Transportation Safety Board of Canada
Bureau de la sécurité des transports du Canada

MARINE TRANSPORTATION SAFETY INVESTIGATION REPORT M23C0257

SINKING AND SUBSEQUENT LOSS OF LIFE

Fishing vessel *Silver Condor*
La Tabatière, Quebec
25 September 2023

Canada

ABOUT THIS INVESTIGATION REPORT

This report is the result of an investigation into a class 3 occurrence. For more information, see the Policy on Occurrence Classification at www.tsb.gc.ca

The Transportation Safety Board of Canada (TSB) investigated this occurrence for the purpose of advancing transportation safety. It is not the function of the Board to assign fault or determine civil or criminal liability.

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Summary

On 24 September 2023, the fishing vessel *Silver Condor*, with 6 people on board, began its return trip to port after fishing for redfish. Around midnight on 25 September, the vessel started listing to port and sinking by the stern; as the vessel sank, all people on board entered the water. At 0230, search and rescue authorities received a signal from the *Silver Condor*'s emergency position-indicating radio beacon. After trying to contact the vessel without success, a search was launched using several vessels and aircraft. All the people were eventually recovered from the water and brought to the hospital in Corner Brook, Newfoundland and Labrador. Three of the people were treated for hypothermia and other injuries, and the other 3 were declared dead. The vessel was not recovered.

1.0 FACTUAL INFORMATION

1.1 Particulars of the vessel

Table 1. Particulars of the vessel

Name	*Silver Condor*
Transport Canada official number	802583
International Maritime Organization (IMO) number	8663834
Fisheries and Oceans Canada vessel registration number	8555
Port of registry	Québec, Quebec
Flag	Canada
Type	Fishing
Gross tonnage	111.72
Length registered	18.53 m
Built	1983
Rebuilt	2005
Propulsion	1 diesel engine (272 kW) driving a single-pitch propeller
Owner/authorized representative	Private individual

1.2 Description of the vessel

The *Silver Condor* was a single-screw stern trawler of fibreglass construction that was built in Canada in 1983 (Figure 1). From forward, the hull comprised the forward store, the engine room, the fish hold, and the lazarette, which were divided by 3 watertight bulkheads. The fish hold and engine room were fitted with a bilge pump and a high water bilge alarm.

The fish hold was divided by a central walkway with 5 pens on each side (figures 2 and 3). Each pen could be closed by aluminum penboards to limit the movement of the catch. The fish hold had 1 main hatch with a coaming that provided access to the main deck via a ladder, as well as 6 smaller flush watertight hatches that opened to the main deck.

The vessel was equipped for shrimp fishing, including a trawler at the stern and pair of paravane stabilizers located just aft of the wheelhouse.

Figure 1. View of the Silver Condor's starboard side (Source: Clarence Vautier, with TSB modifications)

Figure 2. View of the Silver Condor's fish hold looking forward (Source: Third party, with permission)

Figure 3. View of the Silver Condor's fish hold looking aft (Source: Third party, with permission)

Throughout the winter of 2000–2001, the vessel was extensively modified,[1] which increased its overall length and height. In 2005, a coat of fibreglass was applied to the vessel's hull.

The wheelhouse had 2 doors, 1 each to port and starboard, that led to the forward upper deck. The aft portion of the upper deck was only accessible on the port side. The wheelhouse was also accessible via stairs from the galley, which was located on the main deck. The wheelhouse had a navigation console that was located starboard of the centreline and equipped with a conning station, a helm, propulsion control, a radar, an electronic chart, a GPS (global positioning system), an autopilot, and an automatic identification system (AIS). The *Silver Condor* was also equipped with 2 very high frequency (VHF) radiotelephones, 1 of which had digital selective calling (DSC) with integrated GPS (Figure 4). The microphones for the 2 VHF radiotelephones were in very close proximity to each other. An antenna for the vessel's VHF-DSC radiotelephone was fitted to the top of the wheelhouse; the antenna's maximum height was about 10 m above sea level.

The vessel carried an emergency position-indicating radio beacon (EPIRB) that was fitted with a hydrostatic release unit (HRU) and was registered to the vessel owner.

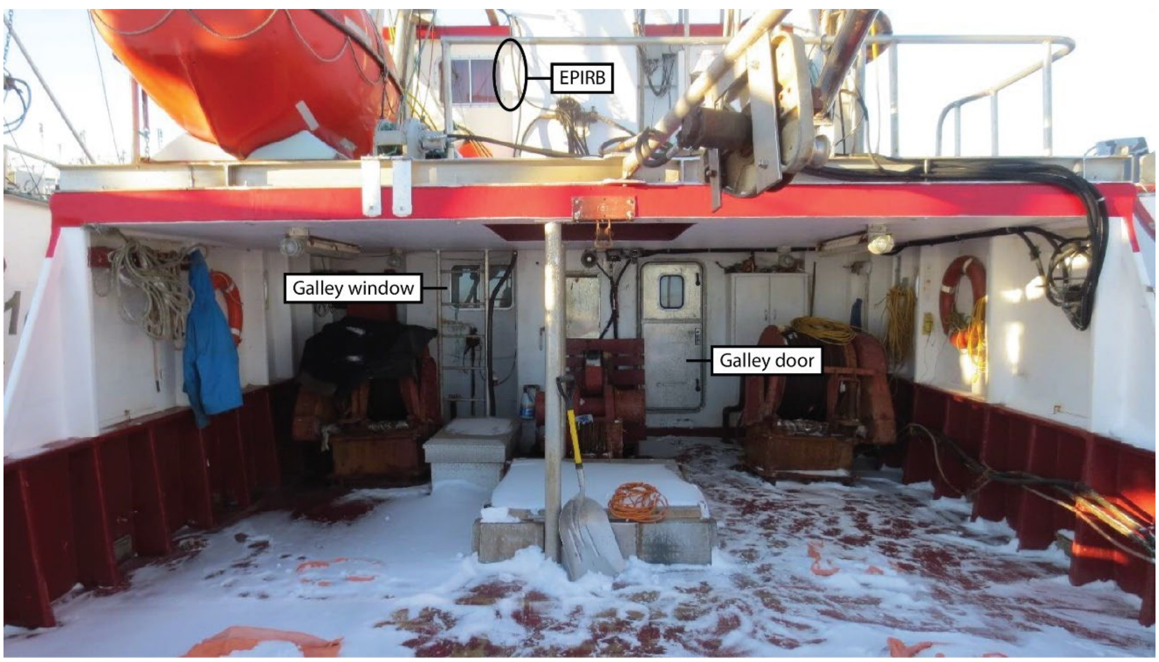
[1] Transport Canada's file for the *Silver Condor* does not contain a record of the modifications made to the vessel, but the vessel registry mentions that the vessel was rebuilt in 2005.

Figure 4. The Silver Condor's navigation console, showing the vessel's helm, propulsion control, navigation equipment, and radio equipment (Source: Third party, with permission and TSB annotations)

The crew accommodations were divided into a galley and 4 cabins; the master had a cabin attached to the wheelhouse, and the remaining 3 cabins were located on the main deck forward of the galley. Three of the cabins each contained 1 bunk and 1 cabin contained 4 bunks. The galley had a porthole on its port side as well as a window and door on the aft wall; both the porthole and window could be opened from the inside (figures 5 and 6).

Figure 5. View of the Silver Condor's port side, showing the galley porthole and life raft (Source: Third party, with permission and TSB annotations)

Figure 6. The Silver Condor's aft main deck, looking forward to the galley window, the galley door, and the vessel's EPIRB (Source: Third party, with permission and TSB annotations)



The vessel's life-saving equipment included one 7 person rigid fibreglass life raft fitted with an HRU, with capacity for 7 persons, which was located aft of the wheelhouse on the vessel's port side. The vessel also carried 6 life jackets and 7 immersion suits, which were located in the crew accommodations (1 immersion suit stored under each bunk).

An additional immersion suit was brought on board by an at-sea observer (observer) for the occurrence voyage, bringing the total number of immersion suits on board to 8.

1.3 History of the voyage

On 21 September 2023, at about 1100 Eastern Daylight Time,[2] the fishing vessel *Silver Condor* departed Blanc-Sablon, Quebec, for its 2nd fishing trip of the season under a licence to fish for experimental purposes.[3] The vessel complement was composed of 6 people: 5 crew members and 1 observer required by Fisheries and Oceans Canada (DFO). All crew members and the observer had participated in the vessel's 1st fishing trip of the season, which had taken place from 04 to 07 September 2023.

The vessel steamed for about 15 hours to fishing ground located south of Harrington Harbour, Quebec, approximately 100 nautical miles (NM) southwest of Rivière-Saint-Paul. At about 0200 on 22 September, the crew started fishing for redfish.

While fishing, the vessel's trawl doors[4] crossed a couple of times, causing the net to close. The crew had to untangle the doors before fishing could resume, which prolonged the crew's fishing time.

On 24 September, at around 1630, the crew completed their fishing activities and was preparing to return to Blanc-Sablon. The vessel's pens, and a portion of the walkway between the pens, were filled with redfish. Incidental catch was stored in a commercial fishing tote that was secured on the main deck with ropes and wood.

Based on Vessel Monitoring System[5] (VMS) data, at 1730 the vessel was making its way towards its home port at a heading of 050° true (T) and a speed over ground of 6 knots. The winds in the area of sailing were light.

At around 2000, all crew members and the observer were stood down and started a rest period in their respective cabins, except the master, who remained at the helm to conduct the vessel, monitor cellphone reception, alert the fish-processing factory of the vessel's arrival, and coordinate the vessel's unloading. The mate, deckhand 1, and deckhand 3 shared the cabin with the 4 bunks. Deckhand 2 and the observer each had their own cabin. The weather in the area of sailing was fair with winds variable at approximately 15 knots.

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2 All time are in Eastern Daylight Time (Coordinated Universal Time minus 4 hours).

3 The licence that was issued to the owner of the *Silver Condor* allowed the vessel and its crew to participate in Experimental Fishing Plan Unit 1 Redfish for the 2023 season. Source: Fisheries and Oceans Canada, "Experimental Fishing Plan Unit 1 Redfish (2023 season)," at https://www.dfo-mpo.gc.ca/fisheries-peches/commercial-commerciale/atl-arc/management-plan-gestion/redfish-sebaste-eng.html (last accessed on 16 October 2025).

4 Trawl doors are attached to either side of the vessel with ropes and are used to keep the mouth of the net open when harvesting fish.

5 Fisheries and Oceans Canada, "National Vessel Monitoring System," at https://www.dfo-mpo.gc.ca/fisheries-peches/sdc-cps/vessel-monitoring-surveillance-navire/index-eng.html (last accessed on 16 October 2025).

The marine weather forecast indicated that 30-knot winds from the northeast were expected to start around midnight, and showers that began in the evening were expected to end later the next morning.

At 2100, the VMS indicated the vessel's speed over ground had reduced to 4.7 knots.

On 25 September, at midnight, the VMS indicated that the vessel was heading 056° T at a speed over ground of 4.5 knots. The VMS continued to transmit information every 30 minutes until the last recorded transmission at 0230.

At some point during this period, the vessel's rolling motion increased and unsecured items fell from shelves and other surfaces throughout the vessel, waking up the off-duty crew members and the observer. Water could be heard splashing below deck and crew members started to yell that the vessel was taking on water. The vessel was listing to port and sinking by the stern. Several actions occurred in succession as water flooded the accommodation space through the galley window and reached the wheelhouse:

- The observer attempted to close the galley window to slow the water ingress.
- Deckhand 1 got the 4 immersion suits from the cabin with the 4 bunks and tossed them up the stairs to the wheelhouse.
- The master grabbed the immersion suit from his cabin.
- All 6 people mustered in the wheelhouse.
- Two crew members and the observer fully donned their immersion suits, 2 crew members partially donned their immersion suits, and 1 crew member donned a life jacket.
- Deckhand 1 grabbed several handheld flares from the wheelhouse.
- The mate issued a Mayday call over VHF radiotelephone; however, there were no other vessels in the area to receive the distress signal.[6]

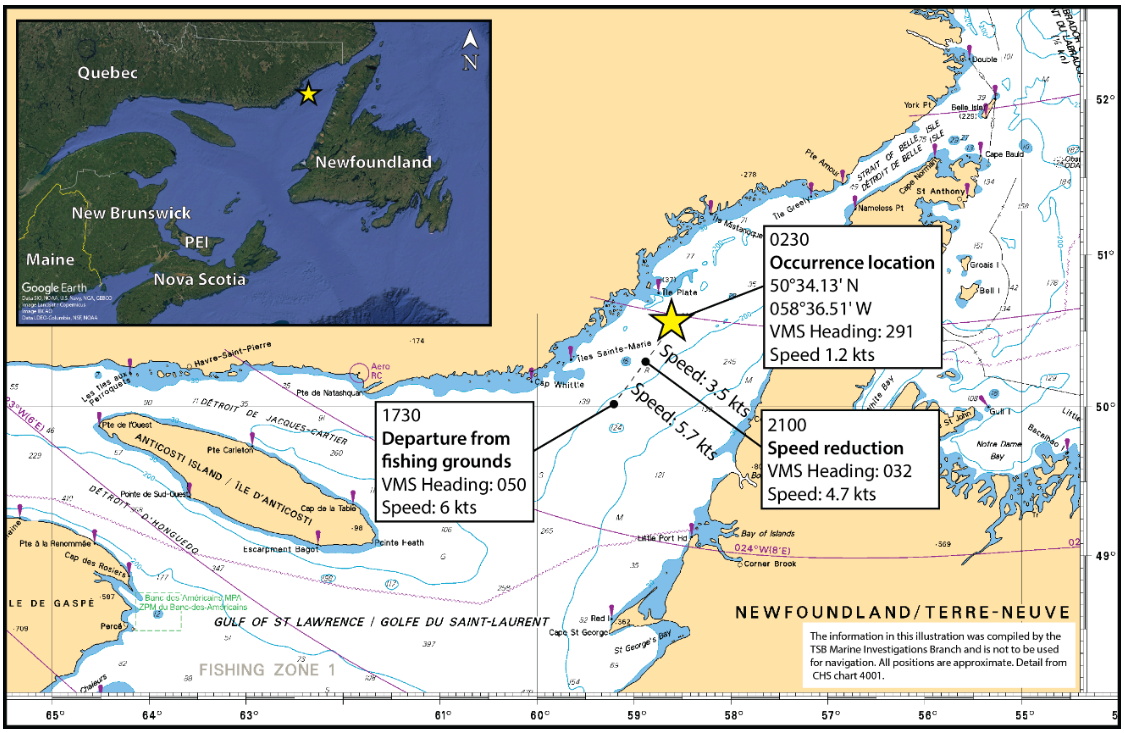
As the vessel continued sinking by the stern and rolling, the wheelhouse doors began to forcefully open and close with each roll. Deckhand 3 prevented the starboard side door from locking shut by putting his hand on the door frame, consequently sustaining a hand injury. Deckhand 1 and the mate pushed themselves off the wheelhouse aft bulkhead to escape via the starboard door and then held on to the vessel's stabilizers. Deckhand 3 immediately followed and helped the observer climb out of the wheelhouse through the door. Finally, deckhand 2 escaped through the starboard window and, after ensuring everyone was out of the wheelhouse, the master followed. Some of the complement mustered on the bow, while others held on to the starboard stabilizer arm. The complement anticipated that the life raft's HRU would have released by that time and that the raft would be floating on the surface. They attempted to locate the life raft, but could not do so in the dark.

