

FIRE PREVENTION AND RESPONSE

1. SCOPE

1.1 Intent. This standard specification requires the Contractor to document Fire Prevention and Response requirements and implementation plans during repair availabilities for Coast Guard vessels in a formal Fire Plan. This Fire Plan provides a formal policy and structure to ensure all involved parties understand their roles and responsibilities. Risk mitigation strategies are tiered based on the amount and complexity of the work performed in the Statement of Work (e.g. operational condition of vessel's firefighting systems, communication and alarm systems, vessel's force manning, etc.).

1.2 Appendices.

PROCESS STANDARD	APPENDICES
Checklists and Templates for Fire Prevention and Response at Contractor Operated (Non USCG) Facilities	A
Checklists and Templates for Fire Prevention and Response at US Coast Guard Facilities	B

1.3 Acronyms and term definitions. Below are definitions of various acronyms and terms used in this standard or encountered in work items.

- **Fitting:** Watertight or fume tight closure i.e. doors, hatches, scuttles, air ports, and dogged manholes.
- **Fire Boundary:** Any physical barrier, fitting, bulkhead or deck, utilized to limit the passage of flame and smoke identified during a fire casualty.
- **Fire Zone:** Fire protection boundaries at main subdivision bulkheads and portions of decks where the subdivision is stepped.
- **Fire Protection Boundary:** Bulkheads, decks, and access fittings designed to limit the passage of flame and smoke, designated to confine a fire within an identified area, and provide a protected staging area for fire parties.
- **Material Condition:** The material condition of readiness refers to the degree of access and system closure in effect at any given time. The securing of certain designated access fittings or systems will limit the extent of damage that could occur to a vessel.
- **Transverse Watertight Bulkheads:** Bulkheads that extend from the keel to a main deck or a Damage Control deck and from side to side. They provide extra transverse stiffening and partition the hull into independent watertight sections. Transverse Watertight Bulkheads are a vessel's fire zone where fire zones are not indicated in Damage Control books or drawings.

2. REFERENCES

COAST GUARD DRAWINGS

None

COAST GUARD PUBLICATIONS

Surface Forces Logistics Center Standard Specification 0000 (SFLC Std Spec 0000), Latest Revision, General Requirements

Surface Forces Logistics Center Standard Specification 0740 (SFLC Std Spec 0740), Latest Revision, Welding and Allied Processes

Surface Forces Logistics Center Standard Specification 8635 (SFLC Std Spec 8635), Latest Revision, Temporary Services

OTHER REFERENCES

Code of Federal Regulations (CFR) Title 29, Part 1915, Occupational Safety and Health Standards for Shipyard Employment

MIL-F-24385, Military Specification: Fire Extinguishing Agent, Aqueous Film Forming Foam (AFFF) Liquid Concentrate, For Fresh and Seawater

National Fire Protection Association (NFPA) Codes and Standards 72, National Fire Alarm and Signaling Code

National Fire Protection Association (NFPA) 105, Standard for Smoke Door Assemblies and Other Opening Protectives

Occupational Safety and Health Standards, 46 CFR Part 164 Subpart 164.009, Non-Combustible Materials for Merchant Vessels

Underwriter Laboratories (UL) Standard 199, Automatic Sprinklers for Fire-Protection Service

Underwriter Laboratories (UL) Standard 268, Smoke Detectors for Fire Alarm Systems

Underwriter Laboratories (UL) Standard 521, Heat Detectors for Fire Protective Signaling Systems

Underwriter Laboratories (UL) Standard 864, Control Units and Accessories for Fire Alarm Systems

3. REQUIREMENTS

3.1 Fire Plan. Since multiple organizations (the Contractor, the Coast Guard Yard, Ship's Force, local/municipal fire departments, etc.) have both distinct and shared responsibilities for shipboard fire prevention and response, Contractors must develop an availability specific Fire Plan to ensure each organization is aware of and acknowledges their assigned responsibilities. The Fire Plan is used to document each organization's agreement with the Contractor and must provide any amplifying information regarding unique duties and responsibilities for a particular cutter availability.

3.1.1 Contractor Facilities and Coast Guard Yard. Consistent with 29 CFR 1915 Subpart P requirements, the Contractor must develop and implement a written fire safety plan that covers all of the actions that

employers and employees must take to ensure employee safety in the event of a fire. In addition to the required topics in 29 CFR 1915 Subpart P, the Fire plan must also address the following:

3.1.2 The availability’s specific Fire Plan must always address, at a minimum, the following:

- material condition and fire protection boundary obstruction mitigations
- inoperable fittings log

3.1.3 The Fire Plan must address the following, as specified in the statement of work:

- fire protection system status
- communication links
- temporary services
- fire alarms
- power disconnects
- firefighting equipment disposition
- fire prevention and safety inspections

NOTE

Vessel specific data is provided via the Principal Characteristics data page in the Statement of Work (SOW).

3.1.4 Fire Prevention Responsible Party. The Contractor must appoint a Fire Prevention Responsible Party (FPRP) who acts as the Contractor’s Responsible Person for fire prevention concerns during the entire availability, as required by the SOW.

3.2 Material condition and fire protection boundary obstruction mitigations. The Contractor must maintain the vessel’s permanent Fire Zones to the extent practicable throughout the availability. This includes maintaining the capability of fire insulation where installed, fire-rated penetrations such as multi-cable transits (MCTs) and pipe penetrations, fume-tightness of the boundary, etc. Existing transverse watertight, airtight, and fume-tight bulkheads must be used on ships built prior to the requirement for fire zones. Where vessels have Fire Zones by design, the designated bulkheads and decks must be used. When authorized industrial work requires disestablishment of vessel’s permanent Fire Zones, alternate Fire Zones must be mutually agreed upon by the FPRP and the COR. The Fire Zone must be continuous throughout the vertical extent of the vessel, from keel up to the main deck unless designated higher.

