Flooding Prevention and Control Reporting

SAFETY DRAFT MARKS

Orange Safety Draft Markers are installed in calculated positions above the waterline:

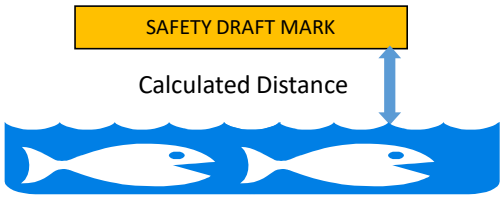
- Port and Starboard
- Forward and Aft

They are early warning indicators:

- A visual indication of an unexpected change in draft

If you see the bottom edge of any Safety Draft marker touching the water:

- Immediately inform the Ship's Safety Watch at the CASCON Watch Station



Submarine Specific Alarms

Click to Listen to each.

Common Alarms that you may hear -

CASCON
Fire Alarm

Stop Hot
Work Alarm

CASCON
Evacuate Ship

Other Alarms that you may hear -

Power Plant
Casualty Alarm

Flooding
Alarm

General
Quarters Alarm

Surface Specific Alarms

Click to Listen to each.

Common Alarms that you may hear -

Fire Alarm

CASCON
Fire Alarm

Power Plant
Casualty Alarm

CASCON
Evacuate Ship

Other Alarms that you may hear -

General
Alarm

How can I tell if that was an actual alarm I heard or just an alarm test?

1. Ship and CASCON Alarms are tested every day at 0900 and 1800.
2. An announcement is made over the ships 1MC and/or CASCON main announcing system prior to and after every alarm test.
3. Each CASCON alarm will be tested for a short time (5 seconds).
4. If the alarms are sounded for an actual casualty:
    a. The casualty will be announced **(twice)** over the ships 1MC and/or CASCON main announcing system (e.g., Fire in Engineroom Lower Level…).
    b. An evacuation route will be announced over the ships 1MC and/or CASCON main announcing system **(twice)**.
    c. The Dry-dock evacuation alarm and air horns will sound **much longer** than they would for an alarm test **(alarms will sound for 30 seconds).**
    d. The CASCON Fire Alarm will be sound **much longer** than it would for an alarm test **(alarm will sound for at least 3 minutes).**

Utilize the 0900 and 1800 daily CASCON tests of alarms to verify you can hear the alarms at the worksite. If performing noisy work (operating vacuum cleaners, sandblasting, needle gunning or grinding, etc.), make sure you can hear the alarms over the noise from your work and over background noise in the area.

Actions When Hearing an Actual Alarm

If you hear an alarm while working on a ship, submarine, or the dry-dock, perform the following:

- Stop work and place it in a safe condition.
  - Welders should secure torches at the torch and if possible at the cylinders.
  - Report a work site that was left in an unsafe condition to your supervisor at the muster site.
- Listen to and follow SF direction. Evacuate via the ANNOUNCED EVACUATION ROUTE and across the ANNOUNCED BROW(S).
  - SF may announce an evacuation route that will direct you away from the emergency.
  - SF will try and reserve a brow for SF and F&ES responders to get onboard.
- If directed to evacuate and route is announced, evacuate via the most direct route.
  - Leave tool bags and equipment behind.
  - Assist others in evacuating by clearing the exit path of obstructions.
- After exiting, Stay Clear of responders headed towards the ship as you go to muster.
  - Stay to the outside of painted yellow fire lanes to allow emergency vehicles to respond.
- Muster with your supervisor at the north west corner of the pier or dry-dock.
  - This include Product Line and ship check personnel.
  - Projects may establish alternate muster sites, check the Fire Bill before you enter the ship or ask your supervisor.
- If you reported or saw the casualty, notify your supervisor so they can inform the Incident Command Post.
  - SF or the Fire Chief may need to ask you about the casualty.

