



National Transportation Safety Board

Marine Accident Brief

Grounding of Fishing Vessel *Freyja*

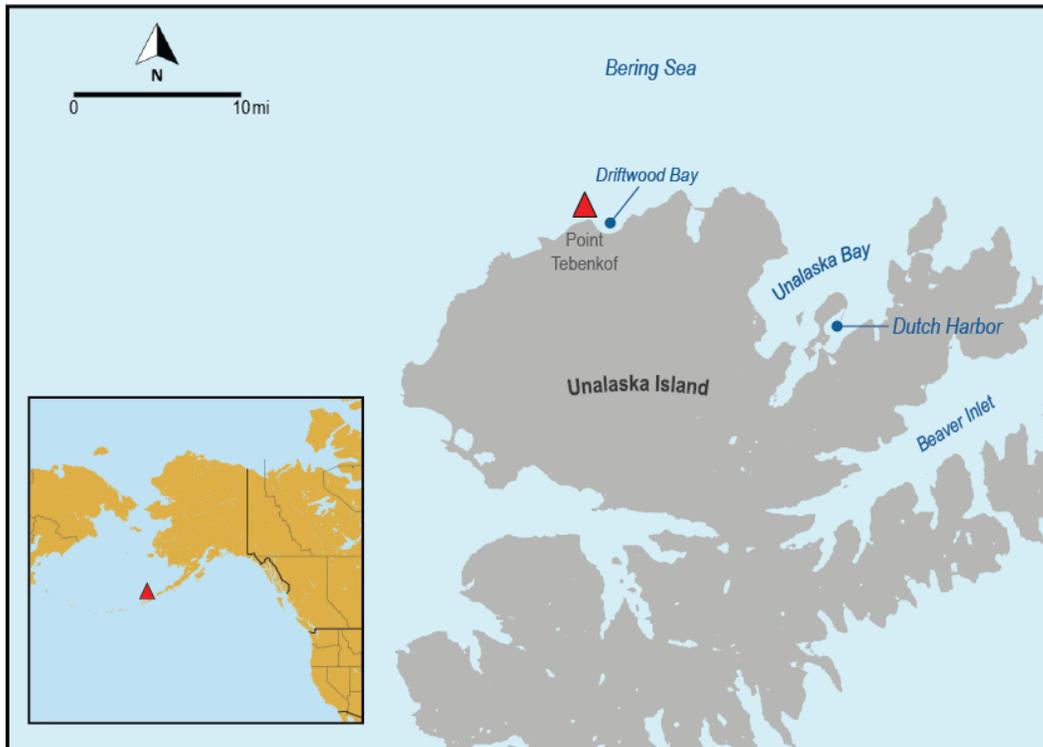
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|-----------------------------|--|-----------------------|
| Accident type | Grounding/Stranding | No. DCA19FM024 |
| Vessel name | <i>Freyja</i> | |
| Location | Bering Sea, near Point Tebenkof, Unalaska Island, Alaska 53° 59.4' N, 166° 53.4' W | |
| Date | March 9, 2019 | |
| Time | About 0155 Alaska standard time (coordinated universal time – 9 hours) | |
| Injuries | None | |
| Damage | \$550,000 est. | |
| Environmental damage | None | |
| Weather | Overcast with rain showers and south winds from 20–25 knots; breaking waves estimated at 10 feet; air temperature 36°F; water temperature 40°F | |
| Waterway information | Fishing grounds in the Bering Sea north of Point Tebenkof, Unalaska Island, Alaska. The island of Unalaska is part of the Aleutian Chain. | |

About 0155 local time on March 9, 2019, the commercial fishing vessel *Freyja* was longline fishing in the Bering Sea near Point Tebenkof, Unalaska Island, Alaska, when the vessel grounded and remained stranded on the rocks. The four crewmembers abandoned the vessel and swam to a nearby Good Samaritan vessel. The vessel was considered a total loss, with damage estimates at \$550,000. There were no reports of injuries or pollution.



