SEATTLE FIRE DEPARTMENT

Administrative Rule 26.01.24

SUBJECT: **CUTTING, WELDING AND OTHER HOT WORK ON MARINE VESSELS**	EFFECTIVE DATE: March 15, 2024
REFERENCES: Seattle Fire Code SFD Administrative Rule 26.02.24, Designated Marine Hotwork Facilities and Shipyards NFPA 306, Standard for the Control of Gas Hazards on Vessels NFPA 307, Standard for the Construction and Fire Protection of Marine Terminals, Piers, and Wharves NFPA 312, Standard for Fire Protection of Vessels During Construction, Conversion, Repair, and Lay-Up OSHA 29 CFR 1915	SUPERSEDES: Administrative Rule 26.01.14 Effective April 4, 2014
	FCAB REVIEW DATE: January 31, 2024
NOTICE: Administrative Rules are established per Seattle Fire Code Section 104.1, and they are subject to the Administrative Sections 104.9 Modifications, Section 104.10 Alternate materials, design and methods of construction and equipment, and Section 111.1 Appeals.	APPROVED: _____ TIMOTHY J. MUNNIS, FIRE MARSHAL/FIRE CODE OFFICIAL

Section 1. INTENT

The intent of this administrative rule is to establish the minimum requirements consistent with nationally recognized good practice for providing a reasonable level of life safety and property protection from the hazards of fire, explosion or dangerous conditions at new and existing piers and wharves where hot work activities are conducted aboard vessels and to provide safety to fire fighters and emergency responders during emergency operations.

Section 2. DEFINITIONS

For the purposes of this rule the following words and terms have the meanings indicated below:

Adjacent spaces. Those spaces in all directions from the subject space, including all points of contact, corners, diagonals, decks, tank tops, and bulkheads, and including areas affected by *hot work*, where slag, products of combustion, and sparks would be expected to fall or accumulate.

Alarm. A signal or message from a *fire watch*, person or device that indicates that there is a fire, medical emergency, or other situation that requires emergency response or evacuation. The alarm shall result in immediate notification of the Fire Department via 911.

Chainfall. A hoisting device consisting of a chain suspended from or laid over a fixed, raised structure such as a beam, used to lift heavy objects, especially vehicle engines.

Confined space. A compartment of small size and limited access such as a double bottom tank, cofferdam, or other space which by its small size and confined nature can readily create or aggravate a hazardous exposure. A *confined space* may be oxygen-deficient or contains flammable or toxic materials or physical hazards.

Designated area. An area such as a *vessel* section, pipe shop, welding shop, fabricating shop and subassembly areas on the *vessel* or at the shore *facility* 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.

Enclosed space. Any space, other than a *confined space*, which is enclosed by a bulkhead and overhead. The term includes cargo holds, fish holds, processing areas, quarters, and machinery spaces. An *enclosed space* may be oxygen-deficient or contains flammable or toxic materials or physical hazards.

Facility. A shore-side location such as a shipyard, cleaning plant, naval base, dock, pier complex, etc. that is under the ownership or control of the same party and has the same continuous shoreline under their ownership or operation.

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. *Fire Watch* is a person trained by a qualified instructor according to OSHA 29 CFR 1915.508 (e) and designated by the employer or the *repair supervisor* to watch for signs of fire. Such persons shall be familiar with Fire Department Permit Conditions, the area where the *hot work* is to take place, and procedures for sounding an *alarm* in the event of fire.

Gangway. A ramp-like or stair-like means of access, provided to enable personnel to board or leave a *vessel* including accommodation ladders, gangplanks, and brows. Whenever practicable, a *gangway* of not less than 20 inches (50 centimeters) walking surface of adequate strength, maintained in safe repair and be safely secured shall be used. Each side of a *gangway*, and the turntable if used, shall have a railing with a minimum height of 33 inches (83.8 centimeters) measured perpendicularly from rail to walking surface at the stanchion, with a mid-rail. Rails shall be of wood, pipe, chain, wire or rope and shall be kept taut at all times.

Hollow structures. Rudders, rudder stocks, skegs, castings, masts and booms, rails, lapped plates, and other attachments to a *vessel* that enclose a void space. *Hollow structures* must be drilled and tested by a *Shipyard Competent Person* or a *Marine Chemist* prior to *hot work*.

Hot work. Any activity involving any of the following: riveting, welding, burning, brazing, soldering, heating, the use of *powder-actuated fastening tools* or similar fire-producing operations, including any operation that raises the temperature of the work piece equal to or greater than 204°C (400°F). Grinding, drilling, abrasive blasting, the use of non-intrinsically safe tools, spark-producing tools, or similar operations in the presence of or against the accumulations of readily combustible materials, flammable gases, or flammable or combustible liquids or vapors when the atmosphere is equal to or exceeds 10 percent of the LEL, as determined by a *Shipyard Competent Person*, are also considered *hot work* unless deemed otherwise by a *Marine Chemist*.

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.

Interbarrier space. That space associated with a flammable cryogenic liquid tank between a primary and secondary barrier, whether or not completely or partially occupied by insulation or other material.

Length of vessel. The length overall (LOA) of the *vessel* as measured along the centerline.

Marine Chemist. The holder of a valid Certificate issued by the National Fire Protection Association in accordance with the "Rules for the Certification of *Marine Chemist*s" establishing the person's qualifications to determine whether construction, alteration, repair, or shipbreaking of vessels can be undertaken with safety.

Non-designated Areas. An area required inspection by a *Shipyard Competent Person* or a *Marine Chemist* prior to performing *hot work*. *Hot work* in non-designated may require a *Fire Watch* with proper fire protection equipment.

Physical isolation. The elimination of a fire hazard by removing the hazard from the work area by covering or shielding the hazard with a fire-resistant material, or physically preventing the hazard from entering the work area.

Powder actuated fastening tool. Means a tool or machine which drives a stud, pin, bolt, or fastener by means of an explosive charge.

Qualified instructor. A person with specific knowledge, training, and experience in fire response or *Fire Watch* activities to cover the material found in OSHA 29 CFR 1915.508(b), (c).

Repair Supervisor. The employer or his authorized representative who is in charge of coordinating *hot work* operations and may be responsible for controlling fire hazards, posting fire protection equipment, assigning *Fire Watch,* correcting unsafe conditions and administering emergency or alarm procedures.

Seizure of vessel. *Vessels* involved in violations of this regulation may be subject to being detained in Port, investigated (with a warrant), or seized, following a fire.

Ship repair. *Ship repair* or *ship repairing* means any repair of a *vessel* including, but not limited to alterations, modification, conversion, installations, cleaning, painting, and maintenance work.

