



# Ship and Fire Safety

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## Objectives:

- Shipyard Fire Hazards
- Emergency Reporting and Actions
- Alarm Sounds and Actions
- Evacuation Procedures
- Work Controls
- Fixed Extinguishing Systems
- Hot Work Coordination
- How can you support

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Catalog # 2177

# Fire Safety

Produced by:

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## Industrial Hazards to Ship Safety

Fire, Flooding, and Toxic Gas are all hazards that ships experience during industrial availabilities.

Knowing your prevention role and how to contact the Casualty Control Station (CASCON), DC Central, or Quarterdeck and sound the alarm during a casualty could save lives and the ship.



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## Fire Damage in Industrial Availabilities

Left is USS OSCAR AUSTIN after 2018 major fire.

Right is the same space from a similar DDG.

- Caused by Hot Work.
- 12 hours to extinguish.
- One shift's poor work practice added 24 months to the availability.



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## Fire Damage in Industrial Availabilities



Fire on USS MIAMI resulted in decommissioning 20 years early.  
The fire started in the space on the far side of the locker in this picture.

## Industrial Availability Major Fires

\* Red Dates indicate weekend or swing shift fires

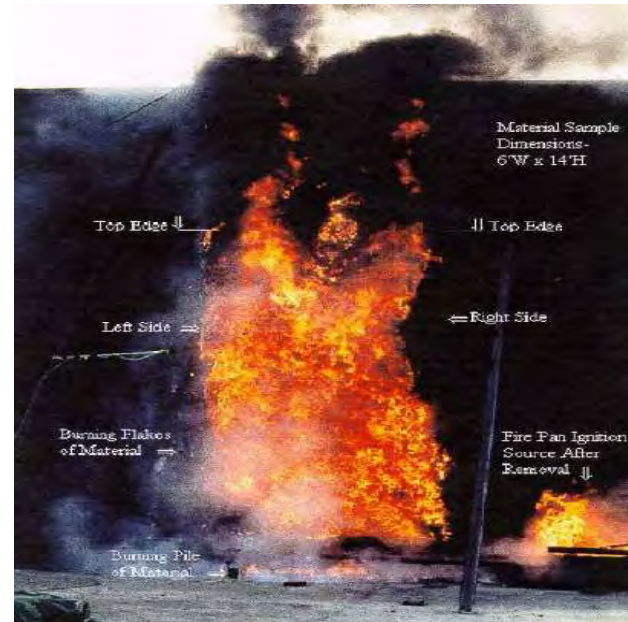
- 2012 USS MIAMI (SSN 755) Arson
  - 12 hours to extinguish by over 200 external responders. Loss of ship.
- 2015 USS GUNSTON HALL (LSD 44) Hotwork
  - 9 hours to extinguish by over 220 external responders. \$120M damage 1 year delay to availability.
- 2015 USS MT WHITNEY (LCC 20) Runaway diesel during retest
  - \$4M and four months to repair.
- 2016 USS COLE (DDG 67) Temporary system
  - Spread to ship vent and cableways. \$3M damage.
- 2017 USS LINCOLN (CVN 72) Hotwork
  - Combat space fire caused \$7M damage.
- 2018 USS OSCAR AUSTIN (DDG 79) Hotwork
  - 12 hours to extinguish. 2 year delay in availability completion.
- 2019 USS IWO JIMA (LHD 7) Under investigation
  - 5 hours to extinguish.



# Fires can rapidly grow in size and severity!

**A Fire on the exterior of a vessel can be just as dangerous as one on the inside.**

- Confined spaces, flammable and combustible material can intensify the heat and smoke.
- Many warships have special sound/radar coatings on the hull that can result in large fires if ignited.



Submarine SHT coating fire test.

The entire 6'x14' test sample was burning ten minutes after ignition.

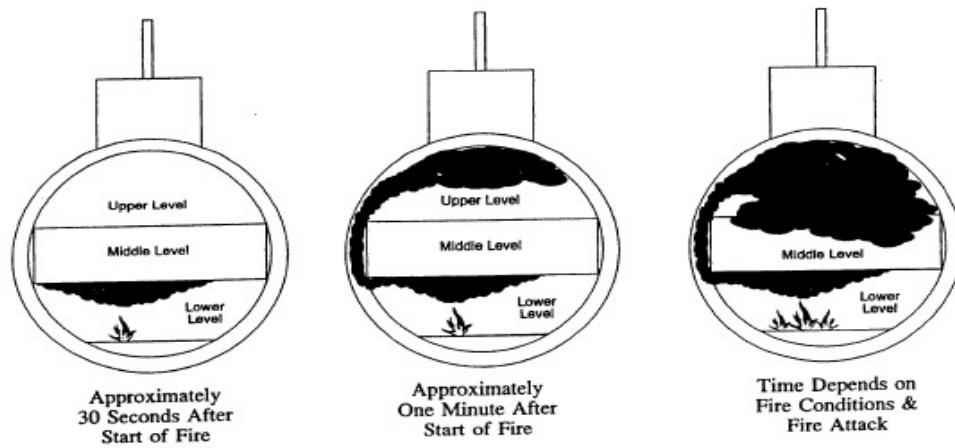
- A fire could happen at any time while the vessel is in an industrial environment due to improper hot work or a housekeeping issue.
- **You could be the one that sees it first!**

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## Smoke can rapidly fill a submarine compartment.