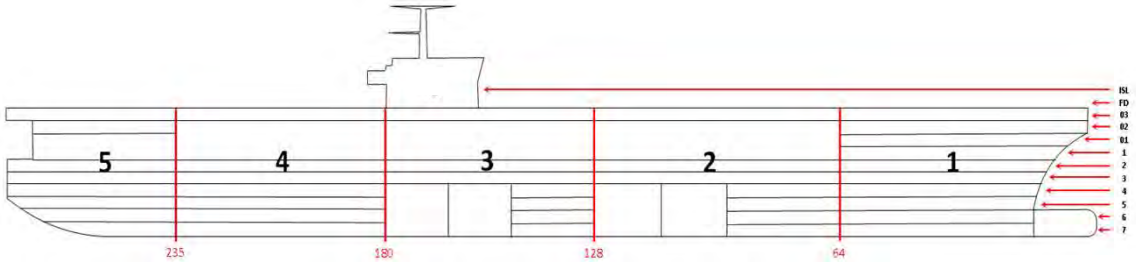
Know Your Location while working inside the Ship

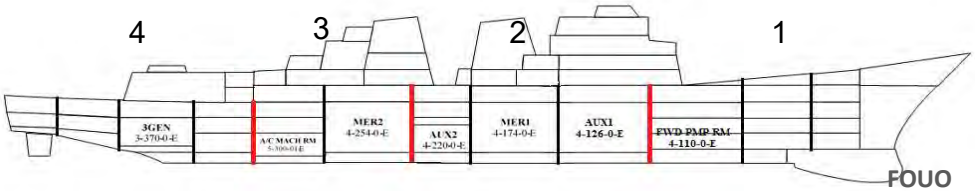
When a casualty is initially reported and under control the ship will only evacuate a section of the ship or “Fire Zone.” Make it part of your daily routine to know the location of your jobsite by frame number by which you can determine the “Fire Zone” you are in.

Each class of ship have unique Fire Zones, the brow boarding signs will specify the frame numbers.

As an example: a CVN evacuation announcement may say:

“All Shipyard, contractor, and non-essential Ships Force personnel evacuate Zone 4, frame 180-235, using the enlisted brow.”

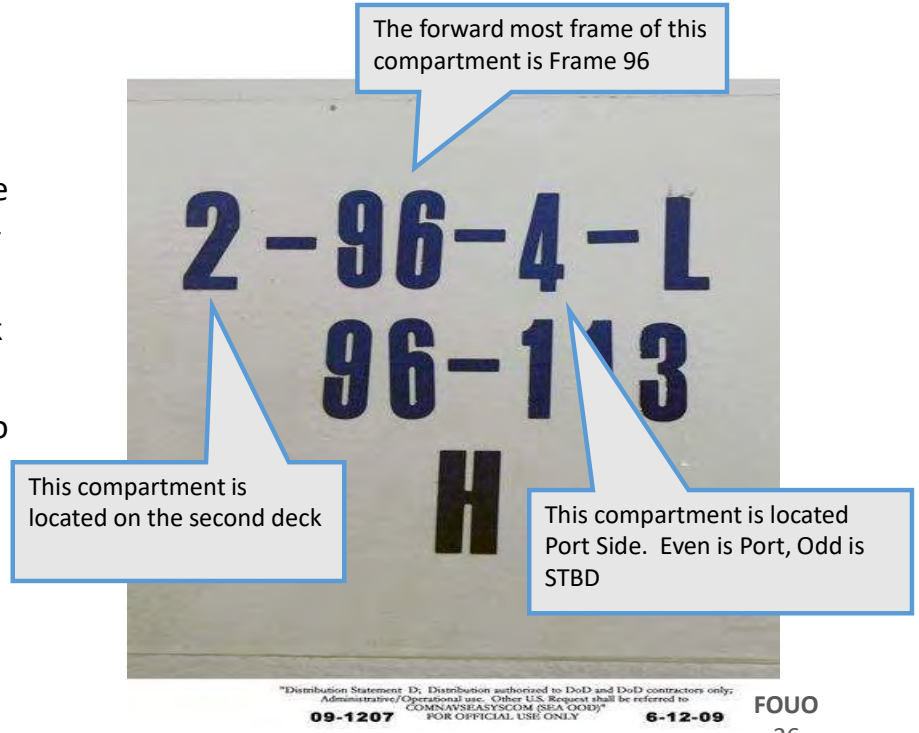




Methods to Determine Your Location Inside the Ship

Know your jobsite location inside the ship by compartment name, number, and frame number:

- On the bulkhead inside each compartment is a photo-luminescent sticker called a “bulls eye” that provides you with your deck, frame, and other information.
- Key components of the bulls eye are to the right. If you’re standing next to this bulls eye, you are in compartment 2-96-4-L.
- 2-96-4-L is a compartment located on the second (2) deck with its most forward bulkhead located at frame (96).
- The remaining info specifies the compartments relation to the centerline of the ship and normal use of the space.



