



AVIATION



HIGHWAY



MARINE



RAILROAD



PIPELINE

June 28, 2024

MIR-24-15

## Fire aboard Passenger Vessel *Qualifier 105*

On January 19, 2023, about 1155 local time, a fire started in a stateroom below the main deck of the small passenger vessel *Qualifier 105*, which was being stored ashore for the winter, on blocks, in the Northern Enterprises Boat Yard in Homer, Alaska (see figure 1 and figure 2).<sup>1</sup> The local fire department responded and extinguished the fire. No pollution or injuries were reported. The owners declared the vessel a constructive total loss. Damages were estimated at \$1.2 million.



**Figure 1.** *Qualifier 105* underway on an unknown date before the fire. (Source: Support Vessels of Alaska)

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<sup>1</sup> (a) In this report, all times are Alaska standard time. (b) Visit [nts.gov](https://www.nts.gov) to find additional information in the [public docket](#) for this NTSB investigation (case no. DCA23FM015). Use the [CAROL Query](#) to search investigations.

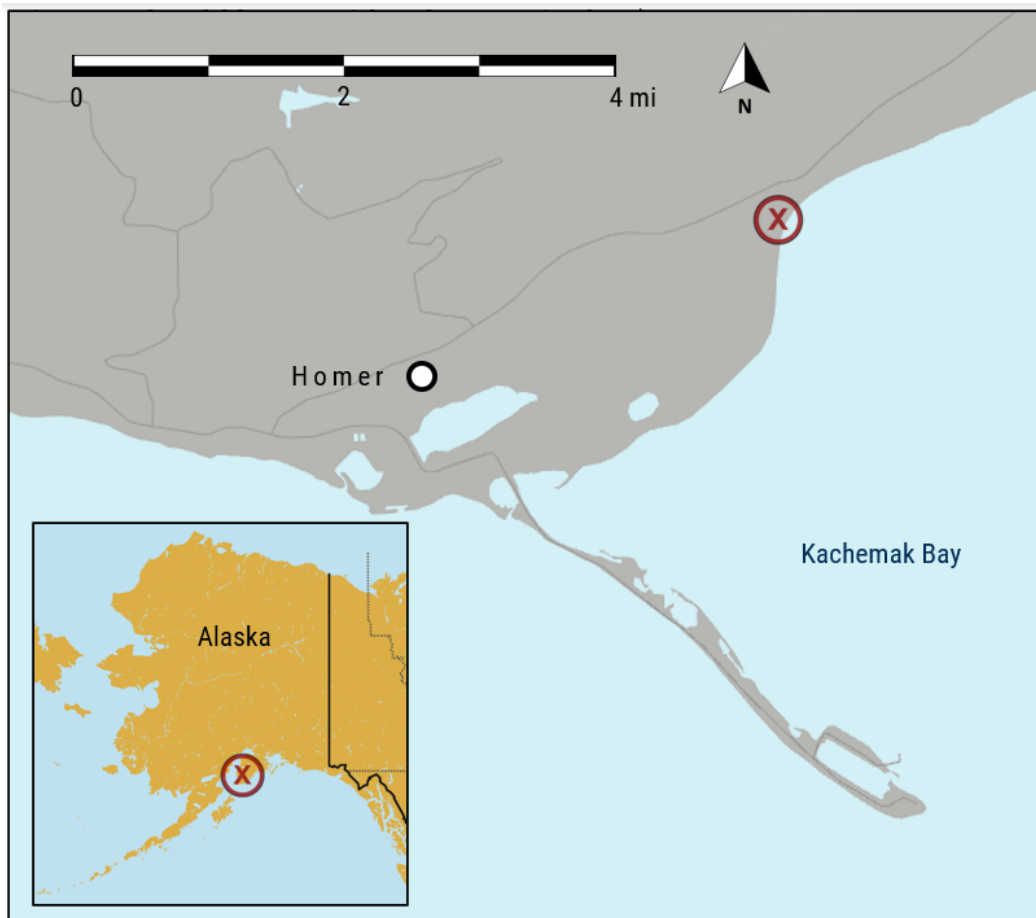
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**Casualty Summary**