[6] The investigation could not determine whether the VHF radiotelephone or VHF-DSC radiotelephone was used to issue the Mayday call.

As the weather worsened, everyone was pushed around by waves and eventually thrown into the water, washed away from the vessel, and separated. Some people spotted each other in the water with the help of the strobe lights on their immersion suits and life jackets and managed to reunite and link arms in groups of 2: the mate was with deckhand 1, and deckhand 3 was with the observer. The master and deckhand 2 were alone in the water. Deckhand 1 activated a handheld flare to show his position to others so they could swim to him.

The VMS data indicates that the *Silver Condor* made way north-northeast at an average speed over ground of 4.5 knots until 0200. At 0230, the vessel changed course to west-northwest and slowed to 1.2 knots at position 50°34.13' N, 058°36.51' W, which is the last known position of the vessel (Figure 7).

Figure 7. Map of the occurrence area showing the Silver Condor's last known position (Source of main image: Canadian Hydrographic Service Chart 4967; source of inset image: Google Earth, with TSB annotations)



1.3.1 Search and rescue operation

At 0230, the Cospas-Sarsat system[7] received a signal from the *Silver Condor*'s EPIRB. The signal information was relayed to Maritime Rescue Sub-Centre Quebec (MRSC), which began to call the emergency contacts listed on the EPIRB's registration.

[7] Cospas-Sarsat is a satellite system designed to detect and locate the signals of distress beacons operating on 406 Megahertz (MHz) anywhere on Earth. The system then forwards distress alert and location data to search and rescue authorities.

At 0239, MRSC requested that Marine Communications and Traffic Services (MCTS) Les Escoumins try to contact the fishing vessel on VHF channel 16 (the emergency channel). At 0248, MCTS Les Escoumins informed MRSC that there was no response from the vessel via VHF radiotelephone or DSC.

At 0255, MRSC received confirmation from the emergency contacts listed in the EPIRB registration that the vessel was out fishing.

At 0301, MRSC requested that MCTS Les Escoumins broadcast a Mayday relay. At the same time, MRSC tasked the following search and rescue (SAR) units via Joint Rescue Coordination Centre (JRCC) Halifax: a Royal Canadian Air Force Cormorant helicopter from Gander, Newfoundland and Labrador (NL),[8] and Canadian Coast Guard Ship (CCGS) *Cape Edensaw* from Port au Choix, NL. Canadian Coast Guard Auxiliary vessels in the area were called to join the search effort, and multiple fishing vessels in neighbouring ports also responded to the Mayday relay.

At 0319, a vessel of opportunity, the cargo vessel *Cape Venture*, was tasked to the SAR effort by MRSC. The vessel's master gave an estimated time of arrival of 2 hours and 15 minutes.

At 0330, the commanding officer of the CCGS *Cape Edensaw* informed MCTS Port aux Basques that the vessel had departed from Port au Choix with an estimated time of arrival of approximately 3 hours.

At 0419, the pilot of the Cormorant helicopter informed JRCC Halifax that the helicopter was ready to leave.

At 0545, the *Cape Venture* arrived on scene and the crew began the vessel's assigned search pattern. The crew members also tried to contact the *Silver Condor* via VHF channel 16 and VHF channel 10 (the working channel for fishing vessels in the area).

At 0555, the commanding officer of the CCGS *Cape Edensaw* informed MRSC that the vessel was closing in on the *Silver Condor*'s last known position. Because of communication difficulties over VHF, the message had to be relayed by MCTS Port aux Basques to MCTS Les Escoumins and finally to MRSC. MCTS Les Escoumins then directed the crew of the CCGS *Cape Edensaw* to listen to 121.5 MHz, to home in on the *Silver Condor*'s EPIRB signal.

At 0615, the Cormorant helicopter arrived on scene and its search pattern was coordinated with the *Cape Venture*.

At 0639, about 4 hours after the vessel sank, the crew of the Cormorant helicopter spotted 4 people in the water in groups of 2. The pilot of the Cormorant helicopter attempted to contact the *Cape Venture* to direct the vessel toward the people in the water, but

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8 The Canadian Coast Guard (CCG) is responsible for maritime search and rescue (SAR) and works in coordination with the Canadian Armed Forces. Both the CCG and the Canadian Armed Forces have readiness posture. The SAR readiness posture for air assets is 30 minutes between the hours of 0800 to 1600 and 2 hours outside of those hours.

communication via radiotelephone was challenging due to the weather. The pilot of the Cormorant helicopter then shared the positions of the people with MCTS Les Escoumins.

The crew of the Cormorant helicopter then established the priority of recovery for the people in water. Seeing that deckhand 1 was wearing only a life jacket, the SAR technicians (SAR Techs) on board the Cormorant helicopter recovered deckhand 1 and the mate first. They then recovered deckhand 3 and the observer. All 4 people were conscious at the time of recovery, but deckhand 1 went into shock[9] after he was brought into the helicopter. One of the SAR Techs immediately provided medical attention.

The pilot of the Cormorant helicopter tried to inform MCTS Les Escoumins that the helicopter crew had recovered 4 people from the water, but communication via VHF channel 16 was ineffective. Instead, the pilot provided an update to JRCC Halifax via satellite phone to relay the information to MRSC. The Cormorant helicopter then resumed the search for the remaining people in the water.

Around 0704, the crew of the Cormorant helicopter spotted deckhand 2 in the water and sent a SAR Tech down to assess his condition. Because deckhand 2 was not responsive, and because the CCGS *Cape Edensaw* was in the vicinity, it was decided to ignite a smoke signal and direct the CCGS *Cape Edensaw* to recover the deckhand. The SAR Tech returned to the Cormorant helicopter and the helicopter crew proceeded to search for the master.

Around 0707, the crew of the Cormorant helicopter spotted the master and recovered him. By 0716, all 5 crew members and the observer had been recovered and all vessels of opportunity were released. The complement were transported to the hospital in Corner Brook, NL; 3 people were treated for hypothermia and other injuries, and 3 people were declared dead.

The vessel was not spotted during or after the SAR operation, and was presumed sunk.

1.4 Injuries and fatalities

Table 2 shows the position each person held on board the *Silver Condor*, the personal protective equipment each person was wearing when they entered the water, how people were grouped in the water, and the injuries resulting from the occurrence.

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9 People who have been subject to prolonged cold water exposure without adequate protection such as a functional immersion suit risk post-rescue collapse. This phenomenon is linked to a sudden shock or cardiac arrest due to a collapse of blood pressure after being pulled from the water. (Source: NATO Research and Technology Organization, "Survival at Sea for Mariners, Aviators and Search and Rescue Personnel" [February 2008], p. 3-7.).

Table 2. Personal protective equipment each person was wearing, how they were grouped in the water, and their injuries

Position on board	Equipment	Grouping	Injury
Master	Immersion suit (partially donned)	Alone	Hypothermia (fatal)
Mate	Immersion suit	With deckhand 1	Hypothermia
Deckhand 1	Life jacket	With the mate	Hypothermia (fatal)
Deckhand 2	Immersion suit (partially donned)	Alone	Hypothermia (fatal)
Deckhand 3	Immersion suit	With the observer	Hypothermia, broken hand
The observer	Immersion suit	With deckhand 3	Hypothermia

When the master and deckhand 2 were recovered, their immersion suits were partially zipped up and their hoods were not donned.

1.5 Personnel experience and certification

The master held a valid certificate for Fishing Master, Third Class. The master also obtained a Restricted Operator's Certificate – Maritime Commercial (ROC-MC) in 2006 and completed Marine Emergency Duties (MED) A1 training in 2001. The master's Transport Canada (TC) medical certificate restricted him from performing watchkeeping duties.

The master had sailed on the *Silver Condor* as a deckhand until he obtained a certificate for Fishing Master, Fourth Class, in March 2001 and began sailing as master of the vessel. In 2018, the master became the vessel owner.

The mate held a valid certificate for Fishing Master, Fourth Class. He also held a valid ROC-MC certificate and had completed MED A2 training. He had worked mainly on the *Silver Condor* since 2014. He also oversaw lower deck operations.

Deckhand 1 held a valid certificate for Fishing Master, Fourth Class. He also held a valid ROC-MC certificate and had completed MED A2 training. Deckhand 1 had been working as a fish harvester on various vessels since 2015. In 2022, he began working on the *Silver Condor*.

Deckhand 2 held a valid certificate of service as Watchkeeping Mate for a fishing vessel of less than 24 m in length overall. He also held a valid ROC-MC certificate and had completed MED A1 training. Deckhand 2 had over 40 years of experience as a fish harvester and had worked mainly on the *Silver Condor* since 1983, where he was in charge of engine room inspections and ensuring that mechanical maintenance was carried out. Deckhand 2 also carried out watchkeeping duties.

Deckhand 3 was a non-certified crew member working on board the *Silver Condor* at the time of the occurrence; he usually worked on a different fishing vessel. He had worked as a fish harvester since 2017.

Before the occurrence voyage, the *Silver Condor* contracted Biorex Inc. to provide an observer on behalf of DFO. The observer was not involved in the *Silver Condor*'s fishing operations. Her primary duty was to ensure the catch met the requirements of the vessel's experimental fishing licence. She completed online MED training in October 2022.

1.6 Vessel certification

The *Silver Condor* was issued by TC a safety inspection certificate on 30 March 2023, with a limited validity of 2 months to correct outstanding deficiencies. The vessel was certificated for near coastal voyages, Class 1, limited to home-trade 2 voyages. At the time of the occurrence, the vessel was engaged in a near coastal voyage, class 1. The vessel was also certificated to harvest groundfish, excluding herring and capelin. The safety inspection certificate expired on 30 May 2023 and was not renewed.

DFO granted the *Silver Condor* a licence to fish for experimental purposes on 30 August 2023. The licence was valid until 31 October 2023. The licence allowed the master and crew of the vessel to harvest redfish, which is categorized as a type of groundfish.

The *Silver Condor*'s 2023 safe manning document indicated that the vessel required a 2-watch arrangement. During periods of darkness, 2 crew members were required to be on watch.[10]

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[10] Transport Canada, SOR/2007-115, *Marine Personnel Regulations* (as amended 20 December 2023), paragraph 216(2)(b). See also Transport Canada, Ship Safety Bulletin 07/2017: Deck Watch Requirements for all Canadian & Foreign Vessels, Including Tug Boats Operating in Waters Under Canadian Jurisdiction (29 September 2017), at https://tc.canada.ca/en/marine-transportation/marine-safety/ship-safety-bulletins/deck-watch-requirements-all-canadian-foreign-vessels-including-tug-boats-operating-waters-under-canadian-jurisdiction-ssb-no-07-2017 (last accessed on 16 October 2025).

Other findings

At the time of the occurrence, the vessel's safety inspection certificate issued by TC was expired. The certificate was not valid when DFO granted an experimental fishing licence to the vessel.

The master had been medically restricted from performing watchkeeping duties. However, during the occurrence voyage, he kept watch alone during the day and at night when the *Marine Personnel Regulations* (MPR) require a certified watchkeeper and 1 other crew member to be on watch during periods of darkness.

1.7 Environmental conditions

At 1530 on 24 September, Environment and Climate Change Canada issued a marine weather forecast for the Northeast Gulf area. The forecast was for light winds increasing to northeasterly winds of 15 knots early in the evening, increasing to 30 knots around midnight, and diminishing to northerly winds of 15 to 20 knots on the morning of 25 September. Showers were expected to begin the evening of the 24 September and to end the morning of 25 September.

The sun set at 1749 on 24 September and the sun rose at 0545 on 25 September.

The SAR units reported the weather on site as northeasterly winds of 23 knots and waves of an average height of 2 to 3 m, with good visibility through the rain. The water temperature was reported by SAR units as 10 °C.

