

MARINE INVESTIGATION REPORT

M98N0064

FOUNDERING

OF THE FISHING VESSEL "ATLANTIC PRIZE"

ON THE GRAND BANKS

06 NOVEMBER 1998

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 06 November 1998, while returning in heavy weather from the Grand Banks, the “ATLANTIC PRIZE”, an 18.7 metre fishing vessel, listed suddenly to starboard, down-flooded and sank by the stern. The crew donned survival suits and abandoned ship into the water. A search and rescue operation involving aircraft and vessels located and rescued the entire crew 6½ hours after the sinking.

Ce rapport est également disponible en français.

Other Factual Information

	"ATLANTIC PRIZE"
Port of Registry	St. John's, Newfoundland
Flag	Canada
Registry/Licence Number	Official No. 813696, CFV 133057
Type	Steel Stern Trawler
Gross Tons ¹	102.1
Length	18.7 m
Draught	2.5 m
Built	1988, Glovertown Shipyards, Newfoundland
Propulsion	Caterpillar Model 3412 diesel engine, 465 kW
Number of Crew	6
Registered Owner	Captain James Short, St. John's, Newfoundland

The "ATLANTIC PRIZE" departed St. John's, Newfoundland, on November 3 at 1600 Newfoundland standard time (NST)² and arrived on the Southern Grand Banks 30 hours later. After fishing for 24 hours, the vessel had caught approximately 45 000 kg of redfish and prepared to return to port. The main fish hold hatch and loose gear on deck was secured and the vessel got under way for St. John's on November 5 at 2330. The mate and engineer took the first watch and the remainder of the crew turned in.

At approximately 0155, the mate noted that the vessel was becoming sluggish in returning upright after rolls to starboard. After approximately one minute, the vessel developed a permanent list to starboard with her afterdeck partially submerged. The engineer went immediately to the engine-room to start the bilge pumps and the master and crew were called to the wheel-house. Upon arriving in the wheel-house and assessing the situation, the master immediately broadcast a MAYDAY on 2 182 kHz using the single sideband radio. The distress call was picked up and acknowledged by St. John's Coast Guard Radio.

As the engineer left the engine-room and proceeded to the wheel-house, he noted water coming down the engine-room vents, leaking through the watertight door from the main deck and flooding through an open window on the after bulkhead of the galley. Immediately upon coming on deck, the crew donned survival suits and launched the 10-person liferaft; however, it was carried away by the wind and fouled on the port topsides and rigging.

¹ Units of measurement in this report conform to International Maritime Organization standards or, where there is no such standard, are expressed in the International System of units.

² All times are NST (coordinated universal time minus three and a half hours).

The vessel carried sufficient survival suits in the wheel-house for her entire complement. However, when the crew donned them, it was found that the bulky gloves attached to the suits made it difficult to pick up the liferaft using the handholds moulded into the casing.

The master continued standing by the single side band radio until water entered the wheel-house. He and the crew then abandoned ship into the water. The vessel was seen to sink by the stern in position lat. 44°00' N, long. 052°31' W, within approximately 10 minutes of the crew abandoning ship.

In the water, the crew found themselves separated into two groups. The master and two deck-hands found and boarded an aluminum skiff which had broken free when the vessel sank. Although they had to bail constantly, they remained relatively warm until rescued at 0730. The second group of crew, consisting of the mate, the engineer and a deck-hand, remained in the water where they placed their backs to the wind/sea and linked arms to stay together. When rescued at 0830, this group was suffering from mild hypothermia.

The vessel's MAYDAY call was heard by St. John's Coast Guard Radio, who immediately began a mayday relay. It was determined that the fishing vessel "ATLANTIC DOROTHY" was the vessel closest to the "ATLANTIC PRIZE". The "ATLANTIC DOROTHY" steamed towards the reported mayday position, and located and rescued the survivors. The survivors reported that they could hear and see an aircraft circling overhead, and that this presence greatly increased their morale. Both the emergency position indicating radio beacon (EPIRB) and the lost liferaft were equipped with lights which were visible to both the crew in the water and Search and Rescue (SAR) aircraft.