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<b>Casualty type</b>	Fire/Explosion
<b>Location</b>	Northern Enterprises Boat Yard, Homer, Alaska 59°39.89' N, 151°26.55' W
<b>Date</b>	January 19, 2023
<b>Time</b>	1155 Alaska standard time (coordinated universal time -9 hrs)
<b>Persons on board</b>	3
<b>Injuries</b>	None
<b>Property damage</b>	\$1.2 million est.
<b>Environmental damage</b>	None
<b>Weather</b>	Mostly cloudy, winds east-northeast 9 mph, air temperature 31°F
<b>Waterway information</b>	N/A

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**Figure 2.** Area where the *Qualifier 105* fire occurred, as indicated by a circled X. (Background source: Google Maps)

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# 1 Factual Information

## 1.1 Background

The 100-foot-long passenger vessel *Qualifier 105* was constructed in 1970 of aluminum and was certificated under Title 46 *Code of Federal Regulations* Subchapter T. The vessel was used for marine survey, oceanographic research, environmental clean-up, housing, and private charters.

The vessel had a salon on the main deck and, above that, a wheelhouse. Below the main deck, forward to aft, were a void space forward of the collision bulkhead, the forward stateroom compartment, the aft stateroom compartment, the engine room, forward fish tanks, aft fish tanks, and the lazarette.

## 1.2 Event Sequence

Following its typical seasonal use in the summer, in September 2022, the *Qualifier 105* was hauled out of the water and put on blocks at the Northern Enterprises Boat Yard in Homer, Alaska, a boat storage facility that allowed owners to conduct maintenance and repairs on their vessels. The owner said that there were no mechanical or electrical issues when the vessel came out of the water.

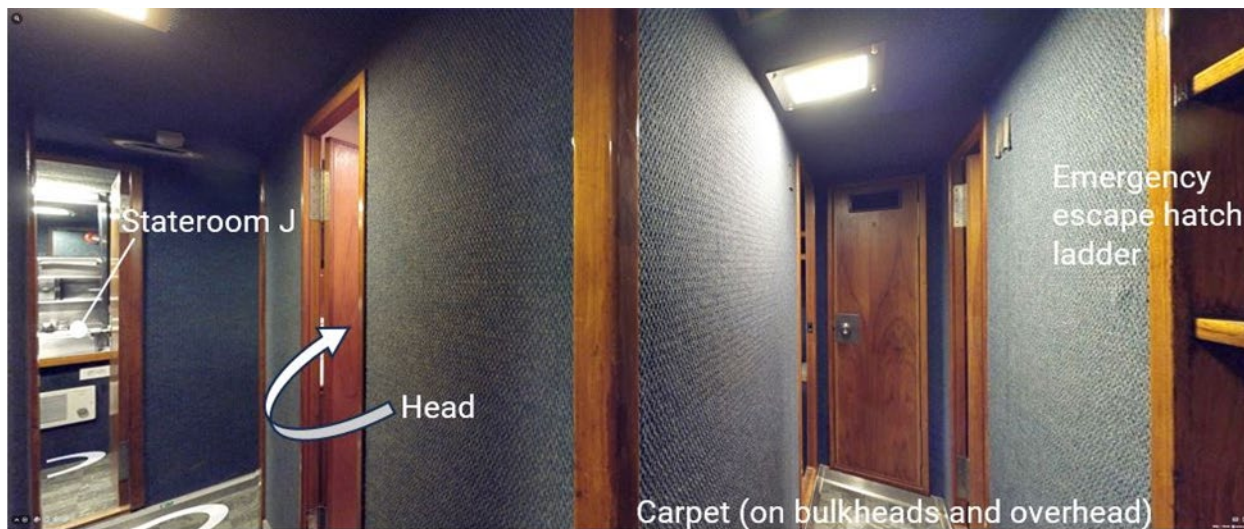
While the *Qualifier 105* was on blocks at the boatyard, the owners conducted general maintenance as well as hull and starboard fuel tank repairs. The US Coast Guard also visited the vessel as part of its ongoing drydock examination—an examination of all accessible parts of the vessel's underwater body when the vessel is out of the water.