1.8 Cold water immersion

Entering cold water without the protection of a properly donned immersion suit, especially if the water is below 15 °C, may trigger an initial cold water shock response that causes a person to gasp for air. The added buoyancy offered by an immersion suit, a personal flotation device[11] (PFD), or a life jacket may prevent drowning during initial cold water shock by keeping the person's mouth away from the surface of the water and preventing water inhalation.

A person who experiences cold water shock without an insulating layer is prone to cold incapacitation, which reduces meaningful movement[12] and the ability to swim. Hypothermia can occur quickly depending on water temperature; activities such as swimming increase heat loss and speed up the onset of hypothermia. This can lead to

11 Standard life jackets are designed to be donned before abandoning ship. Once in the water, a standard life jacket will keep a person buoyant and right them should they turn over. Personal flotation devices (PFDs) are designed for constant wear, provide basic buoyancy, and may have limited capability to turn a person in the water.

12 Canadian Safe Boating Council, "Cold Water Awareness," at https://csbc.ca/en/1-10-1-principle (last accessed on 16 October 2025).

further incapacitation and death. While the person in the water waits for rescue, protection from the elements is essential to survival (Table 3).

Table 3. The effect of life-saving equipment on survival at sea, at different stages of cold water immersion and rescue (Source: TSB)

Stage of immersion/rescue	Life raft	Immersion suit	Life jacket/PFD	No equipment
Cold water entry	Reduced or no exposure time in water	Enters water	Enters water	Enters water
Initial cold water shock	Prevents/reduces cold water shock response	Prevents onset of cold water shock response and keeps a person afloat	Keeps head/mouth above surface when gasping	Gasping, water intake, cardiac response
Psychological response	Reduces threat to life, potentially reducing stress response	Reduces threat to life, potentially reducing stress response	Some reduction in threat to life, may reduce stress response	Immediate threat to life, stress exacerbates cold water shock response
Cold water incapacitation	Prevents/reduces cold effects	Delays onset of cold effects	Keeps a person afloat after loss of swimming ability and dexterity	Erratic breathing, loss of swimming ability, shivering
Hypothermia	May significantly delay effects if the person remains dry	May significantly delay effects if the person remains dry	Hypothermia onset – reduced chance of survival	Hypothermia onset – unlikely to survive
Rescue from distress signal*	Likely to survive	Likely to survive	Reduced chance of survival	Unlikely to survive

* A distress signal may be received through radio communication sent during emergency preparations, personal locator beacons, or float-free EPIRBs.

1.9 Life-saving equipment

TC regulations regarding vessel emergency preparedness require, among other things, the carriage of life-saving equipment and distress-alerting devices as well as the provision of procedures on how to safely operate the vessel and deal with emergencies.[13, 14,15] Life-saving equipment, such as life jackets and immersion suits (when required), must be available for all personnel on board and are normally stowed in the crew accommodations. Immersion suits are equipped with lights and whistles to aid rescue. Life jackets are equipped with a

[13] Transport Canada, C.R.C., c. 1486, *Fishing Vessel Safety Regulations* (as amended 20 December 2023), Division 2.

[14] Government of Canada, *Canada Shipping Act, 2001* (S.C. 2001, c. 26, as amended 30 July 2019), subsection 106(1).

[15] Transport Canada, SOR/2020-216, *Navigation Safety Regulations, 2020* (as amended 06 October 2021).

whistle and a light holder, but there is no requirement for vessels that are less than 24 m in length to carry life jackets that have a light.

1.9.1 Life jackets

Life jackets will prevent drowning by providing flotation and keeping a person's mouth away from the surface of the water during initial cold-water shock and cold incapacitation stages. The *Silver Condor* carried 6 life jackets, which were stowed in the crew accommodations.

1.9.2 Immersion suits

Marine immersion suits are designed to keep a person buoyant, relatively warm, and dry. Immersion suits can prevent drowning, reduce the effects of cold water shock, and delay the onset of cold incapacitation and hypothermia. An immersion suit's effectiveness depends on how well it fits the wearer and whether it was correctly donned. To don an immersion suit correctly and in a timely manner, and for the wearer to benefit from the protection it can provide, they must perform a sequence of steps in a particular order. Each manufacturer issues instructions on how to properly don their immersion suits.

When an immersion suit is not correctly donned, once in the water it will not provide thermal protection because water will enter the suit. If air becomes trapped in the suit's legs and feet, they balloon and float to the surface, which may cause the wearer's head to become submerged. In 2000, TC issued a ship safety bulletin indicating that drills afford an opportunity for crew members to practise donning their immersion suits, to ensure that the suits are of an appropriate size, and to ensure that the suit zippers are properly lubricated.[16] In 2019, TC issued an additional ship safety bulletin on safety measures concerning life-saving appliances, to remind crew members of the importance of visually inspecting the immersion suits after each boat drill and trying on the immersion suits before each departure to confirm the fit.[17]

The *Fishing Vessel Safety Regulations* (FVSR) require fishing vessels of any length engaged in near coastal voyages, Class 1, to carry an immersion suit of an appropriate size for each person on board.[18] The observer brought on board an immersion suit of the appropriate size for her, which her employer had provided. In this occurrence, because there was not

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[16] Transport Canada, Ship Safety Bulletin 11/2000: Marine Abandonment Immersion Suit Systems (19 September 2000), at https://tc.canada.ca/en/marine-transportation/marine-safety/ship-safety-bulletins/bulletin-no-11-2000 (last accessed 16 October 2025).

[17] Transport Canada, Ship Safety Bulletin 05/2019: Safety measures concerning life-saving appliances (19 March 2019), at https://tc.canada.ca/en/marine-transportation/marine-safety/ship-safety-bulletins/safety-measures-concerning-life-saving-appliances-ssb-no-05-2019 (last accessed 16 October 2025).

[18] Transport Canada, C.R.C., c. 1486, *Fishing Vessel Safety Regulations* (as amended 20 December 2023), subsection 3.28(1).

enough time to retrieve this suit from her cabin, she donned an immersion suit that was not appropriately sized for her. As a result, cold water entered her suit and exposed her to the risk of hypothermia.

1.9.3 Life rafts

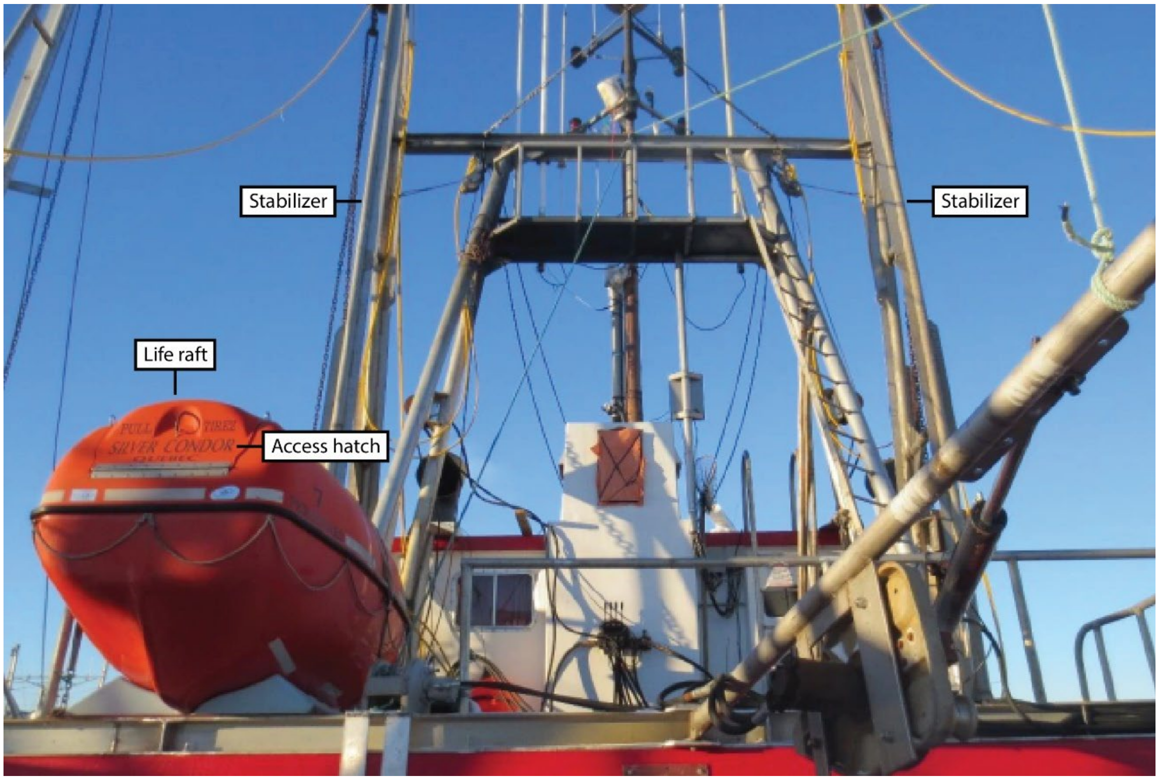
Life rafts are designed to provide crew with a means of protection from the elements while awaiting rescue. If accessed immediately, life rafts will prevent drowning and cold-shock effects, and reduce the onset of any cold incapacitation and hypothermia. For life rafts to be effective, crew members need to know how, and be physically able, to move and deploy them quickly. It is therefore important that crew members are regularly briefed on and/or practice deploying their vessel's life raft.

Life rafts with HRUs will deploy without crew intervention, should the crew be unable to reach the raft for manual deployment. An HRU is designed to activate when submerged in water, and its activation depends on the vessel capsizing or sinking to a certain depth (approximately 4 m of water). Submersion to the required depth could take anywhere from several minutes to several days, which may leave people in the water in the meantime.

The *Silver Condor*'s life raft was a 7-person rigid life raft, made by Ovatek Inc., that included an HRU and a positioning light that could be activated by pulling the battery cord. The life raft was stowed behind the vessel's wheelhouse on the port side, with fishing gear overhead (Figure 8). The investigation determined that the life raft was positioned so that its access hatch extended slightly over the aft edge of the upper deck and could not easily be reached by the vessel's complement. To safely enter the life raft, the vessel complement would need to lift[19] it from its cradle and reposition it so that it could be boarded from the upper deck. The life raft was last inspected by TC in March 2023.

19 The Ovatek Inc. 7-person rigid life raft weighed approximately 182 kg.

Figure 8. View of the Silver Condor's aft upper deck showing the vessel's life raft with fishing gear (including ropes, wires, and stabilizers) overhead (Source: Third party, with permission and with TSB annotations)



The life raft was not spotted during the SAR operation; it was recovered by a fishing vessel 8 days after the occurrence.

1.10 Marine radio communications in Canada

The Global Maritime Distress and Safety System (GMDSS) was developed through the IMO and implemented globally in 1999. GMDSS receives and transmits maritime distress signals from around the world, providing an international distress alerting system via satellite and DSC technology.

There are 4 international sea areas under the GMDSS, and Canada is covered by sea areas A1, A3, and A4. The minimum requirements for a vessel's communications equipment are determined by the sea area in which it operates. Canada's *Navigation Safety Regulations, 2020* define the sea areas as follows:

> ***sea area A1*** means an area within the radiotelephone coverage of at least one VHF coast station in which continuous DSC alerting is available.
>
> ***sea area A2*** means an area, excluding sea area A1, within the radiotelephone coverage of at least one medium frequency (MF) coast station in which continuous DSC alerting is available.

> ***sea area A3*** means an area, excluding sea area A1 and sea area A2, within the coverage of a mobile-satellite service that is recognized by the IMO and supported by the ship earth station carried on board in which continuous alerting is available.
>
> ***sea area A4*** means an area outside of sea area A1, sea area A2 and sea area A3.[20]

In Canada, radio communications for marine operations is overseen by 3 federal departments: TC, the Canadian Coast Guard (CCG), and Innovation, Science and Economic Development Canada (ISED).

The *Navigation Safety Regulations, 2020* also set the requirements for radio equipment on board a vessel, depending on the vessel's size and area of operation, as well as the requirements for the equipment's use and maintenance. Under these regulations, the Gulf of St. Lawrence (which is also the area of the occurrence), is considered sea area A1.

The CCG is responsible for shore-based radio communications, including coast stations and shore-based antennas, as well as inspecting radio facilities aboard vessels of 20 m in length or more. ISED manages Canada's radio frequency spectrum and is responsible for providing access to radio frequency bands, certifying radio operators, and providing guidelines on proper radio communication language.

The CCG publishes a guide entitled *Radio Aids to Marine Navigation*[21] and updates it annually; it summarizes relevant information regarding radio communications, procedures, and reporting requirements in Canada, and provides a map of the 3 sea areas in Canadian waters (Figure 9).

