

MARINE OCCURRENCE REPORT

CAPSIZE

FISHING VESSEL

"3J'S '93 (THE)"

OFF NORTH CAPE, PRINCE EDWARD ISLAND

23 SEPTEMBER 1996

REPORT NUMBER M96M0128

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

While returning to her home port of Tignish and transiting the shallow waters off North Cape in following rough and confused seas, the fishing vessel “3J’S ’93 (THE)”, which was laden with fish, capsized. One crew member reached the shore but the other drowned. The vessel drifted ashore, was later recovered and subsequently was declared a constructive total loss.

Ce rapport est également disponible en français.

Other Factual Information.

	"3J'S '93(THE)"
Port of Registry	Charlottetown
Flag	Canada
Registry/Licence Number	815514
Type	Fishing Vessel (F.V.)
Gross Tonnage	14
Length	11.58 m
Draught	1.08 m
Built	1993, Kensington, Prince Edward Island (P.E.I.)
Propulsion	One six-cylinder Cummings diesel engine, 298 kW driving a single fixed-pitch propeller
Number of Crew	2
Registered Owner	Mr. Lawrence Gaudet Tignish, P.E.I.

Description of Vessel

The "3J'S '93(THE)" was of open construction and the hull was divided into three main compartments. From forward they were: accommodation, wheel-house, and an open well-deck measuring 7.4 m x 3.7 m. The well-deck extended aft over the engine compartment, two water ballast tanks (port and starboard), one small fish-hold (athwartships), two fuel tanks (port and starboard) and a steering gear compartment. The deck had recently been painted with an anti-skid coating. The well-deck, if filled, contains approximately 17 tonnes of water. Access to the wheel-house, which was stepped up from the well-deck, was via a full height sliding door that opened to port and rested against the aft end of the wheel-house. There were two 75 mm diameter scuppers which were threaded for receiving plugs, (one each to port and starboard) in the transom of the vessel. There was no scupper or freeing port forward of the transom.

The water ballast tanks each held approximately 1,110 litres (L) of salt water and were topped up before leaving port. The fish-hold held approximately 270 kg of lobster and was about one-half full. The fuel tanks each held approximately 1,110 L of diesel and were about one-half full. The fuel tanks were interconnected such that they allowed the level in both tanks to equalize. Being less than 15 gross tons, the "3J'S '93(THE)", was an uninspected vessel.

¹ See Glossary at Appendix A for all abbreviations and acronyms.

² Units of measurement in this report conform to International Maritime Organization (IMO) standards or, where there is no such standard, are expressed in the International System (SI) of units.

Voyage

The vessel departed Tignish, at approximately 0600 on Monday, 23 September 1996 for fishing grounds south-west of North Cape in the Northumberland Strait. Upon arrival at the fishing grounds after a passage of approximately 45 minutes, the crew assisted another fisherman with a net full of herring and received approximately two thousand pounds of the catch. This was stored in six plastic fish pans and three extractors and placed on the port aft corner of the well-deck but these were not secured.

The plastic fish pans are 74 cm long, 40 cm wide and 30 cm high. The extractors are 89 cm long, 50 cm wide and 55 cm high. The pans were piled two high alongside the extractors and were neither lashed nor made fast to the vessel.

The weather conditions deteriorated during the day but the vessel fished all 45 sets (5-7 traps per set) of lobster traps before heading for port at approximately 1600. The normal procedure is to off-load the lobster to a designated vessel called a "smack Boat", but the weather was too rough for this operation. Hence, the catch was stored in fish pans in the small fish-hold.