No crewmembers lived aboard the vessel or stayed overnight. While work was being performed, shore power provided electricity for the vessel; shore power was shut off when the last employee left the vessel at the end of the day.

On January 19, 2023, at 0900, the port engineer arrived at the vessel to open and prepare the vessel for the day's work. He energized electrical breakers in the engine room for the vessel's heating. Then, from a breaker panel in the main deck salon, he energized circuits for lights in the salon and the below-deck staterooms. The port engineer conducted a safety brief with the crewmember serving as the fire watch and welding company personnel contracted for hull and starboard fuel tank repairs, and then he departed the vessel.

Two welding company employees (hereafter referred to as welder 1 and welder 2) were cleaning up the area around one of the vessel's fuel tanks and

reinstalling the deck in one of the aft stateroom compartment heads. The head was directly above a fuel tank that had been repaired and tested the day before (see figure 3). Their work included hot work (grinding and welding). The portable Miller XMT welding machine, used for tack welding when reinstalling the deck, was located in stateroom J, on the deck just inside the door, between bunks. (It had been in that location for about a month.) They chose this location to keep the passageway clear and because there was no room for the welding machine near the work area about 8 feet away.



**Figure 3.** *Qualifier 105* aft stateroom compartment head, passageways, and stateroom J before the fire. (Background source: Support Vessels of Alaska)

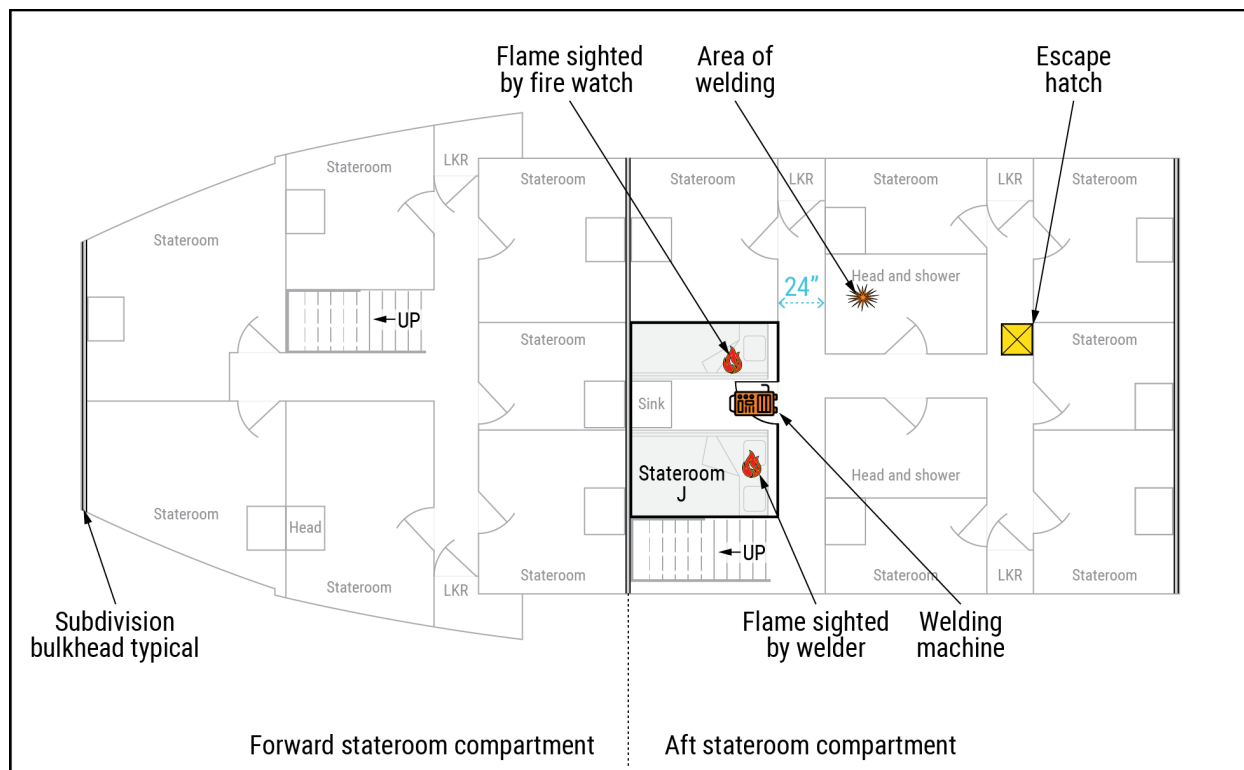
The vessel's aft stateroom compartment was bounded by forward and aft subdivision bulkheads of 0.1875-inch plate and an overhead (the salon/cabin deck) of 0.25-inch plate, all constructed of aluminum. Stateroom J was forward in the compartment, to the port side of the centerline, adjacent to the outboard stairwell. Stateroom J contained three bunks and a sink (see figure 4). The overhead in the compartment consisted of an aluminum-framed drop ceiling; its panels were plywood covered with carpet. Electrical system wiring was above the plywood. Plastic sheeting protected the carpet-covered bulkheads and overheads in the aft stateroom compartment.



