potential fire hazard." (Exs. 21-8; 21-10; 21-15; 21-16; 21-17-1; 22-1; 22-6; 22-7 through 22-11; 22-14) The commenters felt that this terminology was too broad and vague, could be improperly interpreted in the field, and should be clearly defined or changed. One suggestion was to substitute the term with "free of fire hazards," which would be consistent with language used in §§ 1915.503(a)(2)(ii) and (b)(1). Another comment on this term was that: "The use of the word 'potential' is confusing and could be improperly interpreted in the field. Either an area has a 'fire hazard' or it does not." (Exs. 21-10; 21-15; 21-16; 22-1; 22-6; 22-7 through 22-11). OSHA agrees with these commenters that using the phrase "potential fire hazards" could be misconstrued. Therefore, OSHA has changed the language to read "free of fire hazards."

Alabama Shipyard and Atlantic Marine-Mobile noted that the rule does not specify how such areas should be designated, such as by posting signs, inclusion in the fire safety plan, or some other mechanism (Ex. 22-2). In response, OSHA notes that the Agency is allowing employers flexibility in determining how to designate these hot

work areas, and only requires that they do so in an effective manner.

Paragraph (a)(2) of this section contains the requirements for authorization of hot work in non-designated areas. In § 1915.503(a)(2)(i), OSHA requires that, 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 that the area is free of fire hazards, unless a Marine Chemist's certificate or Shipyard Competent Person's log is used for the authorization. OSHA believes that by requiring authorization before hot work is performed in a non-designated area, the employer will pre-plan the operation and thereby identify and control the hazards associated with hot work.

OSHA recognizes that, although Marine Chemists and Shipyard Competent Persons have specific functions to perform under Subpart B, the employer may also use them to assess whether designated and non-designated hot work areas are free from fire hazards. However, the employer is not required to do so. In a related comment, Bath Iron Works remarked that:

Using the term '[the employer] must' implies that no one else can do the inspection. A trained mechanic may be more effective than a supervisor to perform such an inspection. Can the employer utilize employees to perform the inspection prior to hot work if it is part of their internal procedures and the employees are trained to do so? (Ex. 21-3).

OSHA does not intend for the words "employer must" to be interpreted to mean that a supervisory individual must conduct the visual inspection. A supervisor, the hot worker, a fire watch, or some other employee who is capable of performing the inspection may be delegated to do the inspection. Of course, it remains the employer's responsibility to ensure the area is free of fire hazards.

The paragraph requires that the inspection be performed to make sure the area is free of fire hazards. If during the inspection, combustible materials, (e.g., lunch bags, newspapers, coffee cups, or rags) are within 35 feet of the hot work area, the employer can do a number of things. The employer can remove the combustible materials from the area, use barriers to safely isolate the combustible materials, post a fire watch, or not perform the intended hot work.

Similarly, as OSHA explained in the proposal (67 FR 76224), the employer is not required to produce a written authorization. While some employers will choose to produce written

authorizations, such as those required by U.S. Navy contracts, others will choose to use verbal authorizations. The Agency's intent is to enable the employer to perform the steps and to assess the hazard each time it authorizes hot work, but not to require a formal written permit. Therefore, in this paragraph OSHA does not specify what form of authorization must be used.

In § 1915.503(a)(2), the employer can only authorize employees to do hot work in areas that are free of fire hazards or where fire hazards are controlled by physical isolation, fire watches, or other positive means such as inerting. Decisions about authorizing hot work must be based on an inspection by the employer, a Marine Chemist, or a Shipyard Competent Person. Authorization for hot work is appropriate only when such an inspection has shown that there are no uncontrolled combustible or flammable materials in the area.

The note to paragraph (a)(2) states: "[T]he requirements of paragraph (a)(2) apply to all hot work operations in shipyard employment except those covered by § 1915.14." This note is a reminder to employers that there are instances when a Marine Chemist, a U.S. Coast Guard Authorized Person, or a Shipyard Competent Person, is required to inspect a work area prior to hot work. Under these circumstances, the employer would not need to re-inspect the same work area. Conversely, the employer's inspection will not be accepted in lieu of an inspection by a Marine Chemist, a U.S. Coast Guard Authorized Person, or a Shipyard Competent Person when required by § 1915.14.

The likelihood of the hot work areas containing combustible materials during ship repair is greater than in shipbuilding. During ship repair, as in other work, the employer must control the fire hazards prior to performing the hot work. As required in paragraph (a)(2)(ii), control of fire hazards can be by physical isolation, posting fire watches, or other positive means. For example, an employer can achieve physical isolation of combustibles by shielding them or moving them to an area at least 35 feet away from the hot work (see definition of "physical isolation"). The 35-foot vertical and horizontal distance is consistent with current industry practice. Where combustibles cannot be moved or otherwise physically isolated, the employer can post a fire watch to control the fire hazard. Additionally, when flammable atmospheres are found adjacent to the hot work area, the employer can control the fire hazard by

inerting the adjacent space with a non-reactive substance that will not support combustion. [For further information on controlling spaces (flammable atmospheres) adjacent to where hot work is being performed, see Subpart B of this Part.]

The Connecticut Department of Labor submitted the following questions in regard to these requirements:

Pertaining to § 1915.503, what is the covered employer's responsibility regarding hot work and maintaining fire hazard free conditions when the outside contractor is on covered property? \* \* \* How is such an outside contractor/employer treated through the entire scenario under the standard for example, does this employer need to be covered by the plan? (Ex. 22-4).

As discussed in the Scope section, contractors who perform work at shipyards are required to comply with the OSHA shipyard standards, including the requirements regarding hot work.

NAVSEA recommended that two classes of hot work be identified. These would include most hazardous (stick welding and oxyfuel cutting) and less hazardous hot work (grinding, brazing, and TIG welding) (Ex. 22-15). By separating these two, there would be separate fire watch requirements. This commenter further stated that:

The hot worker may serve as his/her own fire watch for less hazardous hot work with the supervisor's approval. In addition, they must have an extinguisher and fire watch training. Recommend differentiating between 'aggressive' hot work and 'other' hot work. Two definitions of hot work would legitimize minor incidental gas igniters in areas that are safe to enter, but not safe for 'aggressive' industrial hot work. (Id.)

OSHA has not incorporated this suggestion into the final rule. The Agency believes that a single approach to ensuring safe hot work is simple and effective, and that for any hot work where the area has not been cleared of fire hazards, the employer must control the fire hazard with physical isolation, fire watches, or other positive means. Allowing the employer to designate particular areas for hot work addresses many of the concerns expressed by NAVSEA. In addition, the Agency does not allow the hot worker to also be the fire watch. Fire watch issues are discussed below.

#### Specific Requirements

In § 1915.503(b)(1), OSHA requires employers to keep all hot work areas free of hazards that may cause or contribute to the spread of fire. This requirement prevents the introduction of combustible or flammable materials during the performance of hot work.

Even though safe conditions often exist at the start of the hot work process, over the duration of the work, materials may be brought to the site, creating a fire hazard. For example, one worker may be performing hot work at the same time a worker from another job introduces combustible or flammable materials within 35 feet of the hot work operation. It is the intent of § 1915.503(b)(1) that hazard assessment be a continual process and not a singular, one-time event. Therefore, after authorizing hot work, the employer must continue to maintain a fire hazard free area. A note has been added to refer the reader to § 1915.181, Subpart L, for unexpected energizing and energy release. In addition, the reader should refer to §§ 1915.1000 to .1450, Subpart Z, for exposure to toxic and hazardous substances. No comments were received on this paragraph, and the proposed language is carried forward in the final rule.

Paragraph (b)(2) deals with fire safety issues related to fuel gas and oxygen supply lines and torches that are typically used for cutting and brazing. Paragraph (b)(2)(i) requires the employer to make sure that no unattended fuel gas and oxygen hose lines or torches are left in confined spaces. The final language in paragraph (b)(2)(i) has been adapted from 29 CFR Parts 1910.252 and § 1915.52 and NFPA 312–2000 *Standard for Protection of Vessels During Construction, Repair, and Lay-up* (Ex. 20–4). This requirement reflects the current practice in the industry, and was recommended by the Committee.

The potential danger associated with unattended fuel gas and oxygen hoses or torches in confined spaces is apparent and universally accepted. Leaking fuel gas and oxygen from unattended hoses or torches can accumulate rapidly in confined spaces leading to several hazardous conditions such as increased fire hazards, oxygen-enriched atmospheres, explosive atmospheres, and similar conditions. This paragraph seeks to eliminate the hazards associated with unattended fuel gas and oxygen hoses or torches in confined spaces.

A number of comments were received on § 1915.503(b)(2), stating that these paragraphs were not the intent of the Committee (Exs. 21–4; 21–5; 21–6; 21–7; 21–13; 21–17–1–1; 22–2). Some commenters stated that the Committee intended these requirements only for charged lines, not lines in general. (Exs. 21–8; 21–17; 21–17–1). These commenters stated that (b)(2)(i) would require the burner to leave someone to attend his or her torch while the burner returned to the supply manifold to turn

on the gas. Two of these commenters raised the question of what OSHA's practice will be with the "no unattended \* \* \* lines" wording (Exs. 21–7; 21–13). Other than minor editorial changes, the requirement in § 1915.503(b)(2) is the language voted upon and approved unanimously by the Committee. In addition, this will eliminate the hazard of leaving leaking lines in a confined space. The provision does not require two employees because the burner can turn on the gas and transport the torch with a charged line to the confined space. If the burner leaves the confined space, the burner can take the torch to an enclosed space, where it can be left unattended for 15 minutes. The final standard maintains the provision as proposed.

In § 1915.503(b)(2)(ii), OSHA requires employers to prohibit unattended charged fuel gas and oxygen hose lines or torches in enclosed spaces for more than 15 minutes. The language in this paragraph was adapted from 29 CFR § 1910.252 and § 1915.52 and NFPA 312–2000 *Standard for Protection of Vessels During Construction, Repair, and Lay-up* (Ex. 19–4). The potential for fire or explosion caused by unattended charged lines in enclosed spaces far outweighs the burden of pulling to open air or disconnecting.

Paragraph (b)(2)(ii) received a number of comments related to what would be considered "charged." NGNN stated that:

NGNN considers the word "charged" to mean that the gas is shut off at the supply manifold or cylinder and that the hose is not required to be disconnected so as to maintain the integrity of the original drop test. We are concerned that the proposed language in 1915.503(b)(2)(ii), if interpreted to mean that the line must be disconnected during unattended periods of 15 minutes or more, would permit the re-connection of the hose without positive verification of line integrity and thus create the potential for gas to be released in an enclosed space. Furthermore, we believe re-connecting and performing a drop test with the hose and torch left in place below deck is poor practice and even unsafe since gas could be released while the torch operator is determining that the line is open or leaking. Proven and equally or more protective alternative methods, such as described below, are currently used that minimize the risk in the event that hose integrity is compromised. (Ex. 21–8).

In addition, NGNN recommended that the standard be revised to read: "No unattended fuel gas or oxygen hose lines or torches are in enclosed spaces for more than 15 minutes unless the gas supply manifold or cylinder valves are closed and the hose lines are inspected or a positive means is used to verify there is no gas leakage, prior to re-

opening the manifold or cylinder supply valves." (Id.)

Other commenters considered lines to be uncharged when:

[T]he gas supply [is] turned off at the manifold valve and/or cylinder valve only, and hose connection [is] not disconnected from the supply. This would allow the hose to not be charged with pressure supplied by the manifold, or cylinder, only the pressure of a drop test. The hose should not be disconnected, interfering with the integrity of the original drop test, and requiring that the drop test be redone. Disconnection of the hose could result in the possibility of mistaken connections (Exs. 21–10; 22–1; 22–6; 22–13).

OSHA's interpretation of "charged line" is any line that is connected to the manifold and filled with gas. Until all of the contents are discharged from the lines, there is the potential of a leak, a cut line, or a disconnection, all of which could contribute to a fire. Therefore, we do not agree with NGNN's recommendation and are maintaining this interpretation in the final rule.

OSHA finds that fuel gas or oxygen in charged hose lines has the potential to empty into an enclosed space and create a fire hazard. Therefore, the final rule includes the provision as proposed, which is consistent with the Committee's recommendation, consensus standards, and sound fire safety practice.

In paragraph (b)(2)(iii) of § 1915.503, the employer must ensure that employees disconnect all fuel gas and oxygen hoses at the supply manifold at the end of each shift. This reduces the possibility of releasing gas into an enclosed space and creating a fire hazard. However, this procedure requires the employer to make sure that hoses are safely reconnected. As described in the preamble to the proposed rule (67 FR 76225), OSHA is concerned about the possibility of hooking up at the supply manifold a different (wrong) hose whose torch end was left hanging in an enclosed space. If the wrong hose is reconnected, it may disperse oxygen and fuel gas into a space without anyone knowing, thus creating a fire or explosion hazard.

OSHA deals with this potential problem in paragraph (b)(2)(iv) of § 1915.503. When fuel gas and oxygen lines are to be disconnected, the employer has two options. One is to completely roll the lines back to the supply manifold or to open air and then disconnect the torch. The other is to use a positive means of identification on the fuel gas and oxygen hose lines before rolling out or extending the line to assure that the proper extended lines are disconnected and that the proper lines

will be reconnected, thus eliminating the hazard. Selecting the positive means of identification for the fuel gas and oxygen hose lines is left to the discretion of the employer. Examples of the positive means of identification include color coding, stamped brass tags, and stenciling of both ends of the line. Using performance language as an alternative to requiring specific methods to identify the lines provides employers with flexibility and will help to nurture developing technology in these areas.

In an identical comment, several commenters objected to proposed paragraphs (b)(2)(iii)(A) and (B), as follows:

The preamble on pages 76225, paragraph 9 misrepresents current industry practice with regard to the use of gauges to test for compression integrity. Only one or two shipyards use gauges for the integrity test. The implied necessity of gauges imposes a large cost for many shipyards, and leaving the existing language in the final rule makes it incumbent on the shipyard to demonstrate that their practice exceeds a gauge as a means of ensuring integrity. Further, the "locking" system described in the preamble ensures positive identification, but does nothing to ensure integrity as implied in the discussion. As a result, we recommend that the language in the proposed rule be changed to:

"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 positive means to insure the integrity of fuel gas and oxygen burning system is identified in employer fire plan" (Exs. 21-4; 21-5; 21-6; 21-7; 21-13; 22-2).

OSHA disagrees with these comments. As discussed above, the employer could use stenciling of both ends of the line, color coding, stamped brass tags, and so forth to identify the lines. Of course, the lines must be identified at both ends regardless of how many sections are joined to create the run. While the preferred way to maintain integrity of the lines is the drop test using gauges, the employer may use other methods such as testing a pressurized system by using soapy water at all connections. The use of gauges may also be avoided entirely by rolling hoses back to open air.

Therefore, apart from the minor editorial changes, the only difference between the provisions of the final rule and the proposed rule is that the sections have been renumbered from § 1915.503(b)(iii)(A) and (B) to § 1915.503(b)(iii) and (iv). Thus, paragraph (iii) clarifies that the hoses must be disconnected, and paragraph (iv) makes clear that two options are available to the employer to assure that hoses are properly reconnected. The employer may roll the lines back to the

supply manifold or to open air and then disconnect the torch, or the employer may keep the lines in place, identify the hose lines to assure that the proper lines are reconnected and check them for integrity. OSHA has also added a definition of "drop test" to the rule, as discussed in the definitions section below.

#### *Section 1915.504 Fire Watches*

The fire watch requirements of this section are divided into three parts: (a) The employer's written policy on fire watches; (b) the posting of a fire watch; and (c) fire watch assignments.

#### *Written Fire Watch Policy*

Paragraph (a) of § 1915.504 requires employers to create and keep current a written policy on fire watches. This written policy must specify the training that fire watches must receive (paragraph (a)(1)); the duties that they will perform (paragraph (a)(2)); the equipment that they will be given (paragraph (a)(3)); and the personal protective equipment (PPE) necessary for fire watches in the workplace (paragraph (a)(4)). The PPE that fire watches will need is specified in 29 CFR Part 1915 Subpart I Personal Protective Equipment. OSHA did not propose a specific format for the written policy, and none has been included in the final rule. OSHA recognizes that the employer needs the discretion to tailor the policy to its workplace.

No comments were received on the proposed text in paragraphs (a)(1) through (a)(3); OSHA is adopting them in this final rule without changes. One comment was received regarding paragraph (a)(4) of § 1915.504. Atlantic Marine recommended that: "[T]he wording of this proposed rule be changed from 'must be given' to 'must be made available' to ensure consistency with 29 CFR 1915.152(a)—Provision and use of [personal protective] equipment" (Ex. 21-17-1). Proposed paragraph (a)(4) stated that employees "must be given" PPE as required in Subpart I, and § 1915.152(a) states that the employer shall provide and shall ensure that each affected employee uses the appropriate PPE. OSHA agrees with this comment and has revised this provision to read: "The personal protective equipment (PPE) must be made available and worn as required by 29 CFR Part 1915, Subpart I." With this wording, the employer has an obligation to provide the proper PPE to all fire watch employees. In addition, the employer must ensure that employees are wearing and utilizing each piece of PPE appropriately as required in § 1915.152(a).

#### *Posting Fire Watches*

Paragraph (b) of § 1915.504 requires the employer to post a fire watch during hot work if any one of eight specific conditions is present (each condition is discussed in detail below). OSHA's requirements for this paragraph are based on the Committee's recommendations.

Comments received stated that: "There is a question of whether this is an 'and' or an 'or' listing of fire hazards." These commenters recommended changing the language to read: "The employer must post a fire watch if during hot work any of the following apply:" (Exs. 21-3; 21-10; 21-15; 21-16; 22-1; 22-6; 22-7 through 22-11). OSHA agrees and the regulatory text has been changed to read: "The employer must post a fire watch if during hot work any of the following conditions are present."

Atlantic Marine stated that the proposed rule "[i]s cost burdensome to small and medium-sized shipyards." (Ex. 21-17-1). It requested that the eight conditions listed in § 1915.504(b) be replaced with the following language: "An employer must post a fire watch if a Marine Chemist, a Coast Guard-authorized person, or a Shipyard Competent Person, as defined in 29 CFR 1915 Subpart B, requires that a fire watch be posted." (Id.)

OSHA disagrees with this commenter. Paragraph (b) is a compilation of conditions that could, according to the Committee, arise in any size shipyard employment, including small, medium, and large shipyards. The current § 1915.52(b)(3) requires:

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 insure that no possibility of fire exists. Such personnel shall be instructed as to the specific anticipated fire hazards and how the fire fighting equipment provided is to be used.

The new requirements for fire watches should not therefore pose any additional burdens on employers, and will provide additional guidance for employers to help them determine when a fire watch is necessary. OSHA has concluded that these provisions are necessary and has included them in the final standard.

Paragraph (b)(1) of § 1915.504 requires controlling ignition sources for work processes that generate slag, weld splatter, or sparks that might pass through an opening and cause a fire. It has been adapted from NFPA 51B-1999

Standard for Fire Prevention During Welding, Cutting, and Other Hot Work, (Ex. 19–3) and § 1910.252(a)(2)(iii)(A)(3). The intent is to have a performance oriented requirement. If a spark can get through an opening and cause a fire, then the area must be protected. No change has been made to this provision in the final rule.

Paragraph (b)(2) of § 1915.504 recognizes that ignition sources can be controlled through the use of fire-resistant guards or curtains. Where the combustible materials cannot be protected from a possible ignition source, the employer must post a fire watch. Combustible materials can be protected through the use of fire-resistant guards or curtains. For example, a sandwich-type bulkhead could be safely protected from ignition of the combustible materials during hot work by using a fire-resistant guard or curtain. No comments were received on this paragraph. OSHA has adopted this paragraph without change.

Paragraph (b)(3) of § 1915.504 includes the 35-foot requirements (minimum distance of combustible materials from hot work) from the § 1910.252(a)(2)(vii) Subpart Q, Welding, Cutting and Brazing and NFPA 51B–1999 Standard for Fire During Welding, Cutting, and Other Hot Work (Ex. 19–3). In this paragraph, OSHA requires that an employer post a fire watch unless combustible materials are relocated to at least 35 feet beyond the hot work area, or are protected by shielding.

Numerous commenters objected to the 35 foot limit in this paragraph (Exs. 21–10; 21–15; 21–16; 22–1; 22–6 through 22–11; 22–14). In a representative comment, Bath Iron Works stated:

In many cases hot work can be safely performed within 35 feet from unprotected, unshielded combustible materials because the ignition source cannot physically reach the combustible material. The material is considered to be protected by location. For instance: The overhead of a space contains combustible insulation. A welder needs to weld a deck penetration in the space. The welder's sparks cannot physically reach the combustible materials on the overhead because of their location. This is considered to be guarded or shielded by location. It meets the intent of the standard by adequately preventing fires. The standard does not explain that if there is no potential for the hot work to ignite the combustible material then the 35-foot rule is not applicable (Ex. 21–3).