The vessel carried a new 406 MHz EPIRB, which floated free and activated when the vessel sank. Its signal was picked up by a geostationary COSPAS SARSAT satellite at 0212 and the vessel identified by the SRSAT Canadian Mission Control Centre in Trenton, Ontario. A call to the vessel's owner provided the general area the vessel was fishing in; however, because the EPIRB was not global positioning system (GPS) equipped, an accurate position of the EPIRB was not determined until 0338, at which time a second satellite was able to obtain a doppler fix.

Two Canadian and one American SAR aircraft were tasked by Rescue Coordination Centre Halifax, as were the Her Majesty's Canadian Ship (HMCS) "CHARLOTTETOWN" and the Canadian Coast Guard Ship (CCGS) "SIR WILFRED GRENFELL".

The "ATLANTIC PRIZE" was of conventional hard chine steel construction. From forward, the hull was comprised of a forepeak, potable water tanks, engine-room, fish hold, cofferdams, fuel tanks, and steering flat. Crew accommodations were forward on the main deck and the steel wheel-house one deck above. A single watertight door led from the accommodations onto the main deck aft, to starboard of which was an opening galley window. The vessel was one of a series of successful 65-foot small fishing vessels, the first of which was built in 1981. Although similar in basic design, various modifications in the arrangements of deck equipment, spars and layout have been incorporated by individual owners. The "ATLANTIC PRIZE" was constructed with an after shelter-deck and "A" frame. The main fish hatch and lazarette hatch comprised the only main deck hatches.

At the time of the occurrence, the vessel's fish hold held approximately 45 000 kg of redfish in 15 pens with boards mounted 2 m high. The vessel's forward fuel tanks were half full and were common to each other. The after fuel tanks were full.

The fish hold hatch cover was divided in half and hinged down the centre. Four dogs were used to secure the hatch and were reported to have been secured before the vessel began her return voyage towards St. John's. A small manhole was located on the starboard side of the hatch cover and was secured with a single dog. It is reported that the hinge along the centre of the main fish hatch was not watertight.

Round flush-deck hatches were fitted outboard of the main hatch on both sides; however, they had been welded closed. A hatch leading to the lazarette and steering gear located on the centre line, aft near the transom, was reported to be closed.

The vessel was equipped with bilge high-water level alarms for the engine-room, fish hold/shaft tunnel, and lazarette. However, prior to the vessel listing, no alarm was heard by the crew at the time of the occurrence.

Roll-dampening paravanes were fitted to the "ATLANTIC PRIZE" on port and starboard outriggers attached to the bulwarks. The paravanes were in use at the time of the occurrence. It is reported that, at the time of abandonment, the port (windward) paravane towing wire was slack, with no paravane visible at its end, and the (windward) outrigger pole had been flipped into the stowed position by the vessel's movement.

The *Small Fishing Vessel Regulations* do not provide requirements for the safe design, installation and operation of roll-dampening paravanes. The TSB, in its investigation into the capsizing and sinking of the small fishing vessel "STRAITS PRIDE II",³ determined that the loss of a paravane stabilizer contributed to the capsizing, and recommended that:

The Department of Transport sponsor research on the dynamics and limitations of paravane stabilizers on fishing vessels with a view to developing adequate guidelines for fishermen on their design, performance and installation.

(M92-08, issued March 1993)

Again, as a result of a similar occurrence in 1994 involving the longliner/dragger "ARCTIC PRIDE",⁴ TSB Marine Safety Information letter No. 08/94 was forwarded to Transport Canada (TC) highlighting the need for research and development on the safe utilization of paravane stabilizers. In response, TC made provisions to include the subject in Marine Safety's research and development program, but the results from Transport Canada Marine Safety (TCMS) research are still pending.

³ TSB Report No. M90N5017

⁴ TSB Report No. M94N0019

In 1995, TC prepared an internal report on roll paravanes. In the interim, several other serious accidents have occurred involving paravane stabilizers on small fishing vessels.⁵

At the time of the occurrence, winds were from the northwest, gusting between 20 and 25 knots. Seas were 5 m. The air temperature was approximately 10°C and satellite imagery of the sea surface temperature, taken 1½ hours after the sinking, indicates that the sea temperature was approximately 14°C. This relatively warm water temperature resulted from the movement of warm water from the edge of the Gulf Stream onto the Grand Banks, from the south.