Upon departing the fishing grounds, the "3J'S '93(THE)" initially steered a north-easterly course, gradually changing to the east, passing between North Cape and the North Cape Reef light and whistle buoy "BY" positioned about 1.5 miles offshore, and finally, due south for Tignish. The seas were rough and confused in shallow water of 5-8 fathoms. Some of the other fishing vessels headed for the same port were seven to eight miles north of the "3J'S '93 (THE)" in water depths of 13-18 fathoms. A following sea broke over the vessel's port quarter and partially filled the well-deck. Some water carried through into the wheel-house via the sliding door which was open at the time. The operator pulled the throttle back to idle and the vessel listed heavily to starboard. The forward end of the vessel became submerged and she continued the roll to starboard, finally capsizing with the two crew still inside the wheel-house.

After the vessel capsized, an air pocket was formed at the deck of the wheel-house. Following discussions, the two men withdrew, without their life jackets, through the sliding door to the well-deck. There they discovered another air pocket. They ducked under the gunwale and were then free of the vessel.

The deck-hand removed his rubber boots and oilskin jacket. He yelled at the owner/operator, who appeared to be in shock, to get rid of his boots and accompany the deck-hand to a wooden rack that had floated clear of the vessel. The operator refused, and except for a couple of brief glimpses of him treading water, the deck-hand did not see the operator alive again. The deck-hand climbed onto the wooden rack, cleared it of a fishing net, and attempted to return to the vessel but was unsuccessful. He drifted to shore, at approximately 1835, and was rescued by Department of Fisheries and Oceans (DFO) officers and individuals who had gathered in the vicinity; the individuals had been alerted earlier by DFO officers. The deck-hand had spent approximately two hours in the water and was suffering from mild hypothermia. He was taken to hospital, where he was examined and later released.

The 18 gross-ton, 11.5 m-long, fisheries patrol boat "W. FERGUSON" sailed from Alberton, P.E.I. at approximately 1300 and returned to port within the hour. The decision to return was based on the fact that the prevailing weather conditions were considered unfit, and the forecast outlook for the coming hours indicated

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All times are ADT (Coordinated Universal Time (UTC) minus three hours) unless otherwise noted.

further deterioration. Thus, the two DFO officers used the DFO vehicle and were on shore patrol at the time of the accident. At approximately 1730, they observed some debris in the water and a boat barely above the water. They proceeded to Sea Cow Pond, some five minutes away, to seek assistance for the distressed vessel. A two-way internal radio with access to the cellular network was provided to meet their communication needs and was used to contact the DFO office at Alberton, P.E.I. The main function of these DFO officials was surveillance, protection and enforcement of resource stocks.

Weather

The weather experienced by the vessel was consistent with the marine weather forecast for the area and the forecasts had been monitored by the crew. The 0530 weather forecast for the area for the day issued by Environment Canada, Maritimes Weather Centre was for winds from the north-east at 15 knots, increasing to north-east 20-25 knots in the afternoon. The visibility was forecast as being good to fair in occasional showers. A "Gale Warning" was issued at 1130 and the forecast was for 35-knot north-east gales that evening.

The adverse effect of waves in shallow waters is explained in the *"Gulf of Saint-Lawrence Marine Weather Guide"* published by Environment Canada. Further, the weather forecast also cautioned mariners that heights of waves may differ significantly in coastal waters and in depths less than 50 m.

The surface water temperature was 12-13 degrees centigrade which would give a predicted survival time of under three hours.

Experience and Training

The crew held no formal marine qualifications nor were they required to do so by regulations. The operator had more than twenty year's fishing experience and the deck-hand approximately thirteen years. The two men had fished together for approximately seven seasons. However, they had neither discussed nor formulated an emergency plan.

Decision to Fish

Fishing was reportedly good and the vessel, together with other fishing vessels in the area, continued to fish despite the deteriorating weather conditions. The lobster season was short.

⁴ "Cold Water Survival" by Canadian Red Cross gives the predicted survival times for an average adult human who is holding still in ocean water and wearing a standard life jacket and light clothing.

