

MARINE OCCURRENCE REPORT

LOSS OF

FISHING VESSEL "PATRICK & ELIZABETH"

IN APPROXIMATE POSITION 47° 40'N, 051° 54'W

12 OCTOBER 1994

REPORT NUMBER M94N0021

MANDATE OF THE TSB

The Canadian Transportation Accident Investigation and Safety Board Act provides the legal framework governing the TSB's activities. Basically, the TSB has a mandate to advance safety in the marine, pipeline, rail, and aviation modes of transportation by:

- conducting independent investigations and, if necessary, public inquiries into transportation occurrences in order to make findings as to their causes and contributing factors;
- reporting publicly on its investigations and public inquiries and on the related findings;
- identifying safety deficiencies as evidenced by transportation occurrences;
- making recommendations designed to eliminate or reduce any such safety deficiencies; and
- conducting special studies and special investigations on transportation safety matters.

It is not the function of the Board to assign fault or determine civil or criminal liability. However, the Board must not refrain from fully reporting on the causes and contributing factors merely because fault or liability might be inferred from the Board's findings.

INDEPENDENCE

To enable the public to have confidence in the transportation accident investigation process, it is essential that the investigating agency be, and be seen to be, independent and free from any conflicts of interest when it investigates accidents, identifies safety deficiencies, and makes safety recommendations. Independence is a key feature of the TSB. The Board reports to Parliament through the President of the Queen's Privy Council for Canada and is separate from other government agencies and departments. Its independence enables it to be fully objective in arriving at its conclusions and recommendations.



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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in Approximate Position $47^{\circ} 40'N$, $051^{\circ} 54'W$

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Synopsis

On 12 October 1994, the "PATRICK & ELIZABETH" was inbound from the fishing grounds. At 2200, from a position about 40 miles north-east of Bay Bulls, Newfoundland, the vessel contacted her home base by radiotelephone, giving an estimated time of arrival of 0600 the next day, and reporting 40- to 50-knot winds. The vessel was not heard from again. During the ensuing search, considerable debris was sighted, some of which was recovered and identified as being from the "PATRICK & ELIZABETH". No trace was found of the crew of five.

The Board determined that there is insufficient information or evidence as to the precise cause of the vessel's loss. However, it appears that the vessel was quickly overwhelmed by wind and waves, and that the crew had insufficient time to send a distress message or abandon the vessel safely.

Ce rapport est également disponible en français.

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1.0 *Factual Information*

1.1 *Particulars of the Vessel*

	"PATRICK & ELIZABETH"
Official Number	346556
Port of Registry	St. John's, Nfld
Flag	Canadian
Type	Longliner
Gross Tons	44
Length	14.35 m
Breadth	5.54 m
Depth	2.50 m
Cargo	3,200 kg of iced turbot (100 nets)
Built	1973, Shelburne, Nova Scotia
Propulsion	180 HP Caterpillar diesel engine
Owner	Patrick Coady St. John's, Nfld

1.1.1 *Description of the Vessel*

The "PATRICK & ELIZABETH", previously called the "SHEILA & CATHY IV", was built of wood. To meet construction requirements, the flush-deck vessel was built to a design approved by the Ship Safety Branch of the Canadian Coast Guard (CCG) and the Nova Scotia Ministry of Fisheries.

¹ See Glossary for all abbreviations, acronyms, and definitions.

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.

The vessel was bought early in 1993, taken to Newfoundland, and renamed by the new owner. At that time, she underwent considerable upgrading/rebuilding. The deck was raised 0.3 m and new decking, a new hatch coaming and a totally new, locally designed superstructure with associated wiring were fitted. New bulwark stanchions were fitted. The bulwark was planked similar to a ranch-style fence to provide ample freeing ports.

A rebuilt main propulsion engine was installed together with two new 2,273-litre fuel tanks. Bilge pumping arrangements consisted of the main engine-driven pump, a gasoline-driven pump and two electric pumps.

The vessel was not equipped with outrigger stabilizers. The fish hold was subdivided. The vessel was rigged for scallop, tuna or gillnet fishing. When the crew members were not scallop fishing, they would remove the winch and associated equipment. A net box was fitted on the stern deck to stow gillnets but was removed for the scallop fishery.