The vessel was inspected and certified in accordance with the *Small Fishing Vessel Inspection Regulations*. The vessel had undergone her quadrennial inspection by TCMS in December 1997 with no defects noted. The vessel was certified for Home Trade I voyages of not more than 200 miles off shore, and as the owner did not intend to fish for capelin or herring, no stability data had been submitted to TCMS for approval. In some circumstances, redfish may exhibit the stowage characteristics of herring and capelin. Small redfish, loaded “in the round” (whole) and mixed with melting ice will easily shift if not adequately penned.

The vessel’s certificate required personnel holding a Fishing Master II and Fishing Master III certificates to be on board. At the time of the occurrence, the master held a Fishing Vessel III licence, and had undergone Marine Emergency Duties (level A1, B1, and B2) training. The other crew members held no formal marine qualifications.

The crew of the “ATLANTIC PRIZE” had been working together for several years before the occurrence and had practised donning survival suits regularly. These practice sessions had included going over the side into the water while the vessel was at sea. As a result of this ongoing practice, the zippers on several of the suits were worn and one inflation tube did not function.

Analysis

While en route from the fishing grounds to St. John’s with a catch of about 45 000 kg of redfish stored in 15 pens, the “ATLANTIC PRIZE” heeled to starboard when the port paravane was lost. The resultant list progressively increased with each roll in the adverse weather conditions, causing the redfish to shift until the vessel down-flooded and, eventually, sank.

Stability may be defined as the tendency of a vessel to return to its original position after being displaced therefrom.⁶ Though adequate stability is essential to fishing vessel safety, a vessel must also be sea-kindly and comfortable in a sea-way if injuries to crew members are to be avoided. Though not required by regulation, the “ATLANTIC PRIZE” was fitted with roll-dampening paravanes to increase crew comfort by reducing the vessel’s motion in a sea-way.

⁵ TSB Report Nos. M95W0011 (“CYDRIK J”), M96N0061 (“NORTHERN VOYAGER”) and M98N0189 (“ELDORADO”).

⁶ *International Maritime Dictionary*, 2nd edition

Development of roll-dampening paravanes has been on an individual and generally empirical basis, with few records and little formal study to determine the precise interaction of the induced righting moments and the vessel's inherent transverse stability. The use of paravanes is not without risk. The safe functioning of the submerged delta-shape "fish" (as they are called by fishermen) is largely dependent on the towing speed and their complementary operation to port and starboard, such that the righting moment caused by the downward force generated on one side is synchronized with the upward roll of the vessel on that same side.

If the port and starboard synchronization is disturbed or lost, an athwartship moment can be applied to the vessel when she is rolling towards the paravane generating the most downward force, and the vessel's roll may actually be increased on that side. The synchronous and complementary operation would be eliminated if a paravane were lost or if the boom and/or the rigging on one side were to fail. Similarly, the operation would be significantly disturbed if one paravane surfaced or became fouled with floating kelp, abandoned nets, submerged debris or obstructions on the seabed.

It is known that the "ATLANTIC PRIZE" lost the port paravane before the vessel capsized. When the paravane was lost, the progressive heel to starboard would have increased with the downward thrust of the starboard paravane. However, as the vessel rolled further to starboard, her return to the upright was slowed, and successive wind and wave action on the port side and the weight of accumulated water on the starboard side deck caused the heel to increase, causing the catch to shift, further increasing the list to starboard.

The arrangement of the fish hold was such that the fish was loaded to the top of the pens, which did not extend all the way to the deckhead. This arrangement permitted the top of the cargo to shift transversely, and the resultant transverse shift of weight in heavy seas had a detrimental effect on the vessel's transverse stability. This situation would have been further exacerbated when water down-flooded into the fish hold. Mounting the pen-boards to a level above the catch would have prevented the catch from shifting when the combination of wind/wave and paravane failure suddenly heeled the vessel.

The list caused by the shifting of the catch would not normally have caused the vessel to sink. However, the vessel's arrangement was such that there were several locations through which down-flooding could occur. Because of the short time between the vessel taking a list and the sinking (approximately 17 minutes), rapid down-flooding must have occurred. The galley window on the accommodation after bulkhead was offset to starboard as was an engine-room intake vent. Water was seen to be flooding through this window into accommodation and also through the vent into the engine-room. The hinge along the centre of the main hatch was not watertight and would have admitted some water. Once the vessel took a permanent list due to the shifted redfish, it rapidly down-flooded through the engine-room air intake vent, open galley window and, to a lesser extent, the main fish hold hatch, until it sank.