3.2.1 The boundary of certain spaces, such as a machinery room or an electronics space, are generally of sufficient tightness to serve as a fire and smoke boundary. Doors and hatches serving such spaces must be kept closed during a fire to minimize fire and smoke spread.

3.2.2 The Contractor must remove their equipment or services (i.e. hoses, cables, or ventilation) that obstruct designated Material Condition or fire protection boundary fittings at the end of the workday, or install quick-disconnects fittings (QDFs) in accordance with Std Spec 8635. If unable to remove obstructions or install QDFs, install fire curtains that meet NFPA 105, Standard for Smoke Door Assemblies and Other Opening Protectives.

3.2.2.1 When installed, fire curtains must be rolled down during any hotwork occurring within the fire protection boundary.

3.2.3 If, due to the extent and duration of work, (i.e. extensive hull access cuts or water-tight door removal) the designated Material Condition or fire protection boundaries cannot be set daily at the end of the workday the Fire Plan must be updated to describe why the material conditions or boundaries are compromised beyond mitigation measures. The Contractor must communicate this condition to the COR via a CFR.

3.3 Inoperable Fittings log. The Contractor must report obstructed fittings. As required by the SOW either relay the information for the vessel's Inoperable Fittings section of the DC Closure Log or the Contractor must maintain a separate Contractor Inoperable Fittings log.

3.3.1 When the vessel's Inoperable Fittings log is maintained, the Contractor must provide all log information to the COR via a CFR.

3.3.2 When directed by the Work Item, the Contractor must maintain an Inoperable Fittings log. The logs must contain the same information as a Damage Control Closure Log found in Appendix A. The log must remain at the access point of the vessel available for inspection or use by authorized personnel, i.e. casualty response. Deliver all logs to the CG when requested and at the end of the availability.

3.3.3 The Contractor must update the Inoperable Fittings logs when fitting status changes.

3.4 Fire protection system status. Provide details of the fire protection system status on the vessel in the Fire Plan. The vessel's fixed firefighting systems, including portable fire extinguishers, must be maintained in as ready for use condition as possible during the availability. A temporary firefighting capability that meets the requirements of a removed system must be provided prior to removal of permanent firefighting equipment or securing of the vessel's fire main or other fixed firefighting system. Ship's Force must be offered the opportunity to witness the installation of temporary firefighting systems.

3.4.1 In unique cases where a temporary firefighting capability is not specified in the work item, the Contractor must propose an appropriate temporary firefighting system via a CFR.

3.4.2 In emergent situations, including dry docking evolutions, when a vessel's firefighting capability becomes inoperable and an appropriate temporary firefighting capability is not readily available, the FPRP must specifically approve the condition, including identifying mitigation actions, and ensure all personnel working on board are notified.

3.4.3 When a vessel system is disabled, but initial responder equipment such as hose racks/reels are left on board, the disabled system/equipment must be clearly identified as out of service at each activation location.

3.4.4 Where a vessel's fixed firefighting system is solely intended to protect from a specific hazard and the hazard has been removed from the vessel during the availability, it is permissible for the system to be inoperable in the absence of the intended hazard.

3.4.5 Locations with sprinkling systems must be kept operational with either Aqueous Film Forming Foam (AFFF) or water sprinkling. Individual sprinkler zones may be secured as needed for maintenance,

provided adjacent zones are operational. The time the zone is out of service must be minimized. Deviations from these requirements must be approved by the FPRP and updated in the Fire Plan.

3.4.6 Hazards of fixed extinguishing systems. The Contractor must comply with the provisions of this section whenever employees are exposed to fixed extinguishing systems that could create a dangerous atmosphere when activated in vessels and vessel sections, regardless of geographic location.

3.4.6.1 Before any work is performed in a space equipped with fixed extinguishing systems, the FPRP must ensure:

3.4.6.1.1 If the specific hazard that the firefighting system is protecting is removed from the vessel, physically isolate the systems or use other positive means to prevent activation; or

3.4.6.1.2 If the specific hazard that the firefighting system is protecting is present, ensure employees can recognize:

- Systems' discharge and evacuation alarms and the appropriate escape routes.
- Hazards associated with the extinguishing system and agents including the dangers of disturbing system components and equipment such as piping, cables, linkages, detection devices, activation devices, and alarm devices.

3.4.6.2 System is restored immediately upon completion of work.

3.4.6.3 During dock trials, the Contractor must ensure that all systems must remain operational.

3.4.6.4 With regards to doors and hatches, the Contractor must:

3.4.6.4.1 Ensure that all doors, hatches, scuttles, and other exit openings remain working and accessible for escape in the event the systems are activated.

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

3.4.6.5 Before conducting maintenance on a fixed extinguishing system, the Contractor must ensure that the system is physically isolated.

3.4.6.6 If fixed manual extinguishing systems are used to provide fire protection for spaces in which the employees are working, the Contractor must ensure that:

3.4.6.6.1 Only authorized employees are allowed to activate the system.

3.4.6.6.2 Authorized employees are qualified to operate and activate the system.

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

3.4.7 Procedures shall be implemented to assure operator safety for disabling and enabling fire suppression systems. Procedures shall be equal to shipboard system specific details for carbon dioxide total flooding systems that create an environment immediately dangerous to life or health upon discharge.

3.4.8 Pumping and dewatering capability. All vessels without installed pumping and dewatering capability must maintain portable water pumping capability.