Shipyard. A pier, wharf, or series of piers and related onshore facilities, designated by the fire code official, which by virtue of the pier construction, location, emergency vehicle access, fire protection, hydrant availability and onsite safety personnel, is suitable to permit repairs, including major conversions, on *vessels* of any length.

Shipyard Competent Person (SCP). A person who is designated in writing by their employer in accordance with OSHA 29 CFR 1915.7 and able to evaluate employee exposure to hazardous substances, fire hazards or to other unsafe conditions and is able of specify the necessary precautions to be taken. The *SCP* must be trained and hold a valid Certificate of Training issued by the National Fire Protection Association (NFPA) or from a *SCP* Training Course provided by an NFPA Certified *Marine Chemist*.

Subject Space. A space or compartment where work is intended or will occur either within or on the boundary of the space.

Vessel. Every description of watercraft or other artificial contrivance used or capable of being used as a means of transportation on water including special purpose floating structures (dry docks, caissons, bridge pontoons, buoys, pipe piles) not primarily designed for or used as a means of transportation on water.

> **Ship.** Any *vessel* propelled by power or sail.
> **Barge.** Any *vessel* not equipped with a means of self-propulsion.
> **Coiled Vessel.** Tank *vessel* using a closed system or heating coils that use thermal oil as the heating medium.
> **Tank Vessels.** Any *vessel* specially constructed or converted to carry liquid bulk cargo in tanks.

Visual inspection means the physical survey of the space, its surroundings and contents to identify hazards such as, but not limited to, restricted accessibility, residues, unguarded machinery, and piping or electrical systems.

Section 3. PERMITS

3.1 An operational marine hot work permit is required by Section 105 of the Seattle Fire Code prior to conducting hot work on any vessel located within the corporate city limits of Seattle. All applicable permit safety requirements required by this rule shall be implemented.

3.2 Marine hot work permits are either temporary permits issued to contractors or individuals or annual permits issued to a facility. It is worth noting that facilities holding annual permits have the option of requiring outside contractors to obtain temporary permits.

3.3 Marine hot work permits are only issued for jobs occurring at approved locations that have been issued a designated marine hot work facility permit in accordance with Seattle Fire Department Administrative Rule 26.02.24. Additional restrictions on acceptable locations can be found in Section 4 of this rule.

3.4. Temporary permits for *hot work* on *vessels* shall be identified as Level I *hot work* or Level II *hot work* to distinguish the fire hazards and fire-watch requirements associated with the work.

3.5 Temporary permits to perform *hot work* onboard passenger *vessels* at locations serving as passenger terminals when passengers or the public have access to the *vessel* must be specifically applied for and a site inspection from the Fire Marshal's Office must be conducted prior to issuance of any such permit. The method of obtaining permits for preapproved applicants set forth in Section 3.9 cannot be used to obtain permits for *hot work* on passenger *vessels* as noted above. Such applications shall be approved on a case-by-case basis, provided that workers and conditions conform to site specific permit conditions.

3.6 Level I Hot Work Permits. Level I permits are temporary permits issued for *hot work* in areas or compartments that are not on or near foam insulation; do not contain or have not contained flammable or combustible vapors, coatings, fuel oils, hydraulic oil, lube oil, waste oil or other petroleum products. Level I *hot work* areas normally will not require a *Marine Chemist* Certificate (see Section 10.2 of this Rule) but inspection of the *hot work* area by a *Shipyard Competent Person* is always required. Such areas or compartments may include, but are not limited to:

1. Ballast tanks, chain lockers and voids.
2. Superstructures, deck house, galley and living spaces.
3. Shell plating, framing decks, bulkheads.
4. Main deck, dry cargo holds, dry stores and processing areas that are not insulated with flammable or combustible foam insulation.

Certain *hot work* operations normally classified as Level I may be classified as Level II *hot work* if deemed necessary by the Seattle Fire Department inspector or a *Marine Chemist*.

3.7 Level II Hot Work Permits. Level II permits are temporary permits issued for *hot work* in hazardous areas or compartments that are insulated with foam, contain or have contained flammable or combustible vapors, coatings, fuel oils, hydraulic oil, lube oil, waste oil or other petroleum products. Level II *hot work* areas will require a *Marine Chemist* Certificate (see Section 10.2 of this Rule). Such hazardous areas or compartments may include, but are not limited to:

1. Fuel oil tanks and piping systems, including pumps, strainers, vents and its associated appurtenances.
2. Hydraulic, lube, slops or waste oil tanks and their associated piping systems.
3. Engine rooms, diesel generator rooms, reefer flats, machinery spaces, shaft alleys and steering gear compartments.
4. Cargo tanks or compartments that contain or have contained hazardous materials including flammable or combustible gases, liquids or solids.
5. Sewage holding tanks and piping systems, including pumps and vents.
6. Foam-insulated compartments such as refrigerated cargo holds, fish holds or processing areas not in compliance with Section 10.3.2 of this document.
7. Work conducted on refrigeration and/or cooling systems using Freon or ammonia.
8. Work on bulkheads and overheads directly adjacent to those compartments listed above.

Certain *hot work* operations normally classified as Level I may be classified as Level II *hot work* if deemed necessary by a Seattle Fire Department inspector or a *Marine Chemist*.

3.8 Annual Permits. Locations where *ship repair* and alteration on *vessels* is the primary line of business and it can be satisfactorily demonstrated that obtaining temporary permits is a practical difficulty, may be eligible to obtain an annual marine *hot work* permit.

> **EXCEPTION:** When approved by the chief, annual permits may be issued where ship repair is not the primary line of business, but frequent repair, alteration, and maintenance of the permit holder's vessels is a necessary and ongoing activity (i.e. construction companies) and it can be satisfactorily demonstrated that obtaining temporary permits is a practical difficulty.

An annual marine *hot work* permit will be issued only to companies that have demonstrated for an established time period, knowledge of, and consistent compliance with, the requirements of this Rule in accordance with Section 3.10. Any *hot work* that is conducted under the annual permit must be performed by employees of the company or by employees of subcontractors that are either hired by the company or under the direct operational control of the company and with the company's prior approval. Whether or not a subcontractor may perform work under the permit shall be at the discretion of the company, and the company may instead require that the subcontractor obtain its own temporary permit. This *hot work* must be performed at a location that is owned by the company and is an approved *designated hot work facility* holding a valid Fire Department *designated hot work facility* permit.
Companies that can demonstrate a lasting commitment through a long-term property lease or other means may be considered as having met the ownership requirement.