The donning of immersion suits during emergency drills conducted several times a year can reduce the time required to find and don the equipment in a real emergency. The survival suits on board the "ATLANTIC PRIZE" were stored in the wheel-house area, which ensured that they were easily accessible. Survival suits are difficult to don in calm conditions and, even though the vessel sank quickly in rough conditions, the crew had time to don survival suits and launch a liferaft. Only the master had Marine Emergency Duties (MED) training; however, he had conducted numerous drills during the preceding years during which the crew had donned their suits and entered the water. Because of these practice drills, when the "ATLANTIC PRIZE" began to heel over,

the crew quickly donned their suits and, once in the water, they had confidence in the suits' ability to keep them afloat and warm. As a result, there was no panic and the crew were able to remain calm until rescued.

Although the practice of conducting regular survival suit drills was a major factor in the crew's survival, the suits themselves suffered some wear and tear as a result. At the time of abandonment, some crew members of the "ATLANTIC PRIZE" had trouble with zippers and inflator tubes. The owner of the vessel was aware of the deterioration and had ordered new suits, but they had not been delivered to the vessel at the time of the occurrence.

The water temperature for the area of the occurrence would normally be 8 to 10°C. However, at the time of abandonment, a northerly meander in the Gulf Stream had raised the water temperature to 14°C. This relatively warm mass of water increased the crew's chance of survival and their ability to remain alert. When rescued 6½ hours after the sinking, the crew were chilled but not incapacitated.

When the crew abandoned ship, they did not activate the new 406 MHz EPIRB. Nevertheless, it floated free when the vessel sank and immediately began transmitting. The information transmitted to the satellite included the identity of the vessel; however, because the EPIRB was not equipped with a GPS receiver, it could not provide an exact location. This resulted in a 66-minute delay in determining the exact location of the vessel. Even though the vessel's MAYDAY call had been received and acknowledged by St. John's Coast Guard Radio, a GPS-equipped EPIRB would have provided an immediate location and aided the already rapid SAR response.

Findings

1. The *Small Fishing Vessel Regulations* do not provide requirements for the safe design, installation and operation of paravane stabilizers.
2. Several other serious accidents have occurred involving roll-dampening paravanes on small fishing vessels.
3. The roll-dampening paravanes on the "ATLANTIC PRIZE" were being used at the time of the occurrence.
4. The port paravane was lost.
5. A combination of wind/wave action on the port side, and the dynamic heeling effect of the remaining paravane on the starboard side, reduced the vessel's righting ability when it rolled to starboard.
6. The penning of the fish hold was such that it allowed fish in the hold to shift over the top of the boards to starboard, further aggravating the vessel's starboard list past deck edge immersion.

7. The cargo hold was down-flooded through an inadequately gasketed fish hatch. The accommodation and engine-room down-flooded through an open galley window and air intake vent respectively.

Causes and Contributing Factors

The vessel foundered when she took a sudden list to starboard and down-flooded her fish hold, accommodation and engine-room. The foundering was initiated by the loss of the port roll-dampening paravane. Inadequate penning of the catch, a galley window being left open, the positioning of the engine-room vent intake, and the lack of complete watertight integrity of the fish hold hatch cover contributed to the down-flooding which caused the vessel to sink.

Contributing to the survival of the crew were the carriage of survival suits, the crew's familiarity and practice with donning the suits, the relatively warm water, the carriage on board of a 406 MHz EPIRB, and the prompt search and rescue response.

Safety Action

Subsequent to this occurrence, TC indicated that it is developing a Ship Safety Bulletin on the use of paravane stabilizers as well as a discussion paper on the same issue. These documents, along with the TC "Internal Report on Paravane Roll Stabilization," will be used to communicate to fishermen the safe use of paravane stabilizers. TC further indicated that it is exploring practical approaches to address TSB Recommendation M92-08, including research and development.

This report concludes the Transportation Safety Board's investigation into this occurrence. Consequently, the Board, consisting of Chairperson Benoît Bouchard, and members Jonathan Seymour, Charles Simpson, W.A. Tadros and Henry Wright authorized the release of this report on 07 January 2000.

Appendix A - Photographs