3.4.9 Operation of major machinery in engineering spaces. Major machinery in engineering spaces must not be operated without the vessel's fixed firefighting systems operational unless temporary firefighting systems are made available for immediate use in the event of a fire. Where the protecting firefighting system (permanent or temporary) requires the development and maintenance of gaseous/mist concentration (e.g., halon, water mist, HFP, CO₂), all openings to the affected space must be capable of being shut or isolated to prevent the escape of firefighting agents. The FPRP and CG concurrence must be obtained prior to machinery operations when a temporary system is established for firefighting use in place of the vessel's permanent system. Major machinery consists of propulsion machinery, boilers, oil fuel units, steam and internal combustion engines, and generators where a significant Class B fire hazard exists.

3.4.10 Liquid fuel pumping and transfer. The pumping or transfer of liquid fuel onto or within the vessel must take place when the vessel's permanent firefighting systems protecting all of the fuel system components is fully operational, unless a suitable temporary firefighting system is made available for immediate use in the event of a fire. FPRP concurrence must be obtained when a temporary system is established for firefighting use in place of the vessel's permanent system prior to fuel pumping or transfer operations.

3.4.11 Mechanical aqueous film forming foam producing equipment. The Contractor must ensure mechanical Aqueous Film Forming Foam (AFFF) producing equipment, such as portable eductors and AFFF concentrate, is available to initial responders in sufficient quantity to protect any compartment from fire where spillage of flammable or combustible liquids could occur. The AFFF must be in accordance with MIL-PRF-24385, and compatible with the AFFF producing equipment.

3.4.12 Portable fire extinguisher requirements. CO₂ portable extinguishers of 15-pound capacity, Dry Chemical Potassium Bicarbonate (PKP), water, or AFFF extinguishers of 2½gallon capacity, must be available as the initial means of fighting fires. The vessels' installed portable CO₂, PKP, and AFFF fire extinguishers must be retained on board and must remain throughout the availability for initial response to a fire. Alternatively, the Contractor must provide the extinguishers as long as they are in accordance with the same specifications, the same quantity, and installed at the same locations as the vessels' permanently installed extinguishers. Portable fire extinguishers must remain on station, unless removal as a restricted interference. In this event, the Contractor must provide a temporary stowage bracket in the vicinity of the installed bracket to enable the relocation of the removed extinguisher. Where extinguishers are relocated, location placards at the original location must direct personnel to the temporary location. The vessels' portable fire extinguishers are not to be used for fire watch. The Contractor must ensure that fire watches are provided with a portable fire extinguisher as required by the SOW.

3.4.12.1 Portable fire extinguishers must be installed so that the maximum travel distance to an extinguisher from any interior point of the vessel on the same level is no more than 50 feet.

3.4.12.2 If Class B fire hazards are not present on board the vessel, pressurized water extinguishers are permitted as an alternative to AFFF extinguishers.

3.4.12.3 Fire protection requirements during hot work must be in accordance with Standard Specifications 0740 and 0000. Fire hoses must not be used as a complement or substitute for portable extinguishers without prior approval of the cutter's Commanding Officer.

3.4.13 Hose and hose reel protection. Where hose or hose reels may be subject to damage, an enclosure must be provided for protection, provided that the enclosure does not restrict access to the hose or hose reel for firefighting. The enclosure must be painted red.

3.4.14 Drydock firefighting requirements. Where dry-docked vessels are constructed of combustible hull materials such as composites and wood, materials subject to melting such as aluminum, or equipped with combustible external hull/structure treatments, fire hose stations must be provided such that all areas of the hull/structure are reachable by straight streams from two separate fire hose stations when rigged with 100 feet of hose. Each fire hose station must include a quick-acting manual valve (fire plug); a constantly available water source with a minimum 95 gpm flow at a 60 psi dynamic nozzle pressure at its highest elevation; at least 100 feet of pre-connected 1½ inch, 1¾ inch, or 2½ inch diameter fire hose; and a nozzle, MIL-N-24408, 1½ inch National Hose (NH) (9 TPI), rated for 125 gpm at 100 psi, or 2½ inch NH (7.5 TPI), rated for 250 gpm at 100 psi. Precautions to prevent freezing of fire hose stations must be taken as required. The requirements of this paragraph are in addition to any other firefighting equipment requirements specified elsewhere in this manual and by the local firefighting instructions.

3.4.14.1 Local firefighting procedures and instructions must address the response and pre-staged firefighting equipment requirements for other types of fires that may occur in a dry docking facility or shipbuilding way among the industrial equipment, structures and materials. The local firefighting instructions must delineate the responsibilities between vessel's force and the fire department in responding to fires in a dry docking facility external to the vessel's hull. Integrated preparation of Ship's Force and local fire and emergency services firefighters must be conducted to ensure familiarization and understanding of the firefighting policies, equipment and responsibilities for each dry docked vessel.

3.4.14.2 For ships dry docked in graving docks with flammable hull material, hulls subject to melting or combustible external hull treatments, the fire hose stations specified in paragraph 3.4.14 must be located at the coping level at the top of the graving dock wall. If the size of the graving dock compared to the vessel's hull dimensions makes it impractical to direct an effective water stream from the top of the dock wall, the fire hose stations must be located on the dock floor with the same coverage requirement by two separate fire hose stations as stated paragraph 3.4.14. Fire hose stations located on the dock floor must be located away from the combustible hull material so that they are still accessible in the event of a fire.