The fishing vessel *Freyja* before the accident. (Source: Monson Fisheries, LLC)

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Area near Point Tebenkof where the *Freyja* grounded, marked by a red triangle. (Background source: Google Maps)

Background

The *Freyja*, a 58-foot long, 65-gross-ton commercial fishing vessel, was equipped with a single propeller and rudder and was fitted with one main propulsion diesel engine and two electrical generators (though one of the generators was not working at the time of the accident and was in need of repair). The vessel's draft was approximately 8 feet. Formerly the fishing vessel *Miss Corrine*, Monson Fisheries, LLC (owned by the captain) purchased the vessel in 2012 and renamed it the *Freyja*.

Accident Events

The crew of the *Freyja* was based in Kodiak, Alaska, and fished out of Dutch Harbor. The crew included three deckhands who had contracts with Monson Fisheries, LLC (hereinafter referred to as deckhands 1, 2, and 3), in addition to the captain. The crew had been on board the vessel since January 19, 2019, and had been working in the Alaska cod fishery, which had opened on January 1, 2019. According to the crew, there were no problems with the vessel's steering or propulsion.

On March 7, the *Freyja* arrived at a processing plant in the port of Dutch Harbor around 0130 to deliver cod. The entire crew slept until 0600, when deckhand 3 awoke and offloaded the cod, while the remainder of the crew continued to sleep. Around 0830, the *Freyja* shifted to another location on the dock to wait for their 1,600-pound bait order. Once the frozen bait was loaded, the vessel got under way (between 1200 and 1300) and began transiting northwest toward the fishing grounds. The captain said that while the vessel was in transit, the crew was resting, but he was not sure if they were sleeping. About 1600, the captain stopped and anchored the vessel to give the bait time to thaw.

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The *Freyja* crew's typical longline fishing routine for cod was to set the automatic baiter, which took about 2 hours.¹ Once the baiter was ready, they put it in the water and let it "soak" for 4–5 hours. Before pulling it back in, the crew had time to rest, cook, do maintenance, or anything else that was needed on the vessel.

The captain estimated that they put the gear in the water to soak around 1800, leaving it for a few hours before hauling it back in. They did not set any more gear. The next morning, on March 8, the crew set gear about 0530, leaving it for a few hours before hauling the gear again.

The captain said that the automatic baiter had "not been functioning very well," so they headed back toward the previous day's anchor location, where they attempted to fix the baiter. They tested the gear, setting a little at a time, until about 2130, when they set one last string.

The captain stated that he typically liked the crew to get 6–8 hours of sleep per day, but during the first couple of weeks on this fishing trip, they were "going pretty good and they were getting burned out." To counter their fatigue, he said that he tried to ensure the crew was getting 4 hours of rest at a time, hoping that they were sleeping at least 3 of those hours, twice a day.

Deckhand 1, who was the newest crewmember, was assigned the responsibility of cooking for the crew and captain. When others took the opportunity to rest, he was frequently preparing their meals. The captain noted that the deckhand often took a long time to prepare meals, so he was unsure how much sleep the deckhand was getting. The captain also recalled that, over the last week leading up to the accident, the deckhand was often the last one out of his bunk. He said that on the afternoon before the grounding, the new deckhand had prepared dinner between 1600 and 1800, when everyone else was resting.

On the evening of March 8, about 3 hours before the accident, the captain directed the deckhands to alternate watchstanding shifts (each 45-60 minutes); he did not specify the order in which the deckhands should rotate shifts. Deckhand 1 stated that the on-watch deckhand would be responsible for awakening the relief deckhand. The captain estimated that the *Freyja* was 1–2 miles offshore when he handed the watch over to deckhand 1, between "2200 or perhaps 2230." They were "jogging" at approximately 1.4–1.5 knots, to "make sure the bait's still on the hooks, see what kind of recovery [or catch] we're getting."² Deckhand 1 took the helm, and the captain went to bed (in his quarters behind the wheelhouse), while deckhand 3 was watching television in the galley, awaiting his watch. He did not go to bed.