Life-Saving Equipment

The vessel's life-saving equipment included life jackets for the complement on board. Ref: CSA s75, SMALL FISHING VESSEL INSPECTION REGULATIONS. Part II [FISHING VESSELS NOT EXCEEDING 15 TONS, GROSS TONNAGE]. There is no requirement for the carriage of either any approved boat, or an inflatable liferaft, or any life-saving equipment which can be used as a work attire or an Emergency Position Indicating Radio Beacon (EPIRB) and none was on board; however, this does not preclude or prevent the voluntary carriage or use of such items.

Search and Rescue

The DFO office at Alberton informed Rescue Coordination Centre (RCC) Halifax of the overturned fishing vessel at 1739. A "MAYDAY RELAY" was broadcast by the Marine Communications and Traffic Services (MCTS) centre at Sydney but no response was received. RCC then tasked the primary Search and Rescue (SAR) helicopter from Greenwood, N.S. at 1748, which was airborne at 1857 and arrived on scene at 2025. At 1755, a Hercules fixed-wing aircraft was tasked, which was airborne at 1911 and arrived on scene at 1946. At 1816, the F.V. "SEA SNAPPER" reported to RCC that she was unable to assist due to the prevailing adverse weather conditions. At 1900, RCC contacted Regional Operations Centre (ROC) Maritimes to request a phone number for a DFO officer in P.E.I. RCC informed ROC that the request was in relation to an incident off North Point, P.E.I. but no details were provided nor was a request for additional information made by ROC.

Meanwhile reportedly, unknown to RCC, a Canadian Coast Guard (CCG) helicopter which is stationed at Charlottetown, had returned to its base at 1720 and the helicopter crew were at the hangar until 1800. The helicopter is restricted to daytime flying and is not provided with a winching device, or a means to rescue a person from either the water or the deck of a ship; however, it is capable of dropping a liferaft or a life jacket to a person in the water. The helicopter was positioned some 25 minutes flying time away from North Cape; the sunset was at 1908 and the helicopter would have been required to land by 1938.

Investigation revealed that RCC Halifax is informed of CCG helicopters' operational status/ flight plan/ itinerary. According to the ROC Maritimes, each morning RCC Halifax receives a copy of the operational status as well as the flight plan/itinerary (as appropriate) of CCG helicopters operating in the region. The 23 September morning report to RCC Halifax conveyed the operational status of the CCG helicopters. Despite this, RCC maintain that they were not informed of, and were unaware of the CCG helicopter's return to base or of its availability for SAR.

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CGO 2/65 deals with reporting requirements for CCG vessels. There are no Coast Guard Fleet Orders for shore-based CCG helicopter reporting requirements. The standard practice is to communicate through MCTS Centres which then forward information to ROC Maritimes.

Any SAR unit, be it primary, secondary or units of opportunity may be considered in the tasking during SAR operations; time being of the essence. In this instance, the primary air units were considered and tasked but the secondary unit, the CCG helicopter, was not considered.

An open communications line existed between RCC, ROC and other interested SAR parties up until March 1993. This link known as "SARCOM" enabled the RCC, ROC, Marine Rescue Sub-Centre (MRSC), and, MCTS among others, to be immediately aware of a possible emergency and also to be advised of RCC's response to the situation as it developed. "SARCOM" was discontinued on the east coast but still remains active on the west coast of Canada, where it is considered a definite asset. The United States of America also maintains a similar system known as "SARTEL".

Analysis

Decision Making

Given the gale warning issued by the Maritimes Weather Centre and the deteriorating weather, the operator of the "3J's '93 (THE)" had to decide whether to continue fishing or to return to port.

When faced with a decision involving risk, research indicates that there is a tendency to view the alternatives as a choice between gains or losses. People are biased towards the loss which is less probable rather than the uncertain loss, even if the less probable loss carries with it potentially disastrous consequences.

