

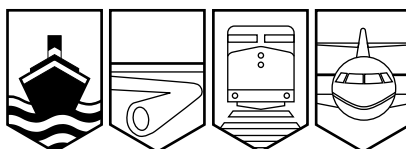
Transportation Safety Board  
of Canada



Bureau de la sécurité des transports  
du Canada

## MARINE INVESTIGATION REPORT

M99M0142



**SINKING WITH LOSS OF LIFE**

**FISHING VESSEL "JOSEPH & SISTERS"**

**MINAS BASIN, BAY OF FUNDY**

**14 OCTOBER 1999**

**Canada**

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.

## Marine Investigation Report

### Sinking with Loss of Life

Fishing Vessel "JOSEPH & SISTERS"  
Minas Basin, Bay of Fundy  
14 October 1999

Report Number M99M0142

### *Summary*

Whilst bound for an area off Parsboro, Minas Basin, Nova Scotia, to lay 160 metal lobster traps at the start of the fall lobster season, the fishing vessel "JOSEPH & SISTERS" encountered adverse weather and shipped a series of three waves. The heavily laden vessel capsized, throwing the unsecured lobster traps into the water. Four crew members who were sitting on top of the traps were also thrown into the water. After the vessel partially righted in a flooded condition, the owner/operator escaped from the wheelhouse. Soon after, the vessel sank stern first. Four of the five persons were rescued. One crew member is missing and presumed drowned.

*Ce rapport est également disponible en français.*

## Other Factual Information

### Particulars of the Vessel

<b>"JOSEPH &amp; SISTERS"</b>	
Official Number	809852
Port of Registry	Shelburne, Nova Scotia
Flag	Canada
Type	Cape Island–open boat
Gross Tons <sup>1</sup>	24
Length	11.2 m (36.7 ft)
Draught at the time of sinking	Unknown
Built	1987
Propulsion	Diesel, 239 kW
Number of Crew Members	5
Registered Owner	Scott Taylor Fisheries Ltd., Canning, Nova Scotia

### Description of Vessel

The "JOSEPH & SISTERS" was of open construction, and the hull had been sheathed with glass-reinforced plastic. The wheelhouse was in the forward part of the vessel, and an open deck work area (the well deck) was aft.

As a registered commercial fishing vessel over 15 gross tons (GT), the "JOSEPH & SISTERS" was inspected pursuant to the *Small Fishing Vessel Inspection Regulations*. The Ship Inspection Certificate (SIC 29) issued by Transport Canada (TC) on 21 November 1995 was valid until 20 November 1999. The certificate listed the number of crew as three, including the owner/operator, and limited the extent of permissible voyages to 20 nautical miles off shore except between May 1 and October 31, during which time the limit is extended to 60 nautical miles. The life-saving equipment included: a four-person inflatable liferaft (secured on top of the wheelhouse), three lifejackets (stowed in the cuddy), and one lifebuoy.

On board the vessel was a crew of five. During the lobster-harvesting season, it was the normal practice for the operator to have a crew of two. The metal traps weighed 79 kilograms (kg) and were heavier than wooden traps. Wooden traps may differ in size and design but often weigh in excess of 40 kg. Manoeuvring metal traps over the side was more easily accomplished by two

---

<sup>1</sup> 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.

persons. The plan for that day was that two crew members would work on each side of the well deck.

Three of four crew members were wearing full-length personal flotation devices (PFDs) at the time of the occurrence.

### *History of the Voyage*

On 13 October 1999, 160 lobster traps were loaded onto the vessel and stowed on its well deck in five tiers. Each lobster trap, including ballast, weighed about 79 kg (175 pounds [lbs]). The total weight of the 160 traps was approximately 12 700 kg (28 000 lbs). The well deck scupper plugs were secured because the deck was below the waterline. The lobster traps were not secured to the vessel, although the uppermost tier—approximately two metres (m) above the deck—was reportedly secured to the tier below it. The number of traps loaded on this occasion was reported to have been the same number of traps loaded in the previous two years.

Prior to departing Delhaven, Nova Scotia, the operator listened to a local radio station for weather information. He did not listen to the sea state forecast issued by Environment Canada at 1700<sup>2</sup> for that evening and for October 14, which stated: “Fundy, seas one metre or less building to 1 to 2 metres this evening and to 3 to 4 metres overnight”. The sea state forecast also advised, “users are cautioned that heights may differ significantly in coastal waters and depths of less than 50 metres”. The 2000 marine synopsis update issued by Environment Canada on October 13 stated: “Marine interests are advised that storm warnings are in effect for Fundy Grand Manan”. However, the operator believed that there was no risk in setting his traps because there was little or no wind either at his residence high on a hill or at the wharf.