Hearing and recognizing the alarm and evacuating as quickly as possible is critical!



On USS MIAMI the fire started in Middle Level and rapidly filled both Upper and Middle Levels with smoke, making even locating the fire difficult.

Safely evacuating is important to:

- Save your life.
- Prevent injury.
- Allow SF and F&ES to save the ship.

- These drawings show how fast smoke can spread and fill a submarine compartment in a “moderately severe” fire. In this example, a fire starts in Lower Level and the following occurs:
  - **30 seconds to 1 minute** - Visibility in the upper level is lost due to smoke.
  - 1 to 3 minutes - Unprotected personnel driven away from the scene by heat.
  - 2 to 6 minutes - Unprotected personnel driven by heat from the upper level.

# Reportable Fire Events

Any unplanned fire event or fire prevention problem must be reported

PPE and Agent Required to Extinguish	Major Fire	A fire that has progressed beyond the incipient stage, beyond the ability of the initial responders to control, and is still not under control when the first hose team outfitted in SCBAs and FFEs needs to be relieved. A multilevel fire is a major fire.
	Fire	State, process, or instance of combustion in which fuel or other material is ignited and combined with oxygen, giving off light, heat, and flame.
Agent Required to Extinguish	Incipient Fire	A fire which is in the initial or beginning stage and which can be controlled or extinguished by portable fire extinguishers, Class II standpipe, or small hose systems without the need for protective clothing or breathing apparatus.
No Agent Required to Extinguish	Smoldering Fire	<b>BURNING:</b> The process of self-perpetuating combustion, with or without an open flame. Smoldering is burning. <b>SMOLDERING:</b> Combustion without flame, usually with incandescence and smoke. <b>CHAR:</b> Material that has been partially burned on the exterior of the object and has a blackened, carbonized appearance

**All Are Reportable Fires.** All of these fires, either shipboard or in the dry-dock need to be reported. Including:

- Small fires in which no extinguishing agent was needed.
- Damage was limited to the originally ignited material and did not spread to other materials or damage the ship.
- No flame present.
- Evidence of previously unreported fires (char) must also be reported upon discovery.

# Fire Reporting Procedures

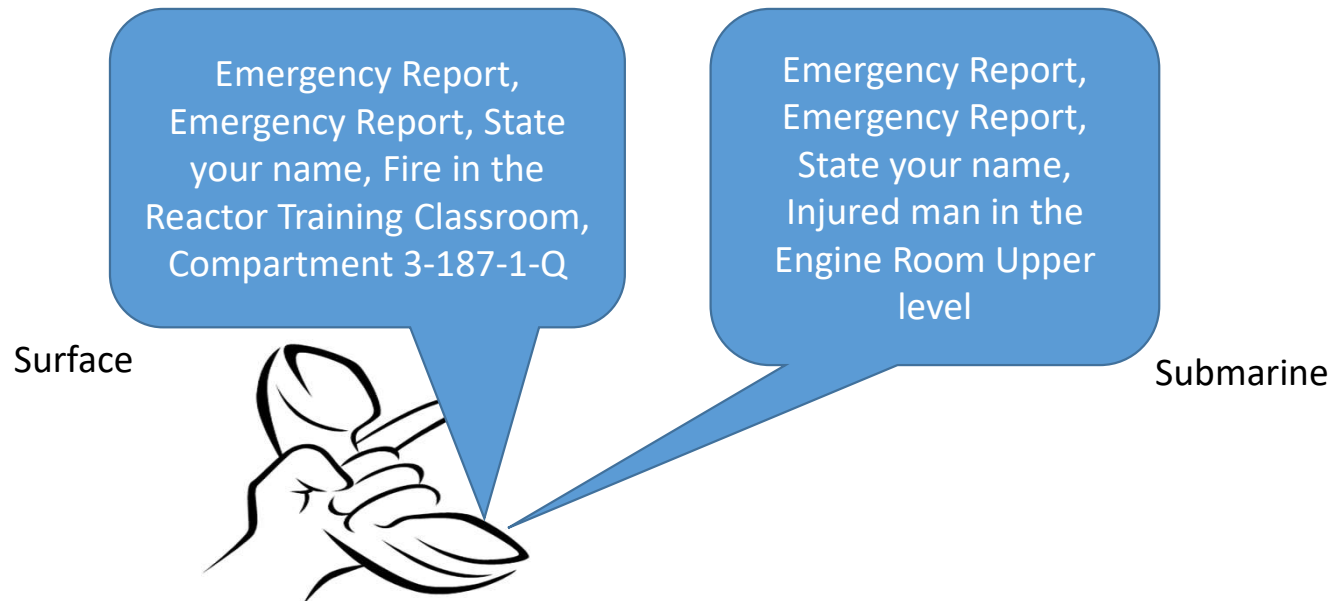
- Smoldering and Incipient Fires:
  - Put it out if you are equipped and able.
  - Once it is out, report it to SF and the SSO. **Emphasize the fire is out.**
  - DO NOT pull the fire alarm pull box.
- Fires that cannot immediately be extinguished:
  - Report it immediately!
  - If using a CASCON remote station, also pull the fire alarm pull box on the remote station.
- IRR ONLY (Recycle Projects) - Small Incipient fires extinguished with water hoses is an approved standard procedure to control flare-ups during the IRR process:
  - DO NOT activate a fire alarm pull box.
  - Do not report these fires to the RDC.