3.9 Method of obtaining temporary permits. Temporary marine *hot work* permits may be requested by telephoning the Fire Department's Marine *Hot work* Permit Program at **206-689-WELD** 24 hours a day. Individuals who are not on the Pre-approved Applicant List (see Section 3.11 of this Rule) requesting a permit will be directed to wait for an inspector from the Special Hazards Unit of the Fire Marshal's Office to return their phone call during normal business hours for information about the job and further direction. Pre-approved applicants will be directed to provide sufficient information about the job to allow for a permit to be generated.

Temporary permits to perform *hot work* onboard passenger *vessels* at locations serving as passenger terminals when passengers or the public have access to the *vessel* must be specifically applied for and a site inspection from the Fire Marshal's Office must be conducted prior to issuance of any such permit. The method of obtaining permits for preapproved applicants set forth above cannot be used to obtain permits for *hot work* on passenger *vessels* as noted above. Such applications shall be approved on a case-by-case basis, provided that workers and conditions conform to site specific permit conditions.

3.10 Method of obtaining annual permits. Applicants for an annual marine *hot work* permit must receive a minimum of six (6) temporary permits (Code No. 4915) over at least a six-month period and found to be in compliance with all temporary permit conditions before an annual permit will be approved for issuance. Applicants who obtain fewer than six (6) permits (Code 4915) during a six-month period will be considered for approval only after six (6) permits have been issued and no permit violations are noted.

Alternatively, an applicant who does not meet the above described requirement for 6 permits over a minimum 6 month time period, may apply for an annual permit if all of the following pre-requisites can be met: The applicant (1) has had no fire code or permit violations for a period of at least 24 months, and (2) can demonstrate to the Fire Marshal a satisfactory history of competence and compliance with fire department regulations with respect to marine *hot work*. Applications submitted on the basis of these alternate conditions will be considered on an individual basis and may or may not be approved depending on the merit of the application.

3.11 Preapproved Applicant List. The Seattle Fire Department "Preapproved Applicant List" is a list of Seattle area maritime professionals, who have demonstrated their competence and ability to conduct marine *hot work* activities in a safe manner in accordance with Fire Department requirements and Administrative Rule 26.01.24 for a designated time period. Qualifications for the list are as follows:

Each applicant who receives a minimum of six (6) temporary permits (Code No. 4915) during a six-month period and is found to be in compliance with all permit conditions will be considered a pre-approved applicant after the six-month period. Applicants who obtain fewer than six (6) permits (Code 4915) during a six-month period will be considered a preapproved applicant only after six (6) permits have been issued and no permit violations are noted.

Alternatively, an applicant who does not meet the above described requirement for 6 permits in 6 months, may apply for pre-approved status if all of the following pre-requisites can be met: The applicant (1) possesses a current annual marine *hot work* permit, (2) has had no violations for a

period of at least 24 months, and (3) can demonstrate to the Fire Marshal a satisfactory history of competence and compliance with fire department regulations with respect to marine *hot work*. Applications submitted based on these alternate conditions will be considered on an individual basis and may or may not be approved depending on the merit of the application. Those applicants who are granted a pre-approved status through this process will retain that status until (1) the applicant's annual permit is no longer valid, or (2) the applicant is cited for a violation.

3.12 Actually Beginning the Job. A *Shipyard Competent Person* (SCP) is required to perform frequent testing and inspections of all Level I and Level II *hot work* operations. Permit applicants will be asked to identify the *SCP* responsible for each *hot work* operation prior to commencement of each job. Additionally, a *SCP* may be required by the *Marine Chemist* or a Seattle Fire Department inspector to be continuously at the job site to oversee all aspects of any *hot work* operations.

If you are not on the "Preapproved Applicant List," or are working towards inclusion on the list, no *hot work* may commence until a site inspection has been conducted by the Fire Department and the inspector has issued the permit. Inspections related to issuing permits for those applicants that are not preapproved have the highest priority, and non-preapproved applicants will be contacted for an appointment during normal business hours as soon as possible after a permit request has been made.

Individuals on the "Preapproved Applicant List" are provided information through the Marine *Hot Work* Permit Program voice message center (206-689-WELD) when commencement of *hot work* may begin. All site inspections for jobs being conducted by preapproved applicants will be random and unannounced.

BEGINNING A HOT WORK JOB ON A MARINE VESSEL WITHOUT AN APPROVED PERMIT IS STRICTLY PROHIBITED IN THE CITY OF SEATTLE

3.13 Responsible Party Identified on the Permit. The responsible party identified on the permit shall be the individual having responsibility for the job in its entirety and is responsible for ensuring that the *hot work* is conducted in accordance with the restrictions and requirements of this regulation and the permit conditions listed on the actual permit.

3.14 Length of Permit Validity. Annual permits, (Code No. 4914), are issued for a one-year period, and renewed yearly thereafter. Temporary permits (Code 4915) may be issued at the request of the applicant for periods of 2 days, 7 days, 15 days, 30 or 60 days. The expiration date of the permit will be clearly marked on the upper right-hand corner of the permit. After the expiration date, the temporary permit ceases to be a valid permit. If *hot work* is to continue, a new permit must be obtained. Expired permits must be removed from the *vessel*, *gangway*, wheelhouse, or otherwise need to be completely obliterated from view.

3.15 Transfer of Permits. Permits are non-transferable. A permit is issued at one *facility*, to the *vessel* owner, *vessel* repairer, host employer, contract employer or to one individual, for one set of specific circumstances on a single *vessel*. If the *vessel* moves to a different *facility*, or the work is transferred to another *vessel* repairer or individual, or the nature of the job changes, the permit becomes invalid and a new permit is required.

EXCEPTION: Container *vessels*, on a regular schedule calling Seattle, may leave berth and return on the same permit, if the nature of the work is routine maintenance and repairs. A *Marine Chemist*'s certificate is required in accordance with current OSHA 29 CFR 1915 and NFPA 306 regulations.

3.16 Posting of Temporary Permits. Temporary permits are required to be maintained "ready for inspection" at all times during the length of the job. Permits shall be posted on the *gangway*, dedicated posting boards adjacent to the *gangway*, or in the wheelhouse, in plain view, visible to an inspector from the pier, wharf, or bulkhead, or wherever access to the *vessel* is gained. Failure to have the permit posted, or posting an expired permit shall be considered sufficient cause for removal from the “pre-approved applicant list.”

Preapproved applicants are required to post a Fire Department Marine *Hot Work* Program Certificate in the same manner as a permit while waiting for the actual permit to be received.

Annual permits are required to be available on site for viewing by the inspector upon request.

3.17 Permit Fees. Temporary Level I and Level II permits (Code 4915) shall have fees associated with them in accordance with the current fee ordinance.