Deckhand 1 stated that he remembered that he had about 10 minutes remaining on his watch (which was to have ended by 2330) when he fell asleep. He was awakened, nearly three hours later, when the *Freyja* struck the rocks on the western side of Driftwood Bay, near Point Tebenkof, about 0130. Deckhand 1 stated that he believed the bridge watch alarm in the wheelhouse was set and recalled that the time interval for the alarm was 10–15 minutes.³ He stated

¹ A baiter is an automatic device for baiting hooks for longline fishing.

² A *jog* is a state or period of relative inactivity. The *Freyja*'s crew described their "jog" as working at a slow pace, moving back and forth.

³ The *Freyja*'s watch alarm worked by requiring the watchstander to push a button on the alarm panel, at preset time intervals, to reset the alarm. If this did not occur, audible and visual alarms would activate in the wheelhouse.

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that the bridge alarm did not wake him, and he had set his phone alarm as well, but he did not hear it.

Deckhand 3, who was in the galley awaiting his turn to take watch, said that he fell asleep while watching television, and the next thing he remembered was waking up when the *Freyja* hit the rocks. At that moment, he ran up to the wheelhouse and saw the captain, who had been awakened by the grounding and was already there; the captain directed him to head to the engine room to check for damage or water entry. After confirming that there was no flooding or damage, the captain put the vessel in astern propulsion in an attempt to free the *Freyja* from the rocks, to no avail. He directed the crew to pump out the aft fish hold to lighten the vessel but was still unable to free it.



Postaccident photo of the *Freyja*, taken March 18, 2019, along the shore of Point Tebenkof. (Source: US Coast Guard)

Deckhand 1 stated that the boat took a big wave, and he saw “a lot of water going down the engine room.” During the ongoing attempt to maneuver off the rocks, the generator failed, and the captain lost rudder control (likely due to it being damaged) and shut down the main engine. The captain then issued a mayday call over VHF channel 16 around 0155.

Deckhands 1 and 2 ran to get the 6-person liferaft, which was located on top of the wheelhouse. The crew estimated the breaking waves at 7–20 feet once the vessel grounded, and the crew were “getting bounced around.” The captain and all crewmembers donned survival suits inside before gathering on deck outside the wheelhouse door. About 0215, the crew launched the liferaft and tethered it to the side of the vessel with the painter line. In the wind and surf, the raft was difficult for the deckhands to control in survival suits, and they struggled to keep it from moving around the bow and toward the rocky shore. The crew stated that eventually the raft was lost.

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The nearby fishing vessel *Alaskan Pearl*, upon hearing the mayday call, arrived around 0230. The captain of the *Freyja* was in direct communication with the crew on the *Alaskan Pearl* via radio. Unable to enter the raft or reach the shore safely in the heavy surf, the captain directed the crew to swim two at a time to the *Alaskan Pearl*. Deckhands 1 and 3 were the first to jump into the water from the stern. They timed their swim to a smaller set of waves and stated that once they were away from the grounded vessel, it was easier to swim. After the two deckhands were safely onboard, the captain and deckhand 2 jumped from the *Freyja* and swam to the *Alaskan Pearl*. The vessel took all four crew to Dutch Harbor (they arrived later that same day). The vessel was salvaged in the summer, following several months of severe weather that made recovery extremely difficult. The vessel was considered a total loss.



Photo of the *Freyja*'s starboard side, showing structural damage due to grounding. (Source: Resolve Magone Marine)

Additional Information

The captain had about 25 years of experience fishing in Alaska and had served as captain of the *Freyja* for “several years,” even prior to purchasing it in 2012. Experience among the deckhands was wide-ranging. Deckhand 1 had been on the vessel since January, but it was his first trip on the *Freyja*, and he was new to fishing in Alaska. Deckhand 2 had 10 months experience on the vessel and 22 years of experience in the industry, and deckhand 3 had worked a total of 6 months on the *Freyja* and had over 17 years of experience in the fishing industry.