NGNN added:

[W]e recommend performance oriented language that requires the employer to ensure that combustibles are removed or protected when they could be ignited by the intended

hot work. Removing or shielding combustible materials for a distance of 35 feet when it is not necessary to prevent ignition places a significant financial burden on the employer with no added degree of safety. We estimate that the current language will cost NGNN approximately \$28 million dollars annually in labor alone. (Ex. 21–8).

NGNN recommended that paragraph (b)(3) be changed to read: “Combustible materials that could be affected by the intended hot work must be removed, protected with flame proof covers, or otherwise shielded with metal or fire resistant guards or curtains so that material will not be ignited by the hot work.” (Ex. 21–8).

The Committee discussed the 35-foot distance at length and agreed that if hot work is within 35 feet of combustible material in any way, a fire watch must be posted. The 35-foot distance has been in regulatory requirements and national consensus standards for many years and reflects the current industry practice. The Agency has concluded that such protection is reasonable and necessary, and has included the 35-foot rule in the final standard.

Paragraph (b)(4) of § 1915.504 addresses the hazards associated with combustible coatings, sandwich-type construction, or other insulating materials. Besides shielding, cutting back, removing the materials, and posting a fire watch, an industry practice for the acoustic foams that are commonly found in inaccessible voids within sandwich type construction is to inert the areas to make them safe for hot work. Industry practice in these situations has been to also provide fire watches with charged fire hoses or portable extinguishers as fire protection measures.

OSHA received many comments on this paragraph expressing a concern with the practice of inerting spaces (Exs. 21–8; 21–10; 21–15; 21–16; 22–1; 22–7 through 22–11). In a representative comment, Bath Iron Works stated:

The Summary and Explanation of the Proposed Rule further complicates matters by stating that “when flammable atmospheres are found adjacent to the hot work area, the employer can control the fire hazard by inerting the adjacent space with a non-reactive substance that will not support combustion.” OSHA should correct this statement as it falsely implies that the employer can inert flammable atmospheres. This promotes employers to prepare spaces that contain flammable atmospheres without seeking a Marine Chemist's assistance. This is a recipe for disaster if performed by an unqualified individual. Flammable atmospheres are covered under Subpart B where a Marine Chemist certificate is required for hot work. NFPA 306, Standard for the Control of Gas Hazards on Vessels, states that “The Marine Chemist will approve

the use of the inerting medium and personally supervise introduction of the inerting medium into the space being inerted, except in situations where an inerting medium has been introduced prior to the vessel's arrival at the repair facility.” It recognizes the hazards associated with the inerting process and places the responsibility with the Marine Chemist. It would be in OSHA's best interest to maintain this status quo (Ex. 21–3).

Recommendations for revising paragraph (b)(4) in the proposed standard from several commenters included (1) removing the language “or the space inerted;” (2) adding the words “or the space inerted by a Marine Chemist or Coast Guard authorized person;” and (3) adding the words “or the space inerted by a qualified individual” and identifying who is qualified. In addition, Bath Iron Works stated that “[T]he summary and Explanation should be corrected as it improperly states that employers can inert flammable atmospheres.” (Ex. 21–3).

OSHA agrees with these commenters that inerting a space is an activity that requires strict procedures to assure worker safety during the operation. However, it was not OSHA's intent to imply that the inerting of any space was an alternative. It was OSHA's intent to only allow inerting within the inaccessible space inside a sandwich type construction, not in any other confined or enclosed space. When an employer is dealing with a confined or enclosed space, the requirements for the use of a marine chemist under Subpart B continue to apply. To make it clear that the inerting allowed in § 1915.504 only applies in limited circumstances, OSHA has reworded the § 1915.504(b)(4) requirements as follows: “On or near insulation, combustible coatings, or sandwich-type construction, that cannot be shielded, cut back or removed, or on a space within a sandwich type construction that cannot be inerted.”

Paragraph (b)(5) of § 1915.504 addresses the potential hazards of adjacent spaces. This paragraph is adapted from existing § 1915.52(a)(3), which states: “[S]ince direct penetration of sparks or heat transfer may introduce a fire hazard to an adjacent compartment, the same precautions shall be taken on the opposite side as are taken on the side on which the welding is performed.” During hot work on or near insulation, combustible coatings, or sandwich-type construction on either side, if the employer cannot cut back or remove the materials or inert the space within the sandwich type construction, a fire watch must also be

posted on the opposite side of the hot work. This requirement is intended to address the increased fire hazard potential that results from hot work conducted in areas with, or adjacent to, polyurethane or other organic foams.

In cases where hot material from hot work could spread or fall over more than one level, as in trunks and machinery spaces, a fire watch must be stationed at each affected level unless positive means are available to prevent the spread or fall of hot material. Positive means could be accomplished by placing barriers or by physically isolating an area. The same is true for adjacent spaces; a fire watch must be stationed at each affected work area. In these instances, two or more employees may be needed to perform the fire watch. OSHA received no comments on this paragraph; it is carried forward in the final rule without change.

Paragraph (b)(6) of § 1915.504 requires a fire watch during hot work when it is performed on pipes or other metal in contact with insulation, combustible coatings, or combustible materials on or near decks, bulkheads, partitions, or overheads if the work is close enough to cause ignition by radiation or conduction. The Agency requested information from the industry on the use of the term "bulkhead" and "deck" since they refer only to vessels and vessel sections. Bath Iron Works stated that these terms "[a]re well known by the vast majority of shipyard employees." From a large shipyard's view point, bulkhead and deck is the proper method of identifying these structures." (Ex. 21-3-1). OSHA agrees and has maintained these terms in the final standard. No other comments were received on this paragraph and OSHA has carried it forward in the final rule.

Paragraph (b)(7) of § 1915.504 requires a fire watch if hot work is conducted close enough to combustible pipe or cable runs to cause ignition. This provision takes into account the large number of cable runs through vessel compartments. Although these cables must have low flame spread and smoke production rates, they are still combustible and have been responsible for the spread of fires. Also, the use of combustible piping is increasing, and although required to meet strict flame spread and smoke production criteria, the potential for fire spread through pipe runs is the same as through cable runs and should therefore be safeguarded.

In the one comment received on this paragraph, Bath Iron Works stated that:

Paragraphs (b)(5), (b)(6) and (b)(7) can be rolled into paragraph (b)(4). They all address

the potential for hot work to ignite combustible materials and the prevention methods are already listed in (b)(4), which are shielding, removal or inerting. It is unclear why these 4 paragraphs were treated separately as they appear to address the same hazard (Ex. 21-3).

Paragraph (b)(4) contains a general requirement to post a fire watch when hot work is being performed on or near insulation, combustible coatings, or sandwich type construction that cannot be protected, while the three following paragraphs provide detailed guidance for specific situations. Paragraph (b)(5) requires a fire watch when there is a fire danger caused by combustible material on the opposite side of the object on which hot work is being performed. Paragraph (b)(6) requires a fire watch when hot work is being performed in proximity to insulated materials and combustible materials or coatings, and paragraph (b)(7) requires a fire watch when hot work is being performed near unprotected combustible pipe or cable runs. OSHA believes that these paragraphs provide additional information describing the specific circumstances when a fire watch is needed, and will be of value for employers, employees, and safety professionals who are determining when a fire watch is required. OSHA has therefore maintained the regulatory language in the final standard.

#### Assigning Employees To Fire Watch Duty

Paragraph (c) of § 1915.504 outlines the assignment of fire watch duty. Proposed paragraph (c)(1) of § 1915.504 stated that the employer must not assign other duties to an employee assigned to fire watch. OSHA has further clarified in the final standard that an employee must not be assigned other duties when designated as fire watch by the employer while hot work is in progress. The fire watch posting is crucial to maintaining safe working areas. For example, welders with their shields down rely totally on the fire watch's observations. The watch should not be distracted by having other duties assigned at the same time.

Two commenters stated that:

[T]here are a variety of other duties that can be accomplished by a fire watch that will not interfere with his/her ability to perform their duties as a fire watch, and in some cases may serve as a means of fire prevention, including activities such as removal and management of potentially combustible material generated during the hot work operations, assisting with welding lead and burning line management, positioning of local area ventilation, etc. We suggest that the language in § 1915.504 (c)(1) be amended to read; "The employer may only assign other

duties to an employee assigned to fire watch, that will not interfere with the performance of a fire watch's primary duty;" \* \* \*. (Exs. 21-17-1; 22-2).

Another recommendation was: "The employer may only assign other duties to an employee assigned to fire watch, while the hot work is [not] in progress." (Exs. 21-4; 21-5; 21-6).

A group of commenters stated:

[T]his entire section defines the duties of a fire watch. It specifically states that the employer cannot assign any additional duties to this employee. It appears to have been written with a focus on a fire watch's reactions to a fire, rather than a fire watch helping to prevent and/or eliminate the potential for fire. Assigning a fire watch implies that a fire hazard exists and someone has determined it is necessary to implement additional controls. The proposed standard's description of a fire watch's duty must provide latitude for the employer to permit the fire watch to maintain safe conditions. Duties such as keeping fire resistant guards or curtains wet, ensuring that fire resistant guards or curtains are maintained in their original position and general housekeeping must be permitted. Preventing fires should be an integral part of a fire watch's duty. In the preamble, OSHA recognized the importance of maintaining conditions. Recommendation: Rewrite § 1915.504(c)(1) "The employer must not assign other duties to an employee assigned to fire watch that would prevent him or her from performing their fire watch duties. Fire watch duties may include, for example, watching for and extinguishing incipient fires, ensuring that fire resistant guards or curtains are maintained in their original position, general housekeeping and maintaining the conditions of the area to eliminate combustible hazards" (Exs. 21-10; 21-15; 21-16; 22-1; 22-6; 22-7 through 22-11).

OSHA does not agree that fire watches should have other duties, such as those mentioned in the comments, while hot work is in progress. Fire watches must not have any distractions while performing their duties. The point is not that they only react to actual fires, but that they observe incipient fires as soon as possible. Accidents and fatalities have occurred where fire watches have been busy with other tasks or not directly observing employees performing hot work. It is crucial that a fire watch have only one task at hand "to watch for and respond to fire hazards that occur during hot work. Should that employee be distracted in any way by performing another task, the safety of other employees is at risk.

OSHA does agree with the comments that under certain conditions the fire watch should be able to assist with fire prevention duties. In order to effectively carry out the fire watch duties, the fire watch must not perform other duties during hot work. After the hot work is



completed, however, the fire watch must remain in the area for at least 30 minutes to assure that there is no further fire hazard, unless the employer or its representative surveys the area and determines that there is no further fire hazard. During this 30-minute period, the fire watch can perform other fire prevention duties. When hot work is not being performed, there is no longer a fire watch, and the fire watch can perform other work.

If the employer has authorized hot work under § 1915.503, the area must be free of fire hazards and deemed safe for the hot work. Therefore, the employer only needs to address a change in the original conditions, such as combustible material or an out of position fire curtain. Immediate action to maintain fire hazard free conditions under § 1915.503(b)(1) is required. In this situation, the fire watch is allowed to stop the hot work and assist with fire prevention activities, such as wetting down a fire blanket, repositioning a fire curtain, and removing combustible debris that has entered the area. OSHA has modified the language of § 1915.504(c)(1) to prohibit the assignment of other duties "while hot work is in progress," and has added a requirement in § 1915.504(c)(2)(iii), (discussed below) for the employer to authorize the fire watch to stop work, if necessary, and restore safe conditions in the area.

Paragraph (c)(2)(i) requires that a fire watch must have a clear view of all areas assigned. Depending on the specific circumstances, two or more employees may be required in the fire watch to assure that all areas are within view. For example, a fire watch employee may be needed on each side of a bulkhead on which hot work is being performed. This requirement also effectively precludes a hot work employee acting as his or her own fire watch.

Paragraph (c)(2)(ii) of § 1915.504 requires the employer to ensure that employees assigned to fire watch duty can communicate with workers exposed to hot work. Communication is important because a fire watch employee may not be able to see a hot worker when, for example, the fire watch employee is on the other side of a bulkhead from the hot worker (a situation that may require two or more employees to perform the fire watch). OSHA does not want to limit the means of communication. For example, in the case of a fire watch employee on the other side of the bulkhead from the employee doing hot work, the means may be as simple as tapping on the bulkhead to signal whether the hot

worker can continue or must stop, or it could be an electronic communication system such as radio communication.

NGNN commented that an additional provision should be included in this paragraph:

Duties of fire watch and hot workers should include maintaining and reestablishing safe conditions if conditions are altered during their absence. Recommend: that a new paragraph (2)(iii) be added: "Ensures that safe conditions are maintained within the area affected by the hot work." (Ex. 21–8).

OSHA agrees that this is a useful addition to the paragraph. In addition to detecting potential fires, the fire watch should also ensure safe conditions. Fire watches are trained to detect fires and can attempt to extinguish any fire in the area if they are qualified and able to do so. If they are not qualified or able to extinguish the fire, they then must alert employees and activate the alarm, which will start the evacuation procedures. All of these factors qualify as ensuring safe conditions. As discussed above, OSHA agrees with the above recommendation of adding a provision that would ensure that safe conditions are maintained. This does not impose any additional requirements on the employer, and is consistent with the remaining provisions in § 1915.504(c). Therefore, OSHA has added the following provision at (c)(2)(iii) requiring the employer to assure that employees assigned to fire watch duty: "Are authorized to stop hot work, if necessary, and restore safe conditions within the work area." The remaining provisions in § 1915.504(c) have been renumbered.

Proposed paragraph (c)(2)(iii) of § 1915.504 specified that the fire watch must remain in the hot work area at least 30 minutes after hot work is completed. The fire watch can be relieved sooner if the employer or the employer's representative surveys the exposed areas, conducts a post-work hazard assessment, and determines that no further fire hazard exists. Obviously, this determination can only be made after a hazard assessment is completed. The intent of this provision is to encourage employers or their representative to use the hazard assessment process throughout the work—at the beginning, middle (to see if conditions have changed), and at the end (to determine how long the fire watch may be needed). No comments were received on the proposed provision and OSHA has carried it forward in the final rule renumbered as (c)(2)(iv).

Proposed paragraph (c)(2)(iv) of § 1915.504 required that the employer

ensure that employees assigned to fire watch duty are trained to detect fires that occur in areas exposed to hot work. (For a further explanation, see the Training section at § 1915.508.) Proposed paragraph (c)(2)(v) of § 1915.504 required that the fire watch must attempt to extinguish any incipient stage fires in the assigned work area that are within the available equipment's capacity and within the fire watch's training qualifications as defined in § 1915.508 Training. The term "incipient stage fire" is defined in the general industry fire protection standard 29 CFR 1910.155(c)(26): "Incipient stage fire means a fire which is in the initial or beginning stage and which can be controlled or extinguished by portable fire extinguishers, Class II standpipe or small hose systems without the need for protective clothing or breathing apparatus." In its proposal, OSHA specifically asked whether this definition needed to be in the final standard (67 FR 76228). No comments were received on this subject. However, the Agency has added this term into the definitions (see § 1915.509 for discussion). Proposed paragraphs (c)(2)(iv) and (v) have been carried forward unchanged in the final standard but have been re-numbered as (c)(2)(v) and (c)(2)(vi).

Proposed paragraph (c)(2)(vi) of § 1915.504 required that the fire watch alert employees of any fire that goes beyond the incipient stage. The method the fire watch uses to alert other employees is not specified. The fire watch can alert in the way most suited to the worksite and conditions. Whether this is accomplished by shouting, radioing across bulkheads, waving of arms, or making hand signals is left up to the employer who will have to instruct the fire watch. In a noisy working environment, it might be most appropriate to tap hot workers on the shoulder and then motion to them to follow or exit the area. In a smoky situation, vocal communication would be more appropriate. Proposed paragraph (c)(2)(vii) of § 1915.504 stated that if fire watches are unable to extinguish fire in the areas exposed to the hot work, they must activate the alarm and start the evacuation procedure as trained, according to § 1915.508(c)(2)(xi) and the employer's fire safety plan, § 1915.502. No comments were received on these paragraphs, and they have been carried forward in the final standard re-numbered as (c)(2)(vii) and (c)(2)(viii).

Paragraph (c)(3) of § 1915.504 requires the employer to ensure that employees assigned to fire watch are physically capable of performing these duties.



During the Committee meetings, there was a concern that each member of a fire watch be able to do his or her job. Although there was much discussion on the issue, the Committee did not include a requirement stating that the employer must make sure that personnel who are expected to stand fire watch be capable of carrying out the duties of fire watch. The Committee members believed that the employer would be the best judge of physical capability and mental alertness of the fire watch. OSHA, therefore, did not include such a requirement in its proposal. Nevertheless, Bath Iron Works commented that:

There are no physical requirements for the fire watch to comply with. This has been a common Labor/management conflict and a cause for concern.\* \* \* Management may select employees on "light duty" (not capable of lifting an extinguisher) to act as a fire watch, or choose not to hire others that cannot perform the function as a result of a physical limitation. In either case, only employees that are physically capable of utilizing the fire extinguishing equipment in a variety of scenarios such as: lugging an extinguisher down inclined ladders or up vertical ladders, hauling hoses, etc. should be assigned to this duty. By spelling out this requirement in the standard we can be assured that employees performing this critical function are those that are capably fit to do so. Recommend: Add a new paragraph (c)(4) The employer shall ensure that each fire watch is physically capable to carry out his/her expected functions (Ex. 21-3).

Although it is the employer's responsibility to select an appropriate fire watch, OSHA feels that in performing this duty, the employer must assure that the employee be in good enough physical condition to fulfill his or her duties. For instance, an employee would need to have the use of both arms to lift and correctly use a fire extinguisher; be able to evacuate the work area if needed; and be able to communicate adequately in the event of a fire. If an employee cannot physically perform all of the duties of fire watch, the employer should not put that employee in such a work situation. Therefore, an additional requirement is being added to § 1915.504(c). Paragraph (c)(3) requires that: "The employer must ensure that employees assigned to fire watch are physically capable of performing these duties."

#### *Section 1915.505 Fire Response*

At present, OSHA does not have any specific requirements in Part 1915 for fire response in shipyard employment. This new section creates a standard that addresses shipyard fire response and is derived from the requirements of 29 CFR 1910.156 Fire brigades and from

some of the provisions in NFPA 1500-2002 *Standard on Fire Department Occupational Safety and Health Program* (Ex. 19-5).

Responders to shipyard fires encounter a complex set of fire hazards involving buildings, as well as vessels in dry-dock, underway, afloat, or docked alongside a quay. Fire responders need to be prepared to safely and successfully handle a wide range of fire scenarios, from a flammable liquid storage room in a shipyard building to oil-soaked rags in the engine room of a ship. The types of fires could include ordinary combustible materials (such as wood, paper, or cloth), flammable or combustible liquids (such as oil, fuels, paints, or chemicals), insulation and other materials that may give off toxic gases and smoke during a fire, electrical fires (involving energized motors, circuit controls, transformers, or wiring), or even a rare combustible metal fire (involving metals such as magnesium, or titanium).

A fire response organization, as defined in section 1915.509 Definitions, may be provided by: (1) Fire brigades; (2) shipyard fire departments; (3) private or contractual fire departments; and (4) municipal fire departments.

Consistent with the recommendations of the Committee, OSHA is requiring that the shipyard liaison's communication with an outside fire response organization address facility and layout familiarization and coordination protocols. Federal OSHA does not have jurisdiction over state and municipal fire departments or volunteers so the standard does not cover them. However, OSHA intends to promote coordination between the shipyard and the outside fire response organization so they can work together safely. OSHA believes that any fire response organization that expects to respond to shipyard fires will benefit from the coordination activities required by this standard, and will be able to respond to fires faster, more effectively, and with greater safety for the shipyard workers and their own fire response members.

OSHA also wants to be clear that shipyard fire responders do not include support personnel responding at or near fires who have only limited support functions to perform. These support functions may include providing information to fire responders, and securing utilities, such as electrical, ventilation, and compressed air and oxy-fuel lines. These support personnel are not expected to fight fires but to perform such tasks as shutting down gas lines or disconnecting electrical service that support the fire response personnel.

NFPA submitted a statement in support of this provision.

NFPA also supports the proposed requirements in § 1915.505 pertaining to Fire Response. The negotiated rulemaking committee highlighted a number of issues during its deliberations related to the complex fire hazards that could be encountered by any fire response unit, whether shipyard personnel or outside fire response organization. Shipyard fires could involve structural fires associated with the shipyard buildings or the fires could occur on the vessels during construction or repair. This fact about the potential locations for fires demonstrates the complex nature of the task facing any response unit. The Committee relied on OSHA's Fire Brigade requirements from 29 CFR 1910.156 and those requirements from NFPA 1500, *Fire Department Occupational Safety and Health Program* to develop a comprehensive standard that specifically addresses the shipyard fire response structure and function. NFPA commends OSHA for using voluntary consensus standards where applicable in this proposed standard. (Ex. 21-14).