3.18 Method of Payment. Permit fees for temporary permits issued to non-pre-approved applicants may be invoiced after the permit has been issued, granted the responsible party at the job site is able and willing to sign the invoice and provide adequate billing information (correct address, contact person and telephone number). Permit fees for temporary permits issued to pre-approved applicants will be invoiced on a monthly basis. Invoices which remain unpaid for a time exceeding one month will result in the loss of the invoice privilege, and subsequent permit request forms will be required to be accompanied by the fee payment and any outstanding balance prior to issuance of any permit.

Permit fees for annual permits must be paid in full prior to issuance of the permit.

Questions about billing, the status of a particular invoice, or method of remitting payment, can be answered by calling the Permit Section of the Fire Marshal’s Office at 206-386-1331.

Section 4. LOCATIONS FOR CONDUCTING MARINE HOT WORK

4.1 General. Level I *hot work* activities may be conducted at almost any location in the City of Seattle except for those locations identified as prohibited in Section 4.3 of this Rule. Level II *hot work* activities may be conducted only at locations that have *designated hot work facility* site permit issued by the Seattle Fire Department. Detailed requirements for *designated hot work facilities* may be found in Administrative Rule 26.02.24.

4.2 Designated Hot Work Facilities. *Designated Hot Work Facilities* are those piers, designated by the fire code official, which, by virtue of their construction, location, fire protection and hydrant availability are suitable to permit certain repairs to *vessels*. The specific permit requirements are contained in Administrative Rule 26.02.24.

4.3 Prohibited Locations. Certain locations are not suitable for Level I or Level II marine *hot work* activities. Please contact the Fire Marshal's Office at (206) 386-1450 for emergency exceptions. Permits may be issued after a site inspection by a Fire Department Inspector and a *Marine Chemist*.

Level I *hot work* shall not be conducted at:

1. Fuel terminals or piers.
2. Passenger terminals unless under special temporary permit.
3. Grain terminals
4. Piers where primary use is residential or recreational in nature.
5. Piers not possessing the required Fire Department permits.
6. *Vessels* that are not immediately adjacent to the dock or pier. See also Section 4.5 of this Rule.

Level II *hot work* shall not be conducted at:

1. Fuel terminals or piers.
2. Passenger terminals unless under special temporary permit.
3. Grain terminals.
4. Piers where primary use is residential or recreational in nature.
5. Piers not possessing the required Fire Department permits.
6. *Vessels* that are not immediately adjacent to the dock or pier. See also Section 4.5 of this Rule
7. Combustible piers, floats or wharves, which are not equipped with suitable access for apparatus, availability of hydrant supply, or fire protection systems, as determined by the fire code official, or appointed representative.

4.4 Locations Suitable for Level I Hot Work. Level I *hot work* may be performed at the *vessel*'s normal berth and various *ship repair* facilities.

4.5 Hot Work Prohibited on Outboard *Vessels*. Level I and Level II *hot work* permits will not be issued to outboard *vessels* or any *vessel* that is not immediately adjacent to the dock or pier (i.e., no intervening *vessels*).

EXCEPTION: Barges, when:

1. Specifically approved under permit after a site inspection, and
2. Sufficient fire and life safety provisions, including provisions for egress of workers, are present.

4.6 Smith Cove Cruise Terminal (Pier 90/91) operational requirements.

1. The ventilation of gas barges is prohibited at Pier 90 and 91 while a cruise ship is moored at Pier 91 or while Smith Cove Cruise Terminal building is utilized as an assembly occupancy (ie: a gathering of 50 or more individuals, not including employees actively working).

2. Level I or Level II hot work is permitted on vessels at Pier 91 while a cruise ship is moored there or while the Smith Cove Cruise Terminal building is being utilized as an assembly occupancy, provided that in addition to compliance with the requirements of SFD Administrative Rule 26.01.24, two Shipyard Competent Persons (SCP) are required while *hot work* is being conducted. One SCP shall be dedicated to oversight of the *hot work* operations on-board the vessel, while the second shall serve as an additional trained SCP. The second SCP shall be located in the vicinity at either the vessel, Pier 90, Pier 91 or the Terminal Building and be available as needed. The two Shipyard Competent Persons (SCP) are in addition to the fire watch that is required in Section 7 of this rule.

3. Hot work conducted on-board cruise ships moored at Pier 91 shall require a temporary SFD permit and SFD permit inspection in addition to a marine chemist's certificate prior to commencement of work. The fee for the temporary SFD permit will be charged at the rate in accordance with the City of Seattle's current fee ordinance.

4. It shall be the responsibility of the Port of Seattle (POS) to provide conspicuous signs along Pier 91 alerting it's tenants whenever a cruise ship is present or whenever Smith Cove Cruise Terminal building is utilized as an assembly occupancy, and the additional controls are required to be in effect.

5. The POS shall also provide written advance notice both to the Pier 91 tenants and to the Seattle Fire Department of upcoming cruise ship schedule and any scheduled activities in the Smith Cove Cruise Terminal building so that ample time is provided to make arrangements for the individual controls required.

6. The presence of a cruise ship moored at Pier 91, or the use of the Smith Cove Cruise Terminal building as an assembly occupancy shall not preclude Level I and Level II hot work from being conducted on Pier 90.

7. All marine hot work operations at Pier 90 and 91 shall be conducted in accordance with SFD Administrative Rules 26.01.24 and 26.02.24.

Section 5. INSPECTIONS

5.1 General. Fire Department inspectors may arrive at the job site randomly and unannounced to verify compliance with permit conditions. Inspectors may or may not be wearing a Fire Department uniform. Prior to conducting the necessary inspection, the inspector will present appropriate identification and request permission to board the *vessel*. If access to the *vessel* is denied or unnecessarily delayed, the permit may be immediately revoked.

5.2 Hours of inspection. Routine inspections are normally conducted between the hours of 8:00 AM and 4:30 PM. However, inspections may occur at any time of the day or night, including weekends.

5.3 What the Inspector will be looking for. When the Fire Department inspector arrives at the job site, the inspector will be looking for compliance with all requirements set forth in Administrative Rule 26.01.24, including, but not limited to: adequate *gangway*s; availability of fire protection equipment; *Fire Watch*; *Marine Chemist's* Certificate; *hot work* areas cleared of foam insulation, hazardous materials and combustibles; scope of the *hot work* to be conducted; and documentation of *Shipyard Competent Person* status.

5.4 Recourse after an inspection. It is the intention of the Seattle Fire Department to provide quality safety inspections and the highest level of customer service in order to adequately protect the citizens of Seattle, marine industry personnel, and fire fighters.