On October 14, the opening day of the fall lobster harvest season, at about 0230, the “JOSEPH & SISTERS” left the wharf at Delhaven to proceed to an area in Minas Basin to lay lobster traps. At the time of departure, the operator reported that the wind was calm. After 25 minutes of sailing, the wind and sea were building up. At approximately 0315 a series of three waves struck the starboard side of the vessel. The first wave shipped water onto the well deck. At that point, the operator shouted to the crew to jettison the traps into the water to try to lighten the vessel. The second wave shipped water, and the vessel developed a starboard list. Only four to six traps were jettisoned before the third wave struck and the vessel capsized to starboard, throwing the four crew members into the sea. The vessel partially righted in a flooded condition allowing the operator to escape from the wheelhouse. None of the lobster traps remained on board after the vessel capsized.

Heavily trimmed by the stern, the vessel began to sink. The vessel submerged to the top of the wheelhouse with 1.5 m of its bow exposed above the water. The operator called out to his crew in the darkness, and upon receiving an answer, he thought that the four crew members were together in the water. The operator climbed onto the top of the wheelhouse and eventually worked his way to the vessel’s aerials.

---

<sup>2</sup> All times are Atlantic daylight saving time (coordinated universal time minus three hours).

Another fishing vessel, the "DENNIS TROY II", bound for a nearby area to lay lobster traps, had departed Delhaven a few minutes after the "JOSEPH & SISTERS". It was following the same general course as the "JOSEPH & SISTERS" but was a long distance astern of it. By chance, the "DENNIS TROY II" struck the sinking vessel and stopped to investigate. Using its floodlight, it found the operator clinging to the aerials of the "JOSEPH & SISTERS" and rescued him and three other crew members who were holding on to the lobster traps' floating marker buoys. The fourth crew member was not located. He was not wearing any type of PFD and was not a good swimmer.

The "JOSEPH & SISTERS" sank in about 90 feet of water approximately seven nautical miles northeast of Delhaven. The crew did not have time to launch the liferaft manually, and it did not deploy automatically when the vessel sank. The liferaft is presumed to have remained secured to the sunken vessel.

The survivors indicated that they were in the nine-degree Celsius (°C) water for approximately 20 to 25 minutes. They were not suffering from hypothermia and did not require medical treatment when rescued. According to the Canadian Red Cross Cold Water Survival Chart (Appendix B), a person wearing a standard lifejacket and light clothing in water of 8 to 10°C could expect to survive for two to three hours before succumbing to hypothermia.

### *Other Searches*

Despite an extensive sea, land, air, and underwater search, the fourth crew member was not found and is presumed drowned. Despite an attempt by the Royal Canadian Mounted Police dive team to locate the sunken vessel, it was not found.

### *Certification, Training, and Experience*

Canadian regulations in force at the time of the occurrence did not require operators or crews of small fishing vessels of less than 70 GT to hold a marine certificate of competency or to undergo marine safety-related training. Effective 31 July 1999, the *Crewing Regulations* were amended to reduce the tonnage limit from 70 to 60 GT. However, smaller vessels such as the "JOSEPH & SISTERS" remain unaffected by this change.

The operator had owned "JOSEPH & SISTERS" for approximately four years and had been engaged in the fishing industry for about 15 years. The operator did not have and was not required to have a certificate of competency to operate his vessel. He had no formal marine training, had not attended any marine safety courses, and was not obliged to have undertaken any such training. Two of the four crew members on board worked regularly and had been employed by the operator for several years. The missing member of the crew and the other member were casual workers employed only on the days the lobster traps were laid.

None of the persons on board had ever received marine safety-related training. The operator had not instructed his crew in the use of any of the life-saving equipment, nor was it his habit to do so.

## *Previous Investigations*

Following the sinking of the fishing vessel "STRAITS PRIDE II" in 1990, the TSB expressed its concern that the lack of knowledge and skills regarding life-saving equipment and survival techniques on fishing vessels reduces fishers' chances of survival in emergency situations.<sup>3</sup> Following the investigation, TC consulted with the fishing industry to reduce to 15 GT the tonnage for fishing vessels required to have a certificated master. It was also envisaged that certificated masters of fishing vessels would receive marine emergency duties (MED) training, but crews, in general, would not be required to acquire survival skills. The *Crewing Regulations* were amended to require a certificated master but only on a fishing vessel if it is greater than 60 GT. At present, there is no requirement for an uncertificated master to have received MED training.