#### *Employer Responsibilities*

In paragraph (a)(1) of § 1915.505, the shipyard employer is required to determine who will perform fire response in the shipyard and what type of response will be provided. Some shipyard employers, typically those with very large facilities, employ full-time shipyard firefighters and provide them with response apparatus and equipment. At the other end of the spectrum are employers at small shipyards who must rely largely on public fire protection. Because fire response capabilities vary widely within the shipyard industry, each shipyard employer must take responsibility for determining who will provide fire response services and what those services will be.

Paragraph (a)(2)(i) of § 1915.505 requires the employer to create and maintain a written policy that describes the internal and outside fire response organizations that the employer will use. In the proposal, OSHA required a "written statement or policy" (67 FR 76248) in § 1915.505. Upon further review, OSHA was concerned that this would cause some confusion with other requirements in subpart P. Therefore, the Agency decided to alter the language in § 1915.505 to read "written policy" in all requirements that were proposed as "written statement or policy." This word change can be found in paragraphs (a)(2)(i) and (ii), (b)(1), (b)(2), (b)(3), (b)(4), and (b)(5) of § 1915.505.

Paragraph (a)(2)(ii) of § 1915.505 requires the employer to create, maintain, and update a written policy that 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. No comments were received on paragraphs (a)(1) to (a)(3), and OSHA is carrying them forward in the final rule.

#### Required Written Policy Information

Paragraph (b) of § 1915.505 describes the information that must be included in the written policy required by this section. The written policy must set forth the basis for operating an internal fire response service, working with an outside fire response service, or using a combination of internal and outside fire response. A key point is to set out clearly the specific functions the fire response service is authorized and expected to perform. Employers must establish the specific functions that the fire response service will provide. The employer also must furnish the necessary resources for delivering the designated services. Such services might include structural fire response, emergency medical services, hazardous materials response, high-angle rescue, and heavy rescue.

OSHA requires in paragraph (b)(1) of § 1915.505 that, if the employer chooses to provide internal fire response, then the employer must create, maintain, and update a written policy that defines the fire response to be provided. The information would include the organizational structure of the fire response service; the number of trained fire response employees; the minimum number of fire response employees necessary; the number and types of apparatuses; a description of the fire suppression operations at the employer's facility; training requirements; expected fire response functions that may need to be carried out; and procedures for use of protective clothing and equipment. Spelling out the specific parameters of services to be provided allows the fire response service to plan, staff, equip, train, and deploy members to perform these duties.

Similarly, OSHA requires in paragraph (b)(2) of § 1915.505 that, if the employer chooses to use an outside fire response organization, then the employer must include specific information in the employer's written policy. The policy must include the following: The types of fire suppression incidents to which the fire response organization is expected to respond at the employer's facility or worksite (paragraph (b)(2)(i)); the liaison between the employer and the outside fire response organization (paragraph (b)(2)(ii)); and a plan for fire response functions (paragraph (b)(2)(iii)). This

plan for fire response functions must include procedures for obtaining help from other fire response organizations (paragraph (b)(2)(iii)(A)), familiarizing the external 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 (paragraph (b)(2)(iii)(B)). The plan must also set forth how hose and coupling connection threads are to be made compatible and where the adapter couplings are kept (paragraph (b)(2)(iii)(C)), or, as an alternative, must state that the employer will not allow the use of incompatible hose connections (paragraph (b)(2)(iii)(D)).

OSHA further requires in paragraph (b)(3) of § 1915.505 that, if the employer chooses to use a combination of an internal and an outside fire response organization, then the employer must define the fire response services in addition to the requirements in paragraphs (b)(1) and (2) above, that will be provided by each fire response organization. Specifically, the following information must be included: The basic organizational structure of the combined fire response; the number of combined trained fire responders; the fire response functions that need to be carried out; the minimum number of fire response employees necessary; the number and types of apparatus; 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 the type, amount, and frequency of joint training with the outside fire response organizations if given to fire response employees (paragraphs (b)(3)(i) through (v)).

Paragraph (b)(3) requires that the employer develop a written policy that describes joint training activities if such training is part of the employers plan. However, OSHA is not requiring fire responders from an outside fire response organization to participate in joint training because the standard does not apply to such outside fire organizations. The employer must make sure that the internal and external fire responses are coordinated so that the fire response is safe and effective. It would be sensible and responsible to coordinate training efforts between the two groups of fire responders. OSHA strongly recommends that internal and outside fire responders participate in joint training. In addition, it would be responsible to have the outside fire response organizations involved in the development of the written policy.

Paragraph (b)(4) of § 1915.505 addresses OSHA's longstanding policy that employers must ensure employee safety through evacuation in case of fire. The employer's evacuation policy must include the following: Emergency escape procedures; procedures to be followed by employees who may remain longer in the worksite to perform critical shipyard operations before they evacuate; procedures to account for all employees after emergency evacuation is completed; the preferred means of reporting fires and other emergencies; and names or job titles of the employees or departments who may be contacted for further information or explanation of duties. These requirements are based on similar requirements found in the general industry standards for employee emergency plans and fire prevention plans (29 CFR 1910.38 and .39).

Paragraph (b)(4)(i) requires that emergency escape procedures be included in the written policy. Emergency escape procedures in shipyard employment can vary greatly depending upon whether the worksite is located on a vessel or vessel section or in a land-side facility. For example, on a vessel at anchorage, escape routes from the vessel may be more difficult to identify than those found in land-side facilities, such as a machine shop, welding shop, cafeteria, employment office, or similar worksite. Paragraph (b)(4)(ii) requires procedures to protect employees who must remain behind to perform critical shipyard operations before they evacuate. Critical shipyard operations may include shutting down a vessel's power plant, securing utilities to the fire area, or similar activities. Additionally, accountability procedures for all employees following emergency evacuation must be established, as set forth in paragraph (b)(4)(iii). For example, employees could be directed to report to a specific location after evacuation. Another important element of the evacuation policy, found in paragraph (b)(4)(iv), is the preferred means of reporting fires or other emergencies. Examples include telephone or radio communications, fire alarms, steam whistles, verbal communication, or other tactile, visual, or audible means of communication at the employer's discretion. Finally, as a means to administer the evacuation policy effectively, the written policy must indicate the key individuals by name, job title, or department to be contacted for further information or explanation of duties under the policy, paragraph (b)(4)(v).

Paragraph (b)(5) requires that the employer include a description of the

emergency rescue procedures and names or job titles of the employees who are assigned to perform rescue and emergency response. OSHA received no comments on any of the requirements in § 1915.505(b), and is carrying them forward in the final standard.

#### Medical Requirements for Shipyard Fire Response Employees

Paragraph (c) of § 1915.505 addresses the physical and medical provisions for shipyard fire response employees. In paragraph (c)(1) of § 1915.505, OSHA requires that all fire response employees receive medical examinations to assure that they are physically and medically fit for the duties they are expected to perform. This approach is consistent with NFPA 600–2000 (Ex. 19–6) and NFPA 1500–2002 (Ex. 19–5), and with other OSHA standards, such as 29 CFR 1910.120 and 29 CFR 1910.156. Employees who perform fire response activities must be able to perform them properly without jeopardizing the safety and health of themselves and other firefighters. Fighting fires is a very hazardous and strenuous job. Some employees may not be physically able to engage in a fire response situation that would require hours of difficult and heavy-duty work. OSHA is requiring the employee's physical and mental fitness be in accord with the duties the employee will perform.

Paragraph (c)(2) of § 1915.505 requires that fire response employees who are required to wear respirators while performing their duties meet the medical requirements of § 1915.154 Respiratory protection. This requirement is consistent with 29 CFR 1910.134(c)(1) that requires employers whose employees use respirators to develop and implement a respiratory protection program. One of the elements of a respiratory protection program is providing medical evaluations for employees who use respirators.

Paragraph (c)(3) of § 1915.505 requires that the employer provide all fire response employees with an annual medical examination. Further, in paragraph (c)(4), medical records of fire response employees must be kept according to § 1915.1020 Access to employee exposure and medical records. These proposed requirements are consistent with existing regulations found in 29 CFR 1910.156 and 29 CFR 1910.134.

NGNN questioned the proposed requirements:

Does OSHA mean that a medical examination should be conducted to identify any condition that may interfere with a fire fighter doing his or her job, or does OSHA intend that shipyard fire fighters also meet

certain physical fitness standards? OSHA needs to address how the medical examination/physical standards requirement applies to shipyards that are unionized and have collective bargaining agreements in place. Can implementation be delayed for the remainder of the current agreement's term? Or until a fixed date, or are employers and unions required to reopen and negotiate impact and implementation of the new standards? This requirement should receive much more detailed consideration. (Ex. 21–8).

The employer is responsible for ensuring that employees are qualified for the fire response activities. The fire response employees must be able to perform their duties and not create another hazard by jeopardizing the safety and health of themselves or others. OSHA has not set specific physical fitness standards that the fire response worker must meet. It is up to the employer to determine the physical fitness level that will be needed to keep each fire response person safe. This will depend upon the duties each of them is assigned.

Likewise, OSHA has not included any provisions to account for existing union agreements. The employer is responsible for addressing any issues related to union bargaining agreements. Employees must be protected equally under the standard, whether or not a union contract is in effect. In summary, without an annual examination, the employer can not be sure that the fire responder is able to do the job at hand. Therefore, OSHA has adopted this provision as proposed.

#### Organization of Internal Fire Response Functions

Paragraph (d)(1) of § 1915.505 requires the employer to organize its fire response functions to ensure that there are enough resources to safely conduct emergency operations at the site. This language is consistent with the goals and language of paragraph 4.1.1 of NFPA 1500–2002 (Ex. 19–5) addressing the fire department's organizational statement. No comments were received on paragraph (d)(1) and OSHA has included it in the final rule as it was proposed.

In paragraph (d)(2) of § 1915.505, OSHA proposed that the employer: “[s]et up written administrative regulations, standard operating procedures, and departmental orders for fire response functions.” The proposed language was based on Chapter 4 of NFPA 1500–2002 addressing the organization of fire response providers and Chapter 2.1 of NFPA 600–2001 addressing the general administration of industrial fire brigades.

No comments were received on paragraph (d)(2). However, upon reconsideration, OSHA has decided that the requirement was not easily understood, and it was unclear how it differed from the written policy requirements for internal fire response proposed at § 1915.505(b)(1). Therefore, OSHA has modified § 1915.505(d)(2) using NFPA 600–2001 to require employers to: “Establish lines of authority and assign responsibilities to ensure that the components of the internal fire response are accomplished.” This language provides a clearer description of the provision's requirements than the terms “administrative regulations” and “departmental orders.” There is no need to include a requirement for “standard operating procedures,” as they are already required in § 1915.505(b)(1).

In paragraph (d)(3) of § 1915.505, OSHA requires the employer to set up an Incident Management System (IMS) to coordinate and direct fire response functions. This system must include specific fire emergency responsibilities; how the employer will account for all fire response employees during an emergency operation; and what resources would be offered by outside organizations. This is consistent with the goals and language found in paragraph 8.1 of NFPA 1500–2002.

The Connecticut Department of Labor raised a question regarding the provision, asking: “Why does the proposed standard change the customary verbiage of incident command system to incident management system? Will this confuse fire departments that will also be involved in the firefighting?” (Ex. 22–4).

While the Incident Command System (ICS) term is customary language often used by firefighting professionals, OSHA proposed to use the IMS term to be consistent with the terms currently in use by firefighting organizations and training institutions. The most recent NFPA standards use the IMS term, including NFPA 1500–2002 Fire Department Occupational Safety and Health Program, NFPA 600–2000 Requirements for All Industrial Fire Brigades, and NFPA 1561–2000 Emergency Services Incident Management System. In addition, the IMS term is commonly used by organizations that train firefighters. For example, individual courses on incident management are currently offered by the Maryland Fire and Rescue Institute (<http://apps.mfri.org>) and the Federal Emergency Management Agency National Fire Academy (<http://www.usfa.fema.gov/fire-service/nfa/nfa.shtm>). Because the IMS is the

preferred term, OSHA is using the IMS term in the final rule.

OSHA is also modifying the proposed definition of IMS in § 1915.509 to match the definition used by NFPA in NFPA 1500–2002, which is: “A system that defines the roles and responsibilities to be assumed by personnel and the operating procedures to be used in the management and direction of emergency operations; the system is also referred to as an incident command system (ICS).” This modification does not change the meaning or intent of the proposed term, and is more consistent with the NFPA’s use of IMS.

Paragraph (d)(4) of § 1915.505 requires that employers provide specified information to the outside fire response organization to be used. These provisions are consistent with existing OSHA requirements (29 CFR 1910.120 Hazardous waste operations and emergency response and 29 CFR 1910.156 Fire brigades). No comments were received on paragraph (d)(4), and it is included in the final standard.

#### Personal Protective Clothing and Equipment for Fire Response Employees

Paragraph (e) of § 1915.505 contains the requirements for providing personal protective clothing and personal protective equipment for shipyard fire response personnel. Paragraph (e)(1) requires that the employer must provide fire response employees with hazard specific personal protective clothing and equipment at no cost to the employees. The employer must also make sure that each employee wears the appropriate personal protective clothing and equipment that offers protection from the hazards to which that employee is likely to be exposed. This is consistent with the language found in Chapter 7 of NFPA 1500–2002 (Ex. 19–5). It is also consistent with existing OSHA standards.

In § 1915.505(e)(2), OSHA states the requirements for thermal stability and flame resistance or protective clothing. Paragraph (e)(2)(i) requires the employer to make sure that each fire response employee exposed to flame hazards wears clothing that minimizes the extent of injury that the fire response employee would sustain. Paragraph (e)(2)(ii) specifically prohibits the wearing of clothing made from acetate, nylon, or polyester, either alone or in blends, unless it can be shown that the fabric can withstand the flammability hazard that could be encountered, or that the clothing is worn in such a way to eliminate the flammability hazard that may be encountered. This language is consistent with the language in existing OSHA standards and in

paragraph 7.1.6 of NFPA 1500–2002 (Ex. 19–5).

Paragraph (e)(3) of § 1915.505 addresses respiratory protection for shipyard fire response employees. Under paragraph (e)(3)(i), the employer must provide self-contained breathing apparatus (SCBA) to all shipyard fire response employees who are involved in emergency operations in an atmosphere that is or may become immediately dangerous to life or health (IDLH), or is unknown. This language is consistent with existing OSHA standards and paragraph 7.8.7 of NFPA 1500–2002 (Ex. 19–5).

Under paragraph (e)(3)(ii) of § 1915.505, the employer must provide SCBAs to fire response employees performing emergency operations during hazardous chemical emergencies that will expose them to airborne chemicals. OSHA recognizes that there may be a potential for employee exposure to hazardous chemicals during fire response emergencies due to the nature of shipyard employment. This requirement would limit employers to the use of SCBAs for this type of chemical exposure.

Under paragraph (e)(3)(iii) of § 1915.505, the employer must provide either SCBA or respiratory protective devices to fire response employees who perform or support emergency operations that will expose them to hazardous chemicals. The SCBA or respiratory device must be certified as required in § 1910.134, and as required by NIOSH under 42 CFR Part 84 as suitable for the specific chemical environment.

Under paragraph (e)(3)(iv) of § 1915.505, the employer must ensure that additional outside air supplies used in conjunction with respirators be positive pressure systems and certified by NIOSH under 42 CFR Part 84. Again, this is consistent with existing OSHA standards and paragraph 7.10.1.1 of NFPA 1500–2002 (Ex. 19–5). No comments were received on paragraphs (e)(3)(i) through (e)(3)(iv) and OSHA has adopted them as proposed.

Under paragraph (e)(3)(v) of § 1915.505, the employer must provide SCBAs that meet the requirements of NFPA 1981–1997, Standard on Open-Circuit Self-Contained Breathing Apparatus for the Fire Service (Ex. 19–7). This is standard equipment for all fire response organizations throughout the country.

NAVSEA stated that: “The latest version of National Fire Protection Association (NFPA) 1981, Standard on Open-Circuit Self-Contained Breathing Apparatus for Fire and Emergency Services is 2002 versus 1997.” (Ex. 22–

15). In the proposed rule (67 FR 76231). OSHA proposed using the 1997 version. Thus, adequate notice and comment on updating to the 2002 version has not been provided. As a result, the 1997 version is referenced in § 1915.505(e)(3)(v) in the final standard. With publication of this document, OSHA recognizes that several of the NFPA standards have been revised since the proposed rule was published. OSHA intends to publish a direct final rule to update the references to the most recent NFPA standards in the near future.

In § 1915.505(e)(3)(vi), OSHA requires that the employer ensure that the establishment of a respiratory protection program and use of respiratory protective equipment is in compliance with § 1915.154 Respiratory protection. Similar requirements are found in 29 CFR 1910.134, and 29 CFR 1910.156 for general industry. The Connecticut Department of Labor raised the following:

§ 1915.505(e)(3)(vi) mandates compliance with 29 CFR 1915.154, which in turn incorporates by reference 29 CFR 1910.134. Does the language of this subsection of the proposed section which mandates compliance with the respiratory protection program of § 1910.134, include the procedures for IDLH atmospheres referenced in § 1910.134(g)(3) and (4) of the respiratory standard, including the requirement for what’s known as two in and two out? (Ex. 22–4).

As the State of Connecticut points out, OSHA states in § 1915.154 that respiratory protection for shipyards is covered under 29 CFR 1910.134. Therefore, shipyard employment is covered by the entire section, which would include § 1910.134(g) as well as all other provisions of § 1910.134.

Paragraph (e)(4) of § 1915.505 addresses personal protective equipment for fire response employees who are exposed to the hazards of interior structural firefighting within shipyard employment. The employer must provide, at no cost to the employee, helmets, gloves, footwear, and protective hoods, and either protective coats and trousers, or protective coveralls that meet the applicable recommendations in NFPA 1971–2000 Standard on Protective Ensemble for Structural Fire Fighting (Ex. 19–8). Paragraph (e)(4) is based upon Chapter 7 of NFPA 1500–2002 (Ex. 19–5). OSHA received no comments on this paragraph, and the proposed language is carried forward in the final standard.

Under paragraph (e)(5), the employer must, at no cost to employees, supply all fire response employees who are exposed to the hazards of proximity

firefighting with the appropriate protective proximity clothing that meets the applicable requirements of NFPA 1976–2000, *Standard on Protective Ensemble for Proximity Fire Fighting* (Ex. 19–9). Only shipyard employees who engage in operations that expose them to the intense radiant heat of a proximity firefighting incident (the proximity hot zone) must be equipped with specialized proximity firefighting protective clothing. No comments were received on this provision and OSHA has adopted it as proposed.

Under paragraph (e)(6) of § 1915.505, the employer must provide a Personal Alert Safety System (PASS) device to each fire response employee involved in firefighting operations. The PASS devices must meet the recommendations in NFPA 1982–1998 *Standard on Personal Alert Safety Systems (PASS)* (Ex. 19–10). This requirement is consistent with paragraph 7.13.1 of NFPA 1500–2002 (Ex. 19–5) and no comments were received. The provision is adopted as proposed.

A PASS is a device that is attached to or is an integral part of self-contained breathing apparatus (SCBA). It automatically sounds a distinctive alarm (some units also display a flashing strobe light) if a fire response employee becomes immobile for a pre-determined period of time (usually 30–40 seconds). For example, the device would be activated in the event a fire responder becomes incapacitated from structural collapse or runs out of breathing air. Fire response employees who might become trapped or lost can also activate the device manually to help searchers locate them. The shrill alarm allows rescuers to locate the wearer quickly in dark or heavy smoke conditions. The alerting sound of a PASS can easily be distinguished from a low air supply alarm emitted by a SCBA. PASS devices are now considered standard issue for fire fighters and are recommended by NFPA 1982–1998. (Ex. 19–10).

Section 1915.505(e)(7) addresses life safety ropes, body harnesses, and hardware. No comments were received on these provisions and they are being adopted as proposed. Under paragraph (e)(7)(i), OSHA requires all life safety ropes, body harnesses, and hardware used by fire response employees for emergency operations to meet the applicable requirements of NFPA 1983–2001, *Standard on Fire Service Life Safety Rope and System Components* (Ex. 19–11). This is consistent with Subpart I of this Part and paragraph 7.14.1 of NFPA 1500–2002 (Ex. 19–5). Under paragraph (e)(7)(ii) of § 1915.505, the employer may allow only Class I

body harnesses to be used to attach fire response employees to ladders and aerial devices. This is consistent with NFPA 1983–2001 (Ex. 19–11). Under paragraph (e)(7)(iii), the employer may only allow Class II and Class III body harnesses to be used by fire response employees for fall arrest and rappelling operations. This is consistent with NFPA 1983–2001 (Ex. 19–11). No comments were received on paragraph (e)(7) and OSHA has carried it forward in the final rule.

#### Equipment Maintenance

Paragraph (f) of § 1915.505 addresses the maintenance of personal protective equipment and fire response equipment. Under paragraph (f)(1), the employer must inspect and maintain personal protective equipment used to protect fire response employees to ensure that it provides the intended protection. Such inspection and maintenance is consistent with OSHA's personal protective equipment standards, § 1910.132.