Any and all questions, comments, or concerns about Seattle's marine *hot work* program are welcome and should be directed to the Special Hazards Unit Lieutenant at 206-386-1450 during regular business hours. If concerns related to the requirements set forth in this administrative rule cannot be resolved directly with the fire code official, an appeal in accordance with Section 111 of the Seattle Fire Code may be pursued.

Section 6. GENERAL PERMIT REQUIREMENTS

6.1 General. All requirements set forth in Section 6 of this Rule must be met prior to commencement of any Level I or Level II *hot work* operation and in order to obtain a permit.

6.2 Ability to Notify the Fire Department. A means shall be provided to rapidly contact the Fire Department in the event of an emergency. Such means shall be available within 200 feet of the work site.

6.3 Maintaining a list of Shipyard Competent Persons. Shipyards and annual permit holders shall make available to the fire code official a list of *Shipyard Competent Person*s on staff or contracted to oversee *hot work* on site. The list shall include, but shall not be limited to, the *SCP's* name, date of *SCP* certification and last refresher date training.

6.4 Required Setback Distances. *Hot work* in the marine industry is inherently dangerous due to the conductive and convective properties of hot metal, unintended direct flame contact, and the rapid-fire spreading characteristics of certain insulation, preservatives, paints, panelings and bulkheads covering materials found on *vessels*.

Whenever *hot work* operations are unable to be conducted exclusive of other activities in the immediate vicinity or adjacent space (e.g., spray painting, tank cleaning, solvent and chemical stripping, spray foaming, oil transfers, forced-ventilation of fuel tanks, sand blasting) a SCP shall specify any mitigating requirements.

Where practicable, portable containers of flammable or combustible liquids shall be removed from the *hot work* area prior to commencement of hot work.

With respect to the location of marine *hot work* on the *vessel*, the following separations shall apply:

1. *Hot work* shall be separated from any flammable liquids or solids (e.g., gasoline, acetone, MEK) by 100 feet.

   EXCEPTION: When a *Marine Chemist* certifies the space "Safe for Hot Work"

2. Hot work shall be separated from any combustible liquids or solids (e.g., hydraulic fluid, diesel fuel, wax, cosmoline, preservative coating, paraffin, polyurethane foam, cardboard, rope, plastic, paneling or other combustible surfaces) by not less than 35 ft.

   EXCEPTIONS:

   1. When a *Marine Chemist* certifies the space "Safe for Hot Work".
   2. Separation from any combustible or flammable material may be reduced to the distance specified on the *Marine Chemist's* Certificate.
   3. Separation distances for polyurethane foam shall be in accordance with Section 10 of this Rule.

NOTE

A *Fire Watch* is required whenever any combustible material closer than 35 feet to the *hot work* in either the horizontal or vertical direction cannot be removed, shielded or protected with flame-retardant covers, guards or curtains.

6.5 Housekeeping.

In accordance with OSHA 29 CFR 1915, Subpart F, good housekeeping practices shall be maintained, including but not limited to the following:

1. Ensure that all combustible materials (construction debris, paper, foam dust and pieces, cardboard, wood, oily rags, paint rags, plastic, etc.) are removed from the area impacted by the *hot work*. This also applies to the opposite sides of bulkheads, overheads and deck plates being welded or burned.

2. Escape routes from the *hot work* area should be clear of obstructions and trip hazards.

3. Fuel gas and oxygen hose connections shall be kept free of grease and oil.

4. Where practicable, portable flammable and combustible liquid containers shall be removed from the *vessel*.

6.6 Prohibited Activities. The following activities are prohibited during any *hot work* operations:

1. Flammable and combustible liquid use (other than that necessary to perform *hot work* operations) or flammable or combustible liquid transfer operations aboard the *vessel*.

EXCEPTIONS:

1. Spray painting or the application of other flammable compounds if sufficient ventilation is provided to maintain the atmosphere at not more than 10 percent of the lower explosive limit for the particular material being applied as determined by a *Marine Chemist* or *Shipyard Competent Person*. Monitoring of such areas shall be continuous until the activity is completed. The monitoring shall be carried out by a *Shipyard Competent Person*.
2. When the operations are authorized by the *Marine Chemist*.

2. *Hot work* shall not occur within 200 feet of use or transfer of flammable liquids or gases unless authorized otherwise by the *Marine Chemist*.

3. Hot work shall not occur within 100 feet of use or transfer of combustible liquids.

EXCEPTIONS:

1. Hot work shall not take place within 50 feet of the use or transfer of Class III-B combustible liquids by means of a hose line.
2. When the operations are authorized by the *Marine Chemist*.

4. Use and transfers of hazardous materials other than those specified above shall not occur within 100 feet of *hot work* operations.

EXCEPTIONS:

1. Distance may be reduced to 50 feet when a fully closed intervening barrier exists.
2. When the operations are authorized by the *Marine Chemist.*

6.7 Advance Preparations for Sealing the Vessel. Prior to the commencement of *hot work*, arrangements shall be made to close the *vessel* as soon as possible in the event of fire. Closure time shall not exceed 30 minutes. Such arrangements shall not require the use of ship's power to make the closures. Such closures shall be sufficient to ensure the efficient use of carbon dioxide (CO_2) to extinguish the fire.

6.8 Gangways. *Gangway*s shall be provided for access to *vessels* in accordance with this section.

6.8.1 Gangway Requirement for Vessels Less than 200 Feet in Length. *Vessels* less than 200 feet in length shall have at least one *gangway* rigged from the *vessel* to the main pier or dock of the *facility* during *hot work* operations in accordance with OSHA 29 CFR 1915.4 (e), 1915.72 and 1915.74.

EXCEPTION: If a *gangway* is not practical, a substantial straight ladder, extending at least 36 inches (91 centimeters) above the upper landing surface and adequately secured against shifting or slipping shall be provided.

When there is a danger of workers falling between the ship and the dock, a net or other suitable protection shall be rigged under the *gangway* in such a manner as to prevent the workers from falling into the water.

6.8.2 Gangway Requirement for Vessels 200 Feet or More in Length. Each *vessel* 200 feet or more in length shall be provided with at least two *gangway*s in accordance with OSHA 29 CFR 1915.4 (e), 1915.72 and 1915.74. At least one *gangway* must be rigged from the *vessel* to the main pier of the *facility* and the second *gangway* may be immediately available and ready to be immediately deployed via a *chainfall*, strap pulley or other approved method.