Due to the extent of the above upgrading/rebuilding, no similar sister ship could be located to permit any form of stability analysis. The vessel was reportedly in good condition which is substantiated by inspection records, photographs and video records (see Appendix A).

1.2 History of the Voyage

After taking on ice and provisions sufficient for a two-week voyage, the "PATRICK & ELIZABETH" sailed from Bay Bulls at 1930, 04 October 1994, bound for the Tobins Point, Nfld, fishing grounds. On arrival, the vessel set her gillnets for turbot. There was a balance of about 1,200 tonnes remaining in the overall turbot quota and no vessel trip quota for this species. Some of the nets were hauled and the offal from the catch was kept as bait for tuna. The nets were then reset and the vessel proceeded to the Virgin Rocks area, south of the Tobins Point fishing grounds (see Appendix B), to try to fill her tuna quota of two fish.

On Monday, 10 October 1994, the "PATRICK & ELIZABETH" was observed fishing in that area by another fishing vessel inbound for St. John's. Nothing appeared out of the ordinary with the "PATRICK & ELIZABETH".

After an unsuccessful effort for tuna at the Virgin Rocks, the "PATRICK & ELIZABETH" returned to her nets at the Tobins Point area where she continued fishing for turbot.

With the forecast of an impending storm, the "PATRICK & ELIZABETH", then eight days out, began the return voyage to Bay Bulls on the morning of 12 October 1994, after taking back her reported 100 nets and stowing them in the net box fitted on the afterdeck. Reportedly, she had taken on board a catch of approximately 3,200 kg of turbot, 20 per cent of her normal capacity. By the start of the return voyage, consumables were 70 to 80 per cent depleted.

At about 1500, the skipper made radiotelephone contact with his wife at home, advising that the vessel was inbound and that, although strong winds were in the forecast, it was nice at that time. He was aware that a storm was forecast for early the next morning but, by that

³ All times are NDT (Coordinated Universal Time (UTC) minus two and one-half hours) unless otherwise stated.

time, the vessel would be well in the lee of the land. However, he told his wife that, were it to get too bad, they would lie-to. She requested that he contact her if that situation were to arise.

At approximately 2200, the skipper again made radiotelephone contact with his wife, advising that the vessel was experiencing 40- to 50-knot winds, but that the seas were not high and that everyone was well and everything was fine. He estimated his position as some six hours from Bay Bulls, with an estimated time of arrival (ETA) of about 0600 the next morning. He further advised that he would contact her after arrival to be picked up and that there was no need to worry, everything was fine.

That was the last contact with the vessel. When the "PATRICK & ELIZABETH" had not arrived by 0830 in the morning, concern mounted. A severe storm had developed, was ongoing, and it was feared that the vessel was in trouble. After consultation between the owner's family and the plant manager of Bay Bulls Sea Products, the Marine Rescue Sub-centre (MRSC) St. John's was contacted at 0934 and the "PATRICK & ELIZABETH" was reported overdue.

1.3 Injuries to Persons

All five persons on board are missing, presumed drowned.

1.4 Certification

1.4.1 Vessel Inspection and Certification

After being upgraded, the vessel was inspected by the Ship Safety Branch of the CCG on 21 May 1993, at which time a ship safety inspection slip (S.I. 7) was issued requiring several items to be attended to before 21 July 1993. On 20 July 1993, the listed items were found to have been completed and the SIC 29 was extended to expire 20 May 1997.

The "PATRICK & ELIZABETH" was classed Home Trade I, East Coast of Canada, not more than 120 miles offshore. Limitations on the use of the certificate stated that the certificate shall be valid for voyages as follows:

Home Trade I (200 miles) permitted between dates of April 1st and November 30th only. Not approved to fish or carry herring or capelin.

Because the vessel was a small fishing vessel of less than 150 gross registered tons (GRT), the *Canada Shipping Act* (CSA), or regulations made pursuant thereto, did not require that the vessel be inclined to generate stability data, and these data were not generated. The vessel was not required to subdivide the fish hold into pens. However, the fish hold of the "PATRICK & ELIZABETH" was subdivided and fitted with portable penboards.