Under paragraph (f)(2), the employer must test and maintain fire response equipment consistent with sound safety practices and the requirements for tools and equipment found in Chapter 7 of NFPA 1500–2002 (Ex. 19–5). Paragraph (f)(2)(i) requires the employer to keep fire response equipment in a state of readiness. In paragraph (f)(2)(ii), the employer must make sure that all fire hose coupling and connection threads are standardized throughout a 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.

If the employer uses an outside fire organization for fire response, and the employer expects them to use the fire response equipment belonging to the employer, then under paragraph (f)(2)(iii), the employer must ensure that either all of its facility's hose and coupling connection threads are the same as those used by the outside fire authority or that suitable adapter couplings are supplied. This requirement is consistent with paragraph 9.3 of NFPA 14–2000 (Ex. 19–12). The Agency did not receive any comments on this paragraph, and the provisions are being adopted as proposed.

#### Section 1915.506 Hazards of Fixed Extinguishing Systems on Board Vessels and Vessel Sections

This section addresses the hazards associated with fixed extinguishing systems on vessels and vessel sections that could create a dangerous atmosphere when such systems are

activated. Of particular concern is the incorrect or inadvertent activation of these systems. Fixed fire extinguishing systems at land-side facilities are covered by the next section of this proposed subpart, § 1915.507 *Land-side fire protection systems*.

The hazards associated with the use of fixed extinguishing systems on vessels and vessel sections have long been recognized by the United States Coast Guard as evidenced by Coast Guard Commandant Notices and Instructions that date from 1978. The International Maritime Organization (the United Nations' specialized agency responsible for improving maritime safety and preventing pollution from ships) has also addressed this issue by issuing regulations that are part of the International Convention for the Safety of Life at Sea (SOLAS).

Testing vessels' fixed extinguishing systems has led to several fatalities. In October 1996, aboard the Italian flag ship SNAM PORTVENERE, an American Bureau of Shipping surveyor and five shipyard technicians were killed when carbon dioxide (CO<sub>2</sub>) was released accidentally from a fixed fire extinguishing system that was being tested. On May 3, 1993, while a contractor was testing a low-pressure CO<sub>2</sub> system aboard the M/V CAPE DIAMOND that protected the ship's engine room, CO<sub>2</sub> was discharged accidentally, causing the deaths of a Coast Guard marine inspector and a shipyard contractor. Additionally, an intentional activation of a manual CO<sub>2</sub> extinguishing system aboard the Australian naval vessel HMS APPLELEAF caused the accidental death of four persons. These incidents were attributed to human error in which the discharge of CO<sub>2</sub> extinguishing systems protecting spaces aboard vessels was allowed to occur while employees were working inside.

This section has gone through some modifications since the proposal. The section has been modified in several areas to address concerns raised by commenters, and to assure that the section adequately addresses the hazards associated with fixed extinguishing systems on board vessels and vessel sections.

#### Employer Responsibilities

The Committee recognized, and OSHA agrees, that although the casualty history reveals problems only with CO<sub>2</sub> systems, similar hazards exist for the use of new extinguishing agents and application methods. Therefore, the employer's responsibilities under paragraph (a) of § 1915.506 apply to all fixed extinguishing systems on vessels

and vessel sections that may result in a dangerous atmosphere if discharged. It is very likely that the only systems that may be affected by this standard will be those that employ gaseous or two-phase (gaseous/liquid) extinguishing agents. However, by including all systems that may create a dangerous atmosphere when activated, the standard is broad enough to cover future systems and extinguishing agents. Examples of future possibilities include systems employing dry chemical extinguishing agents (these systems currently exist but are not typically installed on vessels), combination dual water/dry chemical systems, and systems using Halon alternative agents.

Several comments were received on paragraph (a) of § 1915.506, including:

The proposed standard does not recognize differences between fire suppression systems and different extinguishing agents.

Alternatives to CO<sub>2</sub> often do not present the same hazards as fixed CO<sub>2</sub> systems. \* \* \* Rewrite 1915.506(a) “\* \* \* The employer must comply with the provisions of this section whenever employees are exposed to fixed extinguishing systems charged with materials that could create hazardous atmosphere when activated aboard vessels and vessels sections, regardless of geographic location. Fixed systems that do not cause hazardous atmospheres when activated, including those charged with foam, inert materials, or water sprinklers, are not subject to this section.” (Exs. 21–10, 21–15, 21–16, 22–1, 22–6, 22–7 through 22–11).

NGNN stated:

NGNN agrees with the need to address controls required for working in spaces with fixed extinguishing systems. We believe that systems should remain armed only when the risk to the vessel and workers outweighs the risk if the system were to be inadvertently activated by the work being performed. Therefore, NGNN has instituted procedures and training to ensure work can be safely performed in those rare cases when a system must remain armed. However, our procedures recognize the greater risk posed by a carbon dioxide system versus less hazardous extinguishing media, such as halon. We recommend that OSHA consider the differences in various shipboard fire suppression systems that do not present the same risk as carbon dioxide systems. Some systems use the same compounds used in computer rooms across the country and present far less risk than carbon dioxide systems. (Ex. 21–8).

Great Lakes stated that:

§ 1915.506 (a) of the proposed rule introduces ambiguity. The rule should be clarified so that “exposure to fixed extinguishing systems that could create a hazardous atmosphere” refers to the properties of the agent itself and not to by-products of the combustion process or extinguishment. Actual fire events should be treated separately and require crew egress from the affected space prior to extinguishing

system discharge, as required by fire standards. Section 1–6.1.2 of NFPA 2001 standard for clean agent fire extinguishing systems deals with the issue of human exposure to the agent itself. While exposure to any clean agent should be minimized, the standard does specify safe human exposure times to clean agents at various design concentrations in normally occupied spaces. In the case of HFC–227ea (the active ingredient in FM–200 brand clean agent) the standards allow for installation of systems in occupied spaces up to the LOAEL (Lowest Observable Adverse Effect Level) of 10.5% v/v. In Table 1–6.1.2.18 of NFPA 2001, the recommended exposure time to HFC–227ea for concentrations of 10.5% v/v or less is five minutes. It should also be noted that HFC–227ea is approved by U.S. FDA as a replacement for ozone-depleting CFC propellants in asthma inhalers. In contrast, the standard for carbon dioxide extinguishing agent (NFPA 12) prohibits human exposure to the agent due to its inherent lethality. The time limit for safe human exposure is determined by the toxicological profile of each agent. Therefore, we recommend the proposed rule be revised to base worker exposure to any fire extinguishing agent on the agent’s human safety profile. We also recommend the proposed rule direct shipyard employers to follow safety procedures contained in the NFPA standard for their chosen fire suppression agent. (Ex. 22–5).

While developing this standard, the Committee discussed whether to include requirements for other systems that do not cause dangerous atmospheres when activated, such as foam and automatic water sprinkler systems. After extensive discussion, the Committee decided that a standard for these systems was not necessary because they are not typically relied upon on board vessels and vessel sections, and they do not pose a significant safety and health threat to employees. The Agency agreed and proposed to cover only systems that could create a hazardous atmosphere when activated. Both NGNN and Great Lakes supported the provision not applying when the extinguishing agent is not hazardous. OSHA continues to believe that this is the proper approach and has not altered this provision in the final standard. It is up to the employer to determine when a dangerous atmosphere will be created, either by the properties of the extinguishing agent, or the byproducts that may be produced when it is used. If a dangerous atmosphere will be created, the employer must take action under § 1915.506 to protect its employees.

#### Requirements for Automatic and Manual Systems

Under paragraph (b) of § 1915.506, the employer must protect its employees who may be exposed to a dangerous

atmosphere by a fixed fire extinguishing system by taking one of two actions. First, the employer may physically isolate the system by disconnecting or blanking, or by using other positive means to prevent the system’s discharge. This is possible for most types of shipyard work, and is the preferable method of protection because when the system is isolated, employees cannot be exposed to a dangerous atmosphere. However, OSHA recognizes that some shipyard work must be conducted with the system activated. In those situations, the employer must take the second form of action by ensuring that employees are trained to recognize the system’s discharge and evacuation alarms and the appropriate evacuation routes, and by ensuring that they are knowledgeable about the extinguishing system, its components, and its hazards.

In paragraphs (b), (e), and (f) of § 1915.506, the term “physically isolated” refers to physically preventing the extinguishing agent from entering the work area. This is typically done by installing a blank (a flat piece of metal between two flanges) in the supply line of the extinguishing system so that the extinguishing agent can not possibly be released into the protected area.

Several comments were received on proposed Paragraph 1915.505(b). Bath Iron Works stated:

There is confusion as to how the five paragraphs in this section fit together. The section addresses work in a space equipped with fixed extinguishing systems. It mandates that the system be physically isolated (para 1) or that employees be trained to recognize systems discharge, evacuation alarms and escape routes (para 2). It appears that there are three additional requirements (para 3, 4 and 5) to the options listed in paragraphs 1 and 2 and that all three must occur, as they are separated by the word “and.” If the system is isolated, as in paragraph 1, paragraphs 2–5 should not apply? After all there cannot be a discharge if the system is isolated. If employees are trained, as in paragraph 2, then all the following paragraphs should apply because the system is still energized and represents a potential hazard if activated. It appears that the word “and” was left off the end of paragraph 2. Recommend: Add the word “and” to the end of paragraph (b)(2). (Ex. 21–3).

OSHA agrees with Bath Iron Works that the proposed regulatory text was confusing because it combined “and” statements and “or” statements in a way that was difficult to follow. Therefore, the Agency has changed the regulatory text to clarify the requirements. Paragraph (b) of the final rule only includes the requirements for physical isolation of the system, or employee training, as discussed above. Paragraph



(b) now contains the provisions that were proposed as paragraphs (b)(1), (b)(2), and (b)(5). Paragraph (d) includes the actions that may be taken if activation of the system could result in a positive pressure in the protected space. Paragraph (d) now contains the provisions that were proposed as paragraphs (b)(3) and (b)(4). The remaining paragraphs of section 1915.506 have been renumbered consecutively.

Bath Iron Works stated:

It is not fully understood why work cannot be accomplished in a space that is protected by a fixed extinguishing system. The systems are installed to protect employees and equipment and there is "work" that does not pose a threat of an extinguishing system being activated. On the other hand, it is clearly understood that work that has the potential to activate an extinguishing system poses a real threat. If there is no threat why should any of the requirements in this section apply? The term "work" needs to be expanded to qualify it as "work that has the potential to cause system activation" or some other qualifying phrase. To expect the system to be physically isolated when routine work is to be performed in the space, without qualifying the type of work is unrealistic. Example: Prior to the vessel going to sea/sea trials all systems are operational, including fixed extinguishing systems. Typical work assignments at this stage of construction are to touch up paint that has been disturbed, or stencil piping systems. With all systems up and running, the protection of the fire extinguishing system is a safety feature that should not be eliminated. This section requires that it be deactivated, or that paragraphs 2 through 5 are complied with. Neither is feasible, nor do they provide additional protection to the employee".

\* \* \* Revise paragraph (b) to further define the intent of work. 'Before any work that has the potential to cause systems activation' (Ex. 21-3).

NASSCO stated: "The term 'any work' does not consider the work done during sea trials and other test activities that would not activate the system. We recommend that the paragraph read: 'any work that could activate the system' or 'any hot work.'" (Ex. 22-14).

OSHA believes that this comment relates to the confusion caused by the construction of the proposed regulatory text. The Agency concludes that the qualification in paragraph (a) limits the applicability of this section only to systems that create hazards. In addition, the employer may conduct work with the system activated, so long as employees are trained pursuant to paragraph (b)(2)(i) of § 1915.506. As discussed above, the employer must take one of two courses of action. First, the employer could physically isolate the system or have other positive means to prevent the system from discharging.

Second, the employer could train employees on the system's discharge and the associated hazards, and the evacuation alarms and routes.

If the employer chooses the second option, paragraph (b)(2)(i) of § 1915.506 requires employees to be trained to recognize fire extinguishing systems' discharge and evacuation alarms, and to recognize the appropriate escape routes. This training consists of making sure that employees, including the employees of contractors, recognize the discharge and evacuation alarms and escape routes in accordance with § 1915.508 of this subpart. Paragraph (b)(2)(ii) of § 1915.506, which was proposed as § 1915.506(b)(5), requires that employees be trained on the hazards of the fixed extinguishing system and the dangers associated with disturbing system components. Such components and equipment include piping, cables, linkages, detection devices, activation devices, and alarm devices. Employees in shipyards typically rig materials and equipment in and out of vessels and vessel sections using chain falls and come-alongs. Employees unaware of the dangers of disturbing system components could accidentally activate the system while in the process of rigging.

#### Sea and Dock Trials

Paragraph 1915.506(c) of the final rule requires employers to ensure that fire extinguishing systems are activated during sea and dock trials, which is a different requirement from proposed paragraph (c). The hazards that were addressed in the proposed paragraph (c) are now addressed in paragraphs (b) and (g). The proposed paragraph (c) addressed the risk of intentional or accidental activation of a manual system during sea or dock trials by requiring that all activation stations, whether remote or local, be secured under lock and key or an attendant posted. The intent was to prevent unauthorized persons access to the activation controls of a manual system because a manual system that is activated while employees are in the protected space may result in fatalities. During trials many persons are present who may not be completely familiar with the ship's operation, and OSHA believes that only authorized persons should have the authority and ability to manually activate the systems when employees are working in the protected spaces.

Bath Iron Works stated:

The intent of this paragraph needs to be clarified or the paragraph deleted. Does it pertain only to sea trials or dock trials included? What constitutes work? Many spaces protected by fixed manual systems are

manned spaces. The personnel assigned to these spaces perform "work" of various types. The space should be protected by a fire extinguishing system especially during sea trials. If employees are trained, as is required by proposed paragraphs (b)(2) and (b)(5), they will not activate the system unless it is necessary because they know the hazards associated with it. To keep the pull stations under lock and key prohibits immediate use if the need presented itself. If an unauthorized person wanted to activate the system, a lock is not going to stop him, nor is a guard. \* \* \* Delete this entire paragraph as it does not increase the level of safety for employees and the hazard has been addressed in previous paragraphs. (Ex. 21-3).

Several commenters stated: "This paragraph should be deleted from the proposed rule because it was written before paragraph (b) contained all of the sub-paragraphs as it currently does. Therefore, paragraphs (b)(1) and (2) provide the same coverage as paragraph (c)." (Exs. 21-4; 21-5; 21-6; 21-7; 21-13; 22-2).

NGNN recommended that:

[O]SHA delete this paragraph. No Captain, Vessel Owner, or employer should put the safety of their vessel and personnel in peril by locking out the fire suppression system if it is the designated means of fire protection for the compartment. We have not experienced malicious activation of a fire suppression system and believe it sends the wrong message to lock out or otherwise prevent the use of a fire suppression manual activation device. If a system is to be disarmed, then it should be properly isolated, not by locking out the manual pulls. If it is determined that the risks of disarming the system outweigh the risks of leaving it armed then the manual pulls should be left available for use and workers should be trained on the proper actions to take in the event the system is activated. (21-8).

Several commenters stated:

While a vessel is on sea trials, the extinguishing system must remain operational and ready for activation to protect the vessel in the event of a fire. A tag would be sufficient to inform that personnel are in the space. Recommendation: 1915.506(c) be reworded 'Before any work \* \* \*, the employer must ensure that during sea trials activation stations are tagged, informing personnel they are in the protected space.'" (Exs. 21-10; 21-15; 21-16; 22-1; 22-6; 22-7 through 22-11).

OSHA agrees with these commenters, and has deleted the requirement to lock the manual fire suppression system. Although the intent of the proposal was to prevent accidental activation of the system, it also may have prevented employees from activating the system when needed in an emergency situation. In its place, OSHA has added a provision to require the systems to be operational during sea and dock trials, which is consistent with the views of

the commenters that these systems should always be available for use during trials. While on a sea trial, the shipyard fire response employees, or outside fire response, would not be able to access the vessel. Therefore, the extinguishing systems must be operational at all times. While OSHA does not agree that paragraph (b) alone provides sufficient protection from the hazard posed by manually activating a system while employees are within the protected space, OSHA has determined that the hazard is adequately addressed by the combined provisions of paragraphs (b) and (g). Paragraph (g) covers the use of fixed manual extinguishing systems, and is discussed below.

#### Doors and Hatches

Paragraph (d) of § 1915.506 was proposed as paragraphs (b)(3) and (b)(4). This section was included as a result of United States Coast Guard information about a casualty at sea. (67 FR 76233) In this incident, the chief engineer inadvertently discharged CO<sub>2</sub> into a space with an inward opening door. Members of the crew were unable to open the door until pressure in the space subsided. During that time, crewmembers trapped in the space were asphyxiated. As a result of this incident, the Coast Guard recommended that during inspections, CO<sub>2</sub> storage provisions and means of escape should be evaluated. The Coast Guard stated further that protective measures should be provided, such as making sure that doors open outward, that there are kick-out panels in doors or bulkheads, that doors are blocked open when the space is occupied, or that there are sufficient vent openings to the atmosphere. These recommendations are also recognized in the United States Coast Guard Marine Safety Manual, COMDTINST 16000.7, Vol. II (Ex. 17) and SOLAS 74/78 (Ex.18), which require outward opening access doors in CO<sub>2</sub> protected spaces aboard vessels.

Paragraph § 1915.506(d)(1) addresses the concerns about inward opening doors, hatches, scuttles, and other potential barriers that may close off escape routes as a result of system activation. The paragraph requires that, when employees are working in a space with inward opening doors, the doors must be removed, locked open, braced, or otherwise secured so they will not close and trap employees in the space. OSHA recognizes that placing a blocking device in a fire door is normally an unacceptable practice. However, in order to comply with the requirements of § 1915.506(d)(1), because of the hazard of asphyxiation,

OSHA will allow a fire door to be blocked open, as long as the blocks are removed when the employees are no longer working in the protected space.

Paragraph (d)(2) of § 1915.506 (proposed paragraph (b)(4)) requires that all inward opening doors, hatches, scuttles, and other potential barriers to safe exit must be removed, locked open, braced, or otherwise secured so that they remain open and accessible for escape. This is to ensure that, in the event of the systems' activation that could result in a positive pressure in the protected spaces that all employees would be able to safely escape.

Great Lakes stated that:

[T]o operate a vessel at sea with doors, hatches and scuttles in the closed position ensures the fire suppression system operates as designed, but violates the proposed rule. To operate the vessel with doors, hatches and scuttles locked in the open position complies with the proposed rule, but places the ship in grave danger should a fire break out. To isolate, lock out or otherwise render an extinguishing system inoperable while under way, or to keep all doors, hatches and scuttles locked open ensures that the agent will fail to reach its extinguishing concentration and hold time. Gaseous agents such as FM-200 (HFC-227ea) depend on achieving a specific design concentration in the protected space and maintaining that concentration until it is determined that the fire has been successfully suppressed. The inability to maintain the agent's design concentration (e.g., open doors and hatches) can quickly lead to an uncontrollable fire, severe damage and a potentially life-threatening situation. (Ex. 22-5).

Several other commenters recommended that: "1915.506 (b)(3) be changed by inserting the language "[I]n the protected spaces, the emergency exit route doors, hatches or scuttles remain open and accessible," [and] 1915.506 (b)(4) insert the language: "[I]n the protected spaces, the emergency exit route doors, hatches, scuttles or other potential barriers to safe exit must be removed. \* \* \*" (Exs. 21-10; 21-15; 21-16; 22-1; 22-6; 22-7 through 22-11).

Bath Iron Works stated:

OSHA needs to define positive pressure or clarify the intent of this paragraph. Many naval ships are designed to maintain positive pressure in spaces, including machinery spaces, via their ventilation system. Positive pressure is only an issue if it is great enough to prevent escape via inward opening doors. To mandate that these be removed, or locked open, prevents the halon fire extinguishing system from extinguishing the fire because compartment integrity has been compromised. A greater hazard has been created in complying with the standard. \* \* \* Revise the paragraph to show that the requirements apply only if the positive pressure is great enough to prevent the opening of inward opening doors. This can be achieved by the following revision: "If

systems activation could result in a positive pressure great enough to prevent the opening of doors in the protected spaces, all inward opening doors, hatches, scuttles \* \* \*." (Ex. 21-3).

The purpose of this section is to protect employees who might be exposed to hazardous conditions when they are trapped by doors that are sealed by positive pressure within the space. If the fire suppression system will not create a pressure sufficient to seal an inward opening door, the paragraph does not apply. This section specifically protects the lives of employees working in protected spaces while a fixed extinguishing system is activated. For example, employees working in a shaft alley are in a confined space. Should the alarm be activated, the door(s) will shut automatically, creating a trapping situation for those employees. Although some vessels may have an escape hatch, not all vessels have such hatches. In this circumstance, employees must be trained to block open those doors when entering the space to conduct work. Should the system be activated, the alarm will sound and the employees will leave the space immediately. Upon their exit, they should remove the blocks and shut the door behind them, thus allowing the fire suppression system to perform as designed. By training employees to block those doors open, the trapping hazard is then abated. The Coast Guard, the Committee, and OSHA agree that this section will save lives.