EXCEPTIONS:

1. Container *vessels* located at container terminals for less than 72 hours or When approved by the fire code official.
2. Deck cargo barges or tank barges that do not contain cargo consisting of flammable or combustible liquids or tank barges with all cargo tanks cleaned and certified “gas-freed” by a *Marine Chemist*.
3. If a *gangway* is not practical, a substantial straight ladder, extending at least 36 inches (91 centimeters) above the upper landing surface and adequately secured against shifting or slipping shall be provided.

When there is a danger of workers falling between the ship and the dock, a net or other suitable protection shall be rigged under the *gangway* in such a manner as to prevent the workers from falling into the water.

Section 7. FIRE WATCH

7.1 General. Individuals shall be trained and designated by the employer or the *Repair Supervisor* as *Fire Watches* to look for and report a fire in accordance with Section 7 of this Rule.

7.2 Posting Fire Watches. The employer or the Repair Supervisor must post a Fire Watch if during hot work any of the following conditions are present or may occur:

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) in either the horizontal or vertical direction to the *hot work* cannot be removed, shielded or protected with flame-retardant covers, guards or curtains;
4. The *hot work* is carried out on or near insulation, combustible coatings, or *inter-barrier space* that cannot be shielded, cut back, or removed, or in an *inter-barrier space* 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, convection or radiation;
6. The *hot work* is close enough to cause ignition through heat radiation or conduction on the following:
    1. Insulated pipes, bulkheads, decks, partitions, or overheads; or
    2. Combustible materials and/or coatings;
7. The work is close enough to unprotected combustible pipe or cable runs to cause ignition; or
8. Post a *Fire Watch* whenever the employer, *Repair Supervisor*, Seattle Fire Department Inspector, *Marine Chemist*, or a *SCP* requires it.

7.3 Who Can Be a Fire Watch? A *Fire Watch* is a person trained by a *qualified instructor* according to OSHA 29 CFR 1915.508 (e) and designated by the employer or the *Repair Supervisor* to observe and respond to the fire hazards associated with hot work.

Any *Fire Watch* designated for *hot work* operations on or near polyurethane foam insulation is also required to be a trained *Shipyard Competent Person*.

Any person performing *hot work* operations on a *vessel* may not serve as the *Fire Watch*.

7.4 Responsibilities of a Fire Watch. Each designated *Fire Watch* shall:

1. Read and understand the Seattle Fire Department permit conditions, the *Marine Chemist* Certificate and the *SCP* report;
2. Have a clear view of and immediate access to all areas included in the *Fire Watch*;
3. Able to communicate with workers exposed to *hot work*;
4. Authorized to stop work if necessary and restore safe conditions within the *hot work* area;
5. Remain in the hot work area at least 30 minutes after the completion or interruption of hot work unless released in accordance with Section 9.2 of this Rule;
6. Trained to detect fires that occur in areas exposed to hot work;
7. 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 OSHA 29 CFR 1915.508.
8. Alert employees of any fire beyond the incipient stage; and

9. Activate the alarm if unable to extinguish the incipient stage fire in the areas exposed to the hot work.

7.5 Training Fire Watches. The employer or the *Repair Supervisor* must ensure that employees assigned to *Fire Watch* are physically capable of performing these duties.
The employer shall ensure that *Fire Watch*es 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.

7.6 Watching Multiple Workers Performing Hot Work. When several workers are performing *hot work* at any one site, the *Fire Watch* shall have a clear view of, and immediate access to, each worker.

No more than four workers performing *hot work* shall be attended by a single *Fire Watch*.

Under certain situations, the *Marine Chemist* or the Seattle Fire Department Inspector may require a *SCP* to be continuously at the job site to oversee all aspects of any *hot work* operations and perform frequent testing and inspections.

7.7 Adjacent or Blind Compartments. If adjacent or blind compartments are involved in any *hot work* job, *Fire Watch*es shall be posted simultaneously in each blind area.

Section 8. FIRE PROTECTION EQUIPMENT

8.1 General. Fire protection equipment shall be provided in accordance with Section 8 of this Rule.

8.2 Fire Extinguishers. Unless explicitly stated otherwise on the *Marine Chemist*'s Certificate or the Seattle Fire Department *hot work* permit, the employer, the *Repair Supervisor* or the *SCP* must ascertain the type of fire extinguishers that are suitable for the *hot work* area based on the hazards being protected. Such extinguishers shall be immediately available in the *hot work* area and shall be maintained in a state of readiness for instant use as required in accordance with OSHA 29 CFR 1915.

At a minimum, one or more suitable fire extinguishers shall be posted at the location where *hot work* is being conducted. Suitable fire extinguishers include:

1. Dry chemical extinguishers having an Underwriter's Laboratory (UL) classification of 2A, 40-BC.
2. 20-lb CO^2 (carbon dioxide) extinguishers.
3. 2½-gallon pressurized water pump cans.

The employer, *Repair Supervisor* or the *SCP* must provide the types of fire protection equipment that the *Fire Watch* was trained to use.

Extinguishers aboard the *vessel* which are protecting hazardous areas, such as galleys and engine rooms, shall not be relocated from these areas for the purpose of fire protection during *ship repair*.

8.3 Hose lines. A charged water hose of not less than 5/8-inch diameter capable of delivering not less than 12 gallons per minute shall be laid out in the vicinity of *hot work* operations.

A reliable shore-side water supply shall be used to charge the water hose.

> **EXCEPTION:** The *vessel*'s own water supply is allowed to be used if the shore-side water supply is unavailable due to maintenance or a weather-related shut off and the *vessel*'s engineer or owner is available to ensure that the *vessel*'s water system is properly functioning.

Such hose shall be of sufficient length to reach all areas within the compartment or space where *hot work* is being conducted.

Section 9. Shipyard Competent Person.

9.1 General. The *Shipyard Competent Person* is required to physically perform a *visual inspection* of all Level I and Level II *hot work* areas. A *Shipyard Competent Person* is also required to perform frequent testing and maintain safe conditions of each *hot work* location in accordance with OSHA 29 CFR 1915.14-1915.15.

In addition, a *Shipyard Competent Person* may be required by the *Marine Chemist*, employer, *Repair Supervisor* or a Seattle Fire Department Inspector to be continuously at the job site to oversee all aspects of any *hot work* operations.

9.2 Responsibilities. The responsibilities of the *Shipyard Competent Person* include, but are not limited to the following:

1. Ensure that the conditions in any Seattle Fire Department permit are being complied with by those individuals performing *hot work* operations.

2. Ensure and document in a *Shipyard Competent Person* log maintained at the *hot work* site that any requirements contained in a *Marine Chemist's* Certificate are being complied with by those individuals performing *hot work* operations.

