# National Transportation Safety Board

## Marine Accident Brief

### Fire Aboard Freighter *Alpena*

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|---|---|
| **Accident no.** | DCA16FM012 |
| **Vessel name** | *Alpena* |
| **Accident type** | Fire |
| **Location** | Fincantieri Bay Shipbuilding, Sturgeon Bay, Wisconsin<br>Approx. 44°50'28"N, 87°22'55"W |
| **Date** | December 11, 2015 |
| **Time** | 1730 central standard time (coordinated universal time – 6 hours) |
| **Injuries** | None |
| **Property damage** | Estimated at $4 million |
| **Environmental damage** | None |
| **Weather** | Clear visibility, calm winds, air temperature 45°F |
| **Waterway information** | Graving dock in Sturgeon Bay, Wisconsin |

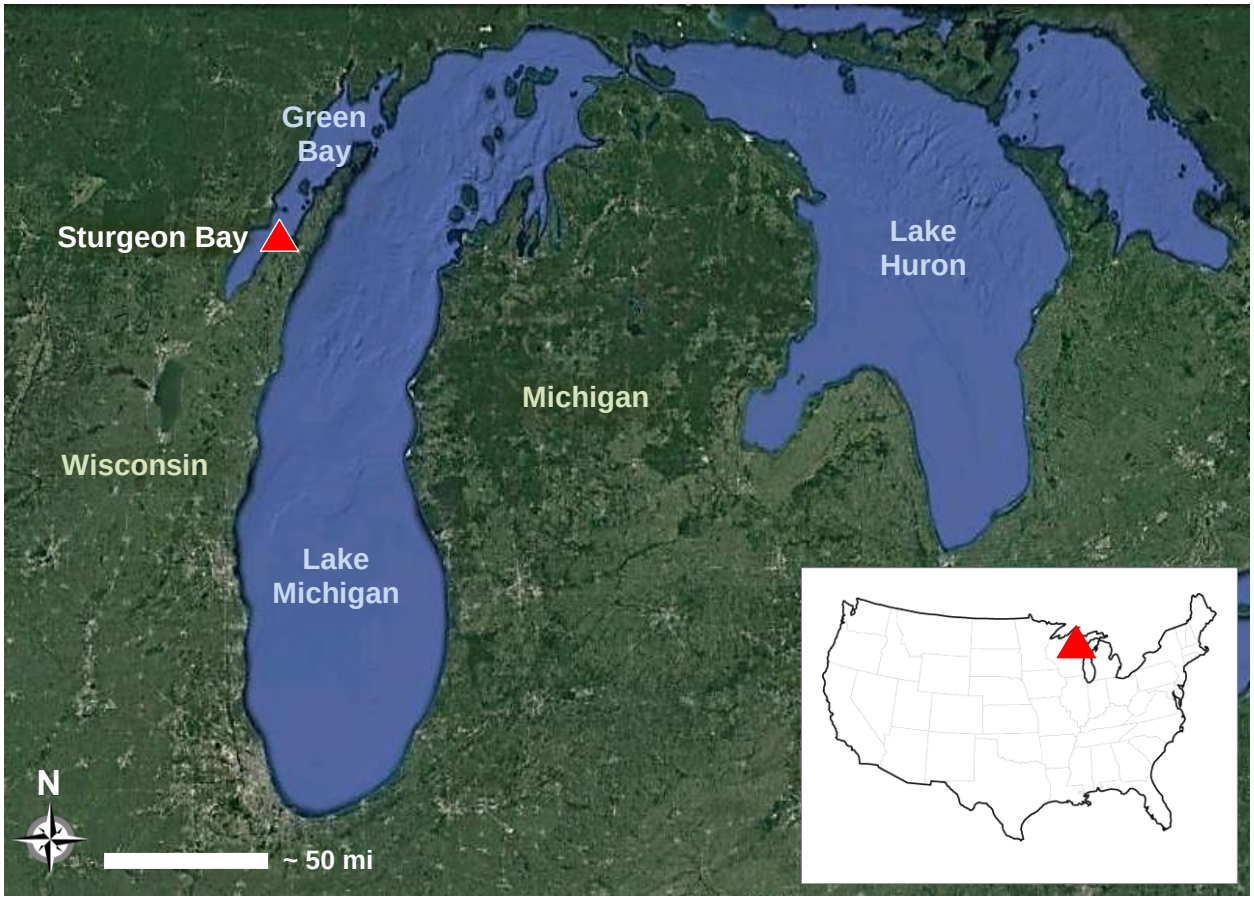
On December 11, 2015, about 1740 local time, a fire broke out in the electrical control room for the aft winches aboard the freighter *Alpena* while the vessel was dry docked undergoing work. Shipyard workers evacuated the vessel and notified the local fire department, who extinguished the fire. No one was injured, but the *Alpena* sustained nearly $4 million in damage.


