

NAVSEA
STANDARD ITEM

FY-11

ITEM NO: 009-35
DATE: 24 JUL 2009
CATEGORY: I

1. SCOPE:

- 1.1 Title: Confined Space Entry, Certification, Fire Prevention Utilizing Military Fire Watches, and Housekeeping; accomplish

2. REFERENCES:

- 2.1 Standard Items
- 2.2 29 CFR Part 1915, Occupational Safety and Health Standards for Shipyard Employment
- 2.3 29 CFR Part 1910.134, Occupational Safety and Health Standards, Respiratory Protection
- 2.4 NFPA Standard 51B, Standard for Fire Prevention During Welding, Cutting, and Other Hot Work
- 2.5 NFPA Standard 312, Standard for Fire Protection of Vessels During Construction, Repair, and Lay-up

3. REQUIREMENTS:

3.1 Comply with the requirements of 2.2 through 2.5 and this item to determine whether or not an explosive or other dangerous atmosphere exists in tanks, spaces, and associated piping, including adjacent tanks, spaces, and piping aboard the ship and control hot work and entry to those spaces to preclude damage to the ship or injury to personnel during the accomplishment of this Job Order.

3.1.1 Submit one legible copy, in electronic media, of a list of tanks or spaces to be opened or certified to the SUPERVISOR at least 24 hours prior to commencement of work.

3.1.1.1 Comply with additional requirements of 009-88 of 2.1 when accomplishing work in Collection, Holding and Transfer (CHT) and Mogas tanks, spaces, or associated piping.

3.1.2 Provide initial and annual update training for Competent Persons by utilizing a National Fire Protection Association (NFPA) Certified

Marine Chemist or NFPA training program meeting the requirements of Section 1915.7 of 2.2. The length of the initial training class shall be at least 24 hours. Annual update training shall be at least 8 hours.

3.1.3 Post a copy of the Marine Chemist's certificate (MCC), Certified Industrial Hygienist's test/inspection record, or Competent Person's test/inspection record at each access to the affected space while work in the space is in progress. A copy of the MCC or test/inspection record shall also be delivered to a location designated by the SUPERVISOR. In the event that the space is found to be NOT SAFE FOR WORKERS/NOT SAFE FOR HOT WORK, the space shall be posted accordingly and the SUPERVISOR and ship shall be notified immediately. The posted copy shall be clearly visible and legible.

3.1.3.1 Initial certification of spaces that require a Certified MCC or Certified Industrial Hygienist's test/inspection record in support of work operations shall be effective until conditions change which would void the certificate or test/inspection record.

3.1.3.2 For those certified spaces which employees will enter, a Competent Person shall visually inspect and test each space certified as ENTER WITH RESTRICTIONS or SAFE FOR WORKERS as often as necessary, and as a minimum, prior to entry by employees on a daily basis. If a space is not to be entered on any given day, it is not required to be inspected and tested by a Competent Person. The initial MCC remains valid if conditions have not changed, unless noted on the MCC.

3.1.3.3 For those certified spaces affected by hot work, a Competent Person shall visually inspect and test each space certified as SAFE FOR HOT WORK as often as necessary and, as a minimum, daily prior to commencement of hot work to ensure that conditions established by the certificate are maintained. When hot work is continuous, the affected spaces shall be visually inspected, tested, and recorded on a daily basis to maintain the SAFE FOR HOT WORK certification.

3.1.3.4 If a Competent Person finds that the conditions within a certified space fail to meet the applicable requirements for which it was certified, work in the space shall be stopped and may not be resumed until the space has been recertified by a Marine Chemist.

3.1.3.5 For those spaces where only Competent Person tests and inspections are required in accordance with 2.2, a Competent Person shall visually inspect and test each space as often as necessary and, as a minimum, daily prior to entry or commencement of hot work to ensure that conditions are safe.

3.1.3.6 After the Competent Person has determined initially that a space is safe for entry and finds subsequently that the conditions within the tested space fail to meet the requirements of 2.2, work shall be stopped until the conditions in the tested space are corrected, the space is retested, and a new record of tests/inspections is recorded and posted.

3.1.4 Tank cleaning personnel shall be trained annually on safety practices to include a discussion of safety information found in Subparts A, B, and Section 1915.152 of Subpart I of 2.2.

