National Transportation Safety Board

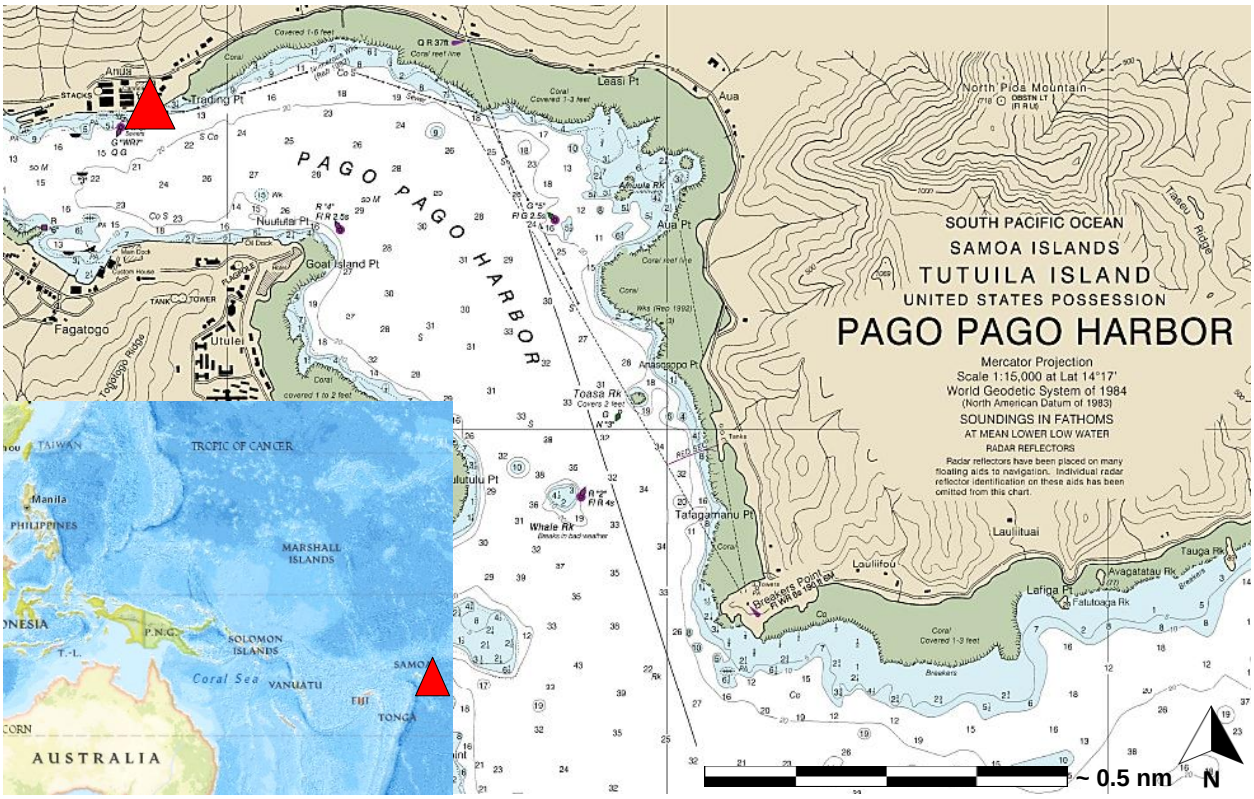
Marine Accident Brief

Engine Room Fire aboard Fishing Vessel *Cape Cod*

Accident type	Fire/Explosion	**No.** DCA18FM024
Vessel name	*Cape Cod*	
Location	Pago Pago Harbor, American Samoa 14°16.30'S 170°41.19'W	
Date	May 20, 2018	
Time	1536 Samoa standard time (coordinated universal time – 11 hours)	
Injuries	None	
Property damage	$650,000 est.	
Environmental damage	None reported	
Weather	Winds east-northeast at 6 knots, air temperature 82˚F, sea temperature 86˚F	
Waterway information	Pago Pago Harbor is a large natural inlet on the central south coast of the island of Tutuila in American Samoa.	