1.4.2 Personnel Certification and Crew Experience

As the "PATRICK & ELIZABETH" was a fishing vessel of less than 100 GRT, the CSA, Part II, Certificates of Officers, did not require that any of the crew be certificated nor did any on board have certification.

The skipper/owner had more than 20 years' seagoing experience and had been owner/skipper of several vessels before obtaining the "PATRICK & ELIZABETH". He was known to be safety-conscious and, when conditions warranted, required his crew to don lifejackets. He weathered many storms during his seagoing career.

The crew members on board the vessel were all considered experienced fishermen; some with up to 20 years' fishing experience at sea on various vessels. One of the crew members was an accomplished swimmer, another could not swim and the other three could manage to stay afloat or make a few strokes.

1.5 *Vessel Traffic*

During her transit from the fishing grounds until the last communication from the "PATRICK & ELIZABETH", no mention of other vessels being sighted or detected was made. There was no report of other vessels in the immediate area nor had any vessel reported transiting that area at about that time.

Furthermore, no other vessel was reported missing on or about that time nor had any vessel returned to port in a damaged state consistent with having been in a collision.

1.6 *Weather Information*

1.6.1 *Harsh Environmental Conditions off Atlantic Canada*

The *Report of the Royal Commission on the Ocean Ranger Marine Disaster* stated that there are few areas in the world which possess as severe environmental conditions as the continental shelf off eastern Canada. Nowhere else are the combinations of wind, wave, fog and ice as perilous and unpredictable as in that vast and varied expanse of ocean.

During the passage between the fishing grounds to Bay Bulls, the "PATRICK & ELIZABETH" transited the East Coast Marine Weather Forecast Area (see Appendix C).

1.6.2 *Need to Monitor Weather Forecasts*

The Transport Canada publication *Manual of Safety and Health for Fishermen* (TP 1283) cautions fishermen that rapid changes can occur in the weather and emphasizes the need to monitor forecast weather reports. It is clear from the skipper's radiotelephone conversations with his wife that the weather forecasts were being monitored and acted upon.

1.6.3 *Weather Forecast*

The Newfoundland Weather Centre of Environment Canada issued a "Storm Warning" bulletin (48 to 63 knots) at 0230, Wednesday, 12 October 1994, for the Newfoundland East Coast Marine Area which stated:

Storm Warning Issued.

Storm force northerlies up to 50 knots are forecast to develop late this evening. Storms are expected to diminish to northerly gales Thursday evening.

The regular forecast for Wednesday and Thursday issued at 0300 on Wednesday, 12 October 1994, for the East Coast Marine Area stated:

Gale warning upgraded to storm warning.

Northerly gales 35 to 40 knots increasing to northerly gales 50 near midnight tonight. Gales diminishing to northerly gales 40 Thursday evening. Showers. Fog patches lifting this afternoon. Visibility fair in showers and poor in fog. Little temperature change.

Subsequent forecasts, issued Wednesday at 1000, 1530 and 2000, and Thursday at 0300 and 1000, continued to issue the storm warning. The storm warning was downgraded to a gale warning (34 to 47 knots) in the 1530 forecast of Thursday, 13 October 1994.

1.6.4 Sea State Forecasts

The Newfoundland Weather Centre also issues a sea state forecast. The 0600 broadcast for the East Coast, North-East Coast Marine Areas of Wednesday, 12 October 1994, stated: "Seas 2 to 3 metres building to 5 to 6 metres this evening."

The 1800 sea state forecast for the East Coast, Funk Island Bank, and South-Western Grand Banks Marine Areas on the same day broadcast: "Seas near 4 metres building to 5 to 6 metres overnight."

The 0600 broadcast on Thursday, 13 October 1994, for the East Coast, South-Western Grand Banks Marine Areas stated: "Seas 5 to 6 metres today and tonight."

The 1800 forecast for the same areas stated: "Seas 5 to 7 metres diminishing to 4 metres Friday morning."

