



AVIATION



HIGHWAY



MARINE



RAILROAD



PIPELINE

Issued January 25, 2022

MIR-22/02

Grounding and Sinking of Fishing Vessel *Tenacious*

On July 24, 2021, about 0326 local time, the fishing vessel *Tenacious* grounded at the entrance to Wells Passage, 14 miles east of Whittier, Alaska, while transiting to fishing grounds in Prince William Sound.¹ All five crewmembers abandoned the vessel and were rescued by a Good Samaritan vessel. The *Tenacious* later sank. Two thousand gallons of diesel fuel were on board and not recovered. One minor injury was reported. Loss of the vessel and fishing gear totaled an estimated \$660,000.



Figure 1. *Tenacious* under way before the casualty. (Source: Zimmerman Fisheries LLC)

¹ (a) In this report, all times are Alaska daylight time, and all miles are nautical miles (1.15 statute miles).
(b) Visit [nts.gov](https://www.nts.gov) to find additional information in the [public docket](#) for this NTSB investigation (case no. DCA21FM033). Use the [CAROL Query](#) to search investigations.

Casualty type	Grounding/Stranding
Location	Wells Passage, Prince William Sound, Alaska 60°45.74' N, 148°14.76' W
Date	July 24, 2021
Time	0326 Alaska daylight time (coordinated universal time -8 hrs)
Persons on board	5
Injuries	1 minor
Property damage	\$660,000 est.
Environmental damage	2,000 gallons diesel fuel est.
Weather	Visibility 10 nm, clear, winds variable 1-3 kts, calm seas, air temperature 56°F, water temperature 57°F, morning twilight 0401, sunrise 0510
Waterway information	Channel, depth 1,380 ft, width 2 nm, current < 0.5 kts



Figure 2. Area where the *Tenacious* grounded and sank, as indicated by the red X.
(Background source: Google Maps)

1. Factual Information

1.1 Background

The steel-hulled fishing vessel *Tenacious* was built in Toledo, Oregon, in 1983 and was owned and operated by Zimmerman Fisheries LLC. The vessel's crew included the captain, skiff man, and three deckhands. One of the deckhands was an owner, training to operate the vessel.

The vessel, which fished primarily for pink salmon, was outfitted as a purse seiner and permitted by the State of Alaska to operate in Prince William Sound. Purse seiners use a large wall of netting with floats on the top of the net and a lead line strung through rings at the bottom of the net. The net is deployed using a skiff and then circled around fish as they school or run. Once the fish are encircled, the lead line is drawn tight to close, or "purse," the bottom of the net, preventing the catch from escaping downward. The net is then pulled alongside the fishing vessel, where the fish are loaded into holds. On the *Tenacious*, a 20-foot-long skiff, large enough to hold the entire crew, was towed astern and used to deploy the net.

Below deck from bow to stern was a bunkroom (modified forepeak), the engine room, two fish holds with a combined capacity of more than 45,000 pounds of catch, and a lazarette. During the casualty transit, one of the fish holds was full of water. The deckhouse included a galley and stateroom on the main deck and the wheelhouse above. The steel bulkhead between the bunkroom and engine room had soundproof insulation and penetrations for plumbing and electrical cable, along with a vent duct that ran under the bunks. The captain's bunk was in the wheelhouse.

Fishery management was controlled by the Alaska Department of Fish and Game, which announced "openers," days when vessels were permitted to fish. The Prince William Sound salmon fishery was seasonal, based on fish migration. The state opened the fishery on specific days based partly on the total quantity of fish landed, rather than a quota per license or per vessel. Within Prince William Sound, districts were opened for salmon on July 22, 2021, and closed on July 23. An opener was announced for July 24 from 0600 to 2000.