On May 20, 2018, at 1536 local time, fishing vessel *Cape Cod* experienced an engine room fire while moored in Pago Pago Harbor on Tutuila Island, American Samoa. The vessel was in port to offload a cargo of fish at the Samoa Tuna Packing dock with 20 crewmembers on board. The fire caused extensive damage to the engine room, including generators and electrical distribution systems, before crewmembers extinguished it using the fixed firefighting system. No pollution or injuries were reported. Damage to the vessel was estimated at $650,000.

***Cape Cod* in port. (Photo courtesy of Tri Marine Fishing Management)**



Accident location in Pago Pago Harbor, Tutuila Island, American Samoa. (NOAA chart 83484)

Background

The 195.5-foot-long *Cape Cod*, a purse seiner fishing vessel, was operated for catching tuna. Purse seiners use a large net deployed in a circle around a school of fish and then drawn tight to harvest the catch. The Western and Central Pacific Fisheries Commission managed the local fishery and granted permission for the *Cape Cod* to operate there.[1] Formerly named *Uncle Louie* and later the *Chance 2*, the vessel was built in 1978 at Campbell Industries in San Diego, California. The current owner bought the vessel in 2006.

The *Cape Cod*'s main deck, also known as a "wet deck," was located above several fish holds, an arrangement common on board tuna vessels. The engine room, with upper and lower levels, was located aft of the holds. The main switchboard, no. 3 generator, and hydraulic power packs were located in the upper engine room, on the same level as the wet deck. The lower engine room, located directly below the wet deck, contained the main engine and generator nos. 1 and 2 on either side, to port and starboard respectively.

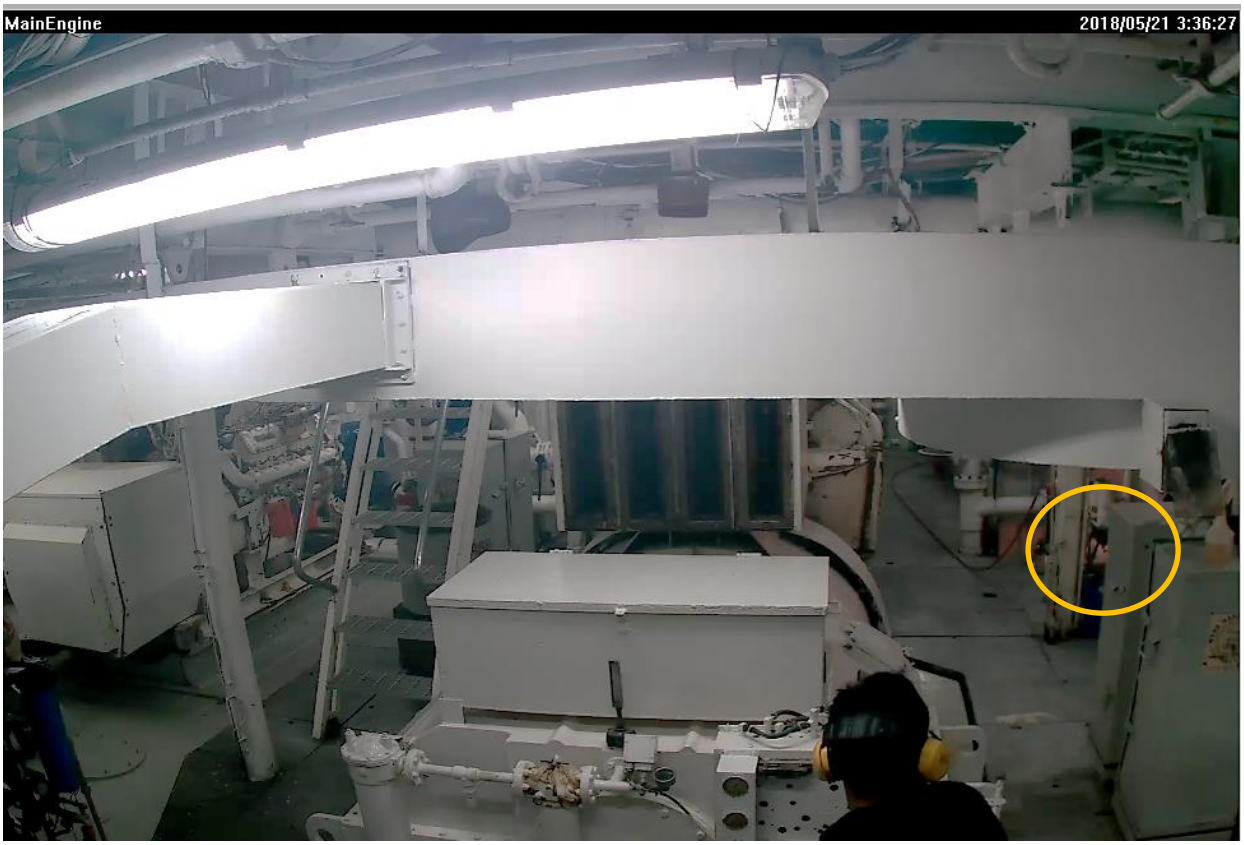
The *Cape Cod* had been in a Mazatlán, Mexico, shipyard from March to December 2017 for routine maintenance, including replacement of exhaust piping lagging on all three generators, the main engine, and the bow thruster. The vessel had returned to service and made four fishing trips prior to the accident.