In this occurrence, the alternatives available to the operator both involved loss. A return to port without having fished all of the traps would result in a certain financial loss. On the other hand, to continue fishing, despite adverse weather, would increase the possibility of crew injury and/or of the vessel sustaining damage/ loss (an uncertain probability of disaster). The operator of the "3J's '93 (THE)" and other fishing vessels in the area chose the latter alternative, which proved to be disastrous for the "3J'S '93 (THE)", over the sure loss of a diminished financial return on the catch. In contrast, the DFO vessel, which was not subject to the same financial considerations, returned to port within an hour of her departure.

In an extremely competitive fishing environment with fish stocks subject to fluctuation, the loss of a full or part day's catch can create a shortfall in revenue to the fishermen. Hence, the operator's decision to continue fishing may have been influenced, in part, by the short lobster season and the good catch reported for the day.

Although the operator was aware that heights of waves may be significantly higher in shallow waters than in deeper waters and despite the worsening weather conditions, he elected to transit the shallow (5-8 fathoms' depth) and rougher waters off North Cape instead of deeper (13-18 fathoms' depth) waters offshore; the latter route was used by other similar-sized

⁶ Search and Rescue Operations Manual, Chapters 4 and 7.

⁷ Nagel, D.C. (1988). "Information processing". In E. L. Weiner and D.C. Nagel (Eds) *Human factors in aviation* (p. 135). San Diego, CA:Academic Press.

vessels to safely transit the area. Further, the steep waves and breaking surf would cause the vessel to glide between the troughs. As the operator lost his life, it was not possible to determine why he had elected to take this route.

Factors Affecting Capsize

The absence of freeing ports and the small number and size of the scuppers in the transom would not permit rapid drainage of the water, but allowed some of the shipped water to accumulate on the well-deck. As the wheel-house door was left open, some of the shipped water found its way into the wheel-house.

As the vessel was operating in a seaway, the transom scuppers would allow water shipped on deck to drain more readily when forward momentum was maintained than would be the case when headway was reduced. The reduction of speed would reduce the suction effect of the scuppers and also would result in loss of directional control. Additionally, because of the reduction of the vessel's forward speed, the momentum of the shipped water would cause it to flow through the open aft wheel-house door into the wheel-house. The weight of the water in the wheel-house would cause the vessel to trim by the head and submerge the bow. The matter of watertight openings and their importance in maintaining integrity was covered in Ship Safety Bulletin (SSB) 16/92.

All small vessels of open construction employed in exposed or relatively rough waters are operated at risk, being particularly vulnerable to swamping by taking water over the gunwale, and prudent operation with regard to loading, freeboard, speed and orientation relative to the prevailing seas is essential for safety.

The quantity of seas shipped over the port quarter resulted in the accumulation of water on the starboard side of the well-deck and its weight would cause the vessel to heel heavily to starboard. The situation would have been further aggravated by the unsecured fish pans and extractors moving to starboard and by the free surface effect of accumulated water on the well-deck. The cumulative effect of the above would cause the vessel to lose transverse stability and capsize. TP 8694 recommended against the carriage of fish outside the fish hold.

Hand-hold on the Ship's Side

The absence of hand-holds on the ship's side precluded the operator from gaining access to, or holding onto, the hull of the capsized vessel.

Safety Equipment and Safety Drills

There is no regulation governing the wearing of a life jacket or a personal flotation device (PFD) while working on the deck of a small fishing vessel or when the vessel is operating in adverse weather conditions. The approved life jacket required to be carried on fishing vessels must meet rigid buoyancy standards and have the ability to turn an unconscious person in the water to a face-up position. The life jacket design makes them cumbersome as a work attire. PFDs on the other hand provide freedom of movement and MOT-approved versions are on the market. However, PFDs are only aids to keep a person afloat in the water and are not a substitute for, nor intended to function as or replace an approved life jacket. In this instance, the life jackets were stowed in the cuddy and were not readily accessible. The rapidity of the capsize precluded the crew from gaining access to the life jackets. Hence, in the absence of a boat or inflatable liferaft requirement, the crew's prospect for survival was limited to accessing/donning of the life jacket and/ or the lifebuoy floating free. This occurrence

once again highlights the dangers associated with overly relying on life jackets as the primary means to save lives, more so as they are rarely worn during operations. A competitively priced, practical alternative to a life jacket that can provide freedom of movement, some thermal protection, and reasonable flotation, and which is required to be worn while working on the decks of small fishing vessels or while the vessel is operating in adverse weather conditions can greatly enhance an individual's chances of survival in the frigid waters of Canada. Transport Canada, through various fora, has suggested or encouraged fishermen to use appropriate work suits, with both thermal and flotation capabilities.