3.4.14.3 For ships dry docked in floating dry docks with flammable hull material, hulls subject to melting or combustible external hull treatments, the fire hose stations specified in paragraph 3.4.14 must be located at the top deck of the wingwall. If the size of the floating drydock compared to the vessel's hull dimensions makes it impractical to direct an effective water stream from the top deck of the wingwall, the fire hose stations must be located on the pontoon deck with the same coverage requirement by two separate fire hose stations as stated in paragraph 3.4.14. Fire hose stations located on the pontoon deck must be located away from the combustible hull material so that they are still accessible in the event of a fire. In addition to the fire hose stations specified in paragraph 3.4.14 for hulls constructed of flammable materials, subject to melting or equipped with combustible external hull treatments, floating dry docks

must also be equipped with fire hose stations so that any area of the pontoon deck and top deck of the wingwall can be reached with a 20-foot fog stream from a minimum hose size of 1½ inches and a hose length no longer than 100 feet.

3.4.14.4 For ships dry docked on a marine railway or vertical lift with flammable hull material, hulls subject to melting or combustible external hull treatments, the fire hose stations specified in paragraph 3.4.14 must be located on or adjacent to the marine railway cradle or vertical lift platform. The fire hose stations must be located away from the combustible hull material so that they are still accessible in the event of a fire.

3.4.14.5 For vessels dry docked on a marine railway, vertical lift, or blocked at a facility that maintains a memorandum of understanding or agreement with a municipal fire response organization for firefighting operations, i.e. the facility does not have dedicated fire response personnel, fire hydrant (fire plug) locations and other permanently installed fire prevention infrastructure shall be identified in the Fire Plan and condition noted in the familiarization tour.

3.4.15 In the Fire Plan, indicate the times when shipboard fixed extinguishing systems (i.e., halon, CO2 banks, galley fire suppression systems, etc.) will be online or offline. Identify any integration of shipboard fire protection systems with Contractor installed equipment. List what equipment will be provided and installed by the Contractor, and describe the types and frequency of tests of the systems, equipment and/or devices.

3.5 Communication links. Provide details of communication links installed on the vessel by the Contractor, i.e. telephones, drop boxes, alarms, horns, and the location, testing interval, and interface with shore side response systems of each in the Fire Plan.

3.6 Temporary Services. Provide details of temporary services installed on the vessel by the Contractor, as required by the SOW, in regards to fire prevention and response in the Fire Plan.

3.6.1 Work must be planned and executed in such a manner that fixed firefighting systems will be out of service for the minimum amount of time.

3.6.2 Preference must be placed on utilizing a vessel's permanent firemain piping system with associated fire plug coverage and installed sprinkling systems rather than a shipyard furnished temporary firemain.

3.6.3 Firemain gauges provided and utilized during overhaul must be calibrated and in proper working order.

3.6.4 Where temporary firemain are necessary, they must be equipped with a minimum of two isolation valves between shore supply feeders. Additional isolation valves must be placed in the remainder of the firemain loop so that the maximum distance between any two adjoining valves does not exceed 200 feet. Where water supply to lowermost compartments is provided through fire hose lines dropped to hose stations, those lines must be valved at the source of supply and the lines unpressurized to preclude inadvertent flooding. Pressure gauges must be installed in reasonable strategic locations along the temporary main to allow personnel to clearly read gage-face during temporary system operation.

3.6.5 Where fire hose coverage cannot be provided by using the vessel's installed fire plugs supplied from the vessel's permanent firemain or a temporary firemain piping system, hose manifolds must be located

on the weather deck, hangar deck, or on any lower deck where flooding due to a ruptured hose could be tolerated. Water supply to hose valve manifolds must be via 2½ to 4-inch jumper hose lines from pier outlets. Hose valve manifolds must be provided in sufficient numbers such that all parts of the vessel, including the interior of temporary structures, can be reached by at least two 100-foot hoses.

3.6.6 Where coverage of the lowermost compartments is impossible with 100 feet of hose, unpressurized 2½ inch drop lines, supplied by the jumper hose lines, with 2½ inch by 1½ inch by 1½ inch wye-gate fittings must be rigged to lower levels. 1¾ inch hoses with 1½ inch couplings and 1½ inch nozzles must be pre-connected and faked on racks nearby. Activating instructions and location of control valves must be posted by the manifold.

NOTE

Legacy 1½ inch hoses may be used until replacement is required. All new hoses must be 1¾ inch hoses with 1½ inch couplings.

3.6.7 Manifolds must have at least three valved outlets of 1½ inch size. One hundred foot lengths of 1¾ inch hoses with 1½ inch couplings must be pre-connected to two of the manifold outlets and the hose faked on portable hose racks. Hoses must be equipped with 1½ inch combination straight stream and spray pattern nozzles having a spray pattern capacity of approximately 95 gpm at 60 psi residual nozzle pressure.

3.6.8 Where weather and flow conditions are such that freezing may occur, a recirculation capability from each manifold back overboard in a safe location must be provided.

3.6.9 Where a permanent or temporary firemain piping system is used aboard vessel, water must be discharged from at least one fire hose immediately after installation at a location hydraulically most remote from the water supply connection to verify valves are not secured or obstructions in the piping system are not present.

3.6.10 Water flow rates for firefighting systems at piers and dry docks serving ships in overhaul must be tested annually by a competent authority to verify that water supplies specified are available.

3.6.11 Permanent lighting requirements. To the extent practicable, the vessel's permanent and emergency lighting systems must be maintained throughout the period of the availability. When the vessel's lighting systems are not operational, the Contractor must provide two sources of lighting to all spaces normally having two sources. The lighting may be the vessel's permanent and emergency lighting systems or a combination of temporary and vessel's permanent lighting, provided that separate power sources are utilized for each system. The removal of lighting from a space or compartment that could impede damage control efforts, personnel egress, and/or casualty responder access must require approval by the FPRP.

3.6.12 Temporary lighting requirements. When the vessel's lighting systems are not operational due to maintenance and repair and/or when additional illumination is required for enhanced working conditions, personnel egress, and/or casualty responder access, the Contractor must install temporary lighting throughout the vessel to provide illumination.