**Figure 4.** *Qualifier 105* stateroom J interior before the fire. (Background source: Support Vessels of Alaska)

The welding machine's power cable ran up from the engine room hatch aft on the main deck, then forward, through the salon door, down the emergency escape hatch for the aft stateroom compartment, and then to stateroom J. The wire for the spool gun ran from the welding machine in stateroom J, through the passageway, to the head where the welding was taking place. The welding machine work clamp (the return current clamp) was connected to an aluminum floor frame in stateroom J, about 10 feet from the point of welding. A 3,000-cubic-foot-per-minute fan was placed outside the escape hatch in the salon, extracting air from the aft stateroom compartment.

While the welders were working in the head, the fire watch made rounds of the vessel, including going below deck to walk the passageways in the forward and aft stateroom compartments. About 1155, a couple hours after work began, while in the salon, he noticed a "strange haze coming from the stairwell." He proceeded down the stairs to the aft stateroom compartment and saw a flame on the starboard bunk in stateroom J, near the door (see figure 5). He yelled "fire" to alert the welders.



**Figure 5.** *Qualifier 105* forward and aft stateroom compartments.

Hearing the fire watch, welder 1, who was laying on the head deck taking measurements, exited the head and saw a fire on the lower port bunk in stateroom J that he described as a “little yellow flame that you could hold in the palm of your hand.” Reaching the doorway for stateroom J, he looked at the welding machine and attachments and noticed nothing unusual. He then looked up and saw smoke between the plastic sheeting and the overhead near the forward bulkhead. The “plastic was ... drifting off of it [the overhead] and falling on both bunks.”

Welder 1 walked about two steps to the bottom of the stairs to retrieve the dry chemical extinguisher. He climbed two or three stairs and saw heavy smoke in the main deck salon. He then directed welder 2 to go up the stairs to assess conditions (see figure 6). Welder 2 came back and reported that he could not breathe in the salon but there were no flames.



**Figure 6.** *Qualifier 105* aft stateroom compartment stairway, passageway, and stateroom J doorway before the fire. (Background source: Support Vessels of Alaska)

Welder 1 found that the passageway was now filled with smoke from the overhead down to his waist. He noted the plastic sheeting for the passageway overhead was hanging down “like ... a bubble” that extended downward from the overhead to about 3 feet above the deck. Behind the bubble, near stateroom J and on the starboard side at the other end of the passageway, was black smoke. Welder 1 got on his back and slid toward stateroom J under the plastic bubble. Still on his back, he discharged the fire extinguisher into stateroom J. He then left the vessel, using the stairs to the salon, and exited through the aft salon doors. On his way out, he noted flames in the salon, with the most flames on the starboard side. He also unplugged and removed the still-operating fan from the escape hatch. Within a minute, the entire salon was engulfed in flames (see figure 7). Shortly after, the fire watch and welder 2 left the vessel.