3. Be continuously on duty at the job site to oversee all aspects of any *hot work* when required by the *Marine Chemist's* Certificate. Personally perform tests

and inspections in the work areas and *adjacent spaces* prior to the commencement of any *hot work* operations.

4. Personally continue to perform tests and inspections as often as necessary throughout the duration of *hot work* to ensure safe conditions are maintained and that hazardous conditions have not developed.

5. Personally make an additional inspection at the end of each work shift or upon completion of the work, whichever comes first, in order to ensure that conditions are safe and no fire will start in the work area.

6. Personally perform hot work *Fire Watch* operations on or near polyurethane foam insulation.

7. Stop or shut down the *hot work* if permit conditions are not complied with, or if hazardous conditions are discovered or developed during the operations.

8. **For preapproved applicants and annual permit holders only:** When authorized by the employer and approved by the designated *SCP*, upon completion or interruption of *hot wor*k the *SCP* shall perform a visual inspection and physically survey the areas of *hot work* to ascertain no fires, smoldering, or potential of ignition prior to relieving the *Fire Watch* from their post.

9.3 Training and Recertification.

The initial *Shipyard Competent Person* Training Course must be a minimum of 24 hours, instructed by the NFPA or by an NFPA Certified *Marine Chemist*.

In order to maintain competency, all *Shipyard Competent Person*s must complete an 8-hour-minimum *SCP* Refresher Course at least every two years.

In addition, each designated *Shipyard Competent Person* must have the following skills and knowledge:

1. Ability to understand and carry out written or oral information or instructions left by the *Marine Chemist* or the Fire Department Inspector;

2. Knowledge of OSHA 29 CFR 1915 Subparts B, C, D, F, H and P;

3. Knowledge of the structure, location, and designation of spaces where work is done;

4. Ability to calibrate and use testing equipment including but not limited to: oxygen, combustible gas, carbon monoxide and carbon dioxide indicators, and to interpret accurately the test results.

5. Ability to perform all required tests and inspections as set forth in OSHA 29 CFR 1915 Subparts B, C, D, H and P

6. Ability to inspect, test, and evaluate spaces to determine the need for further testing by a Certified *Marine Chemist*;

7. Ability to maintain records.

Section 10. TECHNICAL REQUIREMENTS

10.1 General. In addition to the requirements of Section 6 of this Rule all requirements set forth in Section 10 of this Rule shall be met prior to commencement of any *hot work* operation and in order to obtain a permit.

A *Marine Chemist* Certificate is required prior to performing any hot work on or adjacent to any area that has polyurethane insulation.

10.2 Marine Chemist's Certificate. No person shall engage in *hot work* in or on the spaces listed below until a Certificate setting forth that such work can be done safely is issued. Such Certificates shall be valid only if they are issued by a *Marine Chemist* certified by the National Fire Protection Association.

A *Marine Chemist* Certificate shall be required prior to Level II *hot work* operations on any *vessel* and *hot work* in hazardous areas or compartments that are insulated with foam, contain or have contained flammable or combustible vapors, coatings, fuel oils, hydraulic oils, lube oil, waste oil or other petroleum products. Such hazardous areas or compartments may include, but are not limited to:

1. Fuel oil tanks and piping systems, including pumps, strainers,vents and its associated appurtenances.

2. Hydraulic, lube, slops or waste oil tanks and their associated piping systems.

3. Engine rooms, diesel generator rooms, reefer flats, machinery spaces, shaft alleys and steering gear compartments.

4. Cargo tanks or compartments that contain or have contained hazardous materials including flammable or combustible gases, liquids or solids.

5. Sewage holding tanks and piping systems, including pumps and vents.

6. Foam-insulated compartments such as refrigerated cargo holds, fish holds or processing areas not in compliance with Section 10.3.2 of this document.

7. Work conducted on refrigeration and/or cooling systems using fluorocarbons or ammonia.

8. Work on bulkheads and overheads directly adjacent to those compartments listed above.

Marine Chemist Certificates shall be issued in accordance with the requirements of the current edition of NFPA 306 *Standard for the Control of Gas Hazards on Vessels*.

10.3 Areas with Combustible Polyurethane Foam Directly Exposed.

10.3.1 General. When it is necessary to conduct *hot work* on an area that is covered by combustible polyurethane foam insulation, herein referred to as foam, or where foam is directly exposed, such foam shall be removed in accordance with Section 10.3.2 of this Rule and additional fire protection shall be provided in accordance with Sections 10.3.3 and 10.3.4 of this Rule.

10.3.2 Foam Removal. Remove foam 36 inches in all directions unless authorized otherwise by the *Marine Chemist*.

In all cases, exposed foam, located within a 15-foot radius of the *hot work* and all areas where sparks may land, shall be wet down or covered with wet fire-retardant blankets, welding cloths or other suitable “fire- retardant” substances.

All foam dust, small solid bits and pieces shall be swept, vacuumed and removed from the *vessel* prior to commencing *hot work*.

10.3.3 Fire Extinguishing Water. Unless required otherwise by the *Marine Chemist* Certificate, when *hot work* is being performed in areas where foam is present, at least one fire hose, not less than 1½-inch in diameter, shall be continually laid out and kept charged in the vicinity of the *hot work* operations. A 5/8-inch diameter hose laid out, charged and available to reach all areas of the *hot work* operations, may allow the required 1 ½ inch diameter fire hose not to be charged.

A reliable shore-side water supply shall be used to charge the hose line.

EXCEPTION: The *vessel*’s own water supply is allowed to be used if the shore-side water supply is unavailable due to maintenance or a weather-related shut off and the *vessel’s* engineer or owner is available to ensure that the *vessel’s* fire main is charged and properly functioning.

Such hose shall be of sufficient length to reach all areas within the compartment or space being worked on and/or into immediately *adjacent spaces*.

10.3.4 Fire watch. The *Fire Watch* must be a trained *Shipyard Competent Person*, shall pay particular attention to the areas with exposed foam and be immediately available to extinguish *incipient stage fire*s. The *Fire Watch* shall be maintained for at least one hour past completion or interruption of the hot work.

10.4 Areas with Hidden Polyurethane Foam or Foam Indirectly Exposed.

10.4.1 General. Prior to *hot work* being conducted on an area that has foam sprayed on the opposite side, all of the requirements in Section 10.4 of this Rule and those of the *Marine Chemist* must be met.

10.4.2 Fire Watch. The *Fire Watch* must be a trained *Shipyard Competent Person*, shall pay particular attention to the areas on the opposite side of the hot work, and be immediately available to extinguish *incipient stage fire*s. The *Fire Watch* shall be maintained for at least one hour past completion or interruption of the *hot work*.