#### Testing the System and Conducting System Maintenance

Paragraphs (e) and (f) (formerly (d) and (e)) of § 1915.506 address system testing and system maintenance operations. Testing and maintenance have been demonstrated to be the most likely causes of accidental system activation. The Coast Guard currently requires fixed fire extinguishing systems to be disconnected when undergoing any testing or maintenance. The need for these requirements is demonstrated clearly by the fatalities that occurred while testing the fixed system on the M/V CAPE DIAMOND mentioned above. As a result of this incident, the Coast Guard recommended that personnel in spaces protected by CO<sub>2</sub> systems be evacuated during testing, unless suitable safeguards are instituted, such as isolating the CO<sub>2</sub> supply from the protected space or providing personnel with self-contained breathing apparatus (SCBA).

OSHA proposed to both physically isolate the system and to evacuate non-essential personnel during testing because testing of such a system



typically results in alarm activation and could result in a discharge of the extinguishing agent, putting any employees in the space in danger of death or injury.

Bath Iron Works stated:

The paragraph mandates both "physically isolating" the system and evacuation of employees not directly involved in "testing the system." The standard does not explain what "testing the system" means. Judging from the summary and explanation the concern is during a system's concentration test when extinguishing media is actually discharged into the space so the concentration can be measured. This really confuses the intent of this paragraph for the following reasons. (1) You cannot test a physically isolated system because the definition of physically isolated in this standard prevents the system from being hooked to a supply, (2) If the system is physically isolated there is no potential for discharge so evacuation is unnecessary and (3) If there was a potential for the discharge of extinguishing media into a space, then all personnel should be evacuated not just those, "not involved in the testing." This paragraph is extremely confusing. \* \* \* Assuming that the committee's intent is to protect employees during a concentration test, revise the paragraph to read "The employer will ensure that the protected space and affected adjacent spaces are evacuated during system's testing that could result in the discharge of extinguishing media into the space."

**Note:** There is no need to specify vessels and vessel sections as it is the title of this part. (Ex. 21-3).

NGNN commented:

Does this mean that it is acceptable for personnel directly involved in testing to remain in the compartment during actual discharge? \* \* \* Delete the words, "not directly involved in testing it." The modified paragraph will then read, "The employer must make sure that the system is isolated and that all employees are evacuated from the protected spaces when levels of extinguishant can prevent self rescue, before testing any fixed extinguishing system" (Ex. 21-8).

These commenters are correct in noting that there are two types of tests that are performed on automatic fire extinguishing systems. One method involves the total release of extinguishing medium into a space (total flooding), while the other does not. As noted by the commenters, the proposed rule did not address the hazards caused by each type of test, making the proposed rule confusing, and providing inadequate protections for testing involving total flooding. To make the requirement clearer, and to make sure that appropriate protections are in place for employees who may be exposed to hazards by each type of test, OSHA has revised paragraph (e) to address both types of testing.

Paragraph § 1915.506(e)(1) addresses the first test in which the system is intentionally activated to determine whether or not it will introduce sufficient fire extinguishing material to be effective. In this case, the final standard requires the employer to ensure that all employees are evacuated from the space and that no employees remain in the space during the discharge, as recommended by the commenters. OSHA is requiring that, after the discharge of the extinguishing medium into the space, the employer must ensure that the atmosphere is safe for employees to reenter. OSHA is requiring the employer to follow the requirements found in § 1915.12, *Precautions and the order of testing before entering confined and enclosed spaces and other dangerous atmospheres*. OSHA is adding these requirements to eliminate confusion. Paragraph § 1915.506(e)(2) addresses the second, and more common type of test, which involves the use of air or nitrogen as a replacement for the extinguishing medium so that sensors, valves, and heads can be tested individually for their proper operation. This type of testing is commonly performed during ship repair and maintenance work. To perform the test, technicians physically isolate the system's extinguishing medium and then activate individual components to verify proper function. Fire alarms are activated during this testing, and other employees in the area will not know if the alarm is part of the test, or if it is a real alarm. Therefore, the final standard requires the employer to physically isolate the system to assure that the system does not introduce extinguishing medium into the space, and to assure that any employees not directly involved in the testing are evacuated. This evacuation is a reasonable safety precaution because a real alarm may be ignored as a false or nuisance alarm by non-essential employees until it is too late to evacuate the space safely.

Paragraph (f) (proposed paragraph (e)) requires that the employer ensure that the system is physically isolated before conduction maintenance on a fixed extinguishing system. OSHA did not receive comment on this paragraph and has included it in the final rule without revision.

#### Using Fixed Manual Extinguishing Systems for Fire Protection

In paragraph (g) (formerly paragraph (f)) of § 1915.506, OSHA addresses the hazards associated with using fixed fire extinguishing systems by requiring that employees be trained and designated as necessary to operate and activate the

system properly. Further, OSHA requires that all employees be evacuated from spaces, and accounted for before the discharge of the system. As described in the preamble to the proposed rule, these requirements are necessary to prevent fatalities from overexposures to carbon dioxide (67 FR 76234).

Paragraph (g)(1) requires that only authorized employees be allowed to activate fixed manual extinguishing systems. This is based on the proposed requirement that would have required employers to lock out the manual pull stations or post an attendant at them. While OSHA determined that the systems should not be locked out, additional regulatory language was needed to clarify that not all employees should be able to activate a manual fixed extinguishing system. An authorized person must be available to activate the system, if necessary, following the evacuation of the employees who are working in the space. The authorized person or persons should be the only person to activate the system. This will alleviate the possibility of someone activating the system who has not been trained, or does not know what hazards are involved with the activation of the system.

OSHA is not instructing the employer on who should be an authorized person, or on the number of authorized persons they must train. These are determinations that need to be made by each employer. Authorized employees are required to be trained. Therefore, the employer must make the determination of the number of employees that will be authorized to activate the system. Should an employer desire to have all employees designated as authorized, those employees must be trained. Conversely, an employer may designate foremen, or senior employees, as authorized, and train those few employees.

Paragraph (g)(2) requires that authorized employees be trained to operate fixed manual systems when the employer expects these systems to be relied on in the event of a fire. This was proposed as paragraphs (f)(1), and OSHA has modified this provision to ensure that only authorized employees are trained to operate and activate the system. As proposed, the provision allowed for employees to be trained and designated. OSHA wanted to ensure that only authorized employees, rather than designated, would have access to activate the system. NGNN stated:

The paragraph could be interpreted to require us to designate and train our

employees to operate ship's fixed fire extinguishing systems. Current work practices on U.S. Navy vessels do not permit this action by non-Navy personnel. Responsibilities for fire response are established via contract, memorandum of understanding or other means depending on the stage of construction or repair. Similarly, other employers at a host site may not have authority to operate a particular fire extinguishing system, but should ensure their personnel understand their required actions in the event of a fire. Recommend: 1915.506 (f)(1) be changed to read as follows: "Employees are instructed on the appropriate actions to be taken in the event of fire or activation of the fire extinguishing system within the compartment. (Ex. 21–8).

OSHA does not agree with this commenter's suggested revision. The employer is responsible for making sure that someone is present who is designated to operate the manual fire suppression system and is trained to do so safely. Not all employees have the right or authorization to activate a system. The designation of employees to activate the system should come from an agreement with the shipyard, the vessel owner, and the captain to designate a person or persons. The person or persons who are selected need to be trained to operate and activate the system. In addition, Paragraph (g)(3) requires that all other employees need to be evacuated from the protected spaces and accounted for before the system is activated.

Paragraph (g)(3) of § 1915.506, proposed as (f)(2), requires that the protected space be evacuated completely and all employees accounted for before discharge of the fixed manual extinguishing system. OSHA received no comments on this provision, and it is included in the final rule as it was proposed.

#### *Section 1915.507 Land-Side Fire Protection Systems*

This section consolidates various existing requirements as well as providing references to current applicable national consensus standards. (See the proposal to the NPRM for a discussion of existing requirements (67 FR 76235).

#### *Employer Responsibilities*

Under paragraph (a) of § 1915.507, the employer must ensure that all fixed and portable fire protection systems installed to meet a particular OSHA standard comply with the appropriate requirements of this section. The provisions in this section do not apply to fixed or portable fire protection systems the employer has installed to meet requirements other than OSHA's,

such as local requirements, or ships systems.

#### *Portable Fire Extinguishers and Host Systems*

In § 1915.507(b), OSHA regulates the use of portable fire extinguishers and hose systems. By incorporating by reference NFPA 10–1998 Standard for Portable Fire Extinguishers (Ex. 19–1) in paragraph (b) of this section, the employer may replace up to one-half of the required complement of fire extinguishers by uniformly spaced 1-inch (3.8 cm) hose stations. If the employer chooses to use hose systems, then the employer must meet the recommendations of NFPA 14–2000 Standard for the Installation of Standpipe, Private Hydrant, and Hose Systems (Ex. 19–12). This is consistent with current OSHA practice under 29 CFR 1910.157 and 1910.158. The incorporation by reference in § 1915.507(b)(1) will permit some flexibility in offering protection for incipient stage fires.

In paragraph (b)(2) of this section, OSHA is allowing the employer to use hose lines attached to Class II or Class III standpipe systems in place of portable fire extinguishers if those hose systems meet the applicable selection, installation, inspection, maintenance, and testing requirements of NFPA 14–2000 Standard for the Installation of Standpipe, Private Hydrant, and Hose Systems (Ex. 19–12).

Several commenters were concerned about incorporating NFPA standards by reference:

This section requires installation, maintenance and testing in accordance with National Fire Protection Association (NFPA) standards. NFPA is not required to seek non-member participation in the development of standards. Also, these standards are not available free of cost to employers. These consensus standards have been a problem for the shipyard community because once they are incorporated by reference; the NFPA can change or impose a new regulation on industry without industry participation in the process. If OSHA incorporates these standards by reference, OSHA should provide the version that will be enforced to the regulated community, and ensure public participation in additional rulemaking that may result from changes to the standards (Exs. 21–4; 21–5; 21–6; 21–7; 21–13).

Reliance on national consensus standards such as those referenced here is a U.S. government policy. The U.S. Office of Management and Budget in Circular A–119 directs federal agencies to use voluntary consensus standards in lieu of government-unique standards except where inconsistent with law or otherwise impractical. The NFPA also includes the public during the process

of developing new codes and standards, and when NFPA standards are revised. OSHA incorporates consensus standards by reference only in the notice and comment rulemaking process, such as here. OSHA proposed incorporation, received public comment, analyzed the comments, and only then determined if the specific NFPA consensus standard would be incorporated.

NFPA does not provide free copies of their standards to the public. They must be purchased. Due to legal restrictions, OSHA cannot publish another agency or association's standards when OSHA incorporates them by reference into an OSHA standard. However, when OSHA does incorporate by reference, that particular standard or code is submitted to the **Federal Register** and to the OSHA Docket Office. As set forth in § 1915.5, the materials may be purchased from the organization that publishes them, and are available for inspection at the **Federal Register**, the OSHA Docket Office, or in OSHA regional offices. Apart from minor editorial changes, paragraphs (a) and (b) in § 1915.507 are carried forward unchanged in the final standard.

#### *General Requirements for Fixed Extinguishing Systems*

Under § 1915.507(c), OSHA addresses the general requirements of fixed extinguishing systems the employer must install to meet a particular OSHA standard. In paragraph (c)(1), OSHA requires the use of fixed extinguishing systems that have been approved by a National Recognized Testing Laboratory (NRTL). This is consistent with OSHA's current practice of requiring that all fire protection equipment and systems are approved for their purpose and design by a NRTL.

In paragraph (c)(2) of § 1915.507, OSHA requires that employers notify employees and take the necessary precautions to protect employees when a fire extinguishing system becomes inoperable. Precautions must remain in place until the system is working again.

In paragraph (c)(3) of § 1915.507, OSHA also requires that a qualified technician or mechanic repair any inoperable system. This requirement is consistent with current fire protection standards (29 CFR 1910.160 and NFPA 12–2000).

OSHA requires in § 1915.507(c)(4) that when an area remains hazardous to employee safety or health as a result of the discharge of an extinguishing agent, effective safeguards must be provided to warn employees not to enter the discharge area. This is consistent with the requirements in § 1910.160(b). Should an employee need to enter this

discharge area for emergency reasons, personal protective equipment must be provided. An emergency could include the rescue of another employee or to shut down equipment or processes to ensure that additional conditions do not arise.

This paragraph is necessary because some systems are designed to discharge extinguishing agents in concentrations greater than is safe for humans. These systems have the potential to create a hazard to employees and need special consideration and control. OSHA has incorporated the requirements in § 1910.160(b) in this final standard, recognizing that the hazards of such systems need to be identified and controlled in shipyard employment. This is particularly true of systems using carbon dioxide and some of the newer Halon replacement agents. OSHA is also adding a sentence to this paragraph directing the reader to § 1915.12, *Precautions and the order of testing before entering confined and enclosed spaces and other dangerous atmospheres*, for additional requirements for entry into dangerous atmospheres created by the discharge of certain extinguishing agents.

In paragraph (c)(5) of § 1915.507, OSHA requires the employer to post hazard warning or caution signs at both the entrance to and inside of areas protected by fixed extinguishing systems that could discharge extinguishing agents in concentrations that are known to be hazardous to employee safety or health. This is consistent with paragraph (b)(5) of 29 CFR 1910.160.

In § 1915.507(c)(6), OSHA requires the employer to select, install, inspect, maintain, and test all automatic fire detection systems and emergency alarms according to NFPA 72–1999, National Fire Alarm Code (Ex. 19–13). Several technological advancements have occurred in both fire detection and fire alarm technology in recent years. Incorporating NFPA 72–1999 as the OSHA standard for designing and installing all fire detection and alarm systems will provide employees with protections consistent with protections provided by other codes and standards used by local authorities having jurisdiction or other building codes. No comments were received on paragraph (c), and OSHA is carrying it forward in the final standard.

#### Fixed Extinguishing Systems

In § 1915.507(d), OSHA requires that the selection, installation, maintenance, inspection, and testing of specific types of fixed fire extinguishing systems meet the requirements of particular NFPA

standards. The Agency received no comments on this paragraph and has adopted it in the final standard.

In paragraph (d)(1), OSHA requires that standpipe and hose systems in land-side facilities follow the requirements in NFPA 14–2000 Standard for the Installation of Standpipe, Private Hydrant, and Hose Systems (Ex. 19–12).

In § 1915.507(d)(2), OSHA is incorporating by reference NFPA 13–1999 Standard for the Installation of Sprinkler Systems (Ex. 19–14); NFPA 750–2000 Standard on Water Mist Fire Protection Systems (Ex. 19–15); and NFPA 25–2002 Standard for the Inspection, Testing, and Maintenance of Water-based Fire Protection Systems (Ex. 19–16), to address the installation of OSHA-required automatic sprinkler systems in land-side facilities. NFPA 13–1999 and NFPA 750–2000 provide, respectively, requirements for automatic sprinklers and automatic mist systems. NFPA 25–5002 has maintenance and inspection requirements for both of these water systems.

In paragraph (d)(3) of § 1915.507, OSHA is incorporating by reference several NFPA standards with specifications for fixed extinguishing systems that use water spray or foam for the extinguishing agent. These include the NFPA 11–1998 Standard for Low-Expansion Foam (Ex. 19–17); NFPA 11A–1999 Standard for Medium- and High-Expansion Foam Systems (Ex. 19–18); and NFPA 15–2001 Standard for Water Spray Fixed Systems for Fire Protection (Ex. 19–19). In paragraph (d)(4) of § 1915.507, OSHA is incorporating by reference NFPA 17–2002 Standard for Dry Chemical Extinguishing Systems (Ex. 19–20) for fixed extinguishing systems using dry chemical as the extinguishing agent.

In paragraph (d)(5) of § 1915.507, OSHA is incorporating by reference the current edition of NFPA standards that address fixed extinguishing systems using gas as the extinguishing agent. Specifically, OSHA is referencing NFPA 12–2000 Standard on Carbon Dioxide Extinguishing Systems (Ex. 19–21); NFPA 12A–1997 Standard on Halon 1301 Extinguishing Systems (Ex. 19–22); and NFPA 2001–2000 Standard on Clean Agent Fire Extinguishing Systems (Ex. 19–23).

OSHA recognizes that the fire-extinguishing agent Halon 1301 is being phased out because of environmental concerns. However, for economic reasons, existing Halon 1301 systems may remain in service until such time as an alternative agent replaces them. Therefore, OSHA is promulgating the requirements in § 1915.507(d)(5) for the

design and installation of Halon 1301 systems to ensure employee safety. For the systems that will replace Halon, OSHA is requiring that the employer meet NFPA 12–2000 Standard on Carbon Dioxide Extinguishing Systems (Ex. 19–21) or NFPA 2001–2000 Standard on Clean Agent Fire Extinguishing Systems (Ex. 19–23) for their design and installation. No comments were received on paragraph (d), and OSHA is carrying it forward in the final standard.

#### Section 1915.508 Training

Employee training is a critical element of an employer's program in combating the hazards of fire in shipyard employment. The proposed standard placed a specific emphasis on hazard recognition, fire watch, and fire response. This final standard has been reformatted and edited to provide clearer guidance for training employees who are required to evacuate during an emergency, expected to fight an incipient stage fire, designated as fire watch workers, or designated as fire response employees.

First, all employees need training on alarms and proper evacuation procedures. In some cases, employers may want some or all employees to evacuate the work area during a fire emergency and not respond to the fire, so limited training is needed. Second, the employer may decide to designate certain employees to fight incipient stage fires. For example, an employer may designate and train all shift supervisors, or security personnel, on fighting incipient stage fires, while the remaining employees evacuate the work area. These employees need basic knowledge of fire extinguishing equipment and the hazards they may face. Third, fire watch workers who are more likely to actually fight an incipient stage fire require additional training to allow them to perform this duty safely. Finally, fire response employees may be called upon to fight fires that have advanced beyond the incipient stage, and need advanced firefighting knowledge to perform this inherently dangerous work. This section has been reformatted and renumbered from the proposed standard to reflect the additional training requirements required for each type of employee.

Regardless of the amount of training that employees will receive, they must be trained within the time restrictions that are required in paragraph (a). Proposed paragraph (a) required that affected employees be trained when they first start working, or as necessary to maintain proficiency 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 they may use or to which they may be exposed during discharge of those systems; (3) the activation and operations of fixed and portable fire protection systems provided for their use in the workplace; (4) the emergency alarm signals, including system discharge and employee evacuation alarms; and (5) the primary and secondary evacuation routes they must use in the event of a fire in the workplace.

In the final standard, this paragraph has been divided into three new paragraphs. The final requirement in paragraph (a) requires that all employees be trained within 90 days from the effective date of this standard for employees currently working, upon initial assignment for new employees, and when necessary to maintain proficiency for employees previously trained. Under the proposed language, it was not sufficiently clear that the training requirements apply to both current and new employees. This final language is consistent with § 1915.502(c) to provide training for current and new employees. The requirement to train and retrain selected employees is based upon the requirements of 29 CFR 1910.157.

#### Employee Training

Proposed paragraphs (a)(1) through (a)(5) have been divided into two new paragraphs and renumbered. Proposed paragraphs (a)(4) and (a)(5) are now required for all employees in paragraph (b), regardless of their level of participation in fire response. Paragraph (b) requires that all employees be trained on the emergency alarm signals, including system discharge alarms and employee evacuation alarms, and the primary and secondary evacuation routes. OSHA has determined that all employees must be trained on these two basic fire safety issues to protect lives.

In proposed paragraph § 1915.508(a)(5), now paragraph (b)(2), regarding training on the primary and secondary evacuation routes a fire watch employee must use in the event of a fire in the workplace, OSHA proposed a note stating that vessels and vessel sections may not always have a secondary evacuation route (67 FR 76237). In the final rule, in paragraph (b)(2), OSHA has incorporated this note into the regulatory text and modified it to read: "While all vessels and vessel sections must have a primary evacuation route, a secondary

evacuation route is not required when impracticable." This change reflects OSHA's view that multiple evacuation routes provide a greater degree of safety for employees, and that the employer must provide a secondary route unless it is impracticable. The change is also compatible with the requirements of 29 CFR 1910.36, which requires two or more exit routes for buildings and other structures at the shipyard, with certain exceptions. Similar to the § 1910.36 standard, OSHA recognizes that there are circumstances where a second evacuation route is not practicable. In those situations, the employer must train employees only on the primary evacuation route. This change remains consistent with the recommendations of the Committee to recognize the uniqueness of vessels and vessel sections in comparison to buildings and other land-side structures, while providing greater clarity on the need for safe evacuation procedures.

Additionally, comments received on paragraph (a) stated: "This section should include an additional paragraph, which allows for a combined training session that incorporates all emergency training into one session" (Exs. 21-4; 21-5; 21-6; 21-7; 21-13; 22-2). The employer is already free to incorporate all training into one session, or to train all employees at the same time as long as all requirements are met. This requirement is performance-oriented. OSHA indicates what training is required and allows the employer to decide the best way to comply with all of the requirements.