**If you smell smoke, see smoke, or detect abnormal gas levels/leaks: REPORT IT IMMEDIATELY!**

- You can't easily determine the source.
- You determine that the source is not the result of work in progress.
- You see smoke coming from equipment or electrical panels.

# Emergency Reporting

Anyone discovering a casualty:  
fire, flooding, gas leak, injured persons, flammable liquid spills, or other hazardous condition.  
Shall immediately notify SF by any means possible.  
The most common means of reporting are on the next few slides.





## Casualty Reporting Devices

- CASCON remote stations will be placed throughout the inside of the vessel when the 1MC/4MC announcing system (Submarines) or 1MC/J-dial/IVCS system (Surface ships) is secured, CASCON remote stations will also be placed topside, and in the dry-dock.
  - **Before you start work for the day, ensure you know where the nearest reporting device is located.**
- All CASCON remote stations are tested daily to ensure they are in working order. Notify the CASCON watchstander if you notice any problems with a remote CASCON station.
- If the casualty reporting stations becomes disabled on the vessel that you are working on, **the Ship Safety Officer (SSO) will direct repairs to rapidly restore the system. While the system is impaired, hot work may be secured until the system can be restored.**
- Operation of a J-Dial/IVCS is similar to your home phone. The number to reach the QD and/or DCC is located on the Fire Bill at the entry to the ship.

# Casualty Reporting Methods

## CASCON Stations

(located throughout subs and in all drydocks)

Open the door and remove the telephone handset.

\*removing the telephone handset automatically rings the CASCON\*

If reporting a fire or flooding, lift the alarm protective cover and pull the alarm lever down.



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Remote Station  
Alarm Light and  
Speaker



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## A photograph showing the conning tower and upper hull of a submarine as it surfaces. The vessel is cutting through the water, creating a large, white, turbulent splash around the base of the conning tower. The water is dark blue, and the sky is a pale, overcast grey. The perspective is from a slightly elevated position, looking down at the submarine as it emerges.

## A close-up photograph of a red emergency stop button mounted on a machine. A person's hand is shown pressing the button. The button has a silver-colored center with a red ring. Text on the button includes "STOP", "EMERGENCY STOP SWITCH", and "MACHINE STOPPED". The button is connected to a red cable.



- Note: A SF Watch stander will not answer the phone.**

- SF watch standers will hear your emergency report in Maneuvering , CASCON, and other controlling stations.**

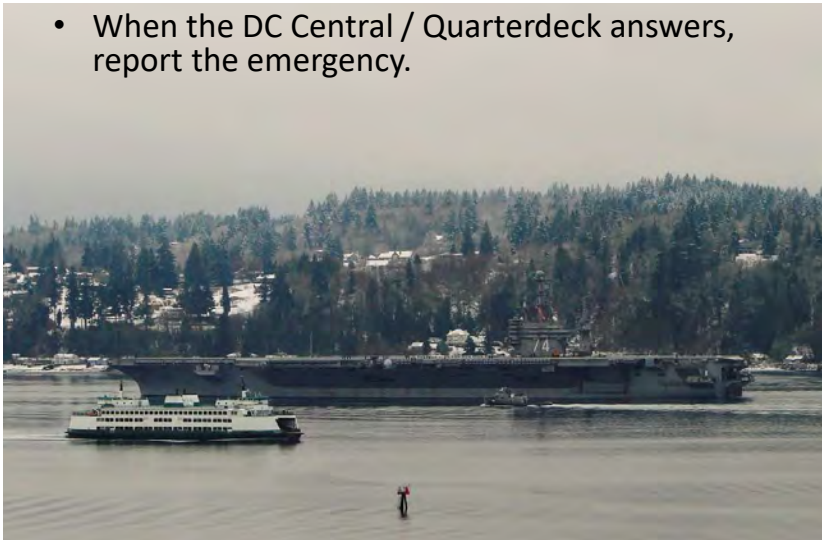
**They will make announcements inside the ship on the main announcing system and will sound ship's alarms as applicable.**