3.1.5 Maintain current copies of the documents listed in 3.1.5.1 through 3.1.5.4 for reference by the SUPERVISOR. Submit one legible copy, in electronic media, of specific documents when requested by the SUPERVISOR.

3.1.5.1 A roster of designated Competent Persons, along with contractor certification that the training in 3.1.2 has been completed within the past year. Updates to the roster each time Competent Persons are added, deleted, or retrained.

3.1.5.2 A list of Competent Person(s) and tank cleaning personnel who will enter or work in confined spaces, including company name, badge number, and date training was provided in accordance with 3.1.2 and 3.1.4.

3.1.5.3 A list of the names of the Shipyard/Plant Rescue Team Members, along with contractor certification that training requirements of Subpart B of 2.2 have been accomplished and are current for each Rescue Team Member, or documentation of arrangements made for an outside rescue team to respond promptly to a request for rescue service in a contractor facility. At a naval facility, the Navy will respond.

3.1.5.4 Describe the manner by which the requirements for fire watches shall be implemented using Ship's Force personnel, including the manner in which the ship's Commanding Officer's designated representative will be notified in case of absence of the assigned fire watch.

3.1.5.5 Train Ship's Force personnel to be utilized as fire watches in accordance with the requirements of 2.2 and 2.4, including steps to be taken by the fire watch and hot work operator prior to accomplishment of hot work, proper selection and use of fire extinguishing equipment and other safety equipment, relationship between the fire watch and hot work operator, proper fire reporting procedures and other sounding of fire alarms, and reporting of fires to the ship's Quarterdeck. This training shall include theory and practical (hands-on) fire suppression techniques. This training shall be provided to all newly assigned fire watches, with annual updates provided to personnel. Ship's Force shall be provided with a visible means of identifying trained fire watches, i.e., badge, sticker, vest, etc.

3.1.6 Spaces that are determined to contain Immediately Dangerous to Life or Health (IDLH) atmospheres shall never be entered except for emergency rescue or for short duration for installation of ventilation equipment in accordance with 2.2 and 2.3. When entering IDLH spaces for the purpose of installing ventilation, notify the SUPERVISOR prior to entry. Notifications of rescue shall be made as soon as possible.

3.1.7 Confirm that all personnel have exited the space prior to closure of tanks, voids, and cofferdams. Designate one person to account for all personnel who may have entered the space.

3.2 Provide a written notice for each job or separate area of hot work aboard ship.

3.2.1 The notice shall state a description of the work to be done, the specific location of the hot work and compartments adjacent to decks, bulkheads, and similar structures upon which hot work is to be accomplished, the time hot work will commence, current gas-free status of the area (if required), the absence or existence of combustible material within 35 feet in any direction of the operation (or further, if affected by the operation), and if combustible material exists, what action shall be taken to protect the material from fire, the provision and assignment of a fire watch, and the affirmation that conditions at the work site (ventilation, temporary lighting, accesses) permit the fire watch(es) to have a clear view of and immediate access to all areas included in the fire watch.

3.2.2 The notice shall affirm that a suitable, fully-charged fire extinguisher shall be available at the job site and provide for an inspection of the area 30 minutes after completion of the hot work or the cessation of hot work at the job site unless the contractor's Hot Work Supervisor surveys the affected work area and determines that there is no further fire hazard as the final action to complete the notice.

3.2.3 The notice shall be signed by a supervisor specifically designated as responsible for coordination of the hot work and the fire watch requirement.

3.2.4 One copy of each notice shall be given to the SUPERVISOR and one copy to the Commanding Officer's designated representative, and at a minimum, one copy of each notice shall also be conspicuously posted at the location where the hot work is being accomplished.

3.2.4.1 The notice to the Commanding Officer's designated representative shall precede the initiation of the actual hot work in order to permit the Commanding Officer to designate a member of the crew to observe the operation, if desired.

3.2.4.2 Deliver written notification of hot work planned Tuesday through Friday to the Commanding Officer's designated representative at least 30 minutes and not more than 24 hours preceding start of work.

3.2.4.3 Deliver written notification of hot work planned over a weekend or Monday following that weekend to the Commanding Officer's designated representative no later than 0900 on the Friday immediately preceding that weekend.