1.2 Event Sequence

Tenacious arrived in Whittier late on July 22, after fishing near Perry Island, to address and resolve maintenance issues with the skiff in time for the opener starting at 0600 on July 24. The vessel and crew spent the night rafted to a floating dock, waiting for the tide to rise to an adequate depth for mooring, and came ashore on July 23. After repairs to the skiff were unsuccessful, the owner, skiff operator, and a new deckhand that

joined the vessel that day traveled to and from Seward, Alaska, by car (a 180-statute-mile, 4-hour round trip) to borrow another skiff, returning about 2300. The captain and another deckhand remained on board to do maintenance on the net and on the vessel.

Following minor repairs to the new skiff, *Tenacious* left Whittier between 0100 and 0130 on July 24. The vessel was en route to Perry Passage, near the south end of Culross Island, via Wells Passage, a 3.5-hour trip. According to the deckhand, the whole crew was running off “not too much sleep,” to which the captain echoed, stating, “everybody was pretty well tired.”

The captain took the wheelhouse watch after departure while the crew slept. While motoring across the mouth of Cochrane Bay on autopilot, the *Tenacious* struck rocks on an unnamed point of the mainland, west of Point Culross, part of the Chugach National Forest, on the opposite side of the passage. The captain later told investigators he fell asleep. According to the captain, in that area shallow water with rocks extended “offshore a little bit.” The captain and crew awoke upon contact. The captain attempted to back off the rocks, and the vessel started going in circles. The captain then went to the engine room to investigate and found the space flooding through penetrations in the forward bulkhead. He began to line up the bilge pump to pump out the engine room but was forced to leave when water started flooding from behind a live electrical panel.

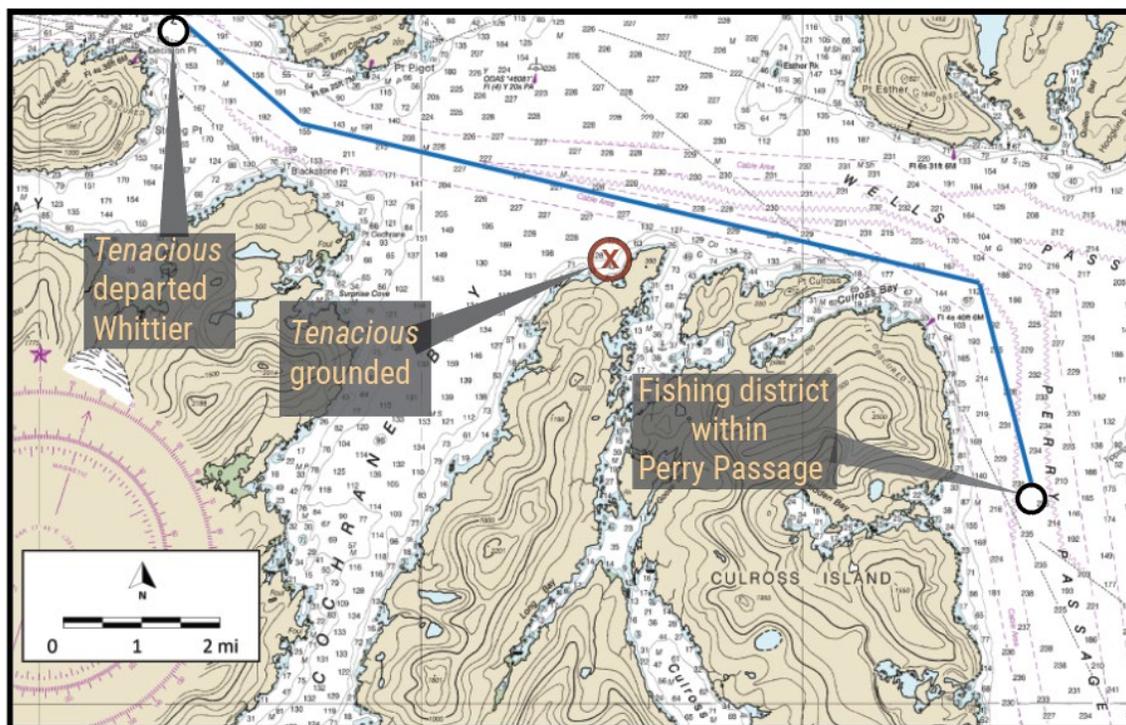


Figure 3. Extract of National Oceanic and Atmospheric Administration (NOAA) chart 16705 (annotated by NTSB). An estimation of the intended route is shown in blue, and the grounding location marked by a red X. Soundings are in fathoms.