Evacuation Routes

- Evacuation route signs are posted inside the vessel and topside to help direct you to the nearest exit.
- Remember, these signs point to the normal personnel exits, but some of these exits may be secured based on current operations going on.
- That is why you ***must check the Fire Bill when coming aboard to view the available exits and pay attention to and follow the announced evacuation route*** given during an emergency to ensure you can evacuate the ship quickly and effectively.

Security Kick-Out Gates

If you are the first person following an announced evacuation route that leads you to a closed security kick-out gate, kick out the wooden slats and exit through the opening.

Damage Control Boundary Maintenance

To help contain a casualty, PSNS & IMF maintains some boundaries operational for SF use.

Quick Disconnect Fittings (QDF's)

- Must be used on all temporary services that go through a posted Boundary.
- Must be located within 10 feet of the opening side of the hatch or door.

Temporary Service Tags

- All temporary services will be tagged at the QDF that go through an Industrial Damage Control Boundary.
- Provided by the Ship Safety Officer.
- Solid Orange used for vital (life, ship, RX safety) services.
- Striped Orange are for non-vital services.

Fire and Flooding Drill Simulations “Drill Props”

You may be the first person to see a simulated fire or flooding casualty.

What do you do?

REPORT IT as if it were a real event!

Flashing red light strings or small flashing red lights simulate fire

Black covers on lights and grey blankets are used to simulate smoke

Training Team members may use flags and smoke machines to represent fire or flooding casualties

Danger (red) & Caution (yellow) Tags

DO NOT OPERATE, REMOVE OR WORK ON TAGGED EQUIPMENT!

DO NOT TURN ANY SHIPS EQUIPMENT ON OR OFF!

DO NOT OPEN OR CLOSE ANY SHIPS VALVES!

REMOVAL OF DANGER OR CAUTION TAGS IS STRICTLY PROHIBITED!

Danger (red) & Caution (yellow) Tags

If you find tags that have fallen off:

- TAKE to SF IMMEDIATELY
- Report it immediately to Ships Force, Centralized Work Control Team (CWCT) and Code 246 (for non-nuclear tags) or Code 2340 (for Nuclear tags)

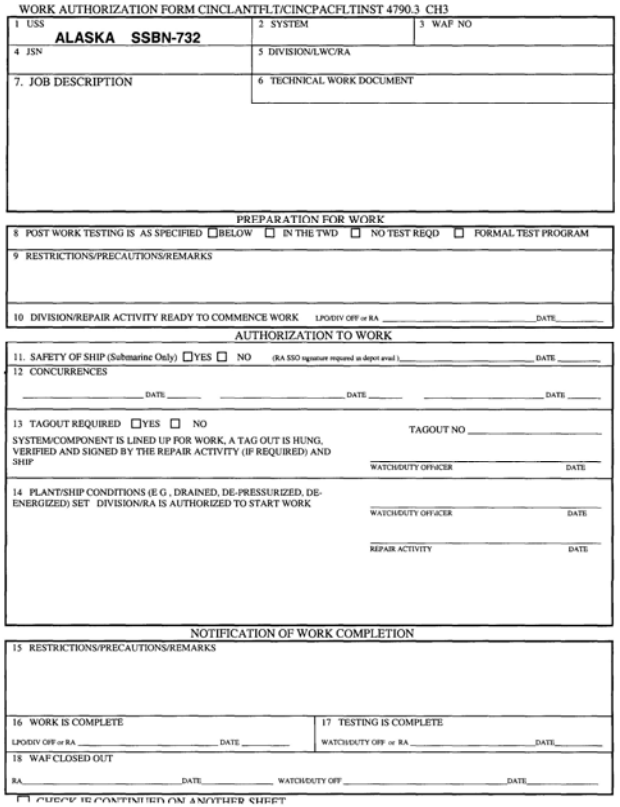
ONLY Ships Force removes tags

- On active Submarines and Surface Ships
- On inactivation availabilities if Ships Force is still on board
- On inactivation availabilities after Ships Force departs, Code 246 will hang and remove tags

Work Authorization Forms

Used to authorize Ships Force, shipyard, and contractor work such as:

- System custody transfer
- Work on systems
- Testing of systems
- Work requiring the use of divers
- System test failure repairs
- Work on energized equipment
- Installing/removing temporary systems
- Work that affects safety of ship must be signed by the Ship Safety Officer prior to opening Work Authorization Form to start work.