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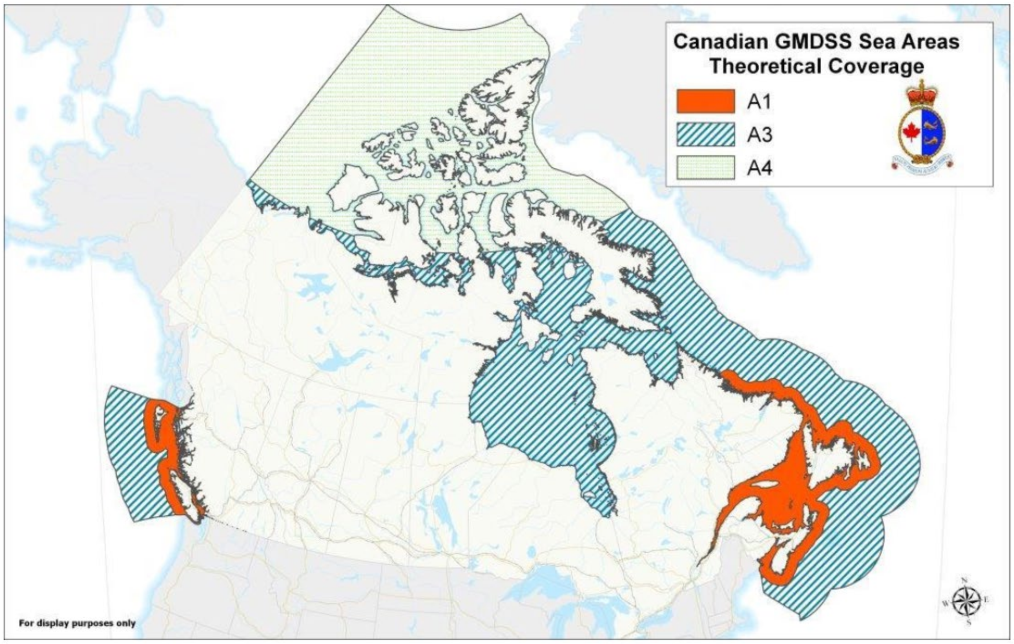
20 Transport Canada, SOR/2020-216, *Navigation Safety Regulations, 2020* (as amended on 20 December 2023), section 200, Definitions.

21 Fisheries and Ocean Canada, Canadian Coast Guard, *Radio Aids to Marine Navigation 2025 (Atlantic, St. Lawrence, Great Lakes, Lake Winnipeg, Arctic and Pacific)* (January 2025), at https://www.ccg-gcc.gc.ca/publications/mcts-sctm/ramn-arnm/index-eng.html (last accessed on 16 October 2025).

Figure 9. Map showing Canadian sea area coverage (Source: Canadian Coast Guard, Radio Aids to Marine Navigation 2025)

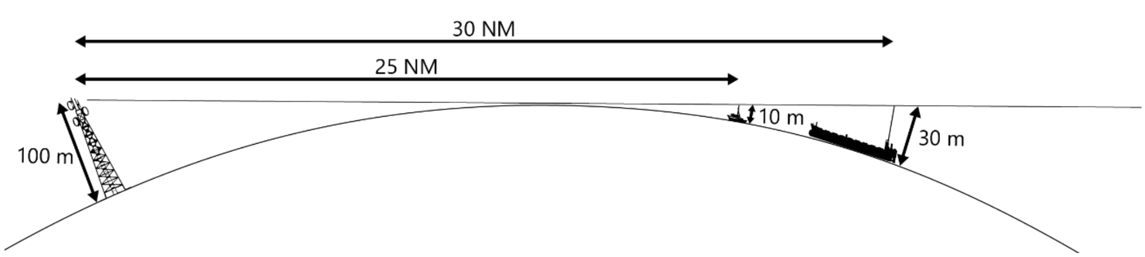


1.10.1 Very high frequency radiotelephone communication

In sea area A1, vessel operators use VHF radiotelephones to communicate with each other and with coast stations. VHF radiotelephones use a line-of-sight transmission, which means the radio waves travel in a straight line and do not propagate past the horizon.

Because a vessel's VHF radiotelephone transmissions occur over the water, the line of sight is mainly limited by the curvature of the earth, the height of the vessel's antenna above water, and the height of the receiving antenna (Figure 10). For a vessel with an antenna 30 m above water, that line of sight would usually be between 29 NM and 33 NM in the best conditions.

Figure 10. Illustration of line of sight between a shore-based antenna and vessel antennas, based on height (Source: TSB)



In heavy seas, a vessel will pitch and roll, which causes the vessel's antenna and the shore-based antenna to become misaligned (Figure 11) and reduces the effectiveness of the signal. Waves also raise and lower a vessel, which increases and decreases the line-of-sight range.

Figure 11. Diagram showing vessel and shore-based antennas misaligned in heavy seas (Source: TSB)

Radio equipment maintenance can also alter the distance a radio signal will travel. If corrosion accumulates on the connection between the power source and radio antenna, this can result in diminished transmission power and can reduce the distance the signal will travel.

1.10.2 Distress alerting using a very high frequency radiotelephone with digital selective calling

Distress alerting with a voice call over VHF channel 16 is the most common way for mariners to let the nearby vessels and coast stations know they are in danger and require immediate help. Like other VHF communication, the distance a distress transmission travels is based on line of sight and is most effective when the transmitting and receiving antennas are aligned in parallel.

A DSC distress alert is a digital transmission that has a greater range than a voice transmission made over VHF radiotelephone. The digital nature of the distress alert also avoids the potential for broken or dropped voice transmissions. When a DSC distress alert reaches another vessel that is equipped with a VHF-DSC radiotelephone, that vessel's radiotelephone will emit an audible alarm and switch to channel 16 to increase the potential that a voice distress message may be heard.

Transmitting a DSC distress alert requires a VHF radiotelephone that is capable of producing a DSC signal and has been programmed with a vessel's maritime mobile service identity (MMSI). When a VHF-DSC radiotelephone is properly programmed, a distress signal will be transmitted after the DSC button has been pressed as per the manufacturer instructions. A DSC distress alert will repeat until it is cancelled by the initiating user or acknowledged by a receiver. All of these features help maximize the potential for a response.

MCTS monitors DSC frequencies at all times and alerts the appropriate rescue coordination centre when a distress alert is received.

1.10.3 Very high frequency shore-based coverage

The CCG's *Radio Aids to Marine Navigation 2023* includes maps showing the predicted radio coverage of CCG shore-based antennas that broadcast messages on VHF channel 16 (Figure 12). The VHF radiotelephone should be the primary means of communication in a marine emergency because it allows all SAR units in the area to receive critical information at the same time.

Figure 12. Map showing predicted radio coverage for the Canadian Coast Guard's shore-based antennas along Canada's Atlantic coast. The Silver Condor's last known position is indicated with a star. (Source: Canadian Coast Guard, Radio Aids to Marine Navigation 2023, with TSB annotations)

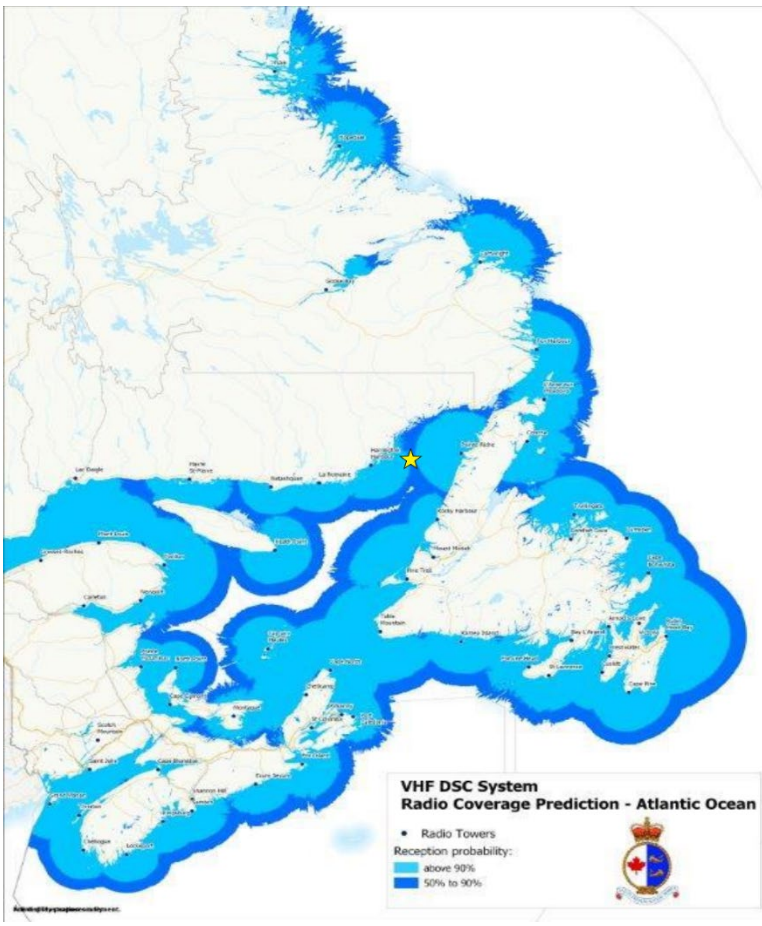


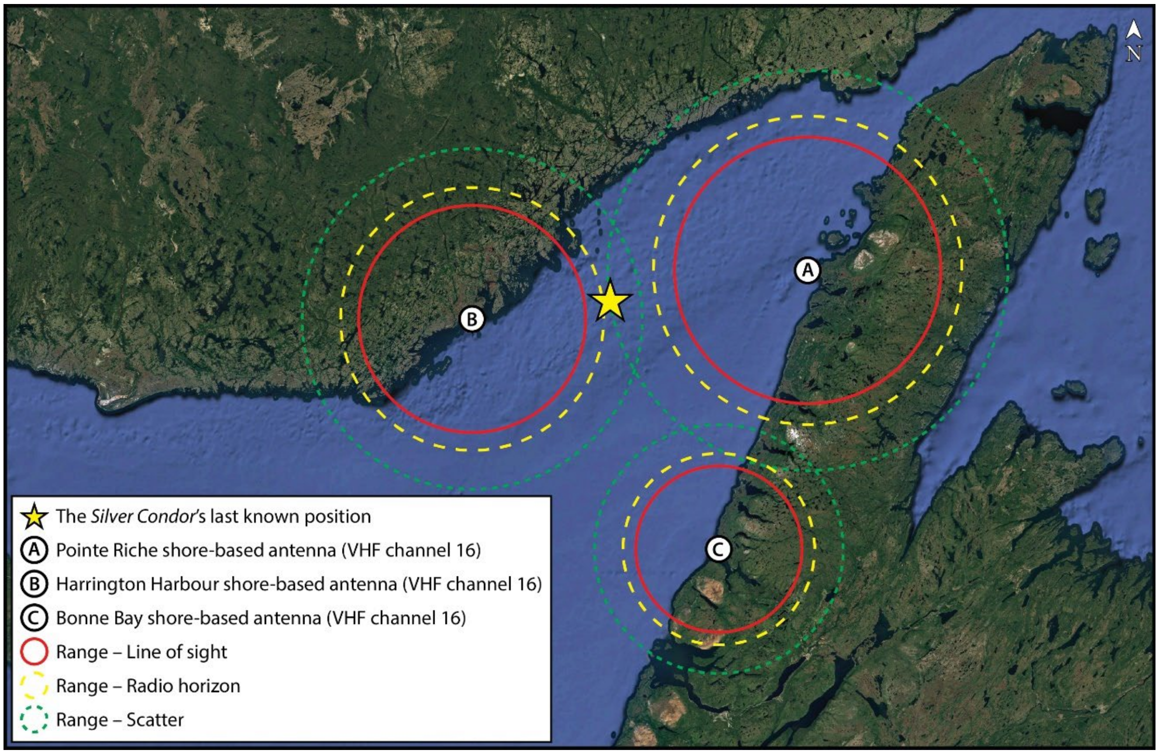
Figure 12 also shows areas within sea area A1 that are not covered by a shore-based radio antenna. The occurrence involving the *Silver Condor* took place in sea area A1 with a predicted 50% to 90% shore-based antenna coverage.

The TSB laboratory reviewed the transmission and receiving power for the CCG's shore-based antennas in the area of the occurrence, to assess the likelihood that a vessel near the *Silver Condor*'s last known position would have received a transmission from 1 of those shore antennas.

The TSB laboratory's review also determined that the *Silver Condor* was in an area where communication between the vessel and the Harrington Harbour antenna over VHF channel 16 could have been successful (Figure 13). Radio communication between the Pointe Riche antenna and the vessel was possible, but would not have been reliable.

It is important to note that Harrington Harbour and Pointe Riche antennas only monitor VHF channel 16 and are not equipped to listen to VHF channels 6 and 10, which are most commonly used by fish harvesters for their operations.

Figure 13. Map of CCG shore-based antenna coverage in the area of the occurrence (Source: Google Earth, with TSB annotations)



The transmission range of a shore-based VHF station is approximately 40 NM.[22] Following the occurrence, it was determined that the antenna at Harrington Harbour was approximately 33 NM from the vessel's last known position, and the antenna at Pointe Riche was approximately 46 NM from the vessel's last known position.

The TSB laboratory could not determine how far the *Silver Condor*'s VHF signal could travel at the time of the occurrence, because the vessel was lost and the relevant data could not be collected.

The investigation could not determine if the vessel's VHF distress signal was received by another radio station.

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22 Fisheries and Oceans Canada, Canadian Coast Guard, "Global Maritime Distress and Safety System," at https://www.ccg-gcc.gc.ca/search-rescue-recherche-sauvetage/distress-sys-detresse-eng.html (last accessed on 16 October 2025).

1.10.4 Radio requirements for the *Silver Condor*

According to the *Navigation Safety Regulations, 2020,* vessels over 8 m are required to be fitted with a VHF-DSC radiotelephone that can transmit an automatic distress message at the push of a button when any part of the voyage is in sea area A1. The regulations also require that vessels maintain a radio record (also known as a radio log book) on board. TC has published TP 13926,[23] which contains information for mariners regarding radio operations and maintenance, as well as templates they can use to maintain the required records. This includes the recording of the date and time of routine checks, such as the testing of the EPIRB battery every 6 months.

The *Navigation Safety Regulations, 2020* also require that a card of instructions[24] be visibly displayed near the vessel's radio installation for crew members to readily access information on how to send various types of distress signals efficiently and effectively. The investigation could not determine if the required card was displayed near the vessel's radio installation.