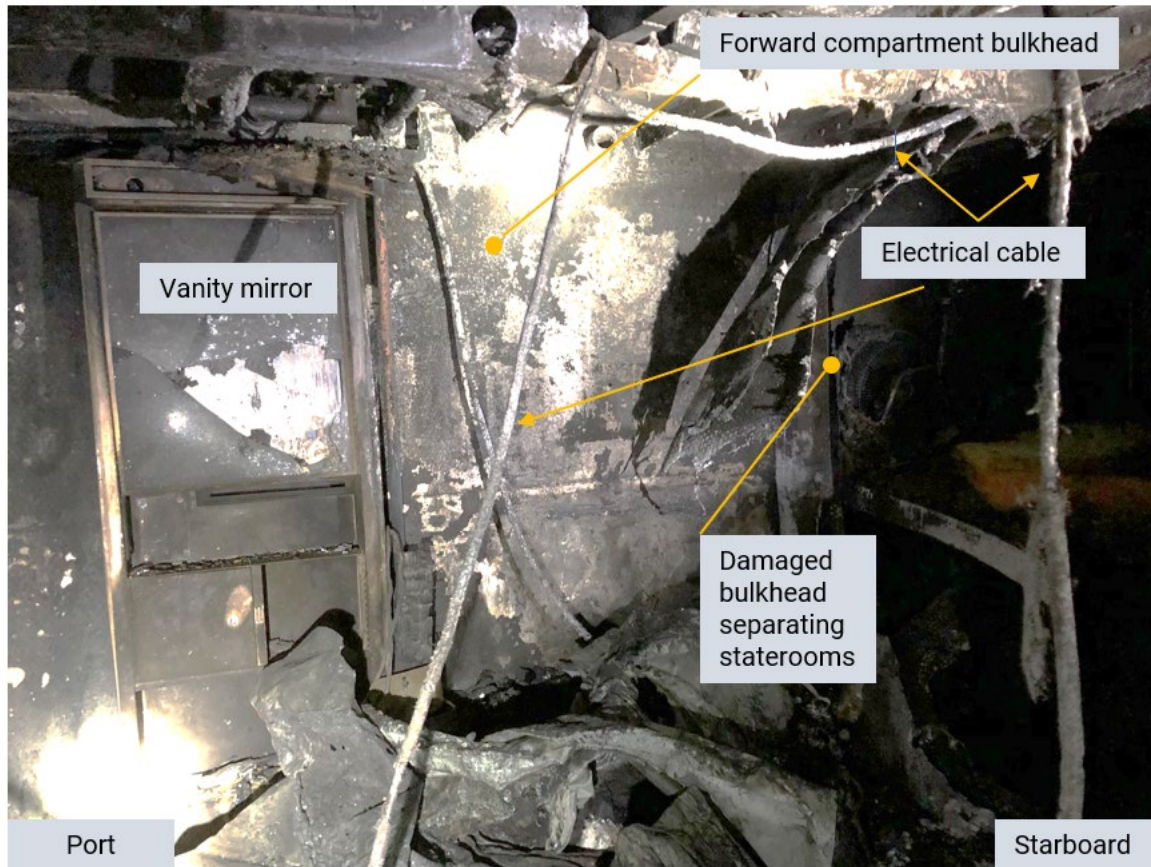
**Figure 7.** *Qualifier 105* on fire in the boatyard. (Source: Homer Volunteer Fire Department)

The Homer Volunteer Fire Department received reports of the fire at 1204 from multiple callers. They arrived at 1211, fought and overhauled the fire, and declared the fire out at 1415.

### 1.3 Additional Information

Areas of the aft stateroom compartment, the salon (including the galley), and an upper deck storeroom behind the wheelhouse were damaged (see figure 8). The welding machine was undamaged.





**Figure 8.** *Qualifier 105* stateroom J interior postfire. (Background source: Coast Guard)

The crew and the welders were not aware of any sources of heat in stateroom J. Fire investigators examined the vessel and removed wires and electrical boxes for examination. As of the date of this report, fire investigators have not produced origin and cause reports, and the vessel has not been repaired. The owners declared the vessel a constructive total loss.