WORK AUTHORIZATION FORM CINCLANTFLT/CINCPACFLTINST 4790.3 CH3

1 USS ALASKA SSBN-732 | 2 SYSTEM | 3 WAF NO

4 JSN | 5 DIVISION/LWC/RA

7. JOB DESCRIPTION | 6 TECHNICAL WORK DOCUMENT

PREPARATION FOR WORK

8 POST WORK TESTING IS AS SPECIFIED ☐BELOW ☐ IN THE TWD ☐ NO TEST REQD ☐ FORMAL TEST PROGRAM

9 RESTRICTIONS/PRECAUTIONS/REMARKS

10 DIVISION/REPAIR ACTIVITY READY TO COMMENCE WORK LPO/DIV OFF or RA _____ DATE_____

AUTHORIZATION TO WORK

11. SAFETY OF SHIP (Submarine Only) ☐YES ☐ NO (RA SSO signature required at depot avail.)_____ DATE _____

12 CONCURRENCES

_____ DATE _____ _____ DATE _____ _____ DATE _____

13 TAGOUT REQUIRED ☐YES ☐ NO TAGOUT NO _____

SYSTEM/COMPONENT IS LINED UP FOR WORK, A TAG OUT IS HUNG, VERIFIED AND SIGNED BY THE REPAIR ACTIVITY (IF REQUIRED) AND SHIP

_____ WATCH/DUTY OFFICER DATE

14 PLANT/SHIP CONDITIONS (E G , DRAINED, DE-PRESSURIZED, DE-ENERGIZED) SET DIVISION/RA IS AUTHORIZED TO START WORK

_____ WATCH/DUTY OFFICER DATE

_____ REPAIR ACTIVITY DATE

NOTIFICATION OF WORK COMPLETION

15 RESTRICTIONS/PRECAUTIONS/REMARKS

16 WORK IS COMPLETE | 17 TESTING IS COMPLETE

LPO/DIV OFF or RA _____ DATE _____ | WATCH/DUTY OFF or RA _____ DATE_____

18 WAF CLOSED OUT

RA_____ DATE_____ WATCH/DUTY OFF _____ DATE_____

☐ CHECK IF CONTINUED ON ANOTHER SHEET

Examples of Safety of Ship Work

- Fire main
- Main drain
- Lighting
- Divers
- Single Valve to Sea
- Access/Egress
  - Ladders/P-ways
  - Brows
- All DC Equipment
- Ship Stability Systems
- Alarm Systems
  - Fire
  - Flooding
  - Fire Pump Operation/Indication
  - H2S
- AFFF
- Temporary FF system
- Fire Zone Boundaries

This is not an all inclusive list, ask the project SSO when in doubt.

Fixed Extinguishing Systems

Surface ships and Submarines use various manual or automatic permanent extinguishing Systems.

- **SHIPYARD WORKERS SHALL NOT ACTIVATE ANY FIXED EXTINGUISHING SYSTEMS** during a fire. All operation of these systems will be performed by SF.
- Shipyard personnel should avoid accidental operation. **DO NOT** disturb system components and equipment such as piping, cabling, linkages, detection devices, activation devices and alarm devices.
    - If you think your work could cause accidental activation of a manual or automatic fixed extinguishing system contact your Supervisor immediately for guidance.
- **Ensure you know how to evacuate a space that has an installed fixed extinguishing system at all times.**

Note: The next slides will explain some of the common locations, hazards, alarm systems, and discharge characteristics associated with fixed extinguishing systems.