3.6.12.1 Lighting guards. Temporary lighting must be equipped with guards to prevent accidental contact with the bulb. When the construction of the reflector is such that the bulb is deeply recessed, guards may

not be required. Missing bulbs must be immediately replaced to minimize potential inadvertent contact with light socket.

3.6.12.2 Electric cords. Temporary lights must be equipped with heavy duty electric cords with connections and insulation maintained in safe condition. Temporary lights must not be suspended by their electric cords unless cords and lights are designed for this means of suspension. Splices which have insulation equal to that of the cable are permitted.

3.6.12.3 Exposed non-current-carrying metal parts. Exposed non-current-carrying metal parts of temporary lights must be grounded either through a third wire in the cable containing the circuit conductors or through a separate wire which is grounded at the source of the current.

3.6.12.4 Portable emergency lighting equipment. When temporary lighting from sources outside the vessel is the only means of illumination, portable emergency lighting equipment must be available to provide illumination for safe movement of crew members and workers.

3.6.12.5 Dark spaces. Workers must not be permitted to enter dark spaces without a suitable portable light. The use of matches and open flame lights is prohibited. Temporary lighting stringers or streamers must be so arranged as to avoid overloading of branch circuits. Each branch circuit must be equipped with over current protection of capacity not exceeding the rated current carrying capacity of the cord used.

3.6.12.6 Restricted usage. Temporary lighting fixtures must not be used to power portable electric tools.

3.6.13 In the Fire Plan, identify the location and testing interval for each normal and emergency source of electric power, firefighting water, and lighting.

3.7 Fire alarm. Provide details of fire alarms on the vessel in the Fire Plan. Fire reporting capabilities must be maintained throughout the availability. When the vessel is unable to report a fire in the usual operational manner, utilize temporary systems to maintain existing capability. This system must consist of smoke and heat detectors for the purpose of quickly identifying the source and location of a fire, especially when the vessel's crew is moved off hull during industrial work.

3.7.1 Additional personnel, in communication with operators, who can take immediate action to transmit an alarm, may be used for short durations of reporting ability loss.

3.7.2 An installed fire alarm system must be arranged to send a signal directly to a central station service, a remote station service, a cognizant fire department, a shipyard fire department, or a continuously manned location within the shipyard where operators can take immediate action to transmit an alarm.

3.7.3 The Contractor may propose adjusting the timing of the installation and/or removal of the detection system based on the scope and amount of work (e.g., hot work) contained in the statement of work, and the status of the vessel's damage control equipment.

NOTE

The Contractor is encouraged to mitigate the risks associated with adjusting the timing of the installation and/or removal of the detection system by effective alternate means, such as increased fire watches.

3.7.4 Combination smoke and heat detector hardware requirements.

3.7.4.1 The combination smoke and heat detectors must be Underwriters Laboratories (UL) listed in accordance with Standard 268 and 521. The combination smoke and heat detectors must also be UL-listed for use with the alarm panel. The heat detector portion of the combination smoke and heat detector must have a minimum UL-listed spacing of 30 feet.

3.7.4.2 The following design criteria must be met:

- Combination smoke and heat detectors must be spot-type and be restorable after alarm only after a reset of the latched audible and visual alarm at the alarm panel is manually executed. A non-restorable fusible alloy is not permitted as the operating mechanism of the heat detector portion of the combination detector. Combination smoke and heat detectors in alarm must cause audible and visual alarms to occur at the alarm panel, but must not initiate audible and visual notification appliances throughout the vessel. Combination smoke and heat detectors must not generate an audible alarm themselves (i.e., detector sounder bases must not be used).
- The heat detector portion of the combination smoke and heat detector must have a fixed temperature alarm threshold of 135°F. The smoke detector portion of the combination smoke and heat detector must be the photoelectric light-scattering type and have at least two programmable sensitivity settings (all within the allowable UL Standard 268 range) and must be programmed and installed using the least sensitive alarm threshold (i.e., the highest percent obscuration per foot sensitivity setting). Ionization smoke detection must not be permitted for the smoke detection portion of the combination smoke and heat detector.
- The combination smoke and heat detector must consist of the detector head as well as the detector's base and a junction box. The junction box may be developed by the installing activity. The junction box must contain at least two mounting holes/tabs to allow for the installation of the detector in the overheads using approved fastening hardware specified in paragraph 3.2.3.2 of SFLC Standard Specification 8635. At least two red labels (e.g., stickers, signage) must be affixed to the sides of the junction box and must state "Do not tamper with this fire detector or move it from this location without authorization from the FPRP". Each combination smoke and heat detector must have at least one Light Emitting Diode (LED) which must identify that power is being supplied to the detector and must also identify, in a different visual way (e.g., separate LED or indicator, one LED capable of two colors, LED flashing versus steady, etc.), when the detector is in an alarm state. Each combination smoke and heat detector base must contain a short circuit isolator that must protect all other detectors on the looped detector power and monitoring cabling from any cable conductors that are accidentally shorted.

3.7.4.3 The automatic fire detection system must be installed in a configuration such that a cable break/open anywhere in the system allows the alarm panel to continue to power and monitor all detectors from both sides of the remaining portions, while also providing a trouble indication that there is a break in the cabling. The junction box must have electrical connectors to allow for quick-disconnect connections of the incoming and outgoing detector power/monitoring cabling, where the cabling has the mating electrical connectors.