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## 2 Analysis

On January 19, 2023, a fire started in stateroom J, below the main deck of the *Qualifier 105*, which was on blocks for several months in the Northern Enterprises Boat Yard in Homer, Alaska. At the time the fire started, welders were on board performing aluminum hot work, cleaning up the area around a fuel tank that had been repaired and tested the day before, and reinstalling the deck in a head that was directly above the fuel tank.

While hot work can generate sparks and molten material that can ignite combustible materials, the two welders, who were working 8 feet from stateroom J, where the fire was discovered by the fire watch, did not find any signs of a fire after or while conducting their work. Therefore, the hot work was not the source of the fire.

The fire watch and welder 1 each saw a small flame on two different bunks in stateroom J—the first sign of a fire observed. Those small flames were likely caused by hot droplets of plastic sheeting—used to protect the carpet-covered, plywood drop ceiling above—that had melted and caught fire from heat or fire between the aluminum overhead and the drop ceiling. Therefore, it is likely that the initial ignition source and the eventual fire in stateroom J originated from the overhead. The accommodation spaces contained combustible materials—including carpet, wood framing, and plastic sheeting—in the overhead and on the bulkheads that further fueled the fire.

Stray welding current—a fault condition where current goes through unintended conductors, such as metal framing or wires, and back to the return terminal of a welding machine—can result in heating and cause fires. On board the *Qualifier 105*, the welding machine work clamp (the return current clamp) was connected to an aluminum cross member below the deck in stateroom J, about 10 feet from the point of welding. The return current had to travel through the vessel's aluminum structure and/or conducting wires from the spool gun's electrode back to the work clamp. The aluminum structure would have served as a conductor, and the resulting current in the structure may have found its way into the vessel's electrical system. An electrical wire in the overhead of stateroom J could have served as an unintended conductor and become overheated and eventually led to a fire. However, investigators could not definitively determine that stray welding current caused wires to overheat. Additionally, there were several wires and electrical boxes in stateroom J that may have been energized and become a potential electrical ignition source due to a fault. Therefore, the exact ignition source could not be determined.

## 3 Conclusions

### 3.1 Probable Cause

The National Transportation Safety Board determines that the probable cause of the fire aboard the passenger vessel *Qualifier 105* was an undetermined electrical source that ignited a stateroom ceiling. Contributing to the extent of the fire damage was the substantial use of combustible materials composing the stateroom ceilings and bulkheads throughout the vessel's accommodation spaces.

### 3.2 Lessons Learned

#### **Taking Precautions for Stray Welding Current**

Stray welding current is a fault condition in which current goes through unintended conductors and back to the return terminal of a welding machine; it can cause fires by overheating wires. To avoid potential fires caused from stray welding current, maintenance personnel, owners, and operators should follow industry practice to place the work clamp (the return current clamp) of the welding machine as close as possible to the point of welding.

## Vessel Particulars

Vessel	<i>Qualifier 105</i>
Type	Passenger (Small passenger vessel)
Owner/Operator	Q105 LLC (Commercial) / Support Vessels of Alaska, Inc. (Commercial)
Flag	United States
Port of registry	Homer, Alaska
Year built	1970
Official number (US)	528583
IMO number	N/A
Classification society	N/A
Length (overall)	105.0 ft (32.0 m)
Breadth (max.)	27.4 ft (8.4 m)
Draft (casualty)	N/A
Tonnage	95 GRT
Engine power; manufacturer	2 x 600 hp (447 kW); Detroit Diesel D-60 diesel engines

NTSB investigators worked closely with our counterparts from **Coast Guard Marine Safety Detachment Homer** throughout this investigation.

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For more detailed background information on this report, visit the [NTSB Case Analysis and Reporting Online \(CAROL\) website](#) and search for NTSB accident ID DCA23FM015. Recent publications are available in their entirety on the [NTSB website](#). Other information about available publications also may be obtained from the website or by contacting—

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