3.2.4.4 Deliver written notification of hot work planned on a federal holiday and on the day following the federal holiday to the Commanding Officer's designated representative no later than 0900 of the last working day preceding the federal holiday.

3.2.4.5 The notice shall be effective for 24 hours unless a shorter period is specified in the contract or the gas-free status of the work area or system requires stopping the work. A new notice is required if work is interrupted due to loss of gas-free status.

3.3 Request sufficient fire watches from Ship's Force to provide fire watches at all affected areas where hot work is being accomplished. Provide each Ship's Force fire watch with fire extinguishing equipment as described in 2.2, 2.4, and 2.5. Fire watches and equipment shall meet the following requirements, as a minimum:

3.3.1 A fire watch must be posted if during hot work any of the following conditions are present:

3.3.1.1 Slag, weld splatter, or sparks might pass through an opening and cause a fire.

3.3.1.2 Fire-resistant guards or curtains are not used to prevent ignition of combustible materials on or near decks, bulkheads, partitions, or overheads.

3.3.1.3 Combustible material closer than 35 feet (10.7 meters) 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.

3.3.1.4 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.

3.3.1.5 Combustible materials adjacent to the opposite sides of bulkheads, decks, overheads, metal partitions, or sandwich-type construction may be ignited by heat conduction or radiation.

3.3.1.6 The hot work is close enough to cause ignition through heat conduction or radiation on the following: (a) insulated pipes, bulkheads, decks, partitions, or overheads; or (b) combustible materials and/or coatings.

3.3.1.7 The hot work is close enough to unprotected combustible pipe or cable runs to cause ignition.

3.3.1.8 A Marine Chemist or a Competent Person, as defined in 2.2, requires that a fire watch be posted.

3.3.1.9 Equipment cannot be protected from falling sparks.

3.3.1.10 Ducts and conveyor systems cannot be blanked off, protected, or shut down.

3.3.2 Each fire watch attending worker(s) accomplishing hot work shall be equipped with a fully-charged and operable fire extinguisher, and shall remain at the job site for 30 minutes from the time the hot work is completed unless the contractor's Hot Work Supervisor surveys the affected work area and determines that there is no further fire hazard.

3.3.2.1 The fire watch shall not accomplish other duties while hot work is in progress.

3.3.2.2 In the event that the fire watch leaves his/her post without permission of the person accomplishing the hot work, stop the hot work and immediately report the absence of the fire watch to the ship's fire watch division. Do not resume hot work until a fire watch is assigned and on station.

3.3.3 Where several workers are accomplishing hot work at one site, the fire watch shall have a clear view of and immediate access to each worker accomplishing hot work.

3.3.3.1 No more than 4 workers shall be attended by a single fire watch.

3.3.4 In cases in which hot material from hot work may involve more than one level, as in trunks and machinery spaces, a fire watch shall be stationed at each level unless positive means are available to prevent the spread or fall of hot material.

3.3.5 In cases where hot work is to be accomplished on a bulkhead or deck, combustible material shall be removed from the vicinity of the hot work on the opposite side of the bulkhead, overhead, or deck, and a fire watch shall be posted at each location.

3.3.5.1 If multiple blind compartments are involved in any hot work job, fire watches shall be posted simultaneously in each blind area.

3.4 Locate oxygen, acetylene, fuel gas, or gas supply systems off the ship. Manifolds connected to pierside supply systems may be placed on board ships as long as they are located on a weather deck and equipped with a shutoff valve located on the pier. The pierside shutoff valve shall be in addition to the shutoff valve at the inlet to each portable outlet header required by 2.2.

3.4.1 ***Each*** fuel gas and oxygen hose must be positively identified by durable unique markings ***that include the company name*** at each end of the hose.

3.4.2 Liquid oxygen (LOX) tanks used for fuel gas/oxygen operations shall be stored to prevent collisions by trucks, forklifts, falling objects, etc.

3.4.3 LOX tanks shall be staged in designated locations on the quay wall/pier to be determined jointly by the contractor, Ship's Force, and the SUPERVISOR.