For fishing vessels under 20 m in length, TC inspectors inspect a vessel's radio equipment and records as part of the vessel's periodic safety inspection. The investigation determined that TC inspectors generally verify that a vessel has radio equipment and that the equipment is registered. TC inspectors are not provided with guidelines to verify if a vessel is in compliance with all the regulatory requirements for radio equipment carriage, installation and maintenance.

The radio equipment on board the *Silver Condor* met the regulatory requirements for the vessel's size and area of operation at the time of the occurrence. A radio log book was not maintained or kept on board the *Silver Condor*, and the investigation was unable to determine how well the radio equipment on board the *Silver Condor* was installed and maintained.

1.11 Additional distress-alerting devices

1.11.1 Emergency position indicating radio beacons

When activated in an emergency, an EPIRB alerts the Cospas-Sarsat system. TC requires vessels like the *Silver Condor* to carry an EPIRB.[25]

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[23] Transport Canada, TP 13926E, *Radio Log Book for Canadian Flag Vessels*, at https://tc.canada.ca/sites/default/files/migrated/tp13926e.pdf (last accessed on 16 October 2025). Note that this publication refers to TC's *Ship Station (Radio) Technical Regulations, 1999*, which have been incorporated into the *Navigation Safety Regulations, 2020*.

[24] Transport Canada, SOR/2020-216, *Navigation Safety Regulations, 2020* (as amended on 20 December 2023), section 214: Main operating position requirements.

[25] Ibid., section 209: Float-free EPIRB.

EPIRBs can be manually activated by personnel on board a vessel in case of an emergency. Familiarization, procedures, and safety drills conducted on board vessels can inform the crew of the importance of activating the EPIRB as soon as possible in an emergency.

Some EPIRBs are fitted with an HRU that allows the EPIRB to float free of a vessel when the vessel has been submerged; this type of EPIRB automatically transmits a distress signal when it floats to the surface. When a Canadian vessel carries an EPIRB, the authorized representative must register the beacon. A non-registered EPIRB will still transmit a signal, but a SAR deployment may be delayed as the SAR authorities try to determine who owns the EPIRB and confirms that a vessel is at sea and is not responding to radio calls.

The *Silver Condor* carried a float-free automatic EPIRB. The EPIRB was registered to the owner of the vessel. During the occurrence, the EPIRB automatically released, floated free, and transmitted a signal as designed and expected.

1.11.2 Very high frequency digital selective calling radiotelephone

VHF-DSC radiotelephones can transmit an automatic distress alert at the push of a button.[26] If the VHF-DSC radiotelephone is installed and programmed with the vessel's MMSI, the distress alert will automatically provide recipients with the vessel's identification information and the time the alert was activated. If the VHF-DSC radiotelephone is integrated with the vessel's GPS, the vessel's position will also be transmitted.

Although it was not possible to recover the *Silver Condor*'s radio equipment, the investigation determined that the vessel was equipped with an Icom IC-M424G radio. This radio model is capable of producing a DSC signal and has an internal GPS. The investigation could not determine if the vessel's VHF-DSC radiotelephone was programmed with the vessel's MMSI, or if the antenna for the GPS was mounted in an optimal area per the radio manufacturer's recommendation. The investigation could not determine if the button to send an automatic distress message was pressed during the occurrence.

1.12 Safety procedures and drills

The FVSR require ARs of fishing vessels like the *Silver Condor* to establish written safety procedures and to familiarize personnel on board with those procedures.[27] The safety procedures must cover, among other things,

- the location and use of all safety equipment;
- measures to maintain a vessel's watertightness and weathertightness to prevent flooding;

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[26] Ibid., subsection 204(1).

[27] Transport Canada, C.R.C., C. 1486, *Fishing Vessel Safety Regulations* (as amended 20 December 2023), subsection 3.16(1).

- measures for safe loading, stowage, and unloading of fish catches, baits, and consumables; and
- measures to prevent overloading the vessel.

The FVSR also specify that drills on the safety procedures must be held to ensure crew members are proficient in carrying out the procedures, and that a record of each drill must be kept for 7 years.[28]

1.12.1 Safety drills

Emergencies typically represent stressful, high-workload situations in which people have limited time to process various types of critical information, make decisions, and adapt their actions accordingly. These increased stress levels and high workloads can adversely affect performance by reducing an individual's ability to perceive and evaluate cues from the environment, thereby reducing the ability to assess the situation and select the best action to take in a timely manner.

Having situational awareness is critical for good decision making. Situational awareness refers to "the perception of elements in the environment within a volume of time and space, the comprehension of their meaning, and the projection of their status in the near future."[29]

In an emergency, a crew member may face a situation that is neither typical nor included in any procedures, or training they may have received. Stressful, high-workload situations, including life-threatening situations, can affect human performance and result in reactions ranging from being distracted to taking inappropriate action or making panicked decisions. Training and safety drills that include realistic scenarios are important because they allow crew members to acquire the knowledge and skills necessary to respond to an emergency effectively, especially under challenging conditions. Realistic scenarios might include different conditions, such as darkness, noise, missing crew members, and damaged equipment, or these scenarios might be combined. Regular practice through training and safety drills also improves proficiency by reinforcing lessons learned.

The crew of the *Silver Condor* conducted safety drills annually, at the beginning of every fishing season. The drills comprised abandon ship and fire drills, recovering and donning immersion suits, and re-familiarizing crew with the life raft operations. The vessel's safety equipment was inspected at the same time as the drills were carried out. All records of drills and maintenance were lost with the vessel.

Familiarization of the observer on the *Silver Condor* consisted of a walk around the vessel to show her where the firefighting and life-saving appliances were located.

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[28] Ibid., subsections 3.16(2) to 3.17(1).

[29] M. Endsley, "Toward a Theory of Situation Awareness in Dynamic Systems," *Human Factors: The Journal of the Human Factors and Ergonomics Society*, Vol. 37, Issue 1 (1995), p. 36.

1.13 Vessel stability

The stability of a vessel is its tendency to return to its original position after it has been inclined due to external forces such as wind or waves. Stability is a fundamental component of a vessel's seaworthiness. It is important that vessel operators understand the characteristics and limitations contained in the stability booklet of their vessel.

The ability of a vessel to return to an upright position after being inclined by any external force depends on the locations of 3 points: metacentre (M), centre of gravity (G), and centre of buoyancy[30] (B) (figures 14 and 15). M is the point at which an imaginary vertical line passing through B and an imaginary vertical line passing through G intersect at low angle. G is the point at which the weight of a vessel acts vertically downward. G remains fixed in its location unless weight moves. B is the point at which the buoyant force of the water acts upward. In calm water, G and B are vertically aligned and in equilibrium.

Figure 14. Cross-section of a vessel in an upright position, illustrating stability (Source: TSB)

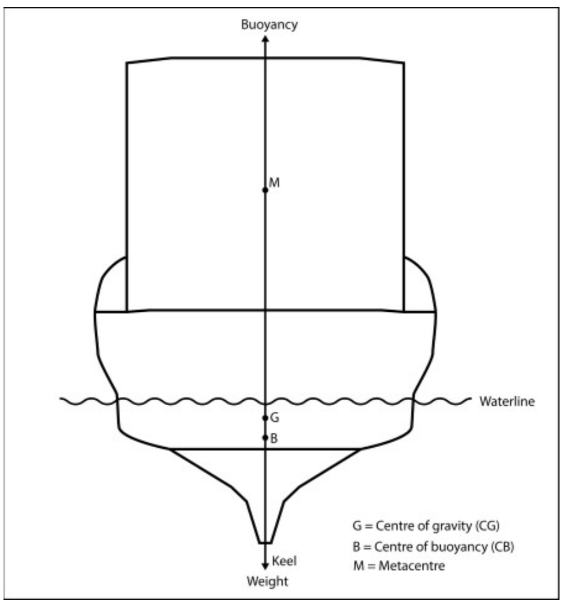
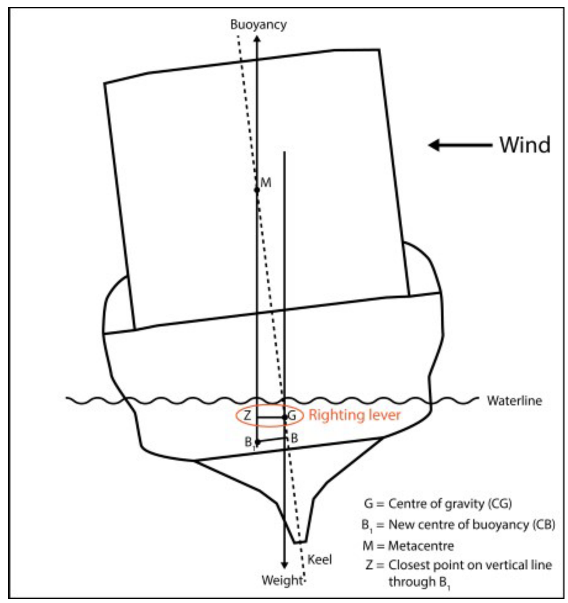


Figure 15. Cross-section of a vessel inclined by an external force, illustrating stability (Source: TSB)



When a vessel rolls, B will move because the immersed volume of the hull changes. The forces of B and G are still equal, and both continue to act vertically. The new location of B is labelled B_1. The horizontal line between G and the vertical line through B_1 is called GZ, which is known as the righting arm, or righting lever. The righting lever and the vessel's weight create the righting moment, which is acting to return the vessel to the equilibrium position after it is inclined. In general, the righting lever increases to some maximum value and then decreases as the vessel heels further.

30 Buoyancy is an upward force exerted by a fluid that opposes the weight of a partially or fully immersed object. It is an upward thrust which enables bodies to float over a fluid without sinking.

1.13.1 Risk factors affecting stability

There are several factors that can adversely affect a vessel's stability, such as overloading (which reduces freeboard and reserve buoyancy), the effects of modifications to the vessel, and external forces created by wind and sea conditions. Understanding how different factors affect stability is important for estimating risks. For example, how the weather and seas affect a vessel's stability depends on the directions of the wind, current, and waves relative to the heading of the vessel.

1.13.1.1 Freeboard and reserve buoyancy

Freeboard is the distance between a vessel's waterline and its main deck. Reserve buoyancy is the volume of a vessel's enclosed space above the waterline that can be made watertight. An increase in freeboard also increases a vessel's reserve buoyancy, which creates better stability. Any additional weight decreases freeboard, which in turn decreases reserve buoyancy; this is especially true on small vessels, where even small increases in weight can have a significant impact on freeboard. A stability assessment will determine the maximum weight to be carried on board so the vessel will maintain a safe freeboard and reserve buoyancy.

Without a means to determine the weight carried on board, crew members working on fishing vessels like the *Silver Condor* have to rely on experience to safely load their vessels, basing their estimations on volume stored in the fish holds.

1.13.2 Vessel stability assessment

Under the FVSR, some fishing vessels are required to undergo a stability assessment. All fishing vessels are required to have a record of modifications made to the vessel that affected its stability, and to have written safety procedures. New fishing vessels (built after 13 July 2017) that undergo a full stability assessment are also required to have a stability notice posted in a conspicuous location that indicates the practices needed to operate those vessels within their safe operating limits.[31] These vessels are also required to be permanently marked, forward and aft, with draft marks or other means of accurately identifying the vessel draft.[32]

As an interim measure for existing fishing vessels, TC published Ship Safety Bulletin 04/2006,[33] which sets out the process for determining whether a small fishing vessel requires a stability booklet and how to obtain one. The *Silver Condor* was required to

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31 Transport Canada, C.R.C., c. 1486, *Fishing Vessel Safety Regulations* (as amended 20 December 2023), section 3.6.

32 Ibid., section 3.62.

33 Transport Canada, Ship Safety Bulletin 04/2006: Safety of Small Fishing Vessels: Information to Owners/Masters about Stability Booklets (07 March 2006), at https://tc.canada.ca/en/marine-transportation/marine-safety/ship-safety-bulletins/bulletin-no-04-2006 (last accessed 16 October 2025).

have a stability booklet after completing a stability information questionnaire provided by TC.

In 2011, the *Silver Condor* underwent an inclining experiment, and a stability booklet for crab and shrimp harvesting was then developed for the vessel by a naval architecture firm and approved by TC in 2012.

When the stability booklet was being developed, the vessel owner at that time informed the naval architecture firm of the crew's usual practice for loading shrimp on the vessel, which included loading the fish hold with 15 metric tons (t) of ice before departure. The vessel owner at that time estimated the vessel's maximum load to be 27 t per voyage. The firm's stability assessment demonstrated that this quantity exceeded the vessel's stability limits.

The stability booklet included a section entitled Notes to Master that indicated, among other things, the loading particulars for shrimp operations, including the weight of the crew, equipment, and ice to be loaded on board before departure. The booklet considered a crew of 4 and 12 t of ice at departure (with the assumption that at least 2 t of ice would melt during the voyage). It also specified that a maximum weight of 22.68 t of shrimp could be safely loaded on board, and that no catch was to be carried on deck. Finally, the booklet indicated that the minimum freeboard for shrimp operations should be 430 mm at all times, measured from the top of the main deck down to the water.

One of the conditions in the stability booklet described the vessel departing the fishing ground with a full load of shrimp and the ice required to keep the shrimp cool, with 10% of the maximum amount of fuel and fresh water remaining in the vessel's tanks. The vessel's maximum load of shrimp and ice combined was 32.7 t (consisting of approximately ⅔ shrimp and ⅓ ice). This was the condition that most closely resembled the likely configuration of the *Silver Condor* at the time of the occurrence.

The investigation could not determine if a stability notice was posted on board at the time of the occurrence to inform the crew of the vessel's stability limits as stated in the stability booklet. In 2012, the vessel's engine and transmission were replaced; however, the resulting change in weight was not reported to TC and a new stability assessment was not carried out. Unlike new fishing vessels, the *Silver Condor* was not required to have a stability notice posted in a conspicuous location or to be permanently marked with draft marks.