1.6.5 Weather Encountered

At 1500 on Wednesday, 12 October 1994, the "PATRICK & ELIZABETH" reported that it was "nice" and that the vessel should be well in before the forecasted storm materialized. Later, at 2200, it was reported that seas were not high and that winds were between 40 and 50 knots. It was estimated that the vessel was 40 to 50 miles north-east of her destination at that time.

The time at which the vessel was overwhelmed and lost is not known.

Several other fishing vessels at sea in the Virgin Rocks area that week reported fair to poor wind and sea conditions. A number of vessels stayed out and weathered the storm on Wednesday, Thursday and Friday. Some of these vessels took part in the search for the "PATRICK &

ELIZABETH" on Thursday and Friday. One vessel which recovered a section of the wheel-house top reported that the night of 12 to 13 October had been very rough, followed by even rougher weather. Seas were reported to be high and confused.

During the initial search effort, the Search and Rescue (SAR) command vessel reported 7-metre seas at times.

1.7 Navigation Equipment

The vessel's navigation equipment included two radars, two echo-sounders, an autopilot, a Loran C, a Global Positioning System (GPS) and three radiotelephones, all of which were reportedly in good working order. One of the radiotelephones was equipped with an automatic emergency alarm.

There is no report of a transmission having been received from that unit nor any report that a distress message was either issued or received from the vessel. The automatic emergency alarm is activated by pushing the alarm button. This sends a two-tone alarm that an emergency call is to follow.

1.8 Search and Rescue

The "PATRICK & ELIZABETH" was reported overdue to MRSC St. John's at 0934, 13 October 1994. Efforts to make radiotelephone contact with the vessel were unsuccessful. An official SAR response was initiated at 0936. In view of the severe storm conditions existing in the area of the vessel's last known position (LKP), a full-scale SAR operation was launched.

A Computer-Assisted Nautical Search and Rescue Plan (CANSARP) was compiled. However, neither the time nor the position of the presumed distress was known. The CANSARP was based on the vessel's LKP at 2200, 12 October, the weather conditions known to exist in the area, the drift, the ETA given and the estimated speed (5 knots) of the vessel in beam seas.

Nine vessels and five aircraft were tasked to the search area. The severe weather limited the air search and hampered the vessels tasked to the area.

Debris was first sighted by a tasked aircraft in position $47^{\circ}13.5'N$, $051^{\circ}42.7'W$. This information was passed to the on-scene commander, CCG SAR vessel "SIR WILFRED GRENFELL", at 1746, 13 October.

During the next several hours, various vessels, at risk to themselves in the severe weather, recovered debris, including the wheel-house top with a section of the front, pieces from the port afterside, a section of the shelter deck after bulkhead, boxes, dory parts, a section of the forecabin floor, rope/twine, net-marking balloons, liferings and the upright, inflated liferaft. A section of what appeared to be the vessel's keel with several pieces of ribs attached was sighted but not recovered.

No trace was found of the crew of five.

1.9 *Recovered Debris*

The recovered debris was examined at the St. John's CCG Base in an effort to learn what might have happened.

The entire wheel-house top was in one piece. A radar scanner was intact, but its dome was missing, and the securing mount for the second radar was in place, but the scanner was missing. A searchlight with slightly bent shaft was found intact, its lens not broken. Two exterior lights fitted to the underside eave at the front were intact. The interior deckhead, consisting of screw-fastened pearlboard and an undamaged interior deckhead light fixture, were intact.

One radar display unit was secured in position to the deckhead. The wheel-house top had been fitted with a guard-rail, consisting of pipe stanchions and rails, all of which were missing. Ten of the 11 stanchion base plates were removed and analyzed by the TSB Engineering Laboratory.

Eight of the 10 galvanized pipe stanchions which had been screw-threaded into the base plates had sheared off. The directions of failure of these stanchions were determined and were found to be different. It is considered unlikely that the stanchions were sheared off simultaneously by the same event, but that this occurred at different times during the breakup of the vessel. The other two base plates indicated that no stanchion pipe had been fitted.

TSB Engineering Laboratory report No. LP176/94 is available upon request.

Some of the fastenings which secured the wheel-house top to the house-frame were bent such that it would be consistent with the top having been forced up and over from port to starboard.