#### Additional Training Requirements for Employees Expected To Fight Incipient Stage Fires

Proposed paragraphs (a)(1) through (a)(3) have been moved and are now included in the training requirements for those employees designated to fight fires in paragraph (c). These employees will be designated by the employer as employees who attempt to extinguish an incipient stage fire. Paragraph (c)(1) requires that these employees be trained on the hazards involved with incipient stage firefighting, and the procedures used to reduce these hazards, as well as the principles of using fire extinguishers or hose lines. In addition, paragraphs (c)(2) and (c)(3) require these employees to be trained on the hazards associated with fixed and portable fire protection systems that they may use or to which they may be exposed during discharge of those systems, as well as the activation and operation of fixed and portable fire protection systems that the employer expects them to use. Proposed

paragraphs (a)(1) through (a)(3) have been carried forward in the final rule.

#### Additional Training Requirements for Shipyard Employees Designated for Fire Response

These requirements were proposed as paragraphs (b)(1) through (b)(10), and have been renumbered as (d)(1) through (d)(10). In § 1915.508(d), OSHA addresses the additional training requirements for fire response employees and the training requirement that will replace paragraph (c) of § 1915.52. Fire response employees may be exposed to many hazards associated with fire suppression, including heat, flame, smoke, explosion, structural collapse, or hazardous materials. It is important that these employees are provided with training specific to what they might encounter. No comments were received on proposed paragraphs (b)(1) through (b)(8), and they are carried forward renumbered as (d)(1) through (d)(8).

In paragraph (d)(1) of § 1915.508, OSHA requires that the employer 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. This is consistent with the requirements found in 29 CFR 1910.156 and NFPA 1500-2002 (Ex. 19-5).

In paragraph (d)(2), OSHA requires the employer to keep written standard operating procedures that address anticipated emergency operations and to update these procedures as necessary. Emergency operations are activities, such as rescue, fire suppression, and emergency medical care that are performed by a fire response organization. In some incidents, these emergency operations may include special operations, such as hazardous materials response (HAZMAT), HAZMAT release mitigation, standby for flight operations, protection of structures exposed to nearby off-site fires, or mutual-aid at other workplaces. Written standard operating procedures are training tools and represent the best practice in the industry. This is consistent with the language in paragraphs 3-1.5 and 3-1.8 of NFPA 1500-2002 (Ex. 19-5).

In § 1915.508(d)(3), OSHA requires the employer to review fire response employee training programs and hands-on sessions before they are used to make sure that fire response employees are protected from hazardous training conditions. This should help to prevent the occurrence of training accidents resulting from unexpected events such as flare-ups, collapses, entrapments, and stress-induced injuries.

In paragraph (d)(4) of § 1915.508, OSHA requires all fire response employees to be adequately trained to carry out their duties and responsibilities under the employer's standard operating procedures. This training program must provide the information necessary to ensure that these employees are competent to respond appropriately to a fire. For example, the fire response employee must know how to respond to a fire on board a vessel, where the pier hook-ups are located, how to gain access to the vessel, and how to determine the location and type of fire within the vessel.

In § 1915.508(d)(5), OSHA requires the employer to train new fire response employees before they engage in emergency duties so that they can work safely and effectively at a fire scene. This language is consistent with paragraph 3–1.3 of NFPA 1500–2002 (Ex. 19–5).

In paragraph (d)(6) of § 1915.508, the employer must provide training for firefighters at least quarterly on the employer's written operational procedures. Because of the complexity of hazards involved in shipyard firefighting, the quarterly training requirement is appropriate. In addition, most fire response operations in shipyard employment, whether on a vessel or in land-side facilities, go beyond the incipient stage and most likely involve an interior attack.

In paragraph (d)(7) of § 1915.508, OSHA requires that all fire response operations training be conducted by qualified instructors. This language is consistent with paragraph 5.2.11 of NFPA 1500–2002 (Ex. 19–5).

In § 1915.508(d)(8), OSHA requires any live firefighting training exercises to follow NFPA 1403–2002 Standard on Live Fire Training Evolutions (Ex. 19–24). This is consistent with paragraphs 4.9.4 and 5.2.10 of NFPA 1500–2002 (Ex. 19–5).

In paragraph (d)(9) of § 1915.508, the employer must provide semiannual drills that cover site-specific operations, occupancies, buildings, vessels and vessel sections, and fire-related hazards, according to the employer's written operational procedures. The semiannual requirement for drills is consistent with the recommended frequency found in paragraph 5.3 of NFPA 1500–2002 (Ex. 19–5).

Bath Iron Works stated:

OSHA does not state that an actual fire response qualifies as meeting the requirement of a drill. To maintain consistency with 29 CFR 1915.12(e) which allows an actual confined space rescue to qualify as meeting the training requirements

the paragraph should be revised.

Recommendation: Add the following text: "Conduct semi annual drills unless the team performs an actual fire response during the 6 month period." (Ex. 21–3).

OSHA disagrees with Bath Iron Works and is convinced that fire responses are not adequate substitutes for training drills. A training drill is intended to be used for assessing and improving operational or deployment procedures. Actual fires provide useful learning experiences, and it is usual and customary to evaluate fires for this purpose, but they do not provide the same training opportunity as drills. When an actual alarm is sounded and the shipyard fire department responds, the on-scene command is coordinating the scene and ensuring that firefighters respond safely and effectively. They cannot effectively observe, document, and evaluate the response at the same time. Drills are used for the sole purpose of training, while fire response is focused on saving lives and property. This issue was discussed during the negotiated rulemaking process and Committee members had varying positions. OSHA was convinced by the position of most of the Committee members that the rule should require semiannual drills without regard to actual fire responses for the above reasons. The Agency has not received compelling reasons to change its position. Therefore, this paragraph has not been changed for the final standard.

In paragraph (d)(10) of § 1915.508, OSHA prohibits the employer from using smoke generating devices that could create a dangerous atmosphere in training exercises. This includes training done on vessels and vessel sections as well as in buildings and other structures. This requirement is consistent with paragraph 8.3.2 of NFPA 1500–2002 (Ex. 19–5). Where the employer must simulate emergency conditions that require smoke generation, smoke-generating devices that do not create a hazard must be used. OSHA received no comments on proposed paragraph (b)(10), and it has been carried forward in the final rule as (d)(10).

#### Additional Training Requirements for Fire Watch Duty

Proposed paragraph (c) of § 1915.508, which has been renumbered as paragraph (e), sets forth the additional training requirements for any person assigned to fire watch duty. In shipyard employment, some employers hire contract workers as needed for the sole purpose of fire watch. The employer is ultimately responsible for ensuring that these fire watches are trained in

accordance with § 1915.508(f). One way to do this is for the employer to have a written evaluation of the contractor's training program that the employer can review and thereby ensure compliance with the OSHA standard. Again, OSHA wants to make clear that it is the employer's responsibility to make sure that all fire watches are trained.

In paragraph (e)(1) of § 1915.508, OSHA requires the employer to make sure the fire watch has been trained: (i) Before beginning the fire watch; (ii) when there is a change in operations that presents a hazard for which the worker has not been previously trained; (iii) when the employer determines that the fire watch employee needs to be trained; and (iv) annually.

Marine Chemist Services, Inc. submitted the following comment on the training of fire watches:

Unlike the requirement in paragraph 1915.508(b)(7) Training requirements for shipyard employees designated for fire response to "(u)se qualified instructors to conduct the training", there is no similar requirement for fire watch training instructors. As a result, literally anyone will be able train fire watches. Consequently, the fire watch training program will contain as much or as little detail as the trainer is knowledgeable (through education and experience) and/or has time. \* \* \* Recommendation: add the words "in an approved fire watch training course taught by a qualified instructor" (Ex. 22–12).

OSHA agrees with this comment. Although most shipyard employers would use a qualified instructor, one could interpret this standard incorrectly, and employees could be trained incompletely or inadequately. Therefore, OSHA is changing the regulatory text of § 1915.508(e)(1) to read: "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:"

Marine Chemist Services also stated:

It is agreed that a fire watch's knowledge and understanding must be adequate in order for him or her to properly perform fire watch duties; but so, too, must be one's skill. Even the requirement to extinguish live fire scenarios seems to suggest the importance of one's skill, both in terms of physical (e.g. strength) and mental (e.g. remaining calm) abilities. Therefore, knowledge and skill and understanding are needed here. Recommendation: insert "skill" as follows: Whenever the employer has reason to believe that the fire watch's knowledge, skill or understanding of the training previously provided is inadequate. (Ex. 22–12).

OSHA agrees that skills are an important component of the training requirements, as are the knowledge and understanding of the duties to be

performed, and has included the word "skills" in § 1915.508(e)(1)(iii) as suggested by Marine Chemist Services.

Under paragraph (e)(1)(iv) of § 1915.508, employers must retrain fire watches annually. Annual training is an industry practice. In addition, annual training is already required by Navy contracts throughout the country.

NAVSEA stated: "Recommend modifying this requirement as follows: 'Annual refresher training to include discussion of the types of fires seen recently in operations that the fire watch may encounter in the next year.'" (Ex. 22-15). OSHA agrees that it would be prudent for any shipyard that has an incident to discuss the incident during the annual retraining, and encourages shipyards to do so if the discussion will add to the knowledge and understanding of fire watches. However, OSHA has concluded that the employer is in the best position to determine if a discussion of past fires would always be useful or necessary for its fire watch workers. Therefore, OSHA does not believe modification of this provision is necessary and has not modified the standard.

Paragraph (e)(2) of § 1915.508 contains 12 items the employer must include in fire watch training. The training includes how to anticipate and be aware of the hazards that may be faced while performing fire watch duties, such as limited egress or possible changes in atmospheric conditions. To recognize the adverse health effects that may be caused by exposure to fire, employees have to be trained under OSHA's Hazard Communication Standard, 29 CFR 1910.1200. Workers need to be knowledgeable about fire prevention practices so they can correctly react to changes in the hot work environment that introduce hazards not identified at the start of hot work. Examples are deterioration of housekeeping or introduction of combustible or flammable materials.

Paragraph (e)(2)(i) of § 1915.508 requires the employer to train a fire watch on the basics of fire behavior, classes of fires, extinguishing agents, stages of fire, and methods of extinguishment. The basics of fire behavior usually include the definition of the fire triangle and tetrahedron as set forth by NFPA 1001-1997 Standard for Fire Fighter Professional Qualification (Ex. 19-25). Extinguishing agents commonly used in shipyard employment are dry chemicals, water, and CO<sub>2</sub>. Methods of extinguishing require removing one or more of the following: heat (ignition), oxygen, fuel, or chemical chain reactions. OSHA

received no comments on this paragraph, and it is carried forward as proposed.

Paragraph (e)(2)(ii) requires that each fire watch be trained using live fire scenarios whenever allowed by law. The training exercise would be a controlled burn and would teach the trainee the proper way to approach the fire. There are different requirements and restrictions across the country in this regard.

Numerous comments were received on this issue.

We believe it is unnecessary to create a hazard with a live fire exercise, employees can demonstrate proper operation of a fire extinguisher with other equipment. Use of charged extinguishers and live fires is costly and may add little reality to the training. Employers should have the option to use alternative instructional methods and equipment for fire watches. (Exs. 21-10; 21-15; 21-16; 22-1; 22-6; 22-7 through 22-11).

In addition, National Steel and Shipbuilding Company stated: "Live fire scenarios are not required to demonstrate the ability to use a fire extinguisher. Employees can be effectively trained without the need to extinguish live fire scenarios. We recommend that the requirement be for live fire scenarios be removed." (Ex. 22-14).

NGNN recommended that this paragraph be deleted:

[P]aragraph (c)(2)(viii) requires the employer to instruct employees assigned to fire watch on how to select and use fire extinguishing equipment and this is sufficient. \* \* \* Our current practice of providing practical hands-on use of the various extinguishers without the presence of a live fire has proven effective at our facility as evidenced by our fire safety record described in our cover letter. \* \* \* We strongly encourage OSHA to use performance-oriented language, such as in paragraph (c)(2)(viii), rather than prescriptive language in this regard. (Ex. 21-8).

There are some localities that prohibit burning due to smog or clean air provisions. If this is the case, then live fire training should not be used. If this is not the case, live fire scenarios must be used and employees are expected to use fire extinguishers on such fires. Learning the different types of fires and appropriate fire extinguishers is more effective when live fire scenarios are used. In addition, fire watches need to know and be able to demonstrate that they can adequately use a fire extinguisher to extinguish a fire. The Committee was unanimous in its support of live fire training as the most effective means to train fire watches for their duties, because it provides the best simulation of actual firefighting

technique. The Agency agrees that this is the case, and finds the comments that live fire training is unnecessary unpersuasive. Therefore, this provision is being included in the final standard as proposed. The only exception is for situations where a state or local law prohibits open burning and the employer is unable to obtain an exception for the training. In this case, the Agency does not wish to put the employer in the position of violating a local fire rule to comply with the OSHA standard.

Paragraphs (e)(2)(iii), (iv), and (v) require, respectively, that employees who stand fire watch duty must be knowledgeable of the adverse health effects that may be caused by exposure to fire, the physical characteristics of the hot work area, and the hazards associated with fire watch duties.

Paragraphs (e)(2)(vi) and (vii) of § 1915.508 require training on personal protective equipment (PPE), including what PPE is appropriate in a particular situation, as well as how to use it. A fire watch may need the same or different items of PPE from that used by a hot worker. The fire watch could be assigned to an isolated or confined space and, therefore, would need the additional protection that is required under other sections of Part 1915.

Paragraph (e)(2)(viii) of § 1915.508 requires that an employee who stands fire watch duty be trained to select and operate fire extinguishers and fire hoses likely to be used by the fire watch. As in the case of fire extinguishers, whenever a fire watch is expected to use a fire hose, the fire watch must be trained in its use. A fire watch who has been trained with a fire extinguisher but not a fire hose does not necessarily understand how to use a fire hose. Fire watches need targeted training if they may have to deal with these different types of equipment within their shipyard employment.

The Agency requires that a fire watch be trained to select and operate the different types of fire extinguishers and fire hoses likely to be used by fire watches in the area. These requirements are similar to those found in 29 CFR 1910.157 in which OSHA requires the employer to train any employee who has been designated to use portable fire extinguishers (or, as stated in paragraph (e)(2)(viii) of this section, fire hoses), and for these employees to be familiar with the general principles of fire extinguisher use and the hazards of fighting incipient stage fires. OSHA does not believe that adopting this training requirement from Part 1910 imposes any new burden on shipyard employers beyond what currently exists.

Paragraph (e)(2)(ix) of § 1915.508 requires fire watch personnel to be trained to know the location and use of barriers that are part of the employer's fire protection program. It is a common shipyard practice to use barriers to prevent molten metal or sparks from traveling to uncleaned areas where flammable materials may be ignited. However, such barriers can also create hazards by blocking an employee's evacuation route or by suppressing ventilation to the point where fumes or vapors can accumulate. Therefore, a worker who stands fire watch must understand how to use the barriers safely.

In § 1915.508(e)(2)(x), OSHA requires that the fire watch be trained in the means of communicating with each worker performing hot work to ensure the safety of workers. Effective communication is especially important when a fire watch can not see a hot worker because, for example, the fire watch is on the other side of a compartment from the hot worker. In this case, the means of communication may be as simple as tapping on the bulkhead to signal whether the hot worker can continue or must stop, or an electronic communication system such as a two-way radio.

In paragraphs (e)(2)(xi) and (xii) of § 1915.508, OSHA requires that fire watches be trained to know when and how to initiate fire alarm procedures and to be familiar with the shipyard's evacuation plan. OSHA recognizes that fire watch work assignments may change between vessels or vessel sections and land-side facilities and that each may have different alarm systems, evacuation plans, and exit routes. For example, a shipyard may be performing repair work on a Navy vessel, a cruise liner, and a tug at the same time, all with different alarm systems.

Regardless of the system, a primary responsibility of a fire watch must be to recognize when to initiate a fire alarm procedure and begin evacuation. A fire watch needs to know when a fire has progressed beyond the incipient stage, when a fire alarm should be activated, and when evacuation should be initiated. The employer must make sure that fire watches are familiar with the type of alarm systems being used on the vessel where they are working.

OSHA received no comment on proposed paragraphs (c)(2)(iii) through (c)(2)(xii) of § 1915.508 and they are being adopted as paragraphs (e)(2)(iii) through (e)(2)(xii).

Proposed paragraph (c)(3) of § 1915.508, now (e)(3), requires the employer to ensure that each fire watch is trained to alert others to exit the work

area whenever: (i) The fire watch perceives an unsafe condition associated with hot work; (ii) the fire watch perceives that a hot worker is in danger; (iii) evacuation is ordered by the employer or designated representative; or (iv) an evacuation signal such as an alarm is activated. OSHA received no comment on these provisions, and they are carried forward in the final rule renumbered.

#### Records

Proposed paragraph (d) of § 1915.508, now renumbered as (f), requires that the employer document that the training required by paragraphs (a) through (e) has been accomplished. In § 1915.508(f)(1), OSHA requires the employer to document the worker's training by keeping a record of the worker's name, the name of the trainer, the type of training, and the date(s) of the training. As proposed, this requirement was separated into four separate provisions, paragraphs (d)(1)(i) through (iv). In this final standard, OSHA has collapsed all of these requirements into one provision, paragraph (f)(1), in order to make them easier to read. No comments were received on these four requirements, and OSHA is carrying them forward as proposed, with the exception of the renumbering.

In addition, OSHA requires in paragraph (f)(2) of § 1915.508 that the employer keep the documentation for at least one year and, consistent with other OSHA standards, make the record available for inspection and copying by OSHA personnel on request. The record that must be kept is minimal. It can be kept as part of the worker's personnel file, in a master file of training, or in any other format the employer chooses. A record in an electronic file or database is sufficient. However, regardless of how the record is kept, it must be available for inspection by the persons authorized to see it. To be available means that it can be easily found, so the employer must first decide how the record is to be kept, and then make certain there is easy access to it.

This record must be kept until it is replaced by a worker's new training record, or for one year from when the record was made, whichever is longest. In the case of a worker who will no longer perform fire watch duties, or is no longer employed at the shipyard, OSHA requires the employer to keep that employee's training record for one year. This information may be relevant in determining whether the employer's fire watch training program was adequate, and for research on the effectiveness of the standard. OSHA

sought comment on whether the requirement for training record retention should be one or three years. No comments were received on this issue, or any other aspect of recordkeeping in this paragraph. Therefore, OSHA has renumbered the proposed paragraphs, and carried them forward in the final standard.

#### Section 1915.509 Definitions

Most of the definitions in OSHA's proposed standard have been carried forward unchanged in the final standard. Additions or modifications have been made in response to various comments, and to provide appropriate definitions for the new terms used in the final standard. The following section discusses the terms for which comments were received, the definitions added to the rule, the definitions OSHA has modified to improve clarity, and the terms that have been included in the final rule without change.

#### Comments on the Proposed Definitions

OSHA's proposed definition for "fire response employee" was "a shipyard employee who performs shipyard employment firefighting." Atlantic Marine submitted a comment stating that the proposed definition was too broad (Ex. 21-17-1). "This definition could mean any employee that discharges a fire extinguisher at the shipyard, including office and administrative personnel." OSHA agrees that the term could be misinterpreted as defined. OSHA has modified the definition of "fire response employee" in the final standard to read "a shipyard employee who carries out duties and responsibilities of shipyard firefighting in accordance with the fire safety plan. A fire response employee may be a full-time employee, may occupy any position or rank within the shipyard, and may engage in fire emergency operations."

Several commenters submitted comments on the definition of "hazardous atmosphere" (Exs. 21-3; 21-8; 21-14; 22-4; 22-15). NFPA commented that the definition of "hazardous atmosphere" was taken from a general industry standard (29 CFR 1910.146 Permit required confined spaces) and inappropriately applied to a maritime industry context in the proposed standard (Ex. 21-14). In addition, there was concern that the use of the term "dangerous atmosphere" in addition to "hazardous atmosphere" was unnecessary and could cause confusion (Exs. 21-14; 22-4). The term "dangerous atmosphere" was used in the proposed standard in the note to § 1915.507(c)(4) and was defined in



§ 1915.509. The term “hazardous atmosphere” was used in §§ 1915.506(a) and .508(b)(10) and defined in § 1915.509. OSHA agrees with these commenters. The term “hazardous atmosphere” in §§ 1915.506(a) and .508(b)(10) in the final standard has been replaced with the term “dangerous atmosphere” and the definition of “hazardous atmosphere” in § 1915.509 has been deleted. The proposed definition of “dangerous atmosphere” has been carried forward unchanged into the final standard.