1.13.2.1 Redfish stability assessment

In 2022, the *Silver Condor* was granted a licence to harvest redfish as part of DFO's Experimental Fishing Plan Unit 1 Redfish, a project to obtain data on the sustainability of reopening the region's redfish fishery. In August 2023, the vessel owner obtained a 2nd licence allowing him to continue harvesting redfish under this project. The requirements for the licence consisted of submitting an application form that stated that the vessel was able to meet the eligibility criteria[34] and that the vessel was registered with TC as a fishing vessel. The 2023 licence authorized the vessel's owner to harvest up to 93 t during the validity period from 30 August to 31 October 2023. The master planned to meet the quota over the course of 3 fishing trips during the 2023 fishing season.

On the 1st fishing trip of the 2023 season, which occurred from 04 September to 07 September 2023, the crew estimated the catch at around 25 t of redfish with an additional 0.63 t of incidental catch stored in a commercial fishing tote on deck. The vessel's landing data, provided by DFO, indicates 29.72 t of redfish and 0.605 t of incidental catch. These weights exceed the limitation of 22.68 t defined in the *Silver Condor*'s stability booklet.

Based on these numbers, the TSB conducted a stability assessment and calculated the vessel's freeboard for the load of redfish caught during the vessel's 1st fishing trip of the 2023 season. The assessment focused on the portion of the stability booklet specific to shrimp because shrimp and redfish are of similar density.[35] The assessment determined that the vessel's freeboard at the time was 331 mm, measured from the top of the main deck down to the water. This means that the freeboard was 99 mm below the minimum freeboard of 430 mm allowed for safe loading, per the stability booklet.

Silver Condor crew members estimated that, at the time of the occurrence, they had caught and stored up to 36 t of redfish, with approximately 0.8 t of incidental catch stored in a commercial fish tote on deck.

1.13.2.1.1 Landing data for the 2022 redfish fishing season

The TSB also reviewed the *Silver Condor*'s landing data, provided by DFO, for the 2022 redfish fishing season. In total, the crew caught 76.56 t of redfish over the course of 3 fishing trips, which is an average of 25.521 t per trip. In contrast, the crew estimated a catch of 20 t for the 1st voyage, 21 t for the 2nd voyage, and 24 t for the 3rd voyage. This gives an estimated total of 65 t, which is 11.56 t lower than the landing data.

1.14 Risk perception and risk tolerance

Risk is a product of the frequency or likelihood of a hazardous event and the severity of the event's consequences.[36] Risk perception is a person's recognition or discernment of the level of risk inherent to a situation: a high level of risk for one person may be perceived as

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[34] Fisheries and Oceans Canada, "Experimental fishing plan Unit 1 Redfish – Spring 2025", at https://www.dfo-mpo.gc.ca/fisheries-peches/commercial-commerciale/atl-arc/management-plan-gestion/redfish-sebaste-eng.html (last accessed on 16 October 2025)

[35] Canadian Coast Guard Ship Safety Branch, TP 7301E, *Stability, Subdivision, and Load Line Standards* (January 1975), Appendix A.

[36] International Maritime Organization, MSC-MEPC.2/Circ.12/Rev.2, "Revised Guidelines For Formal Safety Assessment (FSA) For Use In The IMO Rule-Making Process" (09 April 2018).

low risk for another. Risk tolerance is the amount of risk that an individual is willing to accept in the pursuit of an objective.[37]

Risk perception and risk tolerance are largely subjective. The TSB's Safety Issues Investigation into Fishing Safety in Canada[38] showed that fish harvesters tend to have a high tolerance for risk.

1.14.1 Perception of vessel safety

Contemporary science on system safety has identified that fishing vessel accidents are usually the result of multiple factors that may include lapses on the part of the individuals closest to the work, as well as pressure from the fishing industry.

Various pressures on an operation can result in trade-offs between what is cost-effective or efficient and what is safe. The challenge with managing these competing pressures is that there is a feedback imbalance between these different elements. It is often easy to measure the cost savings or efficiencies gained by a given decision, but harder to quantify how much was borrowed from safety in service of those other goals.[39]

Overloading a vessel, changes in weather conditions, and distance from shore pose significant risks that must be managed when a vessel is in operation. However, these risks are not always considered by vessel operators. Several factors contribute to operators' perception of risk. Personal experience with hazardous situations can influence how dangerous the hazard is perceived to be; a person repeatedly performing a high-risk action without experiencing adverse consequences may eventually become desensitized to the risk.[40]

Previous TSB investigations[41] have found that vessel operators' perception of vessel safety can be influenced by a number of factors, including

- previous accident-free years, which reinforce the belief in the safety and success of their operation and cause operators to overestimate the vessel's stability;
- certificates, licences, and vessel examinations or surveys/inspections from governments, associations, and insurers that may be perceived more broadly as an overall indication of approval of the vessel's capacity to operate safely; and
- operators' confidence in their own skills, actions, and experience.

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37 M. Martinussen and D.R. Hunter, "Aviation Psychology and Human Factors," 2nd Edition (Taylor & Francis Group, 2018), pp. 297–301.

38 TSB Marine Investigation Report M09Z0001, Safety Issues Investigation into Fishing Safety in Canada.

39 S. Dekker, *Drift into Failure: From Hunting Broken Components to Understanding Complex Systems* (CRC Press, 2011), pp. 38–39.

40 J. Inouye, *Risk Perception: Theories, Strategies, and Next Steps* (National Safety Council, Campbell Institute), at https://www.thecampbellinstitute.org/wp-content/uploads/2017/05/Campbell-Institute-Risk-Perception-WP.pdf (last accessed 16 October 2025).

41 TSB marine transportation safety investigations M22P0259, M20P0229, and M02W0147.

Before this occurrence, the *Silver Condor* had

- over 40 years of successful voyages, including 1 season of redfish harvesting in 1992 (before major modifications were made to the vessel);
- conducted 4 successful redfish voyages (3 in 2022 and 1 in 2023);
- been certified by TC as a fishing vessel; and
- been surveyed by insurers and approved for insurance.

1.15 Fatigue

There are 6 risk factors[42] that can cause fatigue: acute sleep disruptions, chronic sleep disruptions, continuous wakefulness, circadian rhythm effects, sleep disorders and other medical and psychological conditions, and illnesses or drugs that affect sleep or sleepiness (Appendix A).

Disruptions to sleep or sleeping patterns in personnel occupying safety-critical roles can reduce performance and increase the risk of incidents and accidents. Fatigue has been shown to slow reaction time, increase risk taking, and reduce a person's ability to solve complex problems. It more generally affects attention, vigilance, and general cognitive functioning. The time of day has a particular effect on an individual's alertness and performance because the human body has circadian highs and lows. The circadian low occurs between approximately 0200 and 0600, when the body is normally more fatigued and prone to diminished alertness and degraded performance.[43]

If suddenly awoken, an individual may experience sleep inertia, which is "a period of confusion and decreased alertness, which consequently impairs the essential cognitive abilities of vigilance and alertness necessary for sound and rational decision making."[44] Although individual differences may vary, the effects associated with being suddenly awoken typically reflect degraded performance in complex tasks like decision making, due to the greater attentional load[45] required in decision-making process.

The MPR set the requirements for work and rest schedules. These requirements are applicable to Canadian vessels, including fishing vessels of 100 GT or more that are engaged in Class 1 or 2 near coastal voyages. The regulations state:

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42 Transportation Safety Board of Canada, *Guide to Investigating Sleep-related Fatigue* (February 2022).

43 Transportation Research Board and National Research Council, *The Effects of Commuting on Pilot Fatigue*, The National Academies Press, 2011.

44 D. Bruck and D. Pisami, "The Effects of Sleep Inertia on Decision-making Performance," *Journal of Sleep Research*, Vol. 8, Issue 2 (1999), pp. 95–103.

45 C. Hilditch and A. Mchill, "Sleep Inertia: Current Insights," *Nature and Science of Sleep*, Vol. 11 (August 2019), pp. 155–165.

> **320** The master of a vessel referred to in subsection 319(1) shall ensure that
>
> (a) the master and every crew member have
>
> (i) at least six consecutive hours of rest in every 24-hour period, and
>
> (ii) at least 16 hours of rest in every 48-hour period; and
>
> (b) not more than 18 hours but not less than six hours elapse between the end of a rest period and the beginning of the next rest period.[46]

The *Silver Condor* did not have a formal work and rest schedule in place for the voyage from Blanc-Sablon to the fishing ground, which took about 15 hours. However, it was common practice for the master to have 6 hours of designated rest during a 24-hour period, and crew members would take turns relieving him. Crew members could request rest periods when necessary and would usually take the steaming time to and from the fishing ground to rest.

The master remained at the helm during the 3-day period at the fishing ground, with occasional breaks, while crew members worked on deck and rested when they could during a tow, ranging from 45 minutes to 3.5 hours in length based on information from previous trips. However, in this occurrence, because the trawl doors crossed twice and the net closed, crew members' actual work periods were sometimes extended, delaying the start of their next rest period. This affected crew members' normal nighttime sleeping patterns and their quality of sleep during rest periods.

The master's sleep was similarly impacted due to navigation tasks, fishing operations, and the 2 malfunctions of the trawl doors that he worked to resolve from his position at the helm. As a result, the master's sleep schedule was directly impacted by multiple hours on duty without a dedicated period of sleep in his quarters.

An observer is not regarded as part of a crew under the MPR and there are no requirements to manage their fatigue. The observer is required to be present each time the crew haul catch on board to record the time and details of the catch.

The *Silver Condor* encountered rough seas around midnight on 25 September, approximately 4 hours after the crew (except the master) and the observer began their rest period. The vessel sank around 0230. Overall, the emergency occurred during a circadian low, when the crew normally required restful sleep.

In 2024, TC and the Canadian Centre for Occupational Health and Safety released a Fatigue Management at Sea e-course that is available to all registered Canadian seafarers with a valid Candidate Document Number.

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46 Transport Canada, SOR/2007-115, *Marine Personnel Regulations* (as amended 20 December 2023), section 320.

1.16 Previous occurrences

1.16.1 Occurrences related to fishing vessel stability

From 2013 to 2023, the TSB received reports of 65 occurrences involving 105 fishing-related fatalities. Of those occurrences, the TSB investigated 18 that were similar to this occurrence involving the *Silver Condor*.[47] Those investigations identified factors that compromise vessel stability, such as reduced freeboard (overloading), raised centre of gravity, modifications, and free surface effects.

Over the same period, 7 occurrences were reported to the TSB that resulted in 9 fishing-related fatalities[48] and that were likely related to stability issues. However, an investigation report was not published for these occurrences.[49]

1.16.2 Occurrences related to cold water exposure

From 2013 to 2023, the TSB investigated 14 occurrences where 39 persons were fatally injured by cold water exposure.[50] Two main contributory factors in these occurrences were the accessibility of life-saving equipment when abandoning a vessel and the incomplete donning of immersion suits.

1.16.3 Occurrence related to distress alerting

M24A0269 (*Elite Navigator*) – On 18 July 2024, the fishing vessel *Elite Navigator*, with the master and 6 crew members on board, was reported overdue 130 NM east-northeast of Fogo Island, NL. The night before being reported overdue, the vessel sustained a fire in the engine room, which likely disabled the EPIRB's automatic activation. Before everyone on board abandoned the vessel, the master sent a VHF-DSC distress signal and broadcast 2 Mayday calls over VHF radiotelephone. However, the vessel was beyond the range of VHF and VHF-DSC, and it was not possible for the signal and calls to reach MCTS stations. The crew did not manually activate the vessel's EPIRB before abandoning the vessel in a life raft, so the EPIRB did not send a signal. The crew were subsequently rescued by the CCG on 20 July. The vessel was reported sunk.

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47 TSB marine transportation safety investigation reports M21A0315, M21A0065, M20P0229, M20A0434, M20A0160, M18A0454, M18A0425, M18A0303, M18A0078, M18A0076, M17C0061, M17P0052, M16A0327, M16A0140, M15P0286, M15A0189, M14A0289, and M14P0121.

48 TSB marine transportation safety occurrences M23A0107, M22P0389, M21A0412, M21A0161, M19A0082, M14C0162 and, M13L0151.

49 Data on all marine transportation occurrences reported to the TSB is available at https://www.tsb.gc.ca/eng/stats/marine/data-6.html. It is updated monthly.

50 TSB marine transportation safety investigation reports M22A0052, M21A0065, M21P0030, M20A0434, M20P0229, M20A0160, M19A0090, M17P0098, M16A0327, M16A0140, M15P0347, M15P0286, M15A0189, and M14P0121.

Like the occurrence involving the *Silver Condor*, this occurrence highlights the need for mariners to understand that VHF-DSC transmissions have a limited range and that communication over VHF-DSC radiotelephone may not be effective in an emergency, especially if there is no vessel traffic in the area of sailing. This occurrence also highlights the importance of manually activating the EPIRB as soon as possible in an emergency.

1.17 Safety Issues Investigation into Fishing Safety in Canada

In August 2009, the TSB undertook an in-depth safety issues investigation into fishing vessel safety in Canada. The *Safety Issues Investigation into Fishing Safety in Canada*[51] report was released in June 2012, and provided a national view of safety issues in the fishing industry, revealing a complex relationship and interdependency among these issues.

Among other things, the TSB found that fish harvesters generally do not understand or use the information in stability booklets and determine the stability of a vessel based only on experiencing its movements in a variety of operating conditions. During the investigation, fish harvesters told the TSB that they do not understand how a stability booklet can make their operation safer. Without a simple, clear, and practical format containing minimum freeboard limits, load limits, loading sequence, identified downflooding points, and minimum and maximum stability conditions, the stability booklet is considered to be of no use.