The afterwall of the wheel-house was also recovered intact, but the door was missing. The other structural items of the wheel-house/shelter (slaughter) house were in smaller pieces. It was evident that tie rods had been fitted, as required by the construction regulations.

A section of the forecastle floor assembly was also recovered and would further substantiate the total breakup of the hull. A section of keel with rib timbers attached had been sighted but was not recovered. None of the nets carried on board were sighted.

1.10 *Life-saving Equipment*

Reportedly, the "PATRICK & ELIZABETH" departed Bay Bulls on 04 October 1994 with the following equipment on board:

- one six-person, RFD Limited inflatable liferaft;
- one 16-foot wooden dory;
- one lifebuoy with line;
- one lifebuoy with automatic light;
- seven approved keyhole lifejackets;

- 12 "C"-type flares;
- six "A"-type rockets;
- two fire axes;
- two fire buckets;
- two 2.27 kg dry-chemical fire extinguishers; and
- two 6.8 kg CO₂ fire extinguishers.

The equipment met the requirements of the Small Fishing Vessel Inspection Regulations and Life Saving Equipment Regulations.

The regulations respecting Emergency Position Indicating Radio Beacons (EPIRBs) do not apply to vessels less than 20 m in length. The "PATRICK & ELIZABETH" did not carry an EPIRB and was not required to by regulation.

The EPIRB Regulations were introduced in November 1989. At that time, the CCG undertook to review, 12 months later, the need to reduce the length of vessels required by regulation to carry an EPIRB. The length of vessels required to carry an EPIRB has not been reduced.

The proposed Small Fishing Vessel Safety Regulations, currently under discussion with industry, include a section headed "Life-saving Equipment" which will require a vessel of this type to carry, among other items:

- a) one lifejacket for each person on board the vessel;
- b) one thermal worksuit for each person on board the vessel, but if a thermal worksuit meets the performance standards of a lifejacket, the lifejacket need not be carried ... (a thermal worksuit means a marine anti-exposure worksuit system that is manufactured in accordance with the Canadian General Standards Board, Standard CAN/CGSB-65.21-M).

A thermal worksuit is not intended to perform the same functions as an immersion suit.

1.10.1 Inflatable Liferaft

The "PATRICK & ELIZABETH" was fitted with a RFD Limited, type MK6, six-person inflatable liferaft. The liferaft, serial No. 6958, was manufactured in June 1986. A pre-sale inspection was performed at an authorized service depot in St. John's on 08 October 1986. The liferaft had been inspected and recertified regularly each year since then until the last recorded recertification on file (February 1993) at which time the inspection certificate indicated that the next servicing was due before March 1994. Reportedly, the liferaft underwent servicing in July 1994 before the vessel's departure for a fishing trip to Labrador. No record of this service was found.

The liferaft was recovered during the search and inspected at the CCG Base in St. John's. It was then shipped to the liferaft shop of the Ship Repair Unit at the Canadian Forces Base in Halifax, Nova Scotia.

On 24 November 1994, testing concluded that there was no physical evidence that the liferaft had been boarded or occupied by the crew of the "PATRICK & ELIZABETH". Personnel from the TSB, CCG Ship Safety Branch, Canadian Forces and the supplier of the liferaft were present.

The liferaft was tested in accordance with the servicing manual and test sheets. It was found to be operational with components and equipment in working order. Except for a bailer, a repair kit and a painter line, which were missing, the liferaft passed all tests and met the Standards for Inflatable Liferafts (1974).

It could not be determined how the liferaft was released from the vessel. The liferaft container and securing cradle were not recovered.

A copy of the liferaft test report is available from the TSB upon request.

1.10.2 *Dory*

A 4.5 m wooden dory, reportedly built in 1985, was also carried on board. During the search, several pieces of wreckage were recovered and were identified as being part of the dory of the "PATRICK & ELIZABETH". It could not be determined from the pieces of wreckage if the dory had been used by the crew.

1.11 *Seawater Temperatures and Survival Time*

A sea surface temperature of 5 °C was reported during the search. The ambient air temperature was 11 °C. It is unknown what type of clothing the crew was wearing. It cannot be determined if the lifejackets carried on board had been donned or if the crew had sufficient time to retrieve them from their stowed position in the forecabin. None was recovered during the search and there was no report of any being sighted.