3.7.4.4 Alarm panel hardware requirements.

3.7.4.4.1 The alarm panel must be listed in accordance with UL 864.

3.7.4.4.2 The following design criteria must be met:

- The alarm panel must be capable of powering and monitoring the number of spaces required to support necessary space monitoring. The alarm panel must be capable of powering at least four loops of detectors in a Class A style, as defined by NFPA 72. The alarm panel must contain an internal back-up rechargeable battery power source, capable of operating the alarm panel for at least 24 hours if primary 120 VAC, 60 Hz power is lost.
- When a combination smoke and heat detector alarms, the alarm panel must be capable of identifying and displaying whether the smoke portion of that detector alarmed or the heat portion of that detector alarmed. The alarm panel must also be capable of temporarily disabling only the smoke portion of any one or a group of detectors, while leaving the heat detection portion of that one detector or a group of detectors fully capable of responding and alarming to high temperatures. When such a disabling feature is employed, the appropriate trouble indication(s) must occur at the panel for that/(those) detector(s) that lost its/(their) smoke detection capability. The capability to disable any detector or feature of a detector must be password protected.

3.7.4.4.3 The alarm panel must have an alphanumeric display of at least 60 characters that can identify each specific combination smoke and heat detector when in an alarm state, as well as in a trouble state. The alarm panel must be programmed such that when a detector goes into an alarm or trouble state, the name of the space (where the detector is located) is displayed in the alpha-numeric display of the alarm panel, as well as additional information that can accurately identify the location of the specific detector in an alarm or trouble state. This additional information displayed about the detector must include at least the frame number where the detector is installed, the level of the space (for multi-level spaces), and the relative location of the detector at that frame number (e.g., port, centerline, or starboard), as well as the detector's assigned numerical address number and (for detectors in alarm) whether the smoke or heat portion of the detector is in an alarm state.

3.7.4.5 Automatic fire detection system installation criteria. Combination smoke and heat detectors must be installed in the overheads of the spaces throughout the vessel using the following criteria:

3.7.4.5.1 Combination smoke and heat detectors must be installed in the overheads of the vessel spaces, using a high temperature line that meets the noncombustibility test requirements contained in 46 CFR Part 164 Subpart 164.009. Detectors must be installed within 12 inches of the overhead. Where firm foundations in the overhead do not exist in the immediate area, detectors may be installed up to 30 inches below the overhead. Overhead areas that require detectors must include the horizontal solid overhead areas of spaces in the forward section of the vessel), and the solid deck (or solid machinery/structure) overheads of middle or lower levels in the multi-level spaces of the vessel (e.g., the engine room, missile compartment).

3.7.4.5.2 Combination smoke and heat detectors must not be located in any direct airflow or closer than 36 inches from an air supply diffuser or return air opening, where air can negatively influence the performance of the detector. Such an installation could allow incoming air to directly prevent the smoke and heated air from a fire in the space from reaching the detector or could disperse such smoke/air, thus preventing the detector from providing an alarm during an actual fire.

3.7.4.5.3 A compartment larger than of 900 ft² or 30 ft. x 30 ft. area or any rectangular area with a single linear dimension greater than 30 ft. requires extra detectors. The proper placement of detectors in such larger compartments must be obtained by breaking down the larger compartment into multiple rectangles. In general, all points in the overhead of a compartment must have a detector within a distance of 0.7 times the selected spacing. For irregularly shaped areas, the spacing between detectors must be permitted to be greater than the listed spacing, provided the maximum spacing from a detector to the farthest point of a bulkhead or corner is not greater than 0.7 times the listed spacing.

3.7.4.6 Automatic fire detection system testing. An operational test of the automatic fire detection system must be conducted after the installation is complete. This operational test must consist of subjecting each combination smoke and heat detector to an appropriate smoke signature (e.g., using smoke test gas recommended by the smoke detector manufacturer) and ensuring an alarm occurs at the alarm panel for each detector installed. This operational test must also consist of subjecting each combination smoke and heat detector to an appropriate heat signature (e.g., using a heat gun) and ensuring an alarm occurs at the alarm panel for each detector installed. The detector LED(s) described in paragraph 3.7.4.2 must also be checked for proper operation during these detector smoke test gas and heat tests. This operational test must also consist of temporarily removing the 120 VAC power to the alarm panel, for at least 5 minutes, to ensure the automatic transition to back-up battery power, the full powering and monitoring of all detectors on battery power for those (at least) 5 minutes, as well as the automatic transition back to 120 VAC when 120VAC is restored after (at least) 5 minutes. Testing must be aligned with other facility testing requirements where feasible. CG and local fire services must be offered the opportunity to witness and verify the automatic fire detection system is adequately tested. In addition, operational testing of both the smoke and heat detection portions of any specific combination smoke and heat detector must also be performed on any detector after the re-installation of any detector that was temporarily removed, as well as on any replacement detector.

3.7.4.7 Automatic fire detection system protection. During the early stages of the automatic fire detection system installation, where individual detectors have been installed but the overall system has not yet been energized/operational, dust covers (that are normally delivered with the procured fire detectors) or other means (e.g., paper/low tack masking tape wrapped around detector) must be temporarily installed on the detectors to protect them from being damaged/contaminated from excessive dust, dirt, grinding, and welding smoke. When the system is first energized and operational, these dust covers or low tack masking tape must be removed (otherwise, the detector will not properly respond/alarm to smoke, heat, or fire).