[1] More information about the Western and Central Pacific Fisheries Commission, established by the Convention on the Conservation and Management of Highly Migratory Fish Stocks in the Western and Central Pacific Ocean, can be found at https://www.wcpfc.int/home.

Accident Events

The *Cape Cod* returned from its latest fishing trip on the morning of May 20, 2018. The crew moored the vessel at the Samoa Tuna Packing dock on the north side of Pago Pago Harbor to provision and offload the fish. All crewmembers were on board, and a single generator, no. 1, was online while awaiting cargo operations.

At 1536, while the assistant engineer and the electrician were in the engine room, a fire started above the offline no. 2 generator. They tried unsuccessfully to extinguish the fire with handheld extinguishers but were forced to retreat due to smoke. They alerted the other crewmembers.



Screenshot from the closed-circuit television camera in the lower engine room, looking forward. The initial fire began in the area overlaid by a yellow circle (starboard side). (Photo by US Coast Guard)

Having donned self-contained breathing apparatus (SCBA), the crew made another attempt to extinguish the fire but were again forced to retreat, this time due to intense heat. After closing the doors and ventilation dampers and accounting for everyone on board, the crew released carbon dioxide (CO_2) into the space using the *Cape Cod*'s fixed firefighting system. As part of the CO_2 release sequence, generator no. 1 tripped offline and the vessel lost power.

The fire was contained to the engine room. About an hour after the fixed firefighting system was activated, municipal first responders and *Cape Cod* crew in SCBAs entered the space to confirm that the fire was out. No injuries were reported and no pollution ensued. Local US Coast Guard investigators were on scene the same day and restricted the vessel from sailing until repairs

were made and firefighting systems were serviced. The operator initially estimated $650,000 in damage.

Analysis

Investigators noted significant heat damage in the lower and upper engine rooms. Both generator nos. 1 and 2 were removed for repair and most of the electrical cables, lighting, and other equipment had to be replaced.

Investigators also reviewed available the closed-circuit television (CCTV) footage. Although ducting blocked the origin of the fire in the CCTV footage, the glow of the fire seen in the video revealed a quick and intense ignition with little smoke, suggesting an electrical ignition source forward of generator no. 2. Also, the engine room appeared clean and free of loose combustibles. The crew's initial response with portable extinguishers was ineffective, given that the electrical power near the fire had not yet been shut down.

Smoke and heat damage in the overhead of the starboard forward corner of the lower engine room. (Photo by Coast Guard)

The American Samoa Department of Public Safety Fire Bureau issued a report, dated July 13, 2018, which attributed the fire to radiated heat from damaged engine exhaust insulation. However, the lagging on exhaust piping had been renewed in the recent maintenance period, which had ended only about 5 months before the fire.[2] Moreover, the only engine running when the fire broke out was portside generator no. 1, opposite from the fire. Starboard generator nos. 2 and 3,

[2] *Lagging* insulates hot surfaces such as engine exhaust piping from combustible surfaces, such as wood or fiber-reinforced plastic, or from flammable liquids including oil and fuel leaks. See Coast Guard Safety Alert 5-08.

each with separate exhaust piping, had not been run since the previous day. It is therefore unlikely that any flammable or combustible material would ignite from contact with offline engines or exhaust surfaces.