All crewmembers underwent post-casualty drug testing; however, by the time they arrived in Dutch Harbor, they were outside of the time requirement window for alcohol testing (8 hours). Three of the four crewmembers, including the captain and the deckhand on watch, tested positive for tetrahydrocannabinol (THC), a marijuana metabolite, which has mood-altering effects and can cause alterations in physical and cognitive function.

Following the grounding, deckhand 1 went to his bunk to retrieve his survival suit, but it did not fit. The survival suit in his bunk was a small, or junior immersion suit, and he had not tried it on since he had boarded the vessel in January. He stated that there were plenty of adult-sized

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suits on board, and he finally found one, but he spent nearly 15 minutes trying to get the small immersion suit on.

Analysis

The *Freyja* was equipped with a bridge watch alarm, which worked by requiring the navigation watchstander to reset the alarm at preset time intervals in order to prevent the watchstander from falling asleep for a prolonged period. If the watchstander did not reset the alarm, audible and visual alarms would activate. Deckhand 1 stated that he believed the watch alarm was set to sound every 10-15 minutes. However, he was asleep in the wheelhouse for about 2 hours before the *Freyja* grounded, indicating that the alarm either was not set or was not loud enough, or the deckhand was extremely fatigued.

One of the crewmembers on the *Freyja* said that in the weeks prior to the accident, the crew was averaging just 3 hours of sleep per 24-hour period, though he stated that they had been “getting a little more than normal” in the days just prior to the accident. Although the captain stated that he gave the crew 4 hours of rest at a time when he could, he did not have a formal policy for work and rest that would have ensured the crew had the opportunity for uninterrupted sleep during their off-duty hours. Moreover, this irregular watchstanding schedule, where crewmembers stood watch for random short shifts (not a 4/8/4 or 12/12 shift) and crewmembers were responsible for waking their relief when their watch was ending, compounded the likelihood of a single point of failure, where, if the on-duty watchstander became incapacitated for any reason (sleep, medical emergency, etc.), he could not notify his relief, and the wheelhouse would be left unattended.

The National Transportation Safety Board (NTSB) has investigated several fishing vessel accidents in which fatigue played a primary role. The latest investigation was the grounding of the *Imperial*, where the crew worked for 4 consecutive days with minimal and fragmented sleep periods, similar to the *Freyja* grounding. The NTSB’s investigation of the capsizing and sinking of the fishing vessel *Destination* in 2017, similarly described the long hours of working in the derby-style cod and opilio crab fisheries. That accident resulted in the loss of all six crew. In the groundings of the *Savannah Ray* and the *St. Dominick*, the crews worked similar hours in the Alaska cod fishery; the *St. Dominick* crewmembers stated that the rules for the cod fishery promoted around-the-clock operations and contributed to inadequate rest. In these accidents, as well as the *Freyja* grounding, the economic pressure to operate continuously encourages working longer hours with little to no sleep in order to fill quotas. This open-access, “derby-style” fishing inherently leads to fatigued crew.

Additionally, the grounding of the *Freyja* occurred at 01:55, which, studies have concluded, is a time where circadian rhythm is at a low. The circadian rhythm dips and rises at different times of the day, and, according to research, an individual’s strongest sleep drive generally occurs between 0100-0500 and 1300–1500 (extensive research has shown that this window varies based on a number of individual factors). The fatigue experienced during these circadian lows is exacerbated when a person is sleep-deprived. Some effects of fatigue include lapses of attention, diminished decision-making ability, slowed responses, and an inability to concentrate. Between 2014 and 2019, 10 of the 14 marine accidents that the NTSB investigated where fatigue was found to be a contributing factor occurred between 0100 and 0600. Individuals have a basic sleep requirement in order to perform optimally and maintain alertness. On average, the requirement is 8 hours in a 24-hour period. A technical memo produced for the National Aeronautics and Space Administration (NASA) states that losing as little as 2 hours of sleep will result in acute sleep loss,

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which induces fatigue and degrades performance and alertness.⁴ If crewmembers were only sleeping 3-4 hours per 24 hours in the weeks before the accident, and then still only sleeping 4-6 hours in the days prior, they likely had an accumulated sleep deficit, resulting in chronic fatigue.