10.4.3 Fire Extinguishing Water. Unless required otherwise by the *Marine Chemist* Certificate, when *hot work* is being performed in areas where foam is present, at least one fire hose, not less than 1½-inch diameter, shall be continually laid out and charged in the vicinity of the *hot work* operations. A 5/8-inch diameter hose laid out, charged and available to reach all areas of the *hot work* operations, may allow the required 1 ½ inch diameter fire hose not to be charged.

The water service for the charged hose shall be shore-side water supply.

> **EXCEPTION:** The *vessel's* own water supply is allowed to be used if the shore-side water supply is unavailable due to maintenance or a weather-related shut off and the *vessel's* engineer or owner is available to ensure that the *vessel's fire main* is charged and properly functioning.

Such hose shall be of sufficient length to reach all areas within the compartment or space being worked on and/or into immediately *adjacent spaces*.

10.4.4 Welding Method. When possible, weld in small strips using "skip welding" or "tack welding" to minimize heat generation. Other methods of hot work generating much less heat involving the use of cutting wheels, grinding or gouging instead of flushing or burning may also be used.

10.4.5 Contaminated Foam. Any oil-contaminated foam shall either be removed according to Section 10.3.2, Foam Removal, or completely removed prior to *hot work* commencing.

10.4.6 Reporting a Fire. Any sign of a fire shall result in an immediate call to the Fire Department 911 number.

10.5 Removal or Relocation of Hazardous Materials. Hazardous materials must be removed from, or relocated within the *vessel* in accordance with the specifications below if *hot work* operations are to be performed at any location where the risk of rapid fire spread is high and the materials are so arranged that they cannot be adequately cooled by Fire Department hose-lines in the event of a serious fire without entering the hull or superstructure.

Areas that have a risk of rapid fire spread include, but are not limited to:

1. Compartments insulated with foam.

2. Compartments that contain other highly combustible interior insulation, preservatives, coatings or finishes.

Unless authorized by the *Marine Chemist*, the following materials must be removed from the *vessel* prior to *hot work* operations in high risk areas:

1. Compressed gas/liquid cylinders (Freon, ammonia, chlorine, oxygen, propane, acetylene, etc.) except those needed for *hot work* operations including welding and cutting.

2. Flammable liquids and solids.

3. Explosives, fireworks and ammunition.

Unless authorized by the *Marine Chemist*, the following materials must be relocated within the *vessel* prior to *hot work* in high risk areas:

1. Flammable refrigerant gases shall be pumped back into the main receiver(s) of the system.

2. Combustible liquids when located in accordance with setback distances specified in Section 6.4 of this Rule.

10.6 Ventilation. Forced draft exhaust ventilation of adequate capacity to remove *hot work* vapors and any accumulation of flammable vapor shall be installed prior to performing any work in an enclosed or *confined space*.

10.7 Testing Spaces for Hazardous or Flammable Vapors. The permissible level of concentration of flammable vapors or gases shall not exceed ten percent (10%) of the lower explosive limit (LEL) in all parts of the spaces in which *hot work* is to be performed. Whenever possible, use engineering control measures to keep the LEL at 0% at all times.

Pipe lines that may convey hazardous substances into the spaces that have been certified as "Safe for Workers-- Safe for *Hot Work*" shall be disconnected or blanked off, or other positive means shall be taken to prevent the discharge of hazardous substances from entering the space.

Manholes and other closures that were secured at the time of the tests shall remain secured. If it is necessary to open secured spaces or to manipulate any valves that may tend to alter conditions, *hot work* operations shall stop and not resume until further tests have certified the space is "Safe for Workers-Safe for *Hot Work*."

10.8 Fuel Cylinders and Hoses. All cylinders or containers used for the storage of compressed gases shall be constructed, charged and marked in accordance with nationally recognized safe practices.

Cylinders shall be stored in locations where they are not subject to excessive rise in temperature, mechanical injury, or tampering. All cylinders (including empty ones) shall have their caps in place and all valves tightly closed.

Oxygen cylinders in storage shall be separated from fuel gas cylinders or combustible materials (especially oil and grease) by not less than 20 feet, or by a non-combustible barrier at least 5 feet high having a fire resistive rating of at least one-half hour.

Cylinders, valves, regulators, hose and other apparatus and fittings shall be kept free of oil or grease of any type. Such devices shall not be handled with greasy or oily hands, gloves or other greasy or oily materials.

All compressed gas cylinders, including those in use, shall be adequately secured to prevent falling or being knocked over.

Hose lines shall be inspected frequently for leaks, burns, torn or worn areas, loose connections or other defects that may render the hose unfit for service. Defective lengths of hose shall be discarded.

Oxygen and fuel gas cylinders shall be placed far enough away from the *hot work* operation to ensure that they will not be unduly heated by radiation from heated materials, sparks or slag, or by misdirection of the torch flame.

ALL TORCHES AND HOSE SHALL BE DISCONNECTED FROM THE CYLINDERS AT THE END OF WORK AND SHALL NOT BE LEFT BELOW DECK OR IN CONFINED SPACES.

Fuel gas cylinders shall not be placed below the main deck, in *confined space*s, or under overhanging decks where flammable gases that are lighter than air may accumulate.

Fuel gas and oxygen supply lines and torches. The employer must make sure that:

1) No unattended fuel gas and oxygen hose lines or torches are in *confined space*s;

2) No unattended charged fuel gas and oxygen hose lines or torches are in *enclosed space*s for more than 15 minutes; and

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

4) 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. (OSHA 29 CFR 1915.503(b)(2)(iv))

10.09 Fuel Gas Manifolds. Fuel gas manifolds shall:

1) Bear the name of the substance they contain in letters at least 1 inch high which shall be either painted on the manifold or located on a sign attached to the manifold,

2) Be placed in a safe and accessible location in the open air. They shall not be located within enclosed or *confined space*s,

3) Have hose connections, including both ends of the supply hose that leads to the manifold, of a type that will prevent the hose from being interchanged between the fuel gas and oxygen manifold and supply header connections. Hose connections shall be kept free of grease and oil, and

4) When not in use, manifold and header hose connections shall be capped.

5) Nothing shall be placed on top of a manifold, when in use, which will damage the manifold or interfere with the quick closing of the valves.

10.10 Vessel's Own Fire Protection System. During *hot work* operations, all of the *vessel*'s fire protection systems shall remain in service.

EXCEPTION: When work is being conducted on places or systems that render the *vessel*'s fire protection system out of service.

When *hot work* is being conducted on the *vessel's* fire protection system, approved shore-side fire protection equipment must be made available and authorized by the Seattle Fire Department Inspector or the NFPA Certified *Marine Chemist*.