A Red Cross Society publication entitled *Cold Water Survival* graphically illustrates survival time of an average adult person who is lightly clad, wearing a lifejacket and holding still in ocean water (see Appendix D). According to the chart, the chance of survival in a seawater temperature of 5 °C is high and persons can help themselves for up to 30 minutes. After 30 minutes and up to 1 hour and 25 minutes in the water, persons have a 50 per cent possibility of survival if rescued. These averages would vary depending upon the physical condition of the person, age, whether injuries had been sustained and the weather conditions at the time.

1.12 *Fatigue*

Because the "PATRICK & ELIZABETH" is a small fishing vessel, the regulations governing manning and hours of rest do not apply.

The vessel departed the fishing grounds on the morning of 12 October, possibly after the crew retrieved the remaining portion or all of the nets. Normally, the routine duties of all on board during the return voyage would be restricted to those required for watchkeeping and the navigation of the vessel. During this period, there would normally be sufficient time for rest.

In the 1500 radiotelephone message and again in the 2200 message, there was no indication of any problem on board. If the vessel encountered rough seas from the onset or before the start of the return voyage, fatigue could have become a factor, given that the normal return trip would have taken about 20 hours.

2.0 *Analysis*

2.1 *Introduction*

As there were no survivors or witnesses, there is insufficient information or evidence as to the precise cause of the vessel's loss.

2.2 *Risks of Operation*

Although the "PATRICK & ELIZABETH" was reported to be sound, well maintained and prudently operated, any small vessel employed offshore in exposed waters is operated at some risk. An insignificant or minor deficiency which, in normal operations, is not apparent or gives no cause for concern can, in extreme conditions, initiate a sequence of events which could rapidly culminate in the loss of the vessel. However, the operator was known to be safety-conscious and the vessel's SIC 29 had no outstanding work to be done. Because there was no pre-trip quota for the fish being caught, the vessel was not under economic pressures to remain at the fishing grounds after the storm warning was broadcast and did not do so.

2.3 *Course Steered by the Vessel from the Fishing Grounds*

The course steered by the vessel from the fishing grounds is unknown; however, the most probable course to Bay Bulls from the positions given by the skipper before the tragedy would have been about 235° True (T). With northerly winds, the storm conditions would have been on the vessel's starboard side.

The skipper had indicated that, should the weather deteriorate, he would lie-to with the vessel, but it is not known if this was done. The direction in which the vessel was heading when she was overcome is unknown.

2.4 *Time and Position of the Distress*

The time and position of the distress are unknown; however, it must have occurred after 2200, 12 October 1994, at which time the skipper reported by radio that everything was fine. The ETA of 0600 the next morning given at 2200 did not agree with the skipper's estimate that the vessel was six hours out from Bay Bulls. The contradiction did not significantly affect the calculation of the vessel's LKP.

CANSARP plots were based on the last-known, mid-point and destination positions. It could reasonably be expected that the vessel could make five knots in beam seas on a course of 235° (T). Once debris had been sighted, CANSARPs were adjusted, taking into account the back drift rate of the various debris and of the liferaft.

According to the adjusted CANSARP, the most likely position in which the vessel was overwhelmed was 47° 40'N, 051° 54'W.

2.5 *Debris*

Analysis of the debris recovered during the search appears to confirm that the vessel was lost as a result of catastrophic structural damage and eventual disintegration.

Examination of the debris, however, did not reveal sufficient evidence to determine the chain of events which led to the vessel's loss because some indications were contradictory. While the fastenings of the wheel-house top were bent in a manner consistent with the top having been forced up and over from port to starboard, this is in the opposite direction (from the lee to the weather side on a course of 235°(T)) from which damage from waves could be expected.

2.6 *Radio Communications*

The vessel's radio equipment functioned satisfactorily at 1500 and at 2200 on 12 October. Because neither a MAYDAY message nor a signal from the radiotelephone automatic alarm was received, it is likely that the damage which overcame the vessel was catastrophic and occurred suddenly, without warning. Given the extent of this damage, it is likely that the crew was unable to transmit a call for assistance.