Although both crew members had worked together for approximately seven seasons, there was neither discussion between them nor was a plan in place to deal with shipboard emergencies.

SAR-Related Issues

Primary SAR resources, for the purpose of carrying out a marine SAR task, are designated government vessels, Hercules aircraft and Labrador helicopters, with crews specially trained in SAR. Secondary resources as defined in the NATIONAL SEARCH AND RESCUE MANUAL, are all resources of the Federal government that are not specifically dedicated to SAR but which may be tasked to aid in the resolution of a SAR incident. CCG helicopters are a secondary SAR resource.

Although the CCG helicopter is a secondary SAR unit, there was no regime in place to ensure that RCC Halifax directly was apprised of the helicopter's return to base either by the ROC Maritimes or by means of the reporting practice similar to that of CCG vessels; a procedure adopted by other RCCs and MRSC. In this instance, the CCG helicopter's return to base was not indicated to RCC Halifax. Nonetheless, RCC Halifax normally receives a daily report, scheduling CCG vessels and their operational status, including CCG helicopters and hence, good operational practice dictates that consideration be given to its tasking (CCG helicopters) for a SAR occurrence. In this instance, RCC opted to task primary SAR air resources and the secondary resource was not considered.

There was a communication deficiency between RCC Halifax and ROC Maritimes respecting SAR operations and reportedly, this is not an isolated occurrence. In the harsh marine environment where prompt tasking of SAR (marine/ air) resources is paramount to a positive resolution of a SAR occurrence, any delay in tasking an appropriate SAR unit unduly jeopardizes the safety of personnel. Further, while RCC Halifax is responsible for tasking SAR units, ROC Maritimes maintains up-to-date information on all government secondary resources in the area. Hence, closer cooperation between RCC and ROC, and a sound regime which ensures that RCC Halifax has up-to-date information on all secondary resources (available for SAR) is essential for the timely tasking of appropriate resources.

The absence of the "SARCOM" line precluded timely input from ROC Maritimes with respect to the availability of all SAR resources. Good operational practice dictates that the procedures established in the SAR Manual for the seeking and tasking of SAR resources be followed. In this instance, they were not.

The rapidity of the capsize precluded the operator from transmitting a MAYDAY. As no EPIRB was carried and as none was required to be carried, there would normally have been no means of alerting RCC of the vessel's need for assistance, resulting in delays to SAR response. In such an eventuality, the delay would reduce the crew's chances of survival. In this instance, it was fortuitous that the DFO officers on shore patrol saw the distressed vessel and promptly alerted the RCC.

Findings

1. Despite deteriorating weather conditions, the "3J'S '93 (THE)" continued to fish all lobster traps before returning to port.
2. The operator of the "3J'S '93 (THE)" elected to transit the rougher shallow waters rather than the relatively calmer deeper water further offshore.
3. The reduction of the vessel's speed may have reduced the suction effect of the transom scuppers and could have resulted in loss of directional control. Additionally, the momentum of the shipped water caused it to flow through the open wheel-house door.
4. The seas from the port quarter caused the shipped water to accumulate on the starboard side which listed the vessel heavily to starboard and caused the unsecured fish boxes to shift.
5. The shipped water could not drain rapidly from the well-deck due to the absence of freeing ports and the limited number and size of scuppers. This allowed water to accumulate on the well-deck to the detriment of the vessel's transverse stability.
6. The heel rapidly increased and the free surface effect of the water accumulated on the well-deck contributed to the vessel losing transverse stability and capsizing.
7. The absence of hand-holds on the ship's side precluded the operator from gaining access to, or holding onto, the hull of the capsized vessel.
8. The deck-hand, who was not wearing a life jacket, was suffering from mild hypothermia when rescued after some two hours of immersion in seawater.
9. The operator was not wearing a life jacket and this substantially reduced his chances of survival.
10. The sudden and unexpected capsize precluded the operator from either transmitting a distress message or from gaining access to the life jackets which were not readily accessible.
11. There was no emergency plan in place nor was an emergency drill held. Neither was required by regulations.