The Connecticut Department of Labor raised a question regarding the term “incident management system” (IMS), asking: “Why does the proposed standard change the customary verbiage of incident command system to incident management system? Will this confuse fire departments that will also be involved in the firefighting?” (Ex. 22–4)

While the Incident Command System (ICS) term is customary language often used by firefighting professionals, OSHA proposed to use the IMS term to be consistent with the terms currently in use by firefighting organizations and training institutions. However, OSHA is modifying the proposed definition of IMS in § 1915.509 to match the definition used in NFPA 1500–2002, which is: “A system that defines the roles and responsibilities to be assumed by personnel and the operating procedures to be used in the management and direction of emergency operations; the system is also referred to as an incident command system (ICS)”. This modification does not change the meaning or intent of the proposed term, and is more consistent with the NFPA’s use of the term IMS. For more discussion, see § 1915.505(d)(3) above.

#### Definitions Added to the Final Rule

Marine Chemist Services, Inc. suggested that a new definition be added for “approved fire watch training course.” As addressed in the discussion of § 1915.508 above, OSHA will be altering § 1915.508(c)(1) to require training to be given by a qualified instructor. OSHA believes that there is no need for an additional definition for “approved fire watch training course” and has not added this term to the definition section of the final standard.

NGNN suggested that OSHA add a description or a definition for “drop test” in order to clarify the term (Ex. 21–8). Drop test is a term found in § 1915.503(b)(2)(iv) “\* \* \* and a drop test is done using gauges or other positive means. \* \* \*” NGNN’s suggested definition was:

Method utilizing gauges to ensure the integrity of an oxygen fuel gas system. Prior

to lighting a torch, but after all connections have been safely made, adjust the operating pressures by turning the adjusting screws clockwise. The pressure at the regulators should be set slightly higher than the required tip pressures. Close the manifold or cylinder supply valves and watch the gauges for at least sixty (60) seconds. Any drop in pressure indicates a leak. Do not turn on the supply valve again until the leak has been repaired. Other than pressure testing gas lines while submerged in water at test shops, only the use of pressure gauges provides a positive measure of line integrity.

OSHA agrees with NGNN that a definition would be appropriate. However, OSHA has modified the definition of “drop test” in the final standard to read:

\* \* \* [M]ethod utilizing gauges to ensure the integrity of an oxygen fuel gas burning system. The method requires that the burning torch is installed to one end of the oxygen and fuel gas lines and then the gauges are attached to the other end of the hoses. The manifold or cylinder supply valve is opened and the system is pressurized. The manifold or cylinder supply valve is then closed and the gauges are watched for at least sixty (60) seconds. Any drop in pressure indicates a leak. \* \* \*

The final sentences of the NGNN suggestion are procedural rather than part of the definition and are therefore unnecessary.

OSHA has added three additional new definitions to the final standard. The definitions of “class II standpipe system,” “incipient stage fire,” and “small hose system” have been added for clarity. These definitions are identical to the definitions used in 29 CFR 1910.155(c). In the NPRM (67 FR 76241), OSHA referred to “incipient stage fire” as a definition used in Part 1910 that would also be utilized for this subpart. There were no comments received on this definition, nor any objections to using this definition from Part 1910. OSHA has also included “class II standpipe system” and “small hose system” in this final standard because they are technical terms used within the definition of incipient stage fire. Including these definitions in the final standard provides greater clarity and reduces the need to reference Part 1910 standards in the final standard.

#### Definitions Modified by OSHA

In order to be more compatible with the regulatory text, and the remainder of Part 1915, OSHA has revised the following definitions for clarity and uniformity. The proposed rule defined a “designated area” as “an area established for hot work after an assessment of fire hazard potential of facilities, vessels, or vessel sections such as a fabrication shop.” OSHA has

simplified this definition to define a designated area as “an area established for ongoing hot work after an inspection has determined that the area is free of fire hazards.”

The proposed definition of “emergency operations” defined the activities performed by a fire response organization. The last portion of the definition included examples of special operations that may be performed, such as HAZMAT release mitigation, standby for flight operations and off-site fires. Because special operations could include any number of activities in addition to these examples, and the examples did not add clarity to the definition, they have been removed.

“Fire suppression” defines the activities involved in controlling and extinguishing fires. The proposed definition included a list of the hazards associated with fire suppression. OSHA realizes that the act of fire suppression creates many hazards, and that employees must be protected from those hazards. However, the Agency has deleted examples of these hazards from the definition since they are not a necessary part of the definition of fire suppression.

“Shipyard firefighting” is the activity of rescue, fire suppression, and property conservation in all shipyard workplaces. The proposed definition included the sentence: “Shipyard firefighting includes any fire that requires a fire attack hose line of 1½ inch diameter or larger to fight, and self-contained breathing apparatus by responders.” OSHA did not want to imply that the definition of shipyard firefighting was limited to the use of specific equipment. Therefore, the final definition does not include examples of specific equipment.

#### Definitions Deleted by OSHA

OSHA has deleted three proposed definitions from the final standard; the terms “affected employee,” “hot work,” and “shipyard employment.” No comments were received on these definitions. The Agency decided to not define “affected employees” since employers can make the determination of who is affected. The terms “hot work” and “shipyard employment” are both currently defined in § 1915.4 for the entire part 1915. OSHA has concluded it is unnecessary to define them again for this subpart.

#### Definitions Included Without Change

OSHA did not receive comments on the remaining definitions and believes that all of the terms used in this subpart are “terms of the industry” and are universally recognized by shipyard employees and employers. These terms



include “alarm,” “alarm system,” “body harness,” “contract employer,” “designated area,” “fire hazard,” “fire protection,” “fire response,” “fire response organization,” “fire watch,” “fixed extinguishing system,” “flammable liquid,” “hazardous substance,” “hose systems,” “host employer,” “inerting,” “interior structural firefighting operations,” “multi-employer workplace,” “personal alert safety system,” “physically isolated,” “physical isolation,” “protected space,” “proximity firefighting,” “qualified instructor,” “rescue,” and “standpipe.” Therefore, OSHA has adopted these proposed definitions in this final standard.

#### **IV. Summary of the Final Economic and Regulatory Flexibility Analysis**

##### *Introduction*

OSHA’s Final Economic and Regulatory Flexibility Analysis addresses issues related to the costs, benefits, technological feasibility, and economic impacts (including small business impacts) of the Agency’s “Fire Protection in Shipyard Employment” standard. This analysis also evaluates the non-regulatory alternatives to this standard.

The final standard will affect approximately 669 employers and about 98,000 employees in the shipbuilding, ship repair and shipbreaking industries. OSHA estimates that the final standard will prevent 1 death and 292 workplace injuries (102 lost workday injuries and 190 non-lost workday injuries) annually. The Agency estimates approximately \$6.2 million in cost savings from these 292 injuries.

OSHA has determined that this final standard is not an economically significant regulatory action under E.O. 12866 and not a major rule under the Congressional Review provisions of the Small Business Regulatory Enforcement Fairness Act. OSHA has provided the Office of Information and Regulatory Affairs with an assessment of the costs, benefits, and alternatives, as required by section 6(a)(3)(C) of E.O. 12866, which is summarized below. Executive Order (EO) 12866 requires regulatory agencies to conduct an economic analysis for rules that meet certain criteria. The most frequently used criterion under EO 12866 is that the rule will impose annual costs on the economy of \$100 million or more. Neither the benefits nor the costs of this rule exceed \$100 million.

The Regulatory Flexibility Act of 1980 (RFA), as amended in 1996, requires

OSHA to determine whether the Agency’s regulatory actions will have a significant impact on a substantial number of small entities. OSHA’s analysis indicates that the final rule will not have significant impacts on a substantial number of small entities. OSHA’s Final Economic Analysis (FEA) and regulatory flexibility analysis include: A description of the industries potentially affected by the standard; an evaluation of the risks addressed; an assessment of the benefits attributable to the final standard; a determination of the technological feasibility of the requirements of the standard; an estimate of the costs employers will incur to comply with the standard; A determination of the economic feasibility of compliance with the standard; and an analysis of the economic and other impacts associated with this rulemaking, including those on small businesses. The FEA has been provided to the docket as Ex. 23. This section of the preamble summarizes the results of that analysis.

##### *Affected Industries*

The final Fire Protection in Shipyard Employment standard will affect all establishments in the shipbuilding, shipbreaking, and ship repair industries. These include large shipyards, government shipyards, and shipyards operated under Navy contracts, operations owning a dock or dry dock, and the vast majority of small firms that perform shipbuilding and repair work, such as metal fabricators, painters, asbestos removal, etc., who do not own or rent docks. For purposes of this analysis, OSHA has defined small firms as: (1) Firms with fewer than 1,000 employees (the Small Business Administration (SBA) definition of small businesses in this sector); (2) firms with fewer than 250 employees (the definition of small business recommended by the negotiated rulemaking committee); and (3) firms with fewer than 20 employees. OSHA has based its estimates of number of firms, establishments, employment, and wages on general Bureau of Labor Statistics (BLS) and Department of Commerce data for the standard industrial classification (SIC) codes for shipbuilding and ship repair 3731 and shipbreaking 4499. OSHA has based its estimates concerning revenues of firms on SBA data, and concerning profit rates on Robert Morris Associate’s data. Table IV–1 shows the total number of establishments, number of firms, employment, and revenues and profits

per firm affected by the rule. As the table shows, there are 717 establishments owned by 669 firms in the industries. The industries employ 97,822 workers, of whom 70 percent are production employees.

The Passenger Vessel Association (PVA) commented that there may be considerably more employers with “[n]o more than 250 employees who have employees engaged in ‘shipyard employment’ but that are not included in the government’s shipbuilding and shipbreaking categories.” (Ex. 21–9). PVA further stated: “If your estimate of 621 affected companies with no more than 250 employees is too low, as we suspect it is, then you have underestimated the total costs and economic impacts of the proposed standard.” OSHA derived the estimate of establishments having less than 250 employees (alternate definition of a small firm) from a manipulation of the SBA and Bureau of the Census (BOC) County Business Patterns data. This involved OSHA applying the distribution of County Business Patterns for the categories of 100–249 employees and 250–499 employees to the profile data for the SBA 100–499 size classification. Having thus estimated SBA profile data for the firm size classification of 250–499 employees, OSHA subtracted these data totals from the totals for the size classification 1–500 employees presented in Table II–1 in the FEA; this calculation yielded SBA totals for a size category of 1–250 employees shown in Column 9 in Table II–2 in the FEA. (Ex. 23). This was necessary because neither data source publishes establishment counts using this size classification. PVA did not supply OSHA with the necessary data to refute the Agency’s findings, thus OSHA is continuing to use its mathematical method of estimation with the SBA data using the BOC distribution percentages. In summary, OSHA has used the best available data for the purpose of estimating the number of affected entities. It is possible that these data omit some firms that engaged in shipbuilding, shipbreaking and ship repair—particularly establishments that do this as only a small part of their total work. However, there are no data available on the number of such establishments. Conversely, OSHA may have overestimated the costs by including some employees as working in establishments that are primarily engaged in shipbuilding, shipbreaking, and repair when they actually work in other industries.

TABLE IV-1.—INDUSTRIAL PROFILE OF EMPLOYEES AND ESTABLISHMENTS

Industry characteristic	1-19 Employees	1-250 Employees	1-1,000 Employees	>1,000 Employees	Entire affected industry
Total Establishments .....	412	621	697	20	717
Total Firms .....	412	607	660	9	669
Total Employees .....	2,305	14,774	39,063	58,759	97,822
Revenues Per Firm (\$1,000's) .....	\$653	\$2,353	\$5,907	\$718,166	\$15,540
Profits Per Firm (\$1,000) .....	\$24	\$85	\$213	\$25,854	\$559

Source: Office of Regulatory Analysis, OSHA.

#### *Evaluation of Risk and Potential Benefits*

For this Final Economic Analysis, OSHA used the same approach as in the Preliminary Economic Analysis (PEA) used in the proposed rule. The PEA involved developing a profile of the risks facing workers in shipyards that might be affected by the standard. OSHA's risk profile for exposure to fire-based risks in shipyards is based on data from the BLS' National Census of Fatal Occupational Injuries, data from the BLS' Survey of Occupational Injuries and Illnesses, and an analysis of OSHA fatality/catastrophe inspection data obtained from the Agency's Integrated Management Information System.

OSHA anticipates that the final standard will significantly reduce the number of fire and explosion related incidents and resulting injuries and fatalities currently reported in the shipyard industry. OSHA believes that the final standard's requirements for inspection prior to hot work, fire watches, planning, and training will help to save lives and prevent injuries in the shipyard workforce. OSHA estimates that approximately 1 fatality, 110 injuries involving days away from work, and 204 injuries not involving days away from work occur annually among shipyard workers due to fire and explosions. This is the current industry risk baseline used in this analysis. OSHA projects that full compliance with the proposed standard would annually prevent 0.88 fatalities, 102 injuries involving days away from work, and 190 injuries not involving days away from work. No comments were received regarding these estimated benefits.

In addition to saving lives and improving overall safety in shipyards, OSHA believes that full compliance with the final standard would yield substantial cost savings to parties within and connected with the industry and ultimately to society as a whole. These monetized benefits take the form of reductions in employer and insurer accident-related costs in several areas: Value of lost output associated with temporary total disabilities and

permanent partial disabilities, an income-based measure derived from estimates of workers' compensation indemnity payments; reductions in accident-related medical costs; administrative expenses incurred by workers' compensation insurers; and indirect costs related to productivity losses, work stoppages, and accident investigations and reports. Applying data from the insurance industry on the direct costs of accidents and data from the literature on the indirect costs of accidents and other administrative-related costs to OSHA's preliminary estimate of avoided injuries, the Agency monetized the value of the cost savings employers and society will accrue by avoiding these injuries. OSHA estimates that annual costs savings of \$6.2 million will result from compliance with the final standard. These savings are those associated with injuries due to fires. OSHA did not attempt to quantify the cost savings resulting from reduced fire damage to property and reduced need to respond to fires.

Some commenters questioned: "[H]ow can there be a general savings for the shipyards if they are spending more money on both training and equipment in order to meet the new requirements of the proposed rule?" [Exs. 21-4, 21-5, 21-6, 21-7, 21-13, 21-16, 22-1, and 22-2]. This general savings (or cost savings) estimate is based on the estimated reduction in injury-related costs due to the standard (developed in the Benefits chapter). This estimate includes indemnity payments, lost income, medical costs, and administrative costs for both temporary total disability and permanent partial disability injuries. These cost savings accrue partially to individual employers, partially to the industry as a whole, partially to the government in the form of reduced taxes, and partially to injured employees. Thus, the cost savings are not necessarily savings to employers, but savings to society as a whole.

On the other hand, the annualized compliance costs estimates are annualized costs to employers, discounted using a 7 percent rate over

ten years, which the employer is projected to spend to comply with the standard. These estimates are based on the employment and establishment counts in the Industrial Profile and the dollar costs needed to comply with the standard. In addition to the employment and establishment counts, these estimates also include non-compliance rates to account for establishments that have already complied with the requirements.

Thus, OSHA estimates that the final standard will prevent approximately 292 injuries and one death per year. As a result of prevention of the injuries, OSHA estimates that there will be direct cost savings to society of \$6.2 million per year, excluding savings associated with reduced property damage and reduced fire response costs. For informational purposes, OSHA also estimates \$6.3 million in cost savings from the 1 prevented death, for a total of \$12.5 million in monetized benefits.

#### *Technological Feasibility and Compliance Costs*

Consistent with the legal framework established by the OSH Act, Executive Order 12866, and court decisions, OSHA has assessed the technological feasibility of the fire protection in shipyards standard. The standard does not require any practices not already undertaken in many shipyards today. Moreover, the final standard is based on a consensus draft recommended to the Agency by a negotiated rulemaking committee (the Committee) consisting of representatives from labor, government, and industry. These representatives included small employers who would be affected by changes to the maritime regulations. The Committee reached consensus on the language of the draft, thereby implicitly acknowledging the feasibility of the proposed revisions to the standard. Therefore, based on the fact that many firms in the industry are already implementing the controls and practices required by the standard and that the Committee reached consensus on the proposed revisions, OSHA has determined that the final fire protection

in shipyard employment standard is technologically feasible.

OSHA developed estimates of the costs of compliance for shipyard employers subject to the final standard. To develop these estimates, OSHA first examined the extent to which shipyard employers were already in compliance with the requirements of the standard as a result of existing OSHA requirements, compliance with rules of other parties (such as the U.S. Navy in some shipyards), and compliance with voluntary codes and good practices. Eliminating provisions for which there is already substantial compliance, OSHA arrived at the list of activities for which shipyard employers would incur costs shown in Table IV-2. Table IV-2 shows that the annualized costs of the final standard are \$4.3 million per year. Ninety-one percent of the costs are associated with fire watch-related provisions; most of these costs are for posting additional fire watch personnel in situations in which fire watches are not currently being posted.

Many commenters stated that: "[T]he analysis estimates that for the industry as a whole, the average cost per employee for training is around \$1." (Exs. 21-4, 21-5, 21-6, 21-7, 21-13, 22-1, 22-2). These same commenters state that the additional requirements for annual fire safety and fire watch training would increase the training time from 0.5 hours to 1 hour per employee, suggesting a far greater additional cost than \$1 per employee. One commenter stated that it employs 117 employees with a training cost of \$850 per employee (Ex. 21-13). OSHA assumed that large establishments are in compliance with the training requirements, thus they would not incur new training cost burdens. Even in smaller size establishments, OSHA estimated that some employers now comply with these training requirements. (Table V-1 on page V-4 of the FEA (Ex. 23)). Further, not all employees need fire watch training. Finally, OSHA computed an annualized cost in which it assumed that most training occurs in the initial year and would not need to be repeated for all workers. These costs only apply to small and medium size establishments that were estimated to not be in compliance with the final standard. Therefore, the similarity between the estimate for Fire Watch Training (\$95,204) in Table V-2 of the proposed rule and the number of estimated employees (97,822) in Table V-1 of the proposed rule is merely coincidence (67 FR 76242-76243).

In regard to the provisions on training and use of fire watches, the majority of shipbuilding and repair activity is for

the U.S. Navy. The Navy already requires its shipyard contractors to employ fire watches for hot work. The Agency also received comment on the cost of supplying pressure gauges for drop tests of fuel gas and oxygen hoses (Exs. 21-4; 21-5; 21-6; 21-7; 21-13; 21-17; 22-2). The final standard does not require employers to perform drop tests with gauges, since hoses can simply be rolled back to the supply manifold. Since this is the least cost alternative, the Agency did not include estimates of costs for gauges.

TABLE IV-2.—TOTAL ANNUALIZED COMPLIANCE COST PER REQUIREMENT FOR THE PROPOSED STANDARD

Requirement	Annualized cost
Posting Fire Watches .....	\$3,789,057
Safe Work Practices .....	245,839
Fire Watch Written Program .....	36,546
Fire Response Policy .....	11,630
Fire Safety Plan .....	36,546
Fire Watch Training .....	95,204
Fire Safety Plan Review/	
General Training .....	37,327
Fire Protection Systems	
Training .....	9,642
Fire Response Training .....	49,430
Total .....	4,261,222

Numbers do not total due to rounding.

Source: Office of Regulatory Analysis, OSHA.

#### Economic Impacts

OSHA analyzed the impacts of these compliance costs on firms in the shipbuilding and repair sector. In order to do this, OSHA determined costs as a percentage of revenues and costs as a percentage of profits. These two measures (in percent) correspond to two assumptions used by economists to bound the range of possible impacts: The assumption of no-cost pass-through, *i.e.*, that employers will be unable to pass any of the costs of compliance forward to their customers (compliance costs as a percentage of profits), and the assumption of full-cost pass-through (compliance costs as a percentage of revenues), *i.e.*, that employers will be able to pass all of the costs of compliance forward to their customers. As summarized in Table IV-3 below, OSHA estimates that, if affected firms in the shipbuilding sector were forced to absorb these compliance costs entirely from profits (a highly unlikely scenario), profits would be reduced by an average of 1.14 percent. If, at the other extreme, affected firms were able to pass all of these compliance costs forward to their customers, OSHA projects that the price

(revenue) increase required to pay for these costs would be less than 0.1 percent (0.04 percent). Given the minimal impact on both prices and profits, OSHA concludes that the regulation is economically feasible. To the contrary, NNGN stated in its comments that it has serious concerns with several aspects of the proposed rule that will result in more than \$35 million annually to its company with little to no added benefit to its health and safety program or the industry at large (Ex. 21-8). NGNN is a large shipyard with "845 trained and qualified fire wardens whose primary responsibilities are fire prevention and emergency evacuation and 3,325 fire watch qualified employees whose primary responsibility is fire prevention and response in support of a specific hot work job." (Id.) In addition, the company reports that it has "long-standing fire safety practices that in many cases go beyond that required in existing regulations, as well as the proposed standard." OSHA is perplexed by NGNN's assertion that the rule will result in costs of more than \$35 million annually to this company. The Agency assumed that this firm was in compliance with the requirements of the final standard, which seems to be validated by its comments. Thus, this company would not incur a high compliance cost burden and its economic impact would be minimal.