1.18 TSB recommendations

1.18.1 TSB Recommendation M94-33

On 13 December 1990, the fishing vessel *Le Bout de Ligne* disappeared with the loss of all crew members while en route from Cap-aux-Meules, Magdalen Islands, Quebec, to Rivière-au-Renard, Quebec. Following the occurrence, the TSB conducted an investigation into the occurrence and found that most fish harvesters did not have formal training in vessel stability and were unable to extrapolate the stability of their vessel under different conditions. Therefore, the Board recommended that

> the Department of Transport establish guidelines for stability booklets so that the information they contain is presented in a simple, clear, and practical format for end-users.
>
> **TSB Recommendation M94-33**

Since that time, the TSB has followed up annually with TC on action being taken to address this recommendation. Each year, TC has provided a response indicating what action has been or will be taken, and the TSB has assessed that response. When the present report was published, TC's last response had been received in January 2019. The TSB has assessed TC's

51 TSB Marine Investigation Report M09Z0001, Safety Issues Investigation into Fishing Safety in Canada.

latest response to this recommendation as Fully Satisfactory. The history of these responses is available on the TSB website.[52]

1.18.2 TSB recommendation M16-02

On 05 September 2015, the fishing vessel *Caledonian* capsized while hauling fish on board about 20 NM west Nootka Sound, British Columbia, and 3 crew members drowned. The TSB conducted an investigation into the occurrence and determined that safety action is required with regard to stability information for fishing vessels; namely, that vessel stability information must be presented in a manner and format that enables it to be clearly understood and easily accessible to crew while working on board.

In July 2016, in response to TSB Recommendation M94-33 and numerous other recommendations relating to fishing vessel stability, TC published, in the *Canada Gazette*, Part II, regulations to create new *Fishing Vessel Safety Regulations* (FVSR) and replace the *Small Fishing Vessel Inspection Regulations*. However, the new regulations did not address the regular monitoring of vessel lightship weight or the provision of adequate stability information for small fishing vessels that had stability booklets produced under the old regulations. The Board therefore recommended that

> the Department of Transport establish standards for all small fishing vessels that have had a stability assessment to ensure their stability information is adequate and readily available to the crew.
>
> **TSB Recommendation M16-02**

Since that time, the TSB has followed up annually with TC on action being taken to address this recommendation. Each year, TC has provided a response indicating what action has been or will be taken, and the TSB has assessed that response. When the present report was published, TC's last response had been received in December 2024. The TSB has assessed TC's latest response to this recommendation as Satisfactory in Part. The history of these responses is available on the TSB website.[53]

While the Board considers TC's initiatives to be helpful in aiding commercial fish harvesters to understand applicable regulations, TC's initiatives do not directly address the safety deficiency underlying this recommendation. The mandatory stability assessment and stability notice are only applicable to new vessels, vessels that have undergone a major modification, or vessels that have changed fishing activities. The requirement to prepare and post a stability notice does not apply to vessels that have stability assessments but have not undergone major modifications or changed fishing activities. This leaves a large number

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[52] TSB Recommendation M94-33: Guidelines for small fishing vessel stability booklets, at https://www.tsb.gc.ca/eng/recommandations-recommendations/marine/1994/rec-m9433.html (last accessed on 16 October 2025).

[53] TSB Recommendation M16-02: Adequate stability information for crews on small fishing vessels that have previously been assessed for stability, at https://www.tsb.gc.ca/eng/recommandations-recommendations/marine/2016/rec-m1602.html (last accessed on 16 October 2025).

of existing fishing vessels, like the *Silver Condor*, that might not have adequate and readily available stability information for their crews.

1.19 TSB Watchlist

The TSB Watchlist identifies the key safety issues that need to be addressed to make Canada's transportation system even safer.

Commercial fishing safety is a Watchlist issue. The Board placed commercial fishing safety on the Watchlist in 2010. Every year, the same safety deficiencies on board fishing vessels continue to put at risk the lives of thousands of Canadian fish harvesters and the livelihoods of their families and communities. As this occurrence demonstrates, gaps remain with respect to vessel stability and emergency preparedness.

ACTION REQUIRED

The issue of **commercial fishing safety** will remain on the Watchlist until there is demonstrable progress on these key indicators:

- **Coordinated regulatory oversight:** TC and the Fisheries and Oceans Canada collaborate to ensure fish harvesters meet all requirements before operating commercially. Federal and provincial authorities also coordinate regulatory oversight of commercial fisheries.
- **Promotion of stability guidelines:** TC, provincial workplace safety authorities, and fish harvester associations promote existing user-friendly guidelines on vessel stability designed to reduce unsafe practices.
- **Sound safety culture:** Fish harvesters demonstrate that they are taking ownership of safety, specifically with respect to the use of stability guidelines, PFDs, immersion suits, emergency signaling devices, and safe work practices.

Fatigue management is a Watchlist issue. As this occurrence demonstrates, fatigue can impact the survivability of people in an emergency. Given that fishing operations are not conducive to obtaining proper restorative sleep, fish harvesters need a greater awareness of the risks associated with fatigue and effective strategies to mitigate its risks. This occurrence further demonstrates the continued need for fatigue education and awareness training to ensure fatigue management plans mitigate all aspects of fatigue.

ACTION REQUIRED

The issue of **fatigue management in marine transportation** will remain on the Watchlist until

- TC requires that watchkeepers whose work and rest periods are regulated by the MPR receive practical fatigue education and awareness training to help identify and prevent the risks of fatigue;
- vessel owners are required to implement fatigue management plans, including education on the detrimental effects of fatigue and support to mariners in reporting, managing, and mitigating fatigue; and
- domestic work and rest provisions are updated to include fishing vessels under 100 GT and to reflect current fatigue science and align with international standards.

1.20 TSB laboratory reports

The TSB completed the following laboratory reports in support of this investigation:

- LP147/2023 – Survival Suit Examination
- LP063/2024 – VHF Transmission Analysis

2.0 ANALYSIS

The analysis will focus on the factors that likely led to the sinking of the *Silver Condor* and the subsequent loss of life. The analysis will also look at the emergency response, radio communications in bad weather, distress alerting, and fatigue.

2.1 Sinking of the *Silver Condor*

Operating a vessel within its stability limits is critical to the safety of the vessel, the crew, and the environment. Therefore, its master and crew must understand the vessel's stability limits and ensure that the vessel is operated within these limits at all times. Previous TSB investigations into occurrences involving issues with vessel stability have shown that a combination of factors lead to a loss of vessel stability, as was the case with the *Silver Condor*.

2.1.1 Vessel stability

The *Silver Condor's* stability booklet was developed for crab and shrimp harvesting. When the vessel master requested an experimental licence from Fisheries and Oceans Canada to catch redfish, the Transport Canada (TC) guidelines on major changes affecting stability were not considered to ensure that the stability booklet was still relevant for harvesting redfish. The master was therefore not aware of any potential impact the redfish catch might have had on the vessel and its stability.

Before the *Silver Condor* underwent a stability assessment in 2011, the vessel's previous owner estimated the vessel's maximum load to be around 27 metric tons (t) of catch plus 15 t of ice, based on his experience. However, the 2011 stability booklet stated that the maximum load for shrimp was 22.68 t plus 12 t of ice. Landing data from between 2011 and the occurrence voyage shows that the vessel was consistently loaded beyond the stability limits set in the stability booklet.

On the occurrence voyage, the crew estimated that they caught and stored about 36 t of redfish under deck, with about 0.8 t of incidental catch stored on deck. This estimated load was 62% higher than the limit set in the stability booklet, which also indicated that catch should not be stored on deck.

When multiple factors combine to make a vessel exceed safe operating limits, even if these factors have only a moderate impact on stability individually, the vessel can experience a critical loss of stability. During this occurrence, the environmental conditions deteriorated quickly and, when combined with the weight of catch beyond the limits, significantly impacted the vessel's stability.

Finding as to causes and contributing factors

The vessel was likely operated beyond its stability limits, reducing its freeboard and its reserve buoyancy, which contributed to its sinking when the sea state degraded.

Numerous TSB investigations involving small fishing vessels have identified factors that compromised vessel stability, and the TSB's *Safety Issues Investigation into Fishing Safety in Canada* identified that fish harvesters need stability information to be presented in a simple, clear, and practical format. Furthermore, the rationale for TSB Recommendation M16-02 highlights the need for all fishing vessels, large and small, to have easily understood, accessible, and up-to-date stability information to enable crew to determine safe operating limits and avoid overloading.

In response to the TSB's recommendation, since 2017 the *Fishing Vessel Safety Regulations* have required that a stability notice be posted on board new vessels. This notice is a summary of the vessel's safe operating limits, such as maximum weight of the catch, the minimum freeboard, and other important information regarding the safe operation of the vessel. This requirement excludes a large number of existing fishing vessels, such as the *Silver Condor*.

It is likely that a stability notice was not posted on board the *Silver Condor* because such a notice was not required. Without a stability notice, crew members on board may not have been aware of the maximum weight of catch for safe loading as stated in the vessel's stability booklet, which may have contributed to the vessel being overloaded. Similarly, crew members were likely not aware that no catch was to be carried on deck; in this occurrence, catch was stored in a commercial fish tote on deck, which raised the vessel's centre of gravity and contributed to the vessel's compromised stability. On this vessel, as on other fishing vessels that the TSB has investigated (including M20A0434 and M18A0454) there was a history of loading more catch than the maximum load indicated in the stability booklet.

Finding as to risk

If the maximum weight of catch for safe loading of a fishing vessel is not readily available and shared among all crew members on board, there is a risk that the vessel will be overloaded and that its stability will be compromised.

2.2 Perception of vessel safety

Operators' perception of the safety of their vessel, including vessel stability, is coupled to operational decision making. This perception is influenced by a number of factors such as operators' knowledge, experience, and training. This perception is also influenced by certificates, licences, and vessel surveys from governments, associations, and insurers, all of which may be perceived as overall external approval of the capacity to operate the vessel safely. Also, operators may have a higher risk tolerance based on previous success.

In this occurrence, the complement's perception of the *Silver Condor*'s safety and its stability was likely influenced by several factors:

- over 40 years of successful voyages, including 1 season of redfish harvesting in 1992 (before major modifications were made to the vessel);

- 4 successful redfish voyages (3 voyages in 2022 and 1 in 2023);
- certification by TC as a fishing vessel; and
- having been surveyed by insurers and approved for insurance.

These factors likely confirmed for the operators that their operational decision making was informed by sufficient knowledge, experience, and competency to operate their vessel safely.

Finding as to risk

If operational decisions are made according to a perception of vessel safety rather than validated limits, there is a risk that the vessel will be operated in a manner that may compromise its safety.

2.3 Crew emergency response

The decision to abandon a small fishing vessel at sea is often made very quickly, and crew members have to make this decision in a high-stress environment. They may have limited time available to respond and little previous experience in emergencies.

Carrying out regular safety drills that include realistic scenarios are therefore important because it allows crew members to acquire the knowledge and skills necessary to respond to an emergency effectively, especially under challenging conditions.

The crew of the *Silver Condor* was required by regulation to conduct safety drills, and did so annually at the beginning of every fishing season. When the at-sea observer (observer) began working on the vessel, she was familiarized with the location of safety equipment but not given the opportunity to participate in the annual safety drills, including tasks such as transmitting a distress signal, deploying the life raft, and donning an immersion suit.

Finding as to risk

If personnel working on board a vessel do not regularly practise responding to emergencies with drills that include realistic scenarios, there is a risk that they will not respond effectively in an actual emergency.

2.3.1 Distress alerting

In an emergency, there is often little time to send a distress alert and so it is important that mariners use distress alerting methods that maximize the potential for a response. Conducting regular safety drills and testing equipment are essential to familiarize the crew with the use of manually activated distress alerting equipment. Increased familiarity with the equipment can reduce the time it takes to send a distress signal.

The *Silver Condor* was equipped with 2 very high frequency (VHF) radiotelephones and their microphones were located close to each other. One radiotelephone had digital selective calling (DSC) capability and was set to channel 16 (the emergency channel), and the other was operated on channel 10 (the working channel for fish harvesters in the area).

When a DSC distress alert is activated, the transmitting VHF-DSC radiotelephone has an automatic repeat function so that the distress message continues to be transmitted until it is cancelled or acknowledged. All of these features help maximize the potential for a response.

During the occurrence, the mate made a distress call using one of the vessel's VHF radiotelephones. The investigation could not determine which radiotelephone was used and whether the DSC function was activated; however, no DSC signal was received by any other station.

The likelihood of a distress call being received over a local channel is contingent upon other vessels in the area monitoring that particular channel, and so a VHF call made on that channel may not always receive a response. Because no other fishing vessels were reported in the area at the time of the occurrence, it is unlikely that the mate's distress call would have been received by another vessel if the call had been made over VHF channel 10.

Also, the heavy seas at the time of the occurrence caused a recurring misalignment between the *Silver Condor*'s transmitting antenna and the receiving shore-based antennas due in part to the rolling motion of the *Silver Condor*; consequently, the vessel's distress message transmitted over VHF radiotelephone was likely not received by a shore-based radio station.

In an emergency, an emergency position-indicating radio beacon (EPIRB) can be manually activated by personnel on board a vessel or, if the EPIRB is fitted with a hydrostatic release unit (HRU), it will float free of the vessel once the vessel has sunk to a certain depth and will automatically transmit a distress signal.

Neither the *Silver Condor*'s familiarization procedures nor the safety drills conducted on board the vessel informed all the crew of the importance of reaching for the EPIRB and activating it as soon as possible in an emergency. The investigation could not determine whether the EPIRB was reachable as the vessel was flooding.