Further, significant performance impairments are usually observed for at least 1-2 hours following marijuana use, and residual effects have been reported up to 24 hours.”⁵ Because traces of marijuana can be found in urine days to weeks after use, the effects vary based on various individual factors. As a result, the presence of THC metabolites in urine (as in this case for the deckhand on watch) often cannot be used to determine impairment by the drug’s effects at any specified time. Therefore, it cannot be determined if, in fact, the use of marijuana impaired the deckhand’s performance at the time of the grounding.

Probable Cause

The NTSB determines that the probable cause of the grounding of the fishing vessel *Freyja* was the failure of the deckhand on watch to monitor the vessel’s track as a result of falling asleep due to an accumulated sleep deficit and the vessel owner’s lack of countermeasures to mitigate crewmember fatigue.

Fatigue Countermeasures

As the NTSB has previously noted in numerous commercial fishing vessel accidents, crew fatigue is a significant contributing causal factor. An effective way to prevent fatigue among crewmembers is for owners/operators to have measures in place to ensure that crewmembers receive enough rest to adequately perform navigational and lookout duties.

Immersion Suits

Marine safety training and periodic drills are designed to provide crewmembers with the knowledge and skills they need to respond to vessel emergencies. For lifesaving equipment to be effective, vessel owners/captains should ensure that each individual on board is aware of how to don an immersion suit or other personal flotation device, and understands how to use the equipment correctly. It is also the responsibility of each crewmember to ensure that immersion suits are the proper size, in serviceable condition, and readily accessible.

⁴ National Aeronautics and Space Administration, “Technical Memorandum 110404: Principles and Guidelines for Duty and Rest Scheduling in Commercial Aviation,” May 1996.

⁵ National Highway Traffic Safety Administration, “Drugs and Human Performance Fact Sheets,” <https://www.nhtsa.gov/sites/nhtsa.dot.gov/files/809725-drugshumanperformfs.pdf>, accessed June 27, 2019.

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Vessel Particulars

| Vessel | <i>Freyja</i> |
|----------------------------|---|
| Owner/operator | Monson Fisheries, LLC. |
| Port of registry | Kodiak, Alaska |
| Flag | United States |
| Type | Fishing vessel |
| Year built | 1979 |
| Official number (US) | 607659 |
| IMO number | N/A |
| Classification society | N/A |
| Construction | Steel |
| Length | 58 ft (17.7m) |
| Draft | 8.3 ft (2.5 m) |
| Beam/width | 20 ft (6.1 m) |
| Tonnage | 64 GRT |
| Engine power; manufacturer | 1,200 hp (895 kW); two Cummins KTA19 at 600 hp each |
| Persons on board | 4 |

NTSB investigators worked closely with our counterparts from Coast Guard Sector Dutch Harbor and Sector Anchorage throughout this investigation.

For more details about this accident, visit www.nts.gov and search for NTSB accident ID DCA19FM024.

Issued: March 2, 2020

The NTSB has authority to investigate and establish the probable cause of any major marine casualty or any marine casualty involving both public and nonpublic vessels under Title 49 *United States Code*, Section 1131. This report is based on factual information either gathered by NTSB investigators or provided by the Coast Guard from its informal investigation of the accident.

The NTSB does not assign fault or blame for a marine casualty; rather, as specified by NTSB regulation, “[NTSB] 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 conducting investigations 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).