2.7 *Emergency Position Indicating Radio Beacon (EPIRB)*

The "PATRICK & ELIZABETH" did not carry an EPIRB and was not required to by regulation. Because it is likely that the crew did not have time to send a distress message, the transmission from an EPIRB could have automatically alerted SAR authorities at the onset of the distress and might have increased the crew's chance of survival.

2.8 *Abandonment*

Given that the wreckage of the vessel's liferaft and dory showed no sign of these craft having been occupied, all indications are that the vessel was overcome by the wind and waves and broke up. It is also probable that the suddenness of the casualty prevented the crew from safely abandoning the vessel.

2.9 *Stability*

Because of the extent of the reconstruction and alterations to the "PATRICK & ELIZABETH", no comparable vessel exists from which stability information might be used to approximate the stability condition of the vessel at the time of her disappearance.

Reportedly, there were 100 nets and 3,200 kg of iced turbot on board. Because the vessel had previously carried catches of 25,000 kg and more than 150 nets on the afterdeck, it is unlikely that the amount and distribution of the fish, ice and nets carried on her final voyage had a deleterious effect on the vessel's stability.

Tank liquids which were reportedly 70 to 80 per cent depleted during the return voyage may have created a free surface effect. However, it is not known how this may have affected the vessel's transverse stability or from which tanks the consumables were drawn.

2.10 *Possibility of a Collision*

It is unlikely that the vessel's loss was caused by a collision because there was nothing on the recovered debris to indicate that the vessel had struck another object or vessel. The fact that no other vessel traffic was known to be in the immediate area strengthens this hypothesis.

3.0 *Conclusions*

3.1 *Findings*

1. The loss of the "PATRICK & ELIZABETH" with her crew of five occurred in the approximate calculated position of 47° 40'N, 051° 54'W, north-east of Bay Bulls, between 2200, 12 October, and 1746, 13 October 1994.
2. Examination of recovered debris indicates that the vessel was lost as a result of sudden catastrophic structural failure and disintegration in severe storm conditions.
3. Although the vessel was fitted with a marine radiotelephone equipped with an automatic emergency alarm, no transmission of a distress was received.
4. The vessel was not required by regulation to carry an Emergency Position Indicating Radio Beacon (EPIRB) nor was one on board.
5. The vessel's liferaft was recovered and found to be in good condition and operational. There is no evidence that the crew succeeded in abandoning the vessel or that the vessel's liferaft or dory had been occupied.
6. There is no evidence to suggest that the vessel was lost as a result of a collision.
7. There is insufficient data to carry out a detailed stability analysis but, compared with previous voyages, the vessel was not overloaded.
8. Tank liquids, depleted during the voyage, may have created an unknown free surface effect which could have adversely affected the vessel's transverse stability.
9. There is no requirement for the vessel to carry anti-exposure worksuits or immersion suits for each member of the complement.

3.2 *Causes*

There is insufficient information or evidence as to the precise cause of the vessel's loss. However, it appears that the vessel was quickly overwhelmed by wind and waves, and that the crew had insufficient time to send a distress message or abandon the vessel safely.

4.0 *Safety Action*

4.1 *Action Taken*

4.1.1 *Carriage of Emergency Position Indicating Radio Beacons (EPIRBs)*

The "PATRICK & ELIZABETH" did not carry an EPIRB and was not required to do so by regulation.

EPIRBs have been instrumental in saving lives in recent marine occurrences. Consequently, following the sinking of the tug "PATRICIA B. McALLISTER" in the Gulf of St. Lawrence (TBS Report No. M91L3010) and the resultant loss of lives associated with delayed rescue operations during abandonment at sea, the Board recommended that:

