



NAVAL SAFETY COMMAND SAFETY AWARENESS DISPATCH



SA 25-15

Shipboard Fires

A quick check of the data over the past 3½ years shows a rough average of one shipboard fire reported every day, with the vast majority of these occurring on ships in a maintenance availability. Please read through these examples of missteps and successes, while thinking about how to improve your own area of influence.

- Are You as Ready as You Should Be? During a sea and anchor detail, a Sailor on watch in an Auxiliary Machinery Room saw a spark flashing on the Low-Pressure Air Compressor (LPAC) and reported the casualty to Central Control Station (CCS). CCS called away the Casualty Response Team (CRT). The Sailor also directed another Sailor to man and test a fire control agent (*good call*) while he electrically isolated the fire at the breaker. After the Sailor identified the breaker and isolated the affected equipment, the fire appeared to be out. CRT arrived on scene and verified that the electrical fire was out. The CRT determined the source of the fire was water intrusion from a pinhole leak on an adjacent seawater pipe flange that shorted the LPAC's A/C motor. — *Ship's electrical equipment often shares spaces with liquid piping close by, creating an inherent risk of a Class C fire. In this case, the risk was mitigated with the watch. The Sailor standing the watch was vigilant in his duties and procedures. The CCS and the CRT responded swiftly. Bottom line: Mechanical systems will break. This team was trained and knowledgeable in their response to the emergency. Is your team ready?*
- When Loose Screws Light Up Your Day. A ship was getting underway when white smoke was reported. Within minutes, a repair party was manned and ready, smoke boundaries were set, the compartment was identified and determined to have a Class A fire. The repair party responded using PKP, CO2 and the Fire Main to put the fire out. The fire originated from a blown gasket caused by loose screws on a flange joint in the diesel generator's exhaust piping. The resulting hot exhaust leak ignited surrounding materials (*improperly stored*) within the space. It was determined that the screws loosened over time and there was no established requirement for periodic inspection. Even though the generator was installed approximately 14 years before this incident, the space had never been reclassified to exclude the storage of materials. Following the incident, the ship conducted a review of other exhaust piping, identifying and addressing additional loose screws on flange joints. To enhance safety measures, procedures were implemented requiring fire marshals to inspect exhaust piping after maintenance and before the ship gets underway, and that spaces remain free of extraneous gear. This mishap resulted in two minor injuries, over \$100,000 in material damage and reduced readiness for the ship and its crew. — *As with any fire, the situation can go from bad to worse in a matter of seconds. This crew was commendable in their swift actions to contain and eliminate the fire. They were also proactive with putting procedures in place to prevent a future mishap by correcting a deficient inspection system and reclassifying the space and others like it to exclude material storage. Improper material storage is a consistent issue found in the Major Fires Review¹.*
- The PCU Strikes Back. While this ship was in port, white smoke was reported in a supply storeroom and identified as a Class C fire within the power conditioning unit (PCU) uninterruptible power supply (UPS). The PCU UPS was electrically isolated, an electrical tagout was completed and the fire was out. There was flammable material packed on top and around the PCU (*not good*), including in front of the cabinet forced air intake and vent, restricting ventilation and causing the equipment to overheat and PCU components to catch fire. The damage cost for this incident was close to \$400,000; the cause was improper stowage of materials. — *In 11 of 15 fire cases studied, the Major Fires Review¹ identified improper handling and stowage of combustible and hazardous material was causal or a contributing factor that provided an unexpected fuel source contributing to fire severity. The simple takeaway here is that lessons learned have*



File photo not associated with a mishap.

Shipboard Fires

been clearly identified from extensive research done by many smart people. Learn from the past and be vigilant with stowing material properly.

- **One Team, One Fight.** A junior Sailor notified the OOD of white smoke coming from the break—a covered walkway between midships and the forecastle. The watch contacted the CCS to ask if hot work was happening in the vicinity. Immediately, a senior engineering Sailor arrived to investigate. Upon entering the suspected area, the smoke thickened causing him to call away a "White Smoke" casualty. The ship's in-port emergency team was called to their station. Investigators confirmed white smoke and requested the attack team report to the scene. The ship's crew, along with several other nearby naval vessels and two local city Fire Services, spent approximately four hours combating the casualty. The fire, which originated in the fan room (accessed from the break), was caused by exposed wires that arced and sparked after the protective rubber casing wore down, allowing contact with the mounting bracket and setting the fan room ablaze. The fire was contained to one space and the surrounding infrastructure with repairs costing over \$650,000.

—Although the report lacks detail, this crew effectively utilized in-port assets and local community resources to help combat and contain the fire. Having a trained team that knows how to quickly engage these resources is essential, especially when undergoing maintenance or operating with reduced crews.

- **Near Miss ID's Bigger Issues.** Ship's force responded to a fire detection system activation. Based on the location from the fire control panel, it appeared to be a false alarm, but the response team noticed a faint smell of smoke. They were persistent in their investigation (*excellent!*); moving materials around in an adjacent storeroom they found a heated metal deck with damaged coatings and charred combustible material. *Because of ship's force's tenacious efforts to ID the source of the active alarm, there was NO fire.* It was discovered that a contracted welder was welding a gusset in an adjacent space without a hot work permit (*not good*). Additionally, there was no fire watch set on the adjacent heat-affected zone and the welder failed to wait the required 30-minute cooldown (*really not good*). The welder's foreman assigned the work without the hot work permit in place (*really, really, not good*). —The investigators did a great job and thankfully this incident didn't erupt into an active fire. But clearly there are problems with the safety culture as noted in the report. An organizational culture that allows for unsafe tasks enables human factors like non-compliance with procedures, not paying attention, and inadequate real-time risk assessment to happen without anyone stopping them.

¹The **Major Fires Review** (MFR) was directed by VCNO after the Bonhomme Richard (BHR) fire in July 2020. In short, it was a review of 15 major fires in a 12-year period culminating with the BHR fire. Follow the link to the secnav.navy.mil website to review entire report: [For Release Major Fires Review \(19 Oct 21\)](#)

Key Takeaways

Many of the mishap reports for shipboard fires that came after the BHR fire in July 2020 have similar circumstances and causal factors to those discussed at length in the Major Fires Review report. We won't attempt to cover all the underlying issues and causes that took hundreds of hours investigating and roughly a year to compile in the MFR, but we leave you with a few things to absorb and act upon:

1. Follow the rules (Compliance). We've emphasized this many times before because it's a common issue with all types of mishaps, including fires. Non-compliance with fire safety protocols was a major factor in many of the fires studied in the MFR. Simply put, had personnel followed established procedures, the fires wouldn't have occurred or at least would have been put out more effectively.

2. Properly store materials. In 60 percent of the 15 major fires reviewed during the MFR, (and in some of our examples) material stowage was a causal or contributing factor and, in many cases, it provided an unexpected fuel source contributing to the fire severity.

3. Know your firefighting equipment. The location and operation of fire extinguishers, hoses, fittings, and protective equipment are a few examples of 'must have' baseline knowledge. The saying 'Every Sailor is a fire-fighter' embodies the military's emphasis on readiness and adaptability. The **key to fire response** is rapid, immediate, and overwhelming action to contain and extinguish shipboard fires.

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