If you require additional information contact your Supervisor

Fixed Extinguishing Systems

Fixed CO_2 Hose Reel Fire Extinguishing Systems

- Common Locations (CVN only):
  - Emergency Diesel, Aviation Shop, Shaft Alley, Pump Room, Reactor Room and Machinery Rooms.
- Alarm Systems:
  - None
- Discharge Characteristics:
  - Manual discharge from fixed hose reels attached to two 50 lb CO2 bottles.
  - Visibility is restricted by discharge of fine, dry ice particles and by condensation of moisture in the air by the cold CO_2. Loss of visibility will occur within two seconds of start of discharge. Good visibility should return in about a minute.
- Hazards to Health:
  - Personnel must not breathe CO^2. Dizziness, increased respiration rate and headaches will occur at low concentrations and loss of consciousness will occur in less than 16-35 seconds at the concentrations expected after discharge of CO_2 to a protected space. Cardiac arrest will occur shortly after loss of consciousness. Serious and permanent injury to the brain can occur within 3-5 minutes after cardiac arrest unless the person is removed from the hazardous atmosphere and CPR is started.
  - Discharged CO_2 may migrate to areas outside the space in which it is discharged through leak paths, ventilation or open doors. It will tend to accumulate at low points in the space
  - Within three seconds, the space into which the CO_2 is discharged will become pressurized. The pressure will be so high that an inward swinging door cannot be pulled open. Doors that swing outward may also be affected.

Fixed Extinguishing Systems

Fixed Halon Fire Extinguishing System

- Common Locations (CVN and DDG):
  - Emergency Diesels, HAZMAT store rooms, HAZMAT issuing rooms, Aviation flammable storerooms, Shaft Alley, Pump Room, Auxiliary Machinery Rooms and Machinery Rooms.
- Alarm Systems:
  - Visual Red beacon illuminates when the system is activated.
  - Audible horn sounds when system is activated.
  - An audible and visual alarm will activate in DCC indicating station is operating.

Click on Video to Watch

Fixed Extinguishing Systems

Fixed Halon Fire Extinguishing System (con't)

- Discharge Characteristics:
  - Manually operated from stations at each exit for the above mentioned locations
  - Discharge is through high velocity nozzles from 125 lb bottles located throughout the affected space.
  - Visibility may be restricted in high humid areas.
- Hazards to Health:
  - Personnel shall EVACUATE the space when the Halon system is actuated in the presence of fire. Produces toxic Hydrogen Fluoride acid gas when exposed to fire.
  - At low concentration levels, personnel have experienced dizziness and tingling of the extremities, indicative of mild anesthesia.
  - At higher concentration levels, personnel have experienced dizziness. Subjects have felt as if they will lose consciousness and physical and mental dexterity is reduced.

Fixed Extinguishing Systems

Fixed AFFF Fire Extinguishing Systems

- Common Locations:
  - Emergency Diesel, Hangar Bay Sprinkling, Flight Deck, Aviation Shop, Shaft Alley, Pump Rooms, Reactor Room and Machinery Rooms Bilges, Weapons Elevators, Incinerator Room, VertRep Areas.
- Alarm Systems:
  - DDG - None.
  - CVN – An audible and visual alarm will activate in DCC indicating station is operating.
- Discharge Characteristics:
  - Manual discharge from fixed hose reels or sprinkling systems.
  - Creates a soap like “foam blanket” over the fire and/or flammable liquids that have not been ignited preventing re-flash.
- Hazards to Health:
  - The potential for hydrogen sulfide formation exists in stagnant premixed solutions of seawater and AFFF concentrate.

Fixed Extinguishing Systems

Fixed APC Fire Extinguishing Systems

- Common Locations :
  - Submarine Galley Deep Fat Fryers
- Alarm Systems:
  - None
- Discharge Characteristics:
  - Manual discharge from fixed system attached to Deep Fat Fryers.
  - Creates a “foam blanket” over the fire and/or flammable liquids that have not been ignited preventing re-flash.
- Hazards to Health:
  - Can cause irritation to respiratory and gastrointestinal tract if inhaled or swallowed. Seek medical attention immediately if exposed.