Life-Saving Equipment

12. The vessel was not required to carry either a boat or an inflatable liferaft, and the crew's survival depended upon accessing/donning their life jackets.
13. Life jackets are cumbersome as a work attire and consequently are rarely worn while working on the deck of a fishing vessel or while the vessel is operating in adverse weather.
14. The absence of a practical alternative to a life jacket and the absence of a requirement to wear life-saving gear while working or operating in adverse weather conditions compromised crew safety and reduced the chances of survival in this emergency.
15. The carriage of an EPIRB, voluntary or otherwise, has the potential to increase the chances of a distress alert being sent, thus leading to SAR resources arriving on scene in a more timely manner and increasing chances for survival.

Rescue Coordination Centre (RCC) and Regional Operations Centre (ROC)

16. There was a communications deficiency between RCC Halifax and ROC Maritimes.
17. RCC tasked primary SAR air units but the secondary SAR unit, a CCG helicopter, was not considered for tasking until some 12 hours after RCC Halifax received initial notification of this incident.
18. There was no regime in place to ensure that RCC Halifax became aware of the CCG helicopter's return to base either through the ROC Maritimes or by means of the reporting practice similar to that used aboard CCG vessels.

Causes and Contributing Factors

While transiting the shallow waters off North Cape in following and confused sea conditions, the "3J's '93 (THE)" shipped heavy seas, and being unable to drain the seawater rapidly from the well-deck, lost transverse stability and capsized. Contributing factors to the capsize were the small size and limited numbers of the scuppers, the unsecured fish boxes and the free surface effect of liquids. The operator was not wearing a life jacket or thermal protection, and this contributed to the loss of his life.

Action Taken

Following the occurrence, ROC and RCC have initiated action to increase cooperation and communication, and are evaluating an open line communication system similar to “SARCOM” as a suitable replacement. The TSB is not aware of the implementation of such a system at this time.

This report concludes the Transportation Safety Board's investigation into this occurrence. Consequently, the Board, consisting of Chairperson Benoît Bouchard, and members Maurice Harquail, Charles Simpson and W.A. Tadros, authorized the release of this report on 10 March 1999.

Appendix A - Glossary

ADT	Atlantic Daylight Time
CCG	Canadian Coast Guard
cm	centimetre
DFO	Department of Fisheries and Oceans
EPIRB	Electronic position indicating radio beacon
extractor	boxes to hold fish
F.V.	fishing vessel
fathom	1 fathom equals 6 feet or 1.8 m
free surface effect	The reduction of stability due to movement of unrestricted liquid surfaces.
IMO	International Maritime Organization
kg	kilogram
kn	knot
kW	kilowatt
L	litre
m	metre
MAYDAY RELAY	A prefix used for a distress message repeated by a station other than the station in distress.
MCTS	Marine Communications and Traffic Services
mm	millimetre
MOT	Ministry of Transport
MRSC	Marine Rescue Sub-Centre
N.S.	Nova Scotia
P.E.I.	Prince Edward Island
PFD	personal flotation device
RCC	Rescue Coordination Centre
ROC	Regional Operations Centre
SAR	Search and Rescue
SI	International System (of units)
SSB	Ship Safety Bulletin
TSB	Transportation Safety Board of Canada
UTC	Coordinated Universal Time