Meanwhile, after the owner awoke, he found the bunkroom flooding from beneath the bunks. He went to the wheelhouse and made a distress call at 0326 on VHF radio channel 16 while the captain was in the engine room. He then returned to the bunkroom, found his bunk underwater, and, with the vessel now stopped, instructed the crew to board the skiff. The owner then fetched survival suits from the wheelhouse to bring in the skiff. The captain, having returned from the engine room, made a second distress call and then joined the crew in the skiff.

With all hands aboard the skiff, the owner cut the tow line. Although the captain told the US Coast Guard that the skiff had enough fuel to make it back to Whittier, the Coast Guard told them to stay on scene. Coast Guard Sector Anchorage requested a helicopter from Aviation Support Facility Cordova and a motor lifeboat from Station Valdez in preparation to rescue the *Tenacious* crew.

The crew witnessed the *Tenacious* roll to port and sink. The liferaft located above the wheelhouse self-deployed, but the emergency position indicating radio beacon (EPIRB), mounted to the mast, did not activate. The Coast Guard did not receive any EPIRB or personal locator beacon (PLB) alerts in Prince William Sound that day.

At 0336, the crew on board the fishing vessel *Grand Pa*, a 39-foot-long, Seward-based commercial fishing vessel, overheard the distress call and relayed to the Coast Guard that all five *Tenacious* crewmembers were aboard the skiff with no medical concerns. The Coast Guard then stood down the search and rescue resources. The fishing vessel *Wildlife* arrived from Whittier at 0642, picked up the *Tenacious* crew, and towed the skiff to Whittier, arriving at 0748.



Figure 4. *Tenacious*, sinking by the bow, about 0345 on July 24. (Source: Lucas Brockman)

1.3 Additional Information

The captain had operated fishing vessels for 32 years, and this was his second season as the *Tenacious* captain. It was the owner's second season on board the vessel. One deckhand was a month into his first season. He stated he was given a book on fishing safety when he came aboard, which he had skimmed through. He told investigators he had never put on his survival suit, was not sure where the liferaft or lifejackets were located, and had not participated in any drills. The captain stated that the crew would practice putting on survival suits annually but had not yet done so this season. Coast Guard regulations requiring drills only apply to fishing vessels operating beyond the Boundary Line or with more than 16 people on board.² There were no PLBs on board the *Tenacious*.

The owner stated the crew typically got a "good night's sleep" during salmon fishing since the openers ended at 2000, after which the vessel delivered its catch to a tender and anchored for the night. He also confirmed that, had they successfully repaired their own skiff (rather than making a 4-hour round trip by car to borrow another skiff), the crew would have sailed the *Tenacious* to the fishing grounds earlier and anchored overnight, instead of sailing early in the morning and arriving just in time for the opener. The crew usually slept from 2230 until 0430. According to the deckhand, the captain was awake all day on July 23. The captain slept 10 hours the night of July 22 but did not sleep between 0800 on July 23 and the grounding in the early morning hours of July 24. The captain stated he "nodded off" on this night. He also stated a pinched nerve had been interrupting his sleep on previous nights, but he did not take any medication for the pain.

Fishing vessels risk missing out on catch by not being on scene for openers. The captain told investigators the casualty "was my fault 100 percent. I knew everybody was tired and wore out and I knew I was too, but... I also knew there was lots of fish around, boat loads, so that probably had a lot to do with my decision." He also stated that the decision was his alone and that the company and owner would not fault him if he chose to stay in port.