Hot Work

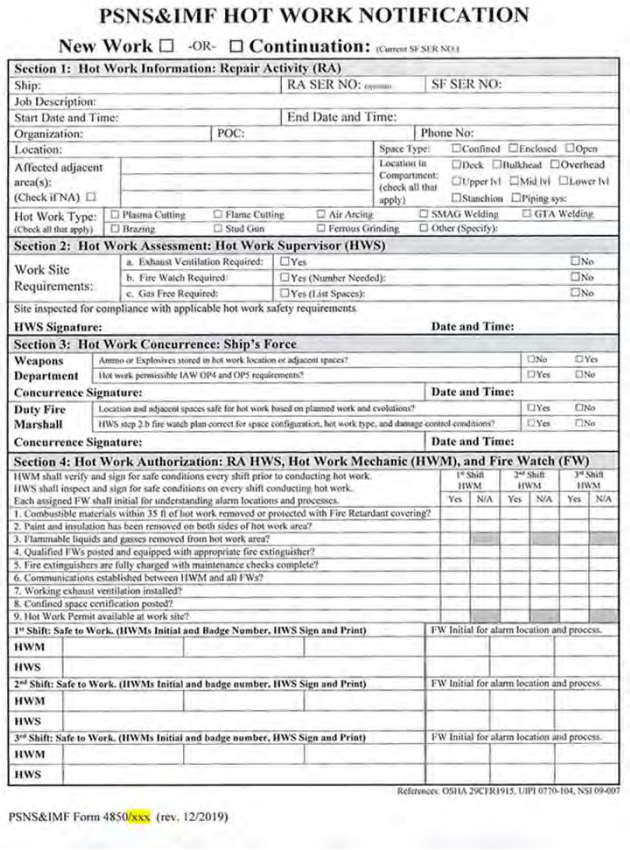
- What is Hot Work?
  - Flame heating, welding, torch cutting, brazing, and carbon arc gouging.
  - Work which produces heat, by any means, of 400 degrees F (204 degrees C), or more.
  - Ferrous metal grinding.
  - Heat Guns, Lasers, and Strip Heaters, and Soldering using an iron.
  - Other spark-producing (grinding, drilling, abrasive blasting, etc.) work may be hotwork, a Gas Free Engineer/Marine Chemist needs to determine.
- Hot Work Coordination
  - Each project has a HW coordination meeting which discusses all organizations HW plans and de-conflicts ship evolutions and cold work.

Hot Work Permitting

All Maintenance activities conducting HW at PSNS will use the PSNS&IMF HOT WORK NOTIFICATION form 4850/588.

- Section 1: Work Information
  - Repair activity describes the work, processes, space location and description.
  - Includes an accurate start time for SF review prioritization.
  - Standard start times: 0900, 1200, 1500, 1800, and 0600.
  - Permits are 24 hours max. If no expiration time is entered, it is a 24 hour permit.

- Section 2: Work Assessment
  - Hot Work Supervisor (HWS) inspects the site.
  - Assesses:
    - Required exhaust ventilation.
    - If a fire watch is required.
    - How many fire watches are required.
    - If a special gas free certification is required.



PSNS&IMF HOT WORK NOTIFICATION

New Work ☐ -OR- ☐ Continuation: (Current SF SER NO.)

Section 1: Hot Work Information: Repair Activity (RA)			
Ship:		RA SER NO: (optional)	SF SER NO:
Job Description:			
Start Date and Time:		End Date and Time:	
Organization:	POC:		Phone No:
Location:		Space Type:	☐Confined ☐Enclosed ☐Open
Affected adjacent area(s): (Check if NA) ☐		Location in Compartment: (check all that apply)	☐Deck ☐Bulkhead ☐Overhead ☐Upper lvl ☐Mid lvl ☐Lower lvl ☐Stanchion ☐Piping sys:
Hot Work Type: (Check all that apply)	☐ Plasma Cutting ☐ Flame Cutting ☐ Air Arcing ☐ SMAG Welding ☐ GTA Welding ☐ Brazing ☐ Stud Gun ☐ Ferrous Grinding ☐ Other (Specify):		
Section 2: Hot Work Assessment: Hot Work Supervisor (HWS)			
Work Site Requirements:	a. Exhaust Ventilation Required:	☐Yes	☐No
	b. Fire Watch Required:	☐Yes (Number Needed):	☐No
	c. Gas Free Required:	☐Yes (List Spaces):	☐No
Site inspected for compliance with applicable hot work safety requirements.			
HWS Signature:		**Date and Time:**	
Section 3: Hot Work Concurrence: Ship's Force			
Weapons Department	Ammo or Explosives stored in hot work location or adjacent spaces?	☐No	☐Yes
	Hot work permissible IAW OP4 and OP5 requirements?	☐Yes	☐No
Concurrence Signature:		**Date and Time:**	
Duty Fire Marshall	Location and adjacent spaces safe for hot work based on planned work and evolutions?	☐Yes	☐No
	HWS step 2.b fire watch plan correct for space configuration, hot work type, and damage control conditions?	☐Yes	☐No
Concurrence Signature:		**Date and Time:**	

