



NAVAL SAFETY COMMAND SAFETY AWARENESS DISPATCH SA 26-05



Shipboard Fire Mishap Prevention

Benjamin Franklin once said, “Nothing can be said to be certain, except death and taxes.” The Navy has a few similar areas of certainty of its own, with shipboard fires being one our Sailors face on an unfortunately regular basis. It’s not a matter of if there’s going to be a fire; it’s when. The most important part of facing shipboard fires is knowing how to prevent them from starting in the first place and, when they do occur, making sure we’re proficient in the skills needed to fight the fire and protect life and equipment.

After reviewing reported shipboard fire mishaps over the past few years, we see recurring themes in how the fire started: 1) Hot work getting out of hand, 2) Kinetic friction (mechanical parts rubbing together at speed), or 3) Electrical shorts creating sparks that cause a fire. However, the examples below show how it’s the actions and decisions people make beforehand that contribute to whether or not a fire occurs at all.



File photo, not associated with a mishap

Too Hot to Handle

Weekend ship workers noticed an oily waste valve leaking in a designated hot work area on a ship undergoing maintenance, and reported the potential fire hazard to their contractor shop supervisor who then notified the weekend superintendent. The superintendent secured hot work in the area and informed the contractor supervisor an employee would evaluate and fix the issue the next day. The next morning, that employee performed repairs he felt were sufficient to stop the leak and informed a Pipe Shop supervisor who then notified a Steel Shop supervisor that the leak was adequately isolated. When Steel Shop workers began welding shortly thereafter, a fire ignited from sparks that passed through an angle iron rat hole and past an erected fire-retardant containment area into an adjacent space containing combustible material saturated in fuel oil that was (*you guessed it*) left over from the earlier leak.

A welder saw the flame coming from the rat hole to the adjacent space on the opposite side of the containment area (where there was no posted fire watch). Using a fire extinguisher from a nearby fire watch, he pulled away the barrier and put out the fire. A ship’s force Sailor saw the incident and quickly reported the fire to the Quarterdeck. Word was passed over the 1MC system for the in-port emergency team, who quickly arrived on-scene and ensured the fire was out. *—While the leak/potential fire hazard was reported promptly and hot work secured at the appropriate level of leadership(superintendent), there was no appropriate supervisory oversight on the repair work, or to ensure compliance with hot work procedures to include: evaluating and mitigating the worksite and surrounding spaces for hot work hazards, i.e., breaches and openings, ensuring combustible materials are not within 35 feet of designated hot work areas, etc., and that fire watches were posted in every location they should be. Additionally, workers began hot work without notification from the higher-level authority that secured hot work in the first place. Proper supervision, oversight and follow-up are key to preventing fires caused by hot work.*

An Ounce of Prevention is Worth a Pound of Cure

White smoke was reported on board a ship at 8:29 p.m., called away within two minutes and the rapid response team (RRT) and duty fire marshal arrived on-scene two minutes later to discover a Class A fire (a broom, dustpan and trash located behind a sink) in a stateroom. Their initial attempt to engage the fire with a CO2 bottle was found to be ineffective as they couldn’t aim the CO2 directly at the fire due to the location of the burning materials, so they switched to a main fire hose, which proved effective. The duty electrician set electrical isolation to the compartment, and the fire marshal confirmed the fire was out, roughly 12 minutes after the first report. It was later found that a degraded gasket covering a cap on an exterior outlet allowed water to seep into the electrical junction box corroding the inside components over time, which caused a Class C fire. That Class C fire sent an eruption of sparks through an associated interior outlet onto the combustible items which triggered the Class A fire. It was determined the

degraded weatherization (faulty gasket) was the result of poorly or improperly performed preventative maintenance. One Sailor from the RRT was treated at the ER for smoke inhalation and released the same day fit for duty. –*The response effort to this fire is commendable as time is a critical factor in fire severity. Every task we do matters. If the preventative maintenance was done incorrectly or poorly, then training is needed to fix the issue, so it doesn't continue. Spot checking similar fixtures would be a proactive measure to rule out a larger problem. This example demonstrates the importance of doing regular maintenance well, because if we can cut down the number of opportunities fires have to get started, the fewer fires we'll have to deal with overall.*

To Be Perfectly Clear...

A ship was pierside and receiving shore power from 10 shore power (SP) cables on a day when its Engineering Department had scheduled switchboard (SWBD) cleaning as part of an annual maintenance check. Per the switchboard tech reference, but not specified on the MRC, the SWBDs need to be de-energized by securing shore power before they're opened, inspected and cleaned. (Pg. 3, MIP 3241 (series), MRC A-26R states: "De-energize and/or isolate switchboard and attach tag(s) in accordance with the Tag-out Users Manual (TUM), and/or local tag-out instruction.") Initial voltage checks were performed between 8 and 9 a.m. to verify all 10 cables were secured and it was discovered #2 SP was still receiving power, prompting one supervisor (SUP1) to tell the nearby electricians the #2 SWBD was not to be worked on as it was still energized. No warning signs were posted, no watch was established, and there was inadequate supervision over the entire maintenance evolution. Around 9 a.m., when the switchboard cleaning began, a Sailor (S1), who had been sent to gather tools during the 6 a.m. safety brief and was unaware of the status of the #2 SWBD, arrived to start cleaning. S1 asked a different supervisor (SUP2) if it was "ok" to begin. Mistakenly thinking S1 was referring to a switchboard other than #2 SWBD, SUP2 gave the go-ahead. S1 then began cleaning the still-energized #2 SWBD. Another Sailor (S2) walked by and noticed the "power available" light on, indicating that #2 SWBD was energized, and saw S1 inside the switchboard cleaning. S2 immediately told S1 to get out of the switchboard and went to inform SUP2 about the power indicator and S1's dangerous proximity to the live equipment (*This was great SA by S2*). S1 exited the switchboard but continued cleaning the front panel. As S2 was reporting the issue to SUP2, the metal edge of S1's cleaning brush made contact with an energized part of the switchboard, causing an arc flash that ignited a Class C fire, followed by a loud explosion as the space filled with smoke. S1 was pulled from the space as other Sailors fought the fire with CO2 bottles and alerted central control. –*S1 sustained second-degree burns, and 10 other Sailors were medically evaluated. The subsequent investigation identified numerous contributing factors, including insufficient supervision, an underappreciation of the risks involved, communication failures among and by supervisors, and failure to follow established procedures in the NSTM 300 and the Tagout User's Manual. NSTM 300 should have been used at the supervisor level and fully understood by all parties prior to executing maintenance.*

Key Takeaways

Improper maintenance, failure to follow procedure, lack of proper oversight and poor communication are often the root cause for many shipboard fires.

1. Following procedures is key to effective fire prevention. *They weren't implemented for fun.*

- Following all hot work procedures to include proper oversight and communication, having required number of fire watches in place according to procedure, and ensuring all spaces are clear of combustible materials.

2. Competent oversight. Supervising requires more than task assignment.

- Supervisors must provide consistent and appropriate oversight to ensure procedures and tasks are understood and that all required tools, references and SOPs are available and utilized.
- Follow-up and perform proper spot-checks to ensure personnel are completing tasks and maintenance according to procedure.

3. Clear communication. All personnel at every level are responsible for communicating any potential hazard or potential area of risk when they see it.

- Don't assume everyone "got the message." Make sure important information is passed along appropriately up and down the chain of command, and that proper signage and notices are posted as needed to protect all personnel.

And remember, "Let's be careful out there"