Tenacious was outfitted with two electronic charting systems (ECS) that had routes saved from previous trips. According to the captain, the ECS had a cross track error alarm, which would have visually and audibly alerted the wheelhouse operator when the vessel departed a set distance off its planned track; however, he was navigating by eye and did not use the route feature on the casualty voyage, stating, "I've done that route a thousand times." He stated his normal route takes him 0.25 miles off the northern tip of

² The Boundary Line as defined in Title 46 *Code of Federal Regulations* part 7 delineates internal and offshore waters for regulatory purposes. Prince William Sound lies wholly within the Boundary Line.

Culross Island. There was a fathometer in the wheelhouse with no alarm set. *Tenacious* was also fitted with a bridge watch alarm which, although it did not include motion sensors, alarmed if not reset before a timer ran out. The key to turn on the bridge watch alarm system was lost, and the system was not in use during the casualty transit.

The captain, owner, and skiff operator tested negative for alcohol and other drugs the following day.

2. Analysis

The weather was not a factor, and investigators found no evidence of alcohol or other drug use, mechanical deficiencies, or aid-to-navigation discrepancies.

Vessel operators must ensure crewmembers have sufficient rest to safely perform duties. The captain and crew worked all day and into the night on July 23 mending nets, performing boat maintenance, and traveling to and from Seward to pick up a new skiff. While the crew rested after getting under way, the captain took the first watch and had been awake 19.5 hours at the time of the casualty. Additionally, the captain told investigators he had not slept well the previous days due to a pinched nerve. The casualty occurred in darkness, about 0300, during a circadian low period. Circadian lows occur when the body has a stronger desire to sleep, which typically occurs between the hours of 0300 and 0500. Given the captain's extended awake hours, operating outside of his typical work/sleep schedule, bad quality of sleep on previous nights, and reduced performance from the circadian low, it is likely the captain was impaired by both acute fatigue and a chronic sleep debt resulting from reduced sleep quality in the preceding days.

The prospect theory of human decision-making proposes that human beings are more likely to accept higher levels of risk when faced with the perception of guaranteed future losses. In this case, the captain intended to fish on the July 24 opener because, as he stated, "there was lots of fish around." He likely framed the possibility of missing the opener as a guaranteed loss in terms of earnings from the catch. To avoid a perceived future loss, the captain's risk tolerance was higher, resulting in the decision to get under way later than planned, during normal sleep hours, while in a fatigued state. With no specific quota for the catch, the *Tenacious* crew was limited only by its own ability to participate in the openers, which were scheduled based on dates and locations where pink salmon populations were plentiful. Thus, there was economic pressure for the owners and crewmembers of vessels in this fishery, including the *Tenacious*, to participate in all openers to catch as much pink salmon as possible, which led to the captain's fatigue. As found in other NTSB investigations, the structure of this fishery encouraged working longer hours to increase the vessel's portion of the catch, which leads to a fatigued crew.

At least two safety tools available to the captain on the transit were not used. *Tenacious* was outfitted with a chart plotter that included a cross track error alarm, which would have visually and audibly alerted the wheelhouse operator when the vessel departed a set distance off its planned track. *Tenacious* was also outfitted with a bridge watch alarm, designed to alarm at set intervals to ensure the operator has not fallen asleep. Either of these alarms could have alerted the captain in time to possibly prevent the grounding.

The vessel was holed below the waterline in the bunkroom. Water entered the engine room via penetrations in the non-watertight bulkhead between the bunkroom and engine room. With one of its two fish holds already full of water, much of the hull volume was flooded, and the vessel sank—as its reserve buoyancy was overcome.

Maintaining watertight integrity of a vessel is a fundamental principal of safe operations on water. Within the hull, watertight bulkheads are designed to prevent progressive flooding when portions of the hull are compromised in a collision or other contact. Had the bulkhead between the bunkroom and the engine room been watertight, it would have contained the flooding to the bunkroom.