***Alpena* under way. (Photo from SS Alpena images)**

Note: This report was reissued on April 3, 2017, with corrections to page 6.

### Fire Aboard Freighter *Alpena*

The *Alpena* arrived at Fincantieri Bay Shipbuilding at Sturgeon Bay, Wisconsin, on December 4, 2015, for a scheduled 5-year-interval dry dock inspection. The shipyard work was to be completed by December 31, after which the vessel was to return to service (carrying bulk cement) and make several transits before winter layup. While the *Alpena* was in dry dock, the crew consisted of 10 individuals. The crewmembers lived aboard while the vessel was in the yard, worked during the day (0800–1700), and could depart the vessel at night. They were providing repair support to the yard workers and performing regular ship maintenance. The fire occurred at night when only the shipyard workers were working. Five of the ship's crewmembers were aboard and off duty in their staterooms.



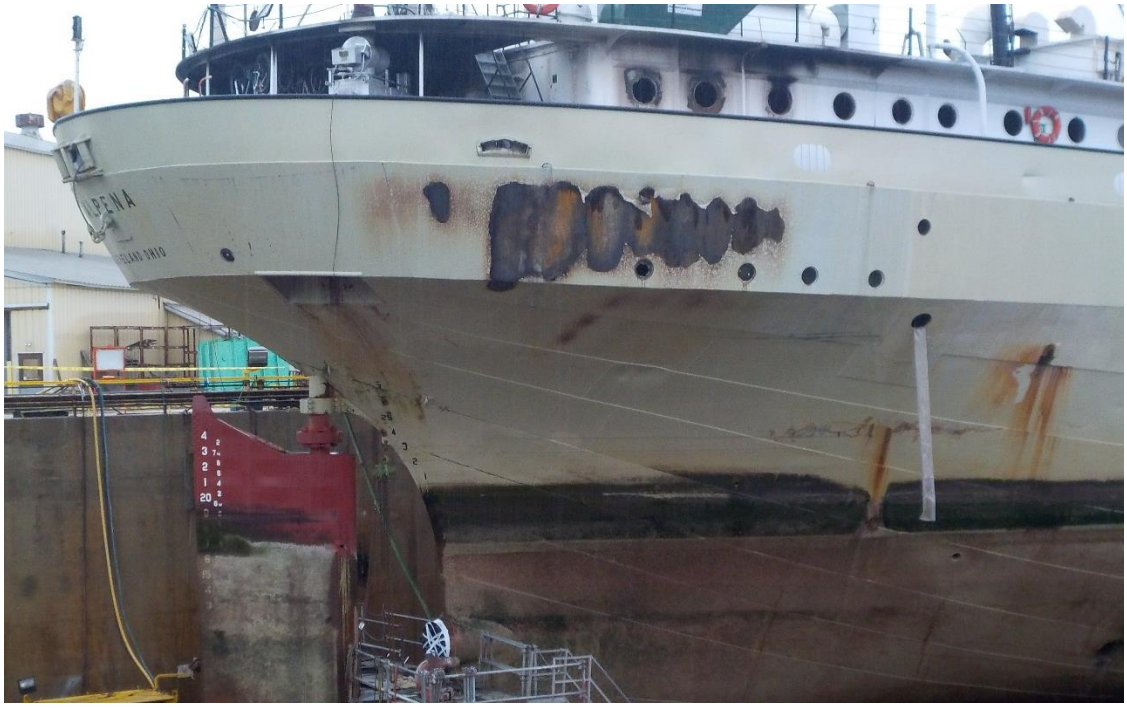

**Satellite image of Lake Michigan and Lake Huron, with the accident location in Sturgeon Bay marked by a red triangle. (Background by Google Earth)**

The shipyard workers aboard the Alpena worked in three shifts. The second shift, about 12 shipyard workers, was on duty when the fire broke out. The workers had commenced their shift about 2 hours earlier, at 1530, and three of them were in the machinery spaces in the vicinity of the aft electrical control room when the fire started. One of the workers was forward of the electrical control room by about 20 feet. Sometime after 1700, this worker informed his leadman that he smelled a sulfur smell and left the vessel to get a respirator. The second worker, who was in the engine room, recalled an abnormal smell that he described as burned plastic. The third worker, a welder, was in the aft peak tank. The tank opening was approximately 15 feet forward of the electrical control room. About 1740, the welder exited the tank to get additional welding rods and recalled being engulfed in heavy smoke, which burned his eyes and throat. As the welder exited the tank, the first worker returned with his leadman.