3.7.4.7.1 Protection during the availability. If, during certain stages of the availability, specific detectors in a portion of the vessel will be exposed to potentially damaging work (e.g., lengthy and significant grinding), the Contractor and CG must review and approve the detector covering actions outlined in 3.7.4.7, prior to any detectors being covered, which will render those detectors essentially non-responsive, and the Contractor must record that degradation. If, during other stages of the availability, certain detectors and the detector interconnecting cabling are at a significant risk of damage, the FPRP must review and approve the removal of the select detectors and their interconnecting loop cable sections, prior to any detector or cabling removal, and the FPRP must record that degradation. When any detectors are temporarily covered or removed in these situations, written notification of all missing/non-operating detectors must be posted on the alarm panel. When it is necessary to remove portions of loop cabling, that cabling removed must be limited to only one section of cables (and associated detectors), thus ensuring that the cabling and detector portion located prior to this removed area, as well as the cabling and detector portion located after this removed area, are still connected to the alarm panel, fully powered and operational. That is, for a loop of 40 detectors (i.e., installed along the loop cabling with sequential

addresses #1 through #40), if detectors #25, #26, #27, #28, and #29 and their interconnecting cabling must be temporarily removed from their location, detectors #1 through #24 must remain connected, powered, and monitored by the alarm panel from their (front) side of the loop cabling, and detectors #30 through #40 must remain connected, powered, and monitored by the alarm panel from their (back) side of the loop cabling.

3.7.4.7.2 Detector cleaning. Detectors that become visibly excessively dirty (e.g., dirt/dust collecting on the outside of the detector) must be externally cleaned in accordance with the manufacturer's published instructions. Detectors that report a "smoke detector dirty", "smoke detector excessively dirty", or similar trouble signal to the alarm panel must also be externally cleaned in accordance with the manufacturer's published instructions. If such cleaning methods do not restore the detector to a fully functioning trouble-free state, a new/spare smoke detector must be installed and operationally tested in agreement with the procedures established in paragraph 3.7.4.6 of this standard specification.

3.7.4.8 Automatic fire detection system installation and removal. The automatic fire detection system must be installed and operational at the start of commissioned vessel availabilities, prior to the initiation of hot work, and/or prior to habitability being disestablished from the vessel, whichever occurs first. When hot work is needed prior to the system being operational in the affected spaces, a mitigation plan to provide continuous monitoring and notification must be implemented. The mitigation plan must be approved by the CG.

3.7.4.8.1 The system may be removed from the vessel once the habitability is established. Under these vessel conditions, the crew has moved back on board and most industrial hot work has been completed. Normal DC equipment must be installed and operational. Actual removal date will be agreed to by the CG, but must occur prior to the final crew certification.

3.7.4.8.2 Individual compartment sections of the system in the engineering spaces are authorized for removal prior to the crew moving back when the system in the engineering spaces are fully operational. Ship's DC gear must be reinstalled in the engineering spaces.

3.7.5 Verify the fire alarm is functioning properly daily to ensure its reliability. Conduct a full system test weekly to ensure operation. Repair or replace defective or inoperative alarms immediately.

3.8 Shore power disconnect. In the Fire Plan, provide the location and distance from the access/gangway of the vessel to the manual disconnect that will secure all temporary power. The access/gangway to the vessel must be installed within reasonable distance of the shore power disconnect to allow rapid actuation in the event of a casualty.

3.9 Other power disconnect. Provide details of other power disconnects in the Fire Plan. All other power sources must have a manual disconnect that will secure power to equipment or gear on the vessel, e.g. off-vessel power generator, or outlets on the pier/drydock.

3.10 Vessel's firefighting equipment. In the Fire Plan, provide the details for placement and disposition of the vessel's firefighting equipment during the availability. All firefighting equipment must be treated as a restricted interference in accordance with SFLC Standard Specification 0000 General Requirements. The Contractor must not obstruct or restrict access to any firefighting equipment.

3.10.1 Relocated firefighting equipment must remain accessible to casualty response personnel.

3.11 Fire prevention and safety inspections. In the Fire Plan, provide the details of fire prevention and safety inspections. The Contractor must conduct fire prevention and safety inspections on each work site for each manned shift where industrial work is being performed to note and initiate actions to eliminate fire hazards or to implement work procedures to keep these hazards to a minimum. The inspection may be limited to the actual working area and adjacent compartments. Take immediate action to eliminate fire hazards or to implement alternate work procedures to keep these hazards to a minimum. Record discrepancies and initial actions in an inspection report. Submit one copy of the inspection report to the Coast Guard within 4 hours after completion of the inspection.

3.11.1 An initial inspection must be made by the Contractor to evaluate potential fire hazards as soon as practicable after the availability is started and before any industrial work commences. The inspection must be conducted jointly by Contractors and CG representatives. Once on each manned/ regular workday, inspections (which must rotate through different areas on large deck vessels) must include: senior project management representative, vessel's safety officer, or equivalent. When the availability is performed in a Coast Guard facility, the installation fire and emergency services representatives must be invited to attend and may be counted as shipboard familiarity preparation. Deficiencies noted must be corrected immediately, and forwarded to the port engineer, vessel's CO or appointed representative, and the Contractor's safety contact or FPRP. The Contractor must compile project provided data to determine where additional focus is required to increase fire prevention performance.

3.11.2 All inspections reports also must, at a minimum, note the status of the following, in the location of inspection:

- housekeeping conditions,
- access and egress routes,
- fire extinguishing systems,
- fire extinguishers,
- combination smoke and heat detectors,
- fire reporting and communication systems,
- hot work authorization paperwork for hot work in progress.

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3.11.3 Fire Prevention and Safety Inspection form.