Section 4: Hot Work Authorization: RA HWS, Hot Work Mechanic (HWM), and Fire Watch (FW)						
HWM shall verify and sign for safe conditions every shift prior to conducting hot work. HWS shall inspect and sign for safe conditions on every shift conducting hot work. Each assigned FW shall initial for understanding alarm locations and processes.	1st Shift HWM		2nd Shift HWM		3rd Shift HWM	
	Yes	N/A	Yes	N/A	Yes	N/A
1. Combustible materials within 35 ft of hot work removed or protected with Fire Retardant covering?						
2. Paint and insulation has been removed on both sides of hot work area?						
3. Flammable liquids and gasses removed from hot work area?						
4. Qualified FWs posted and equipped with appropriate fire extinguisher?						
5. Fire extinguishers are fully charged with maintenance checks complete?						
6. Communications established between HWM and all FWs?						
7. Working exhaust ventilation installed?						
8. Confined space certification posted?						
9. Hot Work Permit available at work site?						

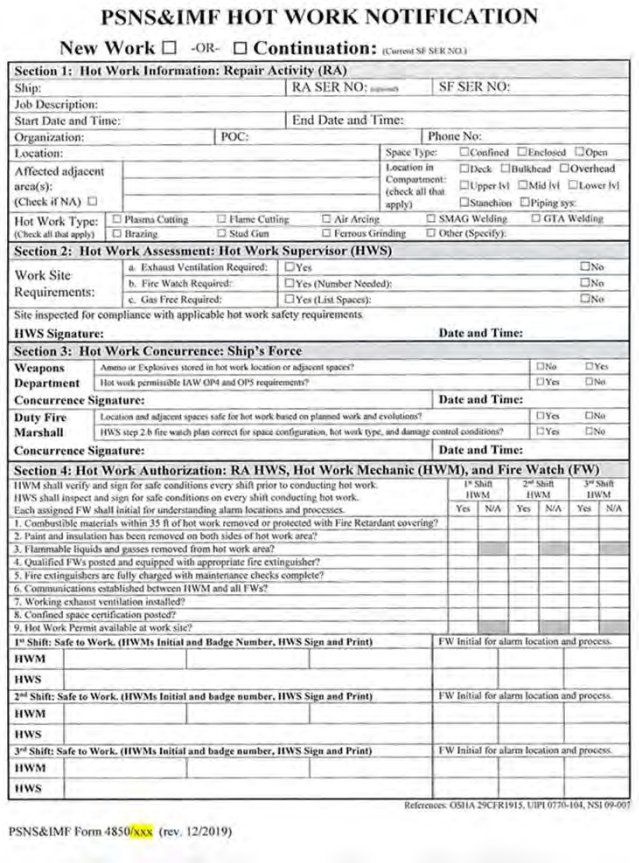
1st Shift: Safe to Work. (HWMs Initial and Badge Number, HWS Sign and Print)		FW Initial for alarm location and process.
HWM		
HWS		
2nd Shift: Safe to Work. (HWMs Initial and badge number, HWS Sign and Print)		FW Initial for alarm location and process.
HWM		
HWS		
3rd Shift: Safe to Work. (HWMs Initial and badge number, HWS Sign and Print)		FW Initial for alarm location and process.
HWM		
HWS		

References: OSHA 29CFR1915, UIPI 0770-104, NSI 09-007

PSNS&IMF Form 4850/xxx (rev. 12/2019)

Hot Work Permitting

- Section 3: SF Concurrence
  - SF assigns a serial number.
  - Site preps in progress, SF is NOT CHECKING set-up.
  - SF is verifying that HW can safely be conducted as requested.
  - Drop off times are 3 hours before the projected start times listed in section 1.
  - Drop off/pick up locations are project specific.
- Section 4: Work Assessment
  - Repair activity posts permit at site.
  - Each shift, HW mechanic verifies site is safe for HW by initialing check list and signing.
  - Each shift, HW Supervisor verifies site is safe for HW by signing.
  - Each shift, Fire Watch locates nearest alarm device and verifies procedure and initials.