The *Tenacious* was not required by regulations to have watertight bulkheads. However, voluntary standards for uninspected commercial fishing vessels found in Coast Guard Navigation and Vessel Inspection Circular No. 5-86 (NVIC 5-86) state that vessels have a “watertight collision bulkhead between five and fifteen percent of the vessel’s length aft from the bow,” and that the main machinery space “be bounded by watertight bulkheads which extend up to the working deck.” The NVIC also notes, “In practice, it is a good idea to design and maintain all bulkheads watertight.” The forward engine room bulkhead on the *Tenacious* would have been watertight if it was designed and operated to have met this guidance.

Despite the rapid progressive flooding and sinking, the crew of five made appropriate distress calls, safely abandoned the vessel, and were assisted by Good Samaritan vessels. At least one crewmember was not familiar with lifesaving equipment, including survival suits, and had not participated in a drill. The EPIRB did not activate after the vessel sank, and with no PLBs for crewmembers on board, their location for search and rescue relied solely on the ability to perform a timely mayday call.

3. Conclusions

3.1 Probable Cause

The National Transportation Safety Board determines that the probable cause of the grounding of the fishing vessel *Tenacious* was the captain's decision to get under way while fatigued. Contributing to the casualty was the decision not to use the navigation system's cross track error alarm and to operate with a non-functioning bridge watch alarm.

3.2 Lessons Learned

3.2.1 Fatigue

In this casualty, and as the NTSB has previously noted in numerous commercial fishing vessel casualties, crew fatigue is a significant causal factor. Owners/operators should ensure that crewmembers receive enough rest to adequately perform duties.

3.2.2 Watch Alarm

A watch alarm, when used as intended, is an effective tool that can help ensure that a crewmember remains awake and vigilant while on duty. However, a watch alarm is not a substitute for the management and mitigation of fatigue. Owners/operators of vessels equipped with a watch alarm should establish procedures for its operation and use, especially when only one crewmember is responsible for navigation and lookout.

Vessel	<i>Tenacious</i>
Type	Fishing
Flag	United States
Port of registry	Seward, Alaska
Year built	1983
Official number (US)	654362
IMO number	N/A
Classification society	N/A
Length (overall)	50.5 ft (15.4 m)
Beam	15.8 ft (4.8 m)
Draft (casualty)	6.0 ft (1.8 m)
Tonnage	50 GRT
Engine power; manufacturer	1 x 275 hp (205 kW); Cummins NT 855 diesel engine

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

The National Transportation Safety Board (NTSB) is an independent federal agency dedicated to promoting aviation, railroad, highway, marine, and pipeline safety. Established in 1967, the agency is mandated by Congress through the Independent Safety Board Act of 1974, to investigate transportation accidents, determine the probable causes of the accidents, issue safety recommendations, study transportation safety issues, and evaluate the safety effectiveness of government agencies involved in transportation. The NTSB makes public its actions and decisions through accident reports, safety studies, special investigation reports, safety recommendations, and statistical reviews.

The NTSB does not assign fault or blame for an accident or incident; rather, as specified by NTSB regulation, "accident/incident investigations are fact-finding proceedings with no formal issues and no adverse parties ... and are not conducted for the purpose of determining the rights or liabilities of any person" (Title 49 *Code of Federal Regulations* section 831.4). Assignment of fault or legal liability is not relevant to the NTSB's statutory mission to improve transportation safety by investigating accidents and incidents and issuing safety recommendations. In addition, statutory language prohibits the admission into evidence or use of any part of an NTSB report related to an accident in a civil action for damages resulting from a matter mentioned in the report (Title 49 *United States Code* section 1154(b)).

For more detailed background information on this report, visit the NTSB investigations website and search for NTSB accident ID DCA21FM033. 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—

National Transportation Safety Board
Records Management Division, CIO-40
490 L'Enfant Plaza, SW
Washington, DC 20594
(800) 877-6799 or (202) 314-6551