3.4.4 When gas cylinders are in use on board ship, they shall be located on the weather decks or in a location determined jointly by the contractor, Ship's Force, and the SUPERVISOR and shall be secured and in an upright position. The number of in-use cylinders shall be limited to those which are required for work in progress and which have pressure regulators connected to the cylinder valves. On-board reserve gas cylinders shall not exceed one-half the number of in-use cylinders and shall be located in a remote area of the weather decks or in a location determined jointly by the contractor, Ship's Force, and the SUPERVISOR. Reserve acetylene cylinders shall be secured in an upright position.

3.4.5 When not in use, gas cylinders and manifolds on board shall have valves closed, lines disconnected, protective cover (cap) in place, and shall be secured. Acetylene cylinders shall be secured in an upright position.

3.4.5.1 Unattended fuel gas and oxygen hose lines or torches are prohibited in confined spaces.

3.4.5.2 Unattended charged fuel gas and oxygen hose lines or torches are prohibited in enclosed spaces for more than 15 minutes.

3.4.5.3 All fuel gas and oxygen hose lines shall be disconnected at the supply manifold at the end of each shift.

3.4.5.4 All disconnected fuel gas and oxygen hose lines shall be rolled back to the supply manifold or to open air to disconnect the torch; or extended fuel gas and oxygen hose lines shall not be reconnected at the supply manifold unless the lines were given a positive means of identification when they were first connected and the lines are tested using a drop test to ensure the integrity of fuel gas and oxygen burning system. Alternate procedures must be approved by the SUPERVISOR.

3.4.6 Upon completion of oxygen-fuel gas system hook-up, accomplish a pressure drop test to include the torch, hoses, and gages.

3.4.6.1 Apply pressure to the system. Back off pressure by turning off the valve supplying gases to the system. If the pressure on the gage drops, a leak in the system exists. If the pressure on the gage does not drop, the system is tight.

3.4.6.2 After applying pressure, wait 2 minutes to ensure pressure does not drop.

3.4.7 The use of gas hose splitters is prohibited.

3.5 Inert gas/oxygen depleting (OD) hoses must be positively identified by durable unique markings **that include the company name** at each end of the hose.

3.5.1 Unattended inert gas/OD hose lines or torches are prohibited in confined spaces.

3.5.2 Unattended, charged inert gas/OD hose lines or torches are prohibited in enclosed spaces for more than 15 minutes.

3.5.3 All inert gas/OD hose lines shall be disconnected at the supply manifold at the end of each shift.

3.5.4 All disconnected inert gas/OD hose lines shall be rolled back to the supply manifold or to open air to disconnect the torch; or extended inert gas/OD hose lines shall not be reconnected at the supply manifold unless the lines were given a positive means of identification when they were first connected and the lines are tested using a drop test to ensure the integrity of inert gas/OD systems. Alternate procedures must be approved by the SUPERVISOR.

3.5.5 Upon completion of inert gas/OD gas system hook-up, accomplish a pressure drop test to include the torch, hoses, and gages.

3.5.5.1 Apply pressure to the system. Back off pressure by turning off the valve supplying gases to the system. If the pressure on the gage drops, a leak in the system exists. If the pressure on the gage does not drop, the system is tight.

3.5.5.2 After applying pressure, wait 2 minutes to ensure pressure does not drop.

3.5.6 The use of gas hose splitters is prohibited.

3.6 Use fire retardant materials aboard or immediately adjacent to the ship for staging, screening, temporary covers, shelters, deck covering, and ventilation ducts. Proper documentation of fire retardancy shall be available for review upon request.

3.6.1 Lumber, except that used for pallets, shall be fire retardant in accordance with Category One, Type I, of MIL-L-19140. Plywood and staging boards shall be Category Two, Type II, of MIL-L-19140.

3.6.2 Storage of material aboard ship shall be limited to that which is required for work in progress. Materials, trailers, temporary lights, flammable liquids, fueling of vehicles, and the rigging of hoses/welding leads/temporary lights aboard the ship shall comply with the following: Material, including that stowed in bins that are placed and held temporarily on hangar decks, well decks, or tank decks shall not exceed 8 feet in height. A 20-foot-wide lane shall be maintained the length of hangar decks to act as a fire break. Material shall occupy a deck space not to exceed 25-feet by 25-feet with adjacent 6-foot-wide aisles on each side for ready hose line access.