PSNS&IMF HOT WORK NOTIFICATION

New Work ☐ -OR- ☐ Continuation: (Current SF SER NO.)

Section 1: Hot Work Information: Repair Activity (RA)			
Ship:		RA SER NO: (optional)	SF SER NO:
Job Description:			
Start Date and Time:		End Date and Time:	
Organization:	POC:		Phone No:
Location:		Space Type: ☐Confined ☐Enclosed ☐Open	
Affected adjacent area(s): (Check if NA) ☐		Location in Compartment: (check all that apply) ☐Deck ☐Bulkhead ☐Overhead ☐Upper lvl ☐Mid lvl ☐Lower lvl ☐Stanchion ☐Piping sys:	
Hot Work Type: (Check all that apply)	☐ Plasma Cutting ☐ Flame Cutting ☐ Air Arcing ☐ SMAW Welding ☐ GTA Welding ☐ Brazing ☐ Stud Gun ☐ Ferrous Grinding ☐ Other (Specify):		
Section 2: Hot Work Assessment: Hot Work Supervisor (HWS)			
Work Site Requirements:	a. Exhaust Ventilation Required:	☐Yes	☐No
	b. Fire Watch Required:	☐Yes (Number Needed):	☐No
	c. Gas Free Required:	☐Yes (List Spaces):	☐No
Site inspected for compliance with applicable hot work safety requirements.			
HWS Signature:		**Date and Time:**	
Section 3: Hot Work Concurrence: Ship's Force			
Weapons Department	Ammo or Explosives stored in hot work location or adjacent spaces?	☐No	☐Yes
	Hot work permissible IAW OP4 and OP5 requirements?	☐Yes	☐No
Concurrence Signature:		**Date and Time:**	
Duty Fire Marshall	Location and adjacent spaces safe for hot work based on planned work and evolutions?	☐Yes	☐No
	HWS step 2.b fire watch plan correct for space configuration, hot work type, and damage control conditions?	☐Yes	☐No
Concurrence Signature:		**Date and Time:**	

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	Yes	N/A	Yes	N/A	Yes	N/A
1. Combustible materials within 35 ft of hot work removed or protected with Fire Retardant covering?						
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HWM						
HWS						
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HWM						
HWS						

References: OSHA 29CFR1915, UFI 0770-104, NSI 09-007

PSNS&IMF Form 4850/xxx (rev. 12/2019)

Fire Prevention and Response

How can you support?

No one knows when the casualty will happen:

- Response preparations have to happen every day and on every job.
- It's rarely one thing wrong, a few small hazards and blocked accesses could add up to the start of a major fire.
- Once a casualty starts we leave, it's up to us to try and keep the area safe for SF and emergency responders.

Maintain Access and Egress Routes:

- Maintain Passageways clear and free from debris.
- Temporary service lines should remain high and tight in the overhead, at least 50 inches from the deck.
- Use Non-Combustible material to support temporary services
- Cover or guard manholes and other deck openings.
- Provide temporary lighting as needed for planned outages and work areas.

Fire Prevention and Response

How can you support?

Do not block access to Damage Control Equipment:

- Fire Extinguishers
- Fire Hose stations
- Damage control lockers (in-hull or the DC Conex boxes)
- Temporary hose stations

Maintain Fire Zone Boundaries:

- Do not block or disable Fire Zone Boundaries
- Install Quick Disconnect Fittings
- Identify and mark services

Responsible Flammable and Combustible use:

- Limit the amount of consumable material used shipboard, remove all unused material at the end of the shift.
- Use Fire Proof or Fire Resistant protective coverings for equipment, decking and furnishings.
- Use Fire retardant treated wood products.
- Use metal bodied vacuum cleaners.
- TAKE YOUR TRASH OFF THE SHIP AT THE END OF YOUR SHIFT!

Conclusion

We all have a role in Ship Safety.

Contact your supervisor or safety representative if you have any questions.