Fire Prevention and Safety Inspection form			Inspection Type (Initial/Daily/Weekly)		
VESSEL		HULL #	DATE & TIME		
INSPECTOR		TELEPHONE	ROLE	DATE & TIME	
Y= Describe action taken N= Cease hot work in compartment and adjacent spaces Hot work MUST NOT be conducted in a compartment (or adjacent space) with a noted discrepancy until corrective action has been taken and permission to proceed has been granted by the Coast Guard Representative.					
	Discrepancies noted	Location	Corrective Action Y/N	Description of action	CG initials
housekeeping conditions					
access and egress routes					
fire extinguishing systems					
fire extinguishers					
combination smoke and heat detectors					
fire reporting and communication systems					
hot work authorization paperwork for hot work in progress					
OTH:					
Name of CG Representative		Date	Time	Signature	Role

3.12 Fire Prevention and Response Conference. Participate in a Firefighting and Fire Prevention Conference in conjunction with the Arrival Conference, or scheduled by the KO or a designated representative of the KO, after contract award and prior to the start of work, at either the Contractor's conference facilities near the vessel, or onboard the vessel (time and location of meeting to be at the sole discretion of the KO). Refer to the Arrival Conference Agenda letter from the KO. This conference must familiarize Ship's Force with the Contractor's Fire Plan. Discuss all parts of the Fire Plan to ensure all parties understand the scope of work and risks associated with aspects of the work and vessel conditions.

3.12.1 The participants of the Conference must address the following matters to establish:

- Fire alarm and response procedures
- Firefighting jurisdictional cognizance
- Installation or municipal fire and emergency services firefighting capability and procedures
- Contractor communication system for fire reporting and control or firefighting efforts
- Shipboard arrangement including access routes, availability or firefighting systems (installed and temporary), and communication systems
- Shipboard firefighting organization, systems, drills, and equipment
- Compatibility of vessel, Contractor, and/or region/installation or municipal fire and emergency services firefighting equipment.

3.12.2 Fire responsibility familiarization tour. The Contractor, with Coast Guard personnel, must conduct a tour of the vessel to become familiarized with the egress/access points and anticipated conditions while industrial work is in progress. Review the locations where Material Condition and Fire Protection Boundary obstruction mitigation measures will be installed.

3.12.2.1 The Contractor's facilities with outside fire response incorporated to their facilities' fire plan in accordance with CFR 1915.505(b)(2) or 1915.505(b)(3), must invite the region/installation or municipal fire and emergency services personnel to attend the Conference and familiarizes the outside fire response organization with the layout of the vessel including access routes to controlled areas, specific operations, occupancies, and hazards.

3.12.3 Initial inspection. Conduct the initial Fire Prevention and Safety Inspection in accordance with paragraph 3.11, to evaluate potential fire hazards during the Fire Responsibility Familiarization Tour, or as soon as practicable after the tour and before any work commences at all availabilities.

3.12.4 At the end of the Familiarization Tour, the Contractor must record any inconsistencies between existing conditions and the Fire Plan. Submit updates to the Fire Plan via CFR.

APPENDIX A

CHECKLISTS AND TEMPLATES FOR FIRE PREVENTION AND RESPONSE AT CONTRACTOR OPERATED (NON USCG) FACILITIES

A1. SCOPE

A1.1 Intent. This appendix provides fire prevention and response checklists and templates for use while conducting USCG depot level availability at a Contractor Operated (Non USCG) facilities.

A2. REQUIREMENTS

A2.1 Template Fire Plan. Format is not mandatory; the availability specific Fire Plan may be added to the requirements of CFR 1915 Subpart P. Below is a continuation with the CFR's model Fire Safety Plan:

Table of Contents

- I. Purpose.
- II. Work site fire hazards and how to properly control them.
- III. Alarm systems and how to report fires.
- IV. How to evacuate in different emergency situations.
- V. Employee awareness.
- VI. Availability Specific Fire Plan

I. Purpose

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

II. Work Site Fire Hazards and How to Properly Control Them

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

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III. Alarm Systems and How to Report Fires

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

IV. How to Evacuate in Different Emergency Situations

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

V. Employee Awareness

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

VI. Availability Specific Fire Plan

- A. Material Condition and Fire Protection Boundary obstruction mitigations.
- B. Inoperable fittings log
- C. Fire Protection system status
- D. Communication Links
- E. Temporary Services
- F. Fire Alarms
- G. Power disconnects
- H. Firefighting equipment disposition
- I. Fire Prevention and Safety Inspections
- J. Fire Prevention and Response Conference
- K. Fire Responsibility Familiarization Tour

A2.2 Example of Coast Guard Damage Control Closure log for use in creation of Contractor’s separate inoperable fittings log.

DC CLOSURE LOG												
PERSONNEL REQUESTING PERMISSION			IDENTIFICATION OF FITTING			OPENED		CLOSED			PERSON GRANTING PERMISSION	
NAME	RANK	DIV	TYPE	CLASSIFICATION	NUMBER	DATE	TIME	DATE	TIME	EST TIME OPEN	NAME	RANK/ATE/
SHULTZ	DC2	R	WTH	X	4-75-1	8/3/22				72 HRS	SHURKE	DC1

APPENDIX B

**CHECKLISTS AND TEMPLATES FOR FIRE PREVENTION AND RESPONSE AT US COAST
GUARD FACILITIES**

B1 SCOPE

B1.1 Intent. This appendix provides a template for fire plans for Contractors coming to US Coast Guard Facilities, i.e. CG Base or the CG Yard.

B2 REQUIREMENTS

B2.1 Fire Plan. Format is not mandatory; the availability specific Fire Plan template reflects the CFR 1915 Fire Safety Plan as an example:

VI. Availability Specific Fire Plan

- A. Material Condition and Fire Protection Boundary obstruction mitigations.
- B. Inoperable fittings log
- C. Fire Protection system status
- D. Communication Links
- E. Temporary Services
- F. Fire Alarms
- G. Power disconnects
- H. Firefighting equipment disposition
- I. Fire Prevention and Safety Inspections
- J. Fire Prevention and Response Conference
- K. Fire Responsibility Familiarization Tour