As the *Silver Condor* sank, the EPIRB's HRU activated and the EPIRB floated to the surface. The EPIRB then transmitted a signal that was received by the Cospas-Sarsat system at 0230 and was relayed to Maritime Rescue Sub-Centre Quebec (MRSC), indicating that both the EPIRB and HRU functioned as intended and expected. However, the vessel had to sink to a certain depth before the devices were activated and the EPIRB had to float to the surface to transmit a signal.

Finding as to risk

If personnel on board a vessel have not been familiarized with activating the vessel's distress alerting devices, the personnel might not be able to transmit an emergency signal, creating a risk that the emergency response will not be timely.

2.3.2 Accessibility of life-saving equipment

As part of a vessel's life-saving equipment, immersion suits should be available for all personnel on board and are usually stowed in the crew accommodations.

At the time of the occurrence, the *Silver Condor* had a total of 8 immersion suits on board for the complement of 6 people: 7 suits were regularly carried on the vessel, and 1 suit was brought on board by the observer. During the occurrence, a crew member grabbed 4 of the immersion suits from the crew accommodations and brought them to the wheelhouse where everyone had mustered; 1 suit was stowed in the master's cabin, which was adjacent to the wheelhouse. By the time the complement recognized the need for an additional immersion suit, the water level inside the vessel had risen to the top of the wheelhouse stairs, and the 3 remaining suits on board were inaccessible. As a result, deckhand 1 was left without an immersion suit and donned a life jacket instead. Not being protected from the cold water environment, he became hypothermic and died.

Finding as to causes and contributing factors

Not all of the vessel's immersion suits were accessible as the vessel sank; consequently, a crew member donned only a life jacket and, after being exposed to the cold water environment, he became hypothermic and died.

While the people on board the *Silver Condor* attempted to abandon the vessel, the vessel's life raft was inaccessible because of the angle at which the vessel was sinking and the deck behind the wheelhouse that was rapidly submerging. The life raft was fitted with an HRU, and so everyone on board expected the life raft would release and float to the surface; however, they were washed away from the vessel before they could see it surface. Without access to the life raft, the crew members and observer were exposed to the elements and the various associated risks, such as hypothermia and drowning.

The vessel's life raft was recovered 8 days after the occurrence by a fishing vessel, indicating that the HRU activated. At the time of the occurrence, the *Silver Condor*'s life raft was secured to the port side of the upper deck, behind the wheelhouse, under fishing gear. It is possible that the cables, stabilizers, and wheelhouse bulkhead prevented the life raft from floating freely after its HRU activated.

Finding as to causes and contributing factors

The way the life raft was stored likely prevented it from floating freely when the vessel sank by the stern. Consequently, the life raft was inaccessible to the complement as they abandoned ship, and they were then exposed to the elements.

2.3.3 Donning immersion suits

Among other things, abandon ship drills provide crew members with an opportunity to demonstrate and practise how to don immersion suits. When crew members practise donning their immersion suits during regular safety drills, they become more efficient at following the sequence for donning, which increases the likelihood they will properly and quickly don the suits in an actual emergency.

In this occurrence, the master and deckhand 2 partially donned their immersion suits; neither of them donned the suit hood and fully zipped the suit up. Safety drills did not provide *Silver Condor* crew members with the knowledge and skills needed to quickly and effectively don their immersion suits within the limited time available to them as the vessel was rapidly sinking, causing them to abandon the vessel. As a result, they were exposed to the cold water, which contributed to their deaths.

Finding as to causes and contributing factors

Crew members had to don their immersion suits quickly because the vessel was rapidly sinking; consequently, 2 crew members did not don their suits properly and were exposed to cold water without adequate protection, which contributed to their deaths.

2.4 Sea area A1 coverage in Canada

Canada's *Navigation Safety Regulations, 2020* define sea area A1 as an area within the radiotelephone coverage of a least 1 very high frequency (VHF) coast station in which continuous DSC alerting is available.

The *Radio Aids to Marine Navigation* shows the predicted radio coverage of the Canadian Coast Guard's (CCG's) coast stations and shore-based antennas along Canada's Atlantic coast, which is part of sea area A1. When comparing the radio carriage requirements for vessels operating in the Gulf of St. Lawrence, which is considered sea area A1 under the *Navigation Safety Regulations, 2020*, with the predicted radio coverage provided in the *Radio Aids to Marine Navigation*, there are sectors within this area that have no calculated probability of VHF radio coverage from coast stations, meaning that communication between coast stations and vessels within those sectors will not be successful. This also means that a distress alert initiated over VHF-DSC radiotelephone in those sectors will likely not be received by a shore-based radio station.

The minimum requirements for a vessel's communications equipment are determined by the sea area in which it operates. Vessels operating within sea area A1 are required to be fitted with a VHF radiotelephone that is capable of DSC. Given that some sectors of sea area A1 do not have VHF radio coverage, mariners may be under-equipped for 2-way communication with shore-based radio stations in an emergency.

Although VHF radio coverage was not a factor in this occurrence, mariners operating vessels within sea area A1 should be aware that there are gaps in VHF coverage within this area. Mariners may therefore have to rely on other forms of 2-way communication, such as satellite phone.

Finding as to risk

If there are gaps in actual radio coverage from coast stations in sea area A1, there is a risk that mariners will not be able to communicate with those stations, which could impede or delay response in an emergency.

2.5 Radio equipment oversight

The *Navigation Safety Regulations, 2020* set the requirements for radio installations on board vessels, including radio equipment maintenance. The *Silver Condor* had the required radio equipment and certified personnel on board at the time of the occurrence. TC's 2023 inspection of the vessel did not identify any deficiencies regarding the vessel's radio equipment.

Regular maintenance plays an important role in making sure that radio and other communications equipment will operate as intended in an emergency. Regular maintenance also helps ensure that radio operators are familiar with how to operate that equipment.

TC inspectors are required to inspect radio equipment and associated records on fishing vessels that are under 20 m in length. However, TC does not provide inspectors with guidelines to verify if a vessel is in compliance with all the regulatory requirements for radio equipment, including equipment maintenance. Without such guidelines, inspectors rely on training they receive from their respective regions, so radio equipment inspections vary from region to region.

The owner of the *Silver Condor* purchased a new VHF-DSC radiotelephone about 3 years before the occurrence, but there is no record of when it was installed or by whom. Similarly, the investigation could not find maintenance records for the vessel's radio equipment. If installation and maintenance are not carried out as required, mariners' communications can be impacted.

Finding as to risk

If the regulatory oversight of radio equipment installation and maintenance is ineffective, equipment deficiencies can remain unidentified, creating a risk that emergency communications will be impacted.

2.6 Fatigue

Sleep-related fatigue and sleep inertia are known to impair performance and cognitive functioning. The TSB's Safety Issues Investigation into Fishing Safety in Canada identified fatigue as a significant safety issue with fishing accidents. Fatigue is widespread in commercial fishing due to the long hours, high levels of physical and mental exertion, increased workload from a reduced crew complement, and lack of awareness of fatigue and its effects.[54] Fish harvesters have confirmed that risk factors for fatigue, such as insufficient, fragmented sleep and variable work and rest schedules, are commonplace.

Leading to the occurrence, the master had a total of 18 hours of designated rest in the 3 days of fishing activities. On the evening of the occurrence, after a full day of fish harvesting, the master remained alone at the helm. Consequently, he did not have an adequate rest period before the occurrence and was acutely fatigued. The master's state of fatigue may have reduced his ability to accurately interpret the deteriorating situation with the vessel and reduced his ability to respond to the unfolding emergency, such as recognizing the need to and calling on crew to abandon ship, sending a distress signal, and properly donning an immersion suit.

Finding as to causes and contributing factors

The master was acutely fatigued, which likely reduced his ability to recognize and respond to the unfolding emergency.

Given that a structured work and rest schedule was not implemented on board the *Silver Condor,* crew members' rest periods were subject to the demands of fishing operations.

Everyone on board was likely fatigued from the effects of the work schedule, especially given the issue with the trawl doors and net, which prolonged the crew's fishing time. This issue also impacted the observer because she was required to stay on deck for longer periods of time while the trawl doors and net were fixed.

Also, the occurrence took place early in the morning during a period of circadian low, when the body is normally more fatigued and prone to diminished alertness and degraded performance. These factors likely impacted the cognitive functioning and ability of everyone on board, which in turn reduced their ability to effectively respond to the emergency. Instead of recognizing that the vessel was sinking and that the complement needed to prepare to abandon the vessel by prioritizing the recovery and donning of their immersion suits, they went about the vessel trying to stop the water ingress.

Finding as to risk

If the complement of a fishing vessel works without sufficient periods of rest, there is a risk that they will not be able to respond effectively to an emergency.

[54] TSB Marine Investigation Report M09Z0001, Safety Issues Investigation into Fishing Safety in Canada.

3.0 FINDINGS

3.1 Findings as to causes and contributing factors

These are the factors that were found to have caused or contributed to the occurrence.

1. The vessel was likely operated beyond its stability limits, reducing its freeboard and its reserve buoyancy, which contributed to its sinking when the sea state degraded.

2. Not all of the vessel's immersion suits were accessible as the vessel sank; consequently, a crew member donned only a life jacket and, after being exposed to the cold water environment, he became hypothermic and died.

3. The way the life raft was stored likely prevented it from floating freely when the vessel sank by the stern. Consequently, the life raft was inaccessible to the complement as they abandoned ship, and they were then exposed to the elements.

4. Crew members had to don their immersion suits quickly because the vessel was rapidly sinking; consequently, 2 crew members did not don their suits properly and were exposed to cold water without adequate protection, which contributed to their deaths.

5. The master was acutely fatigued, which likely reduced his ability to recognize and respond to the unfolding emergency.

3.2 Findings as to risk

These are the factors in the occurrence that were found to pose a risk to the transportation system. These factors may or may not have been causal or contributing to the occurrence but could pose a risk in the future.

1. If the maximum weight of catch for safe loading of a fishing vessel is not readily available and shared among all crew members on board, there is a risk that the vessel will be overloaded and that its stability will be compromised.

2. If operational decisions are made according to a perception of vessel safety rather than validated limits, there is a risk that the vessel will be operated in a manner that may compromise its safety.

3. If personnel working on board a vessel do not regularly practise responding to emergencies with drills that include realistic scenarios, there is a risk that they will not respond effectively in an actual emergency.

4. If personnel on board a vessel have not been familiarized with activating the vessel's distress alerting devices, the personnel might not be able to transmit an emergency signal, creating a risk that the emergency response will not be timely.

5. If there are gaps in actual radio coverage from coast stations in sea area A1, there is a risk that mariners will not be able to communicate with those stations, which could impede or delay response in an emergency.

6. If the regulatory oversight of radio equipment installation and maintenance is ineffective, equipment deficiencies can remain unidentified, creating a risk that emergency communications will be impacted.

7. If the complement of a fishing vessel works without sufficient periods of rest, there is a risk that they will not be able to respond effectively to an emergency.

3.3 Other findings

These findings resolve an issue of controversy, identify a mitigating circumstance, or acknowledge a noteworthy element of the occurrence.

1. At the time of the occurrence, the vessel's safety inspection certificate issued by Transport Canada was expired. The certificate was not valid when the Department of Fisheries and Oceans granted an experimental fishing licence to the vessel.

2. The master had been medically restricted from performing watchkeeping duties. However, during the occurrence voyage, he kept watch alone during the day and at night when the *Marine Personnel Regulations* required a certified watchkeeper and 1 other crew member to be on watch during periods of darkness.

4.0 SAFETY ACTION

4.1 Safety action taken

The Board is not aware of any safety action taken following this occurrence.

This report concludes the Transportation Safety Board of Canada's investigation into this occurrence. The Board authorized the release of this report on 22 October 2025. It was officially released on 04 November 2025.

Visit the Transportation Safety Board of Canada's website (www.tsb.gc.ca) for information about the TSB and its products and services. You will also find the Watchlist, which identifies the key safety issues that need to be addressed to make Canada's transportation system even safer. In each case, the TSB has found that actions taken to date are inadequate, and that industry and regulators need to take additional concrete measures to eliminate the risks.

APPENDIX

Appendix A – Definitions of fatigue risk

1. Acute sleep disruptions — Depending on the stage in which it occurs, sleep disruption may affect physiological functioning and/or cognitive functioning, and elevates the risk of fatigue. The risk increases when the quality or quantity of sleep has been reduced within the previous 3 days.
2. Chronic sleep disruptions — Any disruptions to sleep quantity or quality that are sustained for periods longer than 3 consecutive days are considered chronic sleep disruptions. Comparing the amount of sleep obtained to the amount of sleep required for a given period of wakefulness can provide an estimate of a person's sleep debt.
3. Continuous or prolonged wakefulness — Being awake for more than 17 hours heightens the risk of fatigue.
4. Circadian rhythm effects — Changing sleep-wake patterns too quickly, or working at a time of day at which our body is expecting sleep, can cause circadian rhythms to desynchronize, leading to performance impairments.
5. Sleep disorders — Many disorders result in higher than normal levels of fatigue if they are untreated or not managed properly. Three of the more common sleep disorders are insomnia, obstructive sleep apnea, and periodic limb movement disorder.
6. Medical, psychological conditions, illnesses or drugs — A person's ability to obtain restorative sleep may be influenced by individual factors, including certain illnesses, the use of drugs or medication that affect sleep or sleepiness, or characteristics such as morningness/eveningness, or one's capacity to nap.

Source: Transportation Safety Board of Canada, *Guide to Investigating Sleep-related Fatigue* (February 2022).