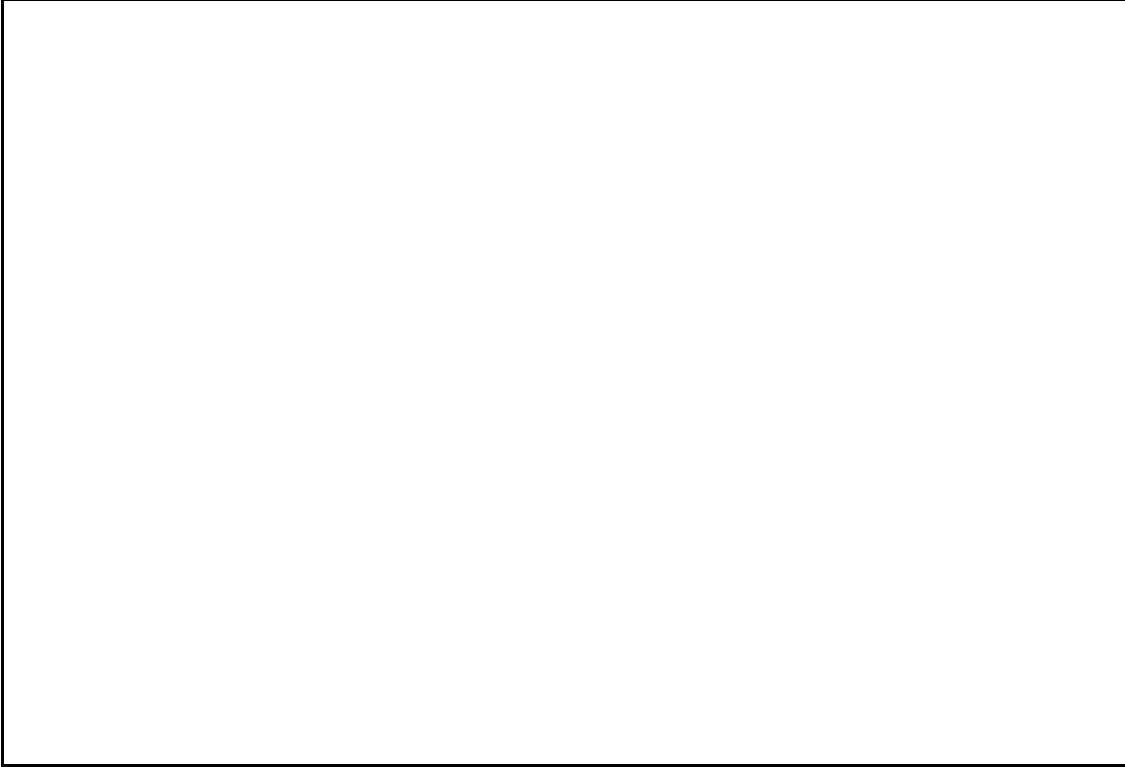
The Department of Transport encourage the use of Class I EPIRBs by all vessels that transit or operate beyond the limits of coastal harbours.

(M93-10, issued September 1993)

Subsequently, Ship Safety Bulletin (SSB) No. 1/94 was issued recommending to mariners, inter alia, to install EPIRBs for better information and identification of casualty location.

This report concludes the Transportation Safety Board's investigation into this occurrence. Consequently, the Board, consisting of Chairperson, John W. Stants, and members Zita Brunet and Hugh MacNeil, authorized the release of this report on 16 August 1995.

Appendix A - Photograph of the "PATRICK & ELIZABETH"



Appendix B - Chart of the Area of Occurrence

Appendix C - Marine Weather Forecast Areas

Appendix D - Cold Water Survival Chart

Appendix E - Glossary

C	Celsius
CANSARP	Computer-Assisted Nautical Search and Rescue Plan
CCG	Canadian Coast Guard
CO ₂	carbon dioxide
CSA	<i>Canada Shipping Act</i>
ETA	estimated time of arrival
GPS	Global Positioning System
GRT	gross registered ton(s)
HP	horsepower
IMO	International Maritime Organization
kg	kilogram(s)
LKP	last known position
m	metre(s)
MRSC	Marine Rescue Sub-centre
N	north
NDT	Newfoundland daylight time
Nfld	Newfoundland
SAR	Search and Rescue
SI	International System (of units)
SIC	Steamship Inspection Certificate
SSB	Ship Safety Bulletin
TSB	Transportation Safety Board of Canada
UTC	Coordinated Universal Time
W	west
°	degree(s)
'	minute(s)

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