Based on the location of the damage in the engine room, the intensity of the fire observed in the CCTV footage, and the lack of operating machinery near generator no. 2, investigators concluded that the fire likely resulted from an electrical source and was fueled by electrical cable housing material, control boxes, light fixtures, and paint. The vessel had recently undergone extensive work in the engine room, although with no subsequent regulatory or classification society drydock exam or sea trial.

Electrical cabling above generator no. 2. (Photo by Coast Guard)

The Coast Guard promulgates regulations for commercial fishing vessels in Title 33 *Code of Federal Regulations* Part 28, but these vessels are not inspected or issued a certificate of inspection. The Coast Guard does not normally attend the vessels during drydock periods nor during major repairs and upgrades. Operators may instead request that the Coast Guard conduct a dockside safety exam, which has been mandatory since 2010 for vessels of this size and service.[3]

[3] See the *Coast Guard Authorization Act* (*CGAA*) *of 2010*, P.L. 111–281. Commercial fishing vessel safety exams deal primarily with lifesaving and firefighting equipment on board the boat and do not include hull or other machinery assessments.

In 2012, legislation extended the required exam interval to 5 years; however, the Coast Guard still recommends biannual safety exams.[4] The *Cape Cod* last had a dockside safety exam in October 2014. During this exam and also during the prior one (in 2013), the Coast Guard identified electrical and fixed firefighting deficiencies, which were subsequently cleared. The *Cape Cod*'s owner had requested a new safety exam, but it had yet to be scheduled when the fire occurred.

The 2010 legislation also required new vessels of this size and service to meet survey requirements of a classification society such as the American Bureau of Shipping. The same legislation required compliance with load line regulations and therefore an annual survey. Existing vessels such as the *Cape Cod* were grandfathered and did not have to meet these requirements. The Coast Guard has published a yet-to-be-finalized 2016 Notice of Proposed Rulemaking to implement requirements of the new statutes.

The fixed firefighting system aboard the *Cape Cod* functioned as designed, and the crew demonstrated competency in activating the system and promptly sounding the alarm. It is important with such systems to shut off all ventilation sources to the space to prevent loss of CO_2 and resupply of fresh air. It is also vital to account for everyone before activating the system. The crew's early and correct use of the fixed system, including shutting down the ventilation, successfully contained the fire to a corner of the engine room and limited the damage to the vessel.

Probable Cause

The National Transportation Safety Board determines that the probable cause of the engine room fire aboard fishing vessel *Cape Cod* was an undetermined electrical ignition source near electrical distribution cabling in the lower engine room.

[4] See the *Coast Guard and Maritime Transportation Act of 2012*, P.L. 112–213, and the Coast Guard's Voluntary Safety Initiatives and Good Marine Practices for Commercial Fishing Industry Vessels, published in January 2017, to meet a provision in the 2010 *CGAA* for existing vessels of 50 feet in length, built before July 1, 2013, and 25 years old, that must meet an Alternate Safety Compliance Program by 2020.

Vessel Particulars

Vessel	*Cape Cod*
Owner/operator	Cape Fisheries Holding LP/ Tri Marine Fishing Management
Port of registry	Pago Pago, American Samoa
Flag	United States
Type	Purse seiner
Year built	1978
Official number (US)	599831
IMO number	7806283
Classification society	None
Construction	Steel
Length	195.5 ft (59.6 m)
Draft	20 ft (6.1 m)
Beam/width	40 ft (12.2 m)
Gross and/or ITC tonnage	1,341 gross tons
Engine power; manufacturer	EMD L20-645-E7
Persons on board	20

NTSB investigators worked closely with our counterparts from Coast Guard Marine Safety Detachment American Samoa and Sector Honolulu throughout this investigation.

For more details about this accident, visit www.ntsb.gov/investigations/dms.html and search for NTSB accident ID DCA18FM024.

Adopted: April 10, 2019