3.6.3 Prior to bringing equipment or working material aboard ship, its crating and packing shall be removed. If the equipment or material may be damaged during handling, the crating and packing shall be removed immediately after the equipment or working material is brought aboard and taken ashore for disposal. A small quantity of pallets may be staged in a location determined jointly by the contractor, Ship's Force, and the SUPERVISOR aboard ship for use in materials handling operations.

3.6.4 Trailers placed aboard the ship shall be equipped with an automatic or manual sprinkler system designed to provide 0.1 GPM per square foot of floor area and an audible alarm that will sound when the sprinkler system is activated. Tool issue shacks or other walk-in enclosures placed aboard the ship shall be constructed of fire retardant material, provided with at least one fire extinguisher of appropriate size and class at each access. The enclosure shall be supported at least 10 inches above the deck.

3.6.4.1 Smoke alarms, approved by Underwriter's Laboratory, shall be installed in enclosures and shall be audible outside the enclosures.

3.6.5 Temporary lights shall have 3-conductor cable, guard or shield, hook, and lamp holder. Exposed non-current-carrying metal parts of the fixture shall be grounded either through a third wire in the cable containing the current conductors, or through a separate wire that is grounded at the fixture's voltage source.

3.6.6 Flammable or combustible liquids with a flash point of 150 degrees Fahrenheit or less, including degreasers, solvents, and fuels, shall be kept in safety cans when not in actual use or when left unattended. These liquids shall be limited to one day's supply for on board use.

3.6.7 Fueling of vehicles or transfer of fuel between containers shall be accomplished at designated sites on weather decks or in a location determined jointly by the contractor, Ship's Force, and the SUPERVISOR. Notify ship's Officer of the Deck prior to the fueling or transfer operation. When fuel is transferred between containers, the containers shall be bonded and grounded to prevent static discharge.

3.6.7.1 Provide a minimum of 2 dry chemical portable extinguishers, each with an Underwriter's Laboratory rating of at least 60-B:C at the fueling site.

3.6.8 Rigging of hoses, welding leads, and temporary lights shall be kept clear of the decks on temporary trees or brackets and be arranged to minimize tripping and other safety hazards and to allow free access through doors, hatches, and passageways.

3.7 Accomplish temporary access requirements as follows:

3.7.1 Temporary access cuts may be made in fire zone boundaries provided they are equipped with fume-tight steel closures when installed. Boundary degradation by use of temporary access cuts or passage of service lines shall be permitted only upon granting of a written waiver by the SUPERVISOR, in conjunction with the Commanding Officer's designated representative, for a limited time.

3.7.1.1 Submit one legible copy, in electronic media, of a record of boundary openings and their locations to the SUPERVISOR and one additional copy to the Commanding Officer's designated representative. Resubmit boundary opening data when any changes, additions, or deletions of boundary openings occur.

3.7.2 Ensure at least one unobstructed access on ships designed with 3 or fewer accesses to each main and auxiliary machinery space and at least 2 unobstructed accesses on ships designed with 4 or more accesses to each main and auxiliary machinery space.

3.8 Accomplish a fire prevention and housekeeping inspection on a daily basis whenever work is in progress. The inspection shall be made jointly with the SUPERVISOR and the Commanding Officer's designated representative.

3.8.1 Submit one legible copy, in electronic media, of a written report of the discrepancies and corrective actions, using Attachment A, to the SUPERVISOR and the Commanding Officer's designated representative within 4 hours after completion of the inspection.

3.9 Determine fire zone boundaries as follows:

3.9.1 The SUPERVISOR, Ship's Force, and the contractor shall establish fire zone boundaries prior to start of production work.

3.9.1.1 Existing transverse watertight, airtight, and fume-tight bulkheads shall be used as fire zone boundaries on ships built prior to the requirements for fire zones.

3.9.1.2 For ships having fire zones by design, the designated bulkheads shall be used as fire zones.

3.9.2 Fire zone boundaries shall be continuous through the vertical extent of the ship, from the keel up to the highest weather deck, excluding the superstructure.

3.9.2.1 For ships that have established fire zone boundaries that run from keel up through the superstructure, the fire zone boundaries as depicted on the ship's damage control diagrams shall be observed.