All four workers reported that the smoke was initially white with a slight yellow tint. The welder exited to the fantail to report the smoke via radio and request ventilation. The workers tried to identify from where the smoke originated. In the meantime, the smoke switched color to black. The workers quickly concluded that a fire had started, and they began to notify everyone and evacuate the vessel. The shipyard workers and *Alpena* crew mustered and accounted for all personnel. Shortly thereafter, at 1747, the Sturgeon Bay Fire Department arrived on scene and began preparations to fight the fire.

**The responding shoreside fire department units. (Photos by Coast Guard)**

At 1903, the fire was under control, and by 0117, all spaces were fully cleared. In total, more than 80 firefighters responded to the accident. The Sturgeon Bay fire chief restricted access to the aft section of the vessel to preserve the scene for subsequent investigation into the cause of the fire. Access to the fire-affected spaces was not authorized until December 15, 2015, because atmospheric readings for lead and asbestos were considered too high for entry. Until asbestos remediation could be undertaken, entry into the galley and accommodation spaces required a respirator.



***Alpena* with fire damage to the hull paint on the starboard quarter and burned-out portholes on the superstructure. (Photo by Coast Guard)**

On December 16, 2015, the fire chief led investigators through the various fire affected spaces. A subsequent survey report stated that the ongoing welding activities showed "no evidence of being connected to the fire." Rather, the fire appeared to have started in the electrical control room and subsequently spread to the steering gear flat and paint locker located in the aft section of the engine room. The fire also spread to the dining room, galley, and several staterooms located on the main deck.

**Fire damage to one of the *Alpena* bathrooms. (Photo by Coast Guard)**

Based on both the Coast Guard and the local fire department investigations, the most likely cause of the fire was an electrical fault in the wiring from the electrical control panel to the aft winch. The electrical system for the aft winch was original to the vessel and complied with regulations for original equipment; however, it did not have the more extensive circuit protection that modern shipboard electrical systems have. (According to the Coast Guard, planned postaccident modifications to the *Alpena* would feature additional circuit protection in accordance with current regulations.) The power cable to the aft winch was completely melted for a length of 10–15 feet. Similar conductors in the same wiring bundle were not damaged, which led investigators to believe that this specific conductor experienced a fault of some kind rather than being destroyed by the heat of the ensuing fire. As further evidence to support this conclusion, the same cable's sheathing and insulation had signs of significant deterioration on the boat deck, several decks above where the fire started, where the aft winch is located. This area of the vessel was not affected by the fire.

**Left, the bundled wires running from the electrical control panel to the aft anchor winch. Right, the outer sheathing of the wire in its decayed and deteriorated condition. (Photos by Coast Guard)**

Fire department investigators noted that an electrical fault at the winch (which would have resulted in high current flow in the wiring circuit) could have possibly caused further electrical faults in the winch circuit resulting in a switchboard/fuse overload.

Another potential fault source could have been caused by chafing, which damages the protective sheathing and reduces the thickness of a conductor's insulation jacket over time. The wiring in the electrical control room had areas susceptible to chafing, specifically where the wires passed through sheet metal unprotected from its rough edges. According to the Coast Guard, the fire damage prevented full assessment of the pre-existing adequacy of this through-metal passage; however, planned postaccident modifications would feature protection for wire passage points.

**Left, the deteriorated state of the outer sheathing insulation jacket of the wire and possible rough chafing points where the bundle passes through steel. Right, the electrical control panel where the fire may have started. (Photos by Coast Guard)**

Investigators found no evidence that the fire was associated with the ongoing shipyard work or with any of the daily work being attended to by the ship's crew living aboard.

## Probable Cause

The National Transportation Safety Board determines that the probable cause of the fire aboard the *Alpena* was a fault in the electrical wiring providing power to the aft anchor winch.

## Vessel Particulars

| Vessel | *Alpena* |
|---|---|
| **Owner/operator** | American Transport Leasing Inc./Inland Lakes Management, Inc. |
| **Port of registry** | Cleveland, Ohio |
| **Flag** | United States |
| **Type** | Freighter |
| **Year built** | 1942 |
| **Official number (US)** | 241856 |
| **IMO number** | N/A |
| **Construction** | Steel |
| **Length** | 503.3 ft (153.4 m) |
| **Draft** | 25 ft (7.6 m) |
| **Beam/width** | 67 ft (20.4 m) |
| **Gross tonnage** | 8,018 registered gross tons |
| **Engine power; manufacturer** | Steam turbine, 4,000 hp (2,980 kW); De Laval Steam Turbine Co. |
| **Crew complement (dry dock)** | 10 |

**NTSB investigators worked closely with our counterparts from Coast Guard Marine Safety Detachment Sturgeon Bay, Wisconsin, throughout this investigation.**

For more details about this accident, visit www.ntsb.gov and search for NTSB accident ID DCA16FM012.

**Issued: October 26, 2016**