# Casualty Reporting Methods

## J-Dial

(Located throughout CVN's)

- Remove the handset
- Dial 911 or the 4 digit number for DC Central or the Quarterdeck (**number is posted on the Fire Bill at the head of each brow**).
- When the DC Central / Quarterdeck answers, report the emergency.



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# Casualty Reporting Methods

## IVCS Phone

(Located throughout DDG's)



- Remove the handset
- Press "ON"

**NOTE: Hold the button on handset while talking, release when not talking**

- Dial the 4 digit number for DC Central or the Quarterdeck (the number is posted on the Fire Bill at the head of each brow).
- When the DC Central / Quarterdeck watch stander answers, report the emergency.
- Ensure you press "OFF" when hanging up the phone.



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# Casualty Reporting Methods

## Cell Phone

Contacting the Regional Dispatch Center (Navy 911).

- When in a dry dock or on a ship/sub, **first try to notify SF of the casualty.**
  - If that is delayed:
    - Dial (360)476-3333 or Dial 911
- NOTE: Dialing 911 will connect you to the county 911 center, tell them you are on base. (they will transfer you to the “Navy 911”)**
- When the operator answers, report the emergency.
  - Continue to try and notify SF.



# Brow Boarding Sign

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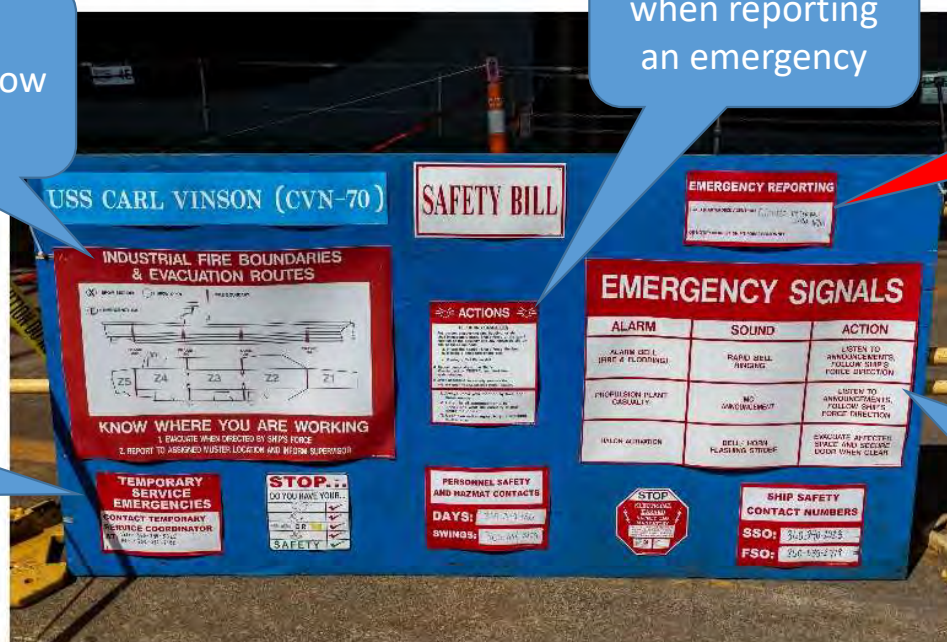
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Evacuation Routes and Brow Availability

Actions to take when reporting an emergency

Emergency Reporting Phone #'s

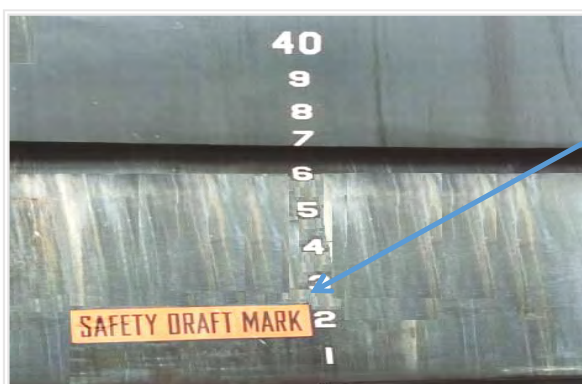
Contact #'s and other safety related signs.



Alarm Sounds and Actions to take if heard.

These signs are located near each access brow to the ship.  
**READ IT BEFORE YOU BOARD, THIS INFORMATION MAY SAVE THE SHIP OR A LIFE!**

# 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