3.9.2.2 On aircraft carriers, provide for closing of hangar division doors in case of fire in the event division doors being repaired by the contractor are mechanically inoperative. As a minimum, rig chain falls to manually close doors in the event of fire. Exceptions shall be permitted only upon execution of a written waiver approved by the SUPERVISOR.

3.9.3 Ships under 600 feet in length shall have a minimum of 2 fire zone boundaries. Ships 600 feet and over in length shall have a minimum of 3 fire zone boundaries.

3.9.3.1 Indicate each fire zone by installing a sign adjacent to each entrance.

3.9.3.2 Service line(s) shall not be run through fire zone boundaries unless quick disconnects are installed in temporary service lines within 10 feet of the opening, door, or closure. The quick disconnects shall be marked with international orange tape and all service line(s) must be able to be secured and pulled back within 3 minutes. Fuel gas/oxygen/compressed gas hoses, steam lines, ***hoses pressurized above 140 PSI***, or hoses carrying hazardous/toxic/flammable materials shall not be run through fire zone boundaries unless expressly authorized in writing by the SUPERVISOR. Hose numbers or sizes shall not restrict free and easy access or closure of fire zone boundary doors.

3.10 Develop and implement a written fire safety plan in accordance with 2.2. Review the plan with contractor employees and subcontractors.

4. NOTES:

4.1 Hydrogen sulfide (H₂S) may be found in AFFF, seawater, and firemain systems.

4.2 Booklet of General Plans and Tank Sounding Tables are available for review at the office of the SUPERVISOR.

4.3 A "quick disconnect" is a coupling or connecting device/system designed to permit easy and immediate separation of lines without the use of tools and to ensure the contents do not escape.

Fire Zone BoundariesATTACHMENT A
ESH Discrepancy and Corrective
Action Log**Attendees**

Ship name/hull number:

Location:

Prime Contractor:

Date:

Time:

No.	Point of Contact	Date Corrected	Location	Discrepancy	Corrective Action	Code

Type Codes: 1-Housekeeping, 2-Fire Prevent./Fire Equipment, 3-Hot Work., 4-FZ Boundary, 5-Electrical, 6-compress gas/hoses/bottles/manifolds, 7-Scaffolding, 8-Egress/Exit, 9- Walking/Working Surfaces, 10-PPE, 11- Containment, 12- Unguarded/Edges/Holes/Openings/Fall Protection, 13-Confined/Enclosed Spaces, 14-Lines & Leads Hazards, 15-Equip. Adrift & Rollback, 16-Ventilation, 17-Machine guarding/hand tools, 18-Crane/Rigging, 19-Environmental & Hazardous Material/Communication, 20-Environmental protection, 21-General Safety

ATTACHMENT A

ESH DISCREPANCY AND CORRECTIVE ACTION LOG INSTRUCTIONS

- 1- Fire Zone Boundaries: List the designated Fire Zone Boundaries.
- 2- Attendees: List Company and or Command and names of personnel present for walk thru.
- 3- Ship Name/hull Number: Indicate ship name and hull number of the location of the walk thru.
- 4- Location: Indicate location where ship is moored or docked, i.e. name of contractor facility or pier at Naval Base or Station.
- 5- Prime Contractor: Indicate prime contractor who has the contract with the SUPERVISOR.
- 6- Date: Indicate date of walk thru being accomplished.
- 7- Time: Indicate start time (24 hour clock) of walk thru being accomplished.
- 8- No. (number): List sequentially, each discrepancy noted during the walk thru. Number will continue where the numbering left off the previous day, until the end of the availability.
- 9- Point of Contact: Indicate Company/Command identified with the discrepancy.
- 10- Date Corrected: Date condition was corrected. If condition is not corrected, condition will be carried over to the next walk thru until condition is corrected.
- 11- Location: Indicate location of the condition, i.e. space number or frame number.
- 12- Discrepancy: Indicate condition that needs corrective action, be specific as necessary.
- 13- Corrective Action: Indicate corrective action taken to correct the condition and who is responsible for the corrective action.
- 14- Code: Indicate code, located at the bottom of ATTACHMENT A that condition can be grouped with, i.e. lines on deck causing trip hazard would use code 14- Lines and Leads Hazards.

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