TABLE IV-3.—ECONOMIC IMPACTS FOR THE FINAL STANDARD

Firm size	Compliance costs as a percentage of revenues	Compliance costs as a percentage of profits
All Firms .....	0.04	1.14
1-19 Employees .....	0.11	3.09
1-250 employees .....	0.07	1.83
1-1000 Employees (SBA Definition) .....	0.06	1.61

Source: Office of Regulatory Analysis, OSHA.

#### Regulatory Flexibility Analysis

The Regulatory Flexibility Act of 1980 (RFA), as amended in 1996 (5 U.S.C. 601 *et seq.*), requires regulatory agencies to determine whether regulatory actions will adversely affect small entities. SBA defines small entities in terms of number of employees or annual receipts. For employers in SIC 3731 (shipbuilding and repair), small firms are defined by SBA as those with fewer than 1,000 employees. As shown in Table IV-3, for firms with fewer than 1,000 employees, costs are 1.61 percent

of profits and 0.06 percent of revenues. OSHA also examined costs as a percentage of profits and revenues for firms with fewer than 250 employees, as recommended by the Committee, and for firms with fewer than 20 employees to see whether there might be significant impacts on the very smallest firms. For firms with fewer than 250 employees, costs were 1.83 percent of profits and 0.07 percent of revenues. For firms with fewer than 20 employees, costs were 3.09 percent of profits and 0.11 percent of revenues.

A major source of these disparate impacts is lower levels of baseline compliance by small firms. Although the economic impacts on the smallest size class of employers are low, they are somewhat higher than for larger employers.

OSHA has set the criteria that if costs exceed one percent of revenues or five percent of profits, then the impact on small entities is considered significant for purposes of complying with the RFA. For all of the classes of affected small firms in the shipbuilding and repair and shipbreaking sectors, costs were less than one percent of revenues and five percent of profits. OSHA therefore certifies that this regulation will not have an economically significant impact on a substantial number of small entities. The Agency did not receive any substantive comments on this portion of the analysis.

#### Non-Regulatory Alternatives

OSHA concludes that economic and social alternatives to a federal workplace standard fail to adequately protect workers from the hazards associated with fires in the shipbuilding and repair and shipbreaking industries. Tort liability laws and workers' compensation provide some protection, but institutional factors limit effective means of addressing the significant costs of occupational injuries and illnesses. Therefore, OSHA finds that this final standard will provide the necessary remedy.

#### V. Regulatory Flexibility Certification

In accord with the Regulatory Flexibility Act, OSHA has examined the regulatory requirements of the final rule to determine if it will have a significant economic effect on a substantial number of small entities. As indicated in the previous section of this preamble, the final standard does not increase employers' compliance costs, and may even reduce the regulatory burden on all affected employers, both large and small. Accordingly, the Agency certifies that the final standard does not have a

significant economic effect on a substantial number of small entities.

#### VI. Environmental Impact Assessment

In accordance with the requirements of the National Environmental Policy Act (NEPA) of 1969 (42 U.S.C. 4321 *et seq.*), Council on Environmental Quality regulations (40 U.S.C. part 1500 *et seq.*), and the Department of Labor's NEPA regulations (29 CFR part 11), the Assistant Secretary has determined that this final rule will not have a significant impact on the external environment.

#### VII. Paperwork Reduction Act

This final rule contains several collections of information (paperwork) requirements that are subject to review by the Office of Management and Budget (OMB) under the Paperwork Reduction Act of 1995 (PRA-95), 44 U.S.C. 3501 *et seq.*, and its regulation at 5 CFR 1320. A collection of information is defined in PRA-95 to mean "the obtaining, causing to be obtained, soliciting, or requiring the disclosure to third parties or the public of facts or opinions by or for an agency regardless of form or format." (44 U.S.C. 3502(3)(A)).

In the preamble to the proposed rule, OSHA asked for comment on each of the paperwork requirements in Subpart P (67 FR 76243-76246). OSHA received no comments on the paperwork burdens or OSHA's estimation of those burdens. Therefore, the Agency has made no changes to the paperwork package. OSHA estimates the total burden hours associated with all of the collection of information requirements at 5,344 burden hours in the first year and 4,788 burden hours in the second and subsequent years.

Potential respondents are not required to respond to the information collection requirements until they have been approved by OMB, and a currently valid OMB control number is displayed. OMB is currently reviewing OSHA's request for approval of the 29 CFR Part 1915 Subpart P information collections. OSHA will publish a subsequent **Federal Register** document when OMB takes further action on the information collection requirements in the shipyard fire protection rule.

#### VIII. Unfunded Mandates

For the purposes of the Unfunded Mandates Reform Act of 1995, this rule does not include any Federal mandate that may result in increased expenditures by State, local, and tribal governments, or increased expenditures by the private sector of more than \$100 million in any year.

#### IX. Federalism

OSHA has reviewed this final rule in accordance with the Executive Order on Federalism (Executive Order 13132, 64 FR 43255) which requires that agencies, to the extent possible, refrain from limiting state policy options, consult with states prior to taking any actions that would restrict state policy options, and take such actions only when there is clear constitutional authority and the presence of a problem of national scope. The Order provides for preemption of State law only if there is a clear Congressional intent for the Agency to do so. Any such preemption is to be limited to the extent possible.

Section 18 of the OSH Act (29 U.S.C. 651 *et seq.*) expresses Congress' intent to preempt state laws where OSHA has promulgated occupational safety and health standards. Under the OSH Act, a state can avoid preemption on issues covered by Federal standards only if it submits, and obtains Federal approval of, a plan for the development of such standards and their enforcement (State-Plan state). 29 U.S.C. 667. Occupational safety and health standards developed by such State-Plan states must, among other things, be at least as effective in providing safe and healthful employment and places of employment as the Federal standards. As Congress has expressed a clear intent for OSHA standards to preempt State job safety and health rules in areas addressed by OSHA standards, in States without OSHA-approved State plans, this rule limits State policy options only to the extent required by law. In States with OSHA-approved State Plans, this action does not significantly limit State policy options.

#### X. State-Plan States

The 26 States or U.S. Territories with their own OSHA approved occupational safety and health plans must revise their standards to reflect this final standard or show OSHA why there is no need for action, *e.g.*, because an existing state standard covering this area is already "at least as effective as" the new Federal standard. The state standard must be at least as effective as this final standard, must be applicable to both the private and public (State and local government employees) sectors, and must be completed within six months of the publication date of this final Federal rule.

Currently only five States (California, Minnesota, Oregon, Vermont, and Washington) with their own State plans cover private sector onshore maritime activities in whole or in part. Federal OSHA enforces maritime standards

offshore in all States and provides onshore coverage of maritime activities in Federal OSHA States, in the five States above, to the extent not covered by them, and in all the other State Plan States: Alaska, Arizona, Connecticut (plan covers only State and local government employees), Hawaii, Indiana, Iowa, Kentucky, Maryland, Michigan, Nevada, New Jersey (plan covers only State and local government employees), New Mexico, New York (plan covers only State and local government employees), North Carolina, Puerto Rico, South Carolina, Tennessee, Utah, Virginia, Virgin Islands (plan covers only territorial government employees), and Wyoming. All State Plans must also extend protection to any public sector workers engaged in maritime activities.

#### List of Subjects in 29 CFR Part 1915

Fire protection, Hazardous substances, Incorporation by reference, Longshore and harbor workers, Occupational safety and health, Reporting and recordkeeping requirements, Shipyards, Vessels.

#### XI. Authority and Signature

This document was prepared under the direction of John L. Henshaw, Assistant Secretary of Labor for Occupational Safety and Health, U.S. Department of Labor, 200 Constitution Avenue, NW., Washington, DC 20210. It is issued pursuant to sections 4, 6, and 8 of the Occupational Safety and Health Act of 1970 (29 U.S.C. 653, 655, 657); Secretary of Labor's Order No. 5-2002 (67 FR 65008); and 29 Part 1911.

Signed in Washington, DC, this 7th day of September, 2004.

**John L. Henshaw,**

*Assistant Secretary of Labor.*

■ OSHA amends 29 CFR Part 1915 as follows:

#### PART 1915—[AMENDED]

■ 1. The authority citation for part 1915 is revised as follows:

**Authority:** Sec. 41, Longshore and Harbor Workers' Compensation Act (33 U.S.C. 941); secs. 4, 6, and 8 of the Occupational Safety and Health Act of 1970 (29 U.S.C. 653, 655, 657); Secretary of Labor's Order No. 12-71 (36 FR 8754), 8-76 (41 FR 25059), 9-83 (48 FR 35736), 1-90 (55 FR 9033), 6-96 (62 FR 111), 3-2000 (65 FR 50017), or 5-2002 (67 FR 65008) as applicable; 29 CFR Part 1911.

■ 2. In § 1915.5, add paragraph (d)(4) to read as follows:

#### § 1915.5 Incorporation by reference.

\* \* \* \* \*

(d)(4) The following material is available for purchase from the National

Fire Protection Association, 1 Batterymarch Park, PO Box 9101, Quincy, MA 02269-9101:

(i) NFPA 1981-1997, Standard on Open-Circuit Self-Contained Breathing Apparatus for the Fire Service, IBR approved for § 1915.505(e)(3)(v).

(ii) NFPA 1971-2000, Standard on Protective Ensemble for Structural Fire Fighting, IBR approved for § 1915.505(e)(4)(ii).

(iii) NFPA 1976-2000, Standard on Protective Ensemble for Proximity Fire Fighting, IBR approved for § 1915.505(e)(5).

(iv) NFPA 1982-1998, Standard on Personal Alert Safety Systems (PASS), IBR approved for § 1915.505(e)(6)(ii).

(v) NFPA 1983-2001, Standard on Fire Service Life Safety Rope and System Components, IBR approved for § 1915.505(e)(7)(i).

(vi) NFPA 10-1998, Standard for Portable Fire Extinguishers, IBR approved for § 1915.507(b)(1).

(vii) NFPA 14-2000, Standard for the Installation of Standpipe, Private Hydrant, and Hose Systems, IBR approved for § 1915.507(b)(2) and (d)(1).

(viii) NFPA 72-1999, National Fire Alarm Code, IBR approved for § 1915.507(c)(6).

(ix) NFPA 13-1999, Installation of Sprinkler Systems, IBR approved for § 1915.507(d)(2).

(x) NFPA 750-2000, Standard on Water Mist Fire Protection Systems, IBR approved for § 1915.507(d)(2).

(xi) NFPA 25-2002, Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems, IBR approved for § 1915.507(d)(2).

(xii) NFPA 15-2001, Standard for Water Spray Fixed Systems for Fire Protection, IBR approved for § 1915.507(d)(3).

(xiii) NFPA 11-1998, Standard for Low-Expansion Foam, IBR approved for § 1915.507(d)(3).

(xiv) NFPA 11A-1999, Standard for Medium- and High-Expansion Foam Systems, IBR approved for § 1915.507(d)(3).

(xv) NFPA 17-2002, Standard for Dry Chemical Extinguishing Systems, IBR approved for § 1915.507(d)(4).

(xvi) NFPA 12-2000, Standard on Carbon Dioxide Extinguishing Systems, IBR approved for § 1915.507(d)(5).

(xvii) NFPA 12A-1997, Standard on Halon 1301 Fire Extinguishing Systems, IBR approved for § 1915.507(d)(5).

(xviii) NFPA 2001-2000, Standard on Clean Agent Fire Extinguishing Systems, IBR approved for § 1915.507(d)(5).

(xix) NFPA 1403-2002, Standard on Live Fire Training Evolutions, IBR approved for § 1915.508(d)(8).

■ 3. § 1915.52 [Removed]

Remove § 1915.52.

■ 4. Part 1915 is amended by adding a new subpart, subpart P, to read as follows:

#### Subpart P—Fire Protection in Shipyard Employment

Sec.

1915.501 General provisions.

1915.502 Fire safety plan.

1915.503 Precautions for hot work.

1915.504 Fire watches.

1915.505 Fire response.

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

1915.507 Land-side fire protection systems.

1915.508 Training.

1915.509 Definitions applicable to this subpart.

Appendix A to Subpart P—Model Fire Safety Plan (Non-Mandatory)

#### § 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 1981–1997 Standard on Open-Circuit Self-Contained Breathing Apparatus for the Fire Service (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.

#### **§ 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 10–1998 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 10–1998, as portable fire extinguishers if the employer selects, installs, inspects, maintains, and tests those systems according to the specific recommendations in NFPA 14–2000 Standard for the Installation of Standpipe, Private Hydrant, 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 72–1999 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 14–2000 Standard for the Installation of Standpipe, Private Hydrant, 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 NFPA 13–1999 Standard for the Installation of Sprinkler Systems (incorporated by reference, see § 1915.5) or NFPA 750–2000 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); NFPA 11–1998 Standard for Low-Expansion Foam (incorporated by reference, see § 1915.5); and NFPA 11A–1999 Standard for Medium- and High-Expansion Foam Systems (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 12–2000 Standard on Carbon Dioxide Extinguishing Systems (incorporated by reference, see § 1915.5); NFPA 12A–1997 Standard on Halon 1301 Fire Extinguishing Systems (incorporated by reference, see § 1915.5); and NFPA 2001–2000 Standard on Clean Agent Fire Extinguishing Systems (incorporated by reference, see § 1915.5).

#### **§ 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.

#### **§ 1915.509 Definitions applicable to this subpart.**

*Alarm*—a signal or message from a person or device that indicates that there is a fire, medical emergency, or other situation that requires emergency response or evacuation. At some shipyards, this may be called an "incident" or a "call for service."

*Alarm system*—a system that warns employees at the worksite of danger.

*Body harness*—a system of straps that may be secured about the employee in a manner that will distribute the fall arrest forces over at least the thighs, shoulders, chest, and pelvis, with means for attaching it to other components of a personal fall arrest system.

*Class II standpipe system*—a 1½ inch (3.8 cm) hose system which provides a means for the control or extinguishment of incipient stage fires.

*Contract employer*—an employer, such as a painter, joiner, carpenter, or scaffolding sub-contractor, who performs work under contract to the host employer or to another employer under contract to the host employer at the host employer's worksite. This excludes employers who provide incidental services that do not influence shipyard employment (such as mail delivery or office supply services).

*Dangerous atmosphere*—an atmosphere that may expose employees to the risk of death, incapacitation, injury, acute illness, or impairment of ability to self-rescue (*i.e.*, escape unaided from a confined or enclosed space).

*Designated area*—an area established for hot work after an inspection that is free of fire hazards.

*Drop Test*—a method utilizing gauges to ensure the integrity of an oxygen fuel gas burning system. The method requires that the burning torch is installed to one end of the oxygen and fuel gas lines and then the gauges are attached to the other end of the hoses. The manifold or cylinder supply valve is opened and the system is pressurized. The manifold or cylinder supply valve is then closed and the gauges are watched for at least sixty (60) seconds. Any drop in pressure indicates a leak.

*Emergency operations*—activities performed by fire response organizations that are related to: rescue, fire suppression, emergency medical care, and special operations or activities that include responding to the scene of an incident and all activities performed at that scene.

*Fire hazard*—a condition or material that may start or contribute to the spread of fire.

*Fire protection*—methods of providing fire prevention, response, detection, control, extinguishment, and engineering.

*Fire response*—the activity taken by the employer at the time of an emergency incident involving a fire at the worksite, including fire suppression activities carried out by internal or external resources or a combination of both, or total or partial employee evacuation of the area exposed to the fire.

*Fire response employee*—a shipyard employee who carries out the duties and responsibilities of shipyard firefighting in accordance with the fire safety plan.

*Fire response organization*—an organized group knowledgeable, trained, and skilled in shipyard firefighting operations that responds to shipyard fire emergencies, including: fire brigades, shipyard fire departments,

private or contractual fire departments, and municipal fire departments.

**Fire suppression**—the activities involved in controlling and extinguishing fires.

**Fire watch**—the activity of observing and responding to the fire hazards associated with hot work in shipyard employment and the employees designated to do so.

**Fixed extinguishing system**—a permanently installed fire protection system that either extinguishes or controls fire occurring in the space it protects.

**Flammable liquid**—any liquid having a flashpoint below 100 °F (37.8 °C), except any mixture having components with flashpoints of 100 °F (37.8 °C) or higher, the total of which make up 99 percent or more of the total volume of the mixture.

**Hazardous substance**—a substance likely to cause injury by reason of being explosive, flammable, poisonous, corrosive, oxidizing, an irritant, or otherwise harmful.

**Hose systems**—fire protection systems consisting of a water supply, approved fire hose, and a means to control the flow of water at the output end of the hose.

**Host employer**—an employer who is in charge of coordinating work or who hires other employers to perform work at a multi-employer workplace.

**Incident management system**—a system that defines the roles and responsibilities to be assumed by personnel and the operating procedures to be used in the management and direction of emergency operations; the system is also referred to as an “incident command system” (ICS).

**Incipient stage fire**—a fire, in the initial or beginning stage, which can be controlled or extinguished by portable fire extinguishers, Class II standpipe or small hose systems without the need for protective clothing or breathing apparatus.

**Inerting**—the displacement of the atmosphere in a permit space by noncombustible gas (such as nitrogen) to such an extent that the resulting atmosphere is noncombustible. This procedure produces an IDLH oxygen-deficient atmosphere.

**Interior structural firefighting operations**—the physical activity of fire response, rescue, or both involving a fire beyond the incipient stage inside of buildings, enclosed structures, vessels, and vessel sections.

**Multi-employer workplace**—a workplace where there is a host

employer and at least one contract employer.

**Personal Alert Safety System (PASS)**—a device that sounds a loud signal if the wearer becomes immobilized or is motionless for 30 seconds or more.

**Physical isolation**—the elimination of a fire hazard by removing the hazard from the work area (at least 35 feet for combustibles), by covering or shielding the hazard with a fire-resistant material, or physically preventing the hazard from entering the work area.

**Physically isolated**—positive isolation of the supply from the distribution piping of a fixed extinguishing system. Examples of ways to physically isolate include: removing a spool piece and installing a blank flange; providing a double block and bleed valve system; or completely disconnecting valves and piping from all cylinders or other pressure vessels containing extinguishing agents.

**Protected space**—any space into which a fixed extinguishing system can discharge.

**Proximity firefighting**—specialized fire-fighting operations that require specialized thermal protection and may include the activities of rescue, fire suppression, and property conservation at incidents involving fires producing very high levels of conductive, convective, and radiant heat such as aircraft fires, bulk flammable gas fires, and bulk flammable liquid fires. Proximity firefighting operations usually are exterior operations but may be combined with structural firefighting operations. Proximity firefighting is not entry firefighting.

**Qualified instructor**—a person with specific knowledge, training, and experience in fire response or fire watch activities to cover the material found in § 1915.508(b) or (c).

**Rescue**—locating endangered persons at an emergency incident, removing those persons from danger, treating the injured, and transporting the injured to an appropriate health care facility.

**Shipyard firefighting**—the activity of rescue, fire suppression, and property conservation involving buildings, enclosed structures, vehicles, vessels, aircraft, or similar properties involved in a fire or emergency situation.

**Small hose system**—a system of hoses ranging in diameter from 5/8" (1.6 cm) up to 1 1/2" (3.8 cm) which is for the use of employees and which provides a means for the control and extinguishment of incipient stage fires.

**Standpipe**—a fixed fire protection system consisting of piping and hose

connections used to supply water to approved hose lines or sprinkler systems. The hose may or may not be connected to the system.

## Appendix A to Subpart P—Model Fire Safety Plan (Non-Mandatory)

### Model Fire Safety Plan

**Note:** This appendix is non-mandatory and provides guidance to assist employers in establishing a Fire Safety Plan as required in § 1915.502.

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- III. Alarm systems and how to report fires.
- IV. How to evacuate in different emergency situations.
- V. Employee awareness.

#### I. Purpose

The purpose of this fire safety plan is to inform our employees of how we will control and reduce the possibility of fire in the workplace and to specify what equipment employees may use in case of fire.

#### II. Work Site Fire Hazards and How To Properly Control Them

- A. Measures to contain fires.
- B. Teaching selected employees how to use fire protection equipment.
- C. What to do if you discover a fire.
- D. Potential ignition sources for fires and how to control them.
- E. Types of fire protection equipment and systems that can control a fire.
- F. The level of firefighting capability present in the facility, vessel, or vessel section.
- G. Description of the personnel responsible for maintaining equipment, alarms, and systems that are installed to prevent or control fire ignition sources, and to control fuel source hazards.

#### III. Alarm Systems and How To Report Fires

- A. A demonstration of alarm procedures, if more than one type exists.
- B. The work site emergency alarm system.
- C. Procedures for reporting fires.

#### IV. How To Evacuate in Different Emergency Situations

- A. Emergency escape procedures and route assignments.
- B. Procedures to account for all employees after completing an emergency evacuation.
- C. What type of evacuation is needed and what the employee's role is in carrying out the plan.
- D. Helping physically impaired employees.

#### V. Employee Awareness

Names, job titles, or departments of individuals who can be contacted for further information about this plan.

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