During its investigation of other occurrences involving fishing vessels, the TSB has observed that many crews on fishing vessels do not fully appreciate that some of their day-to-day operating procedures may be creating unsafe conditions. The TSB recommended that there should be a national safety promotion program for operators and crews of small fishing vessels to increase their awareness of the effects of unsafe operating practices on vessel stability. Further, the TSB recommended that there be a study to identify the extent of unsafe loading and operating practices on small fishing vessels, with a view to developing guidelines for the safe operation of these vessels. Work was started to address these recommendations; however, it was not completed.<sup>4</sup>

## *Analysis*

### *Loading of Vessels*

There are no regulations governing the draught or trim to which a fishing vessel may be safely laden with fish or gear. Consequently, fishing vessels have no load lines and the loading of these vessels is left to the judgement of the operators. In this occurrence, the 160 metal lobster traps, in five tiers, weighing approximately 12 700 kg, raised the vessel's centre of gravity and contributed to reducing the vessel's freeboard to the extent that the well deck scuppers were below the waterline. Consequently, the five well deck scuppers were plugged before departure to prevent the ingress of water. Any water shipped over the gunwale would therefore be retained on board. With the scuppers plugged, a small amount of water shipped over the gunwale would give rise to the free surface effect. With a higher centre of gravity and the reduction of stability due to free surface effect, the vessel was in a vulnerable condition and unable to right itself when the successive waves came over the gunwale. In general, few fishers understand free surface effect and fewer appreciate the substantial reduction of initial transverse stability brought about when water, even a few inches deep, is shipped and retained on deck.

---

<sup>3</sup> TSB Report No. M90N5017.

<sup>4</sup> *An Evaluation Study of Non-Regulatory Marine Occurrence Prevention Programs—Phase I*, Program Evaluation Branch, Transport Canada, 31 March 1995. *An Evaluation Study of Non-Regulatory Marine Occurrence Prevention Programs, Workplan for Phase II*, Goss Gilroy Inc., March 1995.

## *Use of Personal Flotation Devices*

In this occurrence, the operator was wearing a pair of insulated coveralls, without any buoyancy features. Three of the five persons aboard were wearing full-length PFDs. The missing crew member was not wearing any flotation device. The wearing of a PFD was left to the discretion of each crew member.

Full-length PFDs reduce thermal shock upon entry into cold water, delay the onset of hypothermia, provide acceptable flotation, and minimize the risk of drowning. These suits use a wetsuit principle, and the survival time of the person wearing such a suit is not as high as that afforded by drysuits, i.e. immersion suits.

Standard lifejackets, unlike PFDs, must meet rigid buoyancy standards and have the ability to turn an unconscious person to a face-up position in the water, but they provide poor thermal protection in the cold water.

There are several types of commercially available full-length outer workwear that provide buoyancy and afford protection from the effects of cold water immersion. In the past, fishers have been reluctant to wear this type of outer workwear because they consider it to be restrictive and difficult to wear while working. Improvements have been made to the design and manufacture of this type of outer workwear, and its use is gaining acceptance within the fishing industry.

## *Quick Release Devices on Liferaft Lashings*

In this instance, the liferaft on the "JOSEPH & SISTERS" was secured with rope lashings but did not have a quick release device. The vessel carried an inflatable liferaft on board although it was not required by regulation. The regulations require certain fishing vessels to carry a liferaft; however, regulations do not describe how the liferaft is to be secured to the vessel. TC has published a handbook providing information on safety on small fishing vessels for operators who do not hold a certificate of competency.<sup>5</sup> The Manual states that an inflatable liferaft should be secured with a senhouse slip and weak link or a hydrostatic release.

On small fishing vessels, some operators fear that liferafts could be dislodged from their stowed position if not well secured or if fitted with a hydrostatic release device. For this reason, they may use additional rope lashings to secure the liferafts. However, liferafts need to be launched in emergency situations, and it is imperative that any securing arrangements be such that the liferaft can be launched quickly and safely.

While the liferaft on board the "JOSEPH & SISTERS" was approved for four persons, there were five crew members on board the vessel.

---

<sup>5</sup> *Small Fishing Vessel Safety Manual* (TP 10038 E), Transport Canada, 1989.

## *Findings*

1. The operator of the “JOSEPH & SISTERS” encountered the adverse weather that was forecast by Environment Canada. The vessel shipped water over the gunwale. The free surface effect created by the water entrapped on the well deck caused its list and contributed to reducing the vessel’s stability.
2. The operator had not listened to the weather forecast issued by Environment Canada prior to his departure from Delhaven. He relied on his knowledge and on a weather-related broadcast from a local radio station, and was unaware of impending adverse weather.
3. The “JOSEPH & SISTERS” loaded onto its well deck 160 metal lobster traps five tiers high, weighing about 12 700 kg (28 000 lbs), to a height of approximately 2 m (6 ft). The weight of the lobster traps raised the vessel’s centre of gravity, thereby reducing the vessel’s stability.
4. This was the third season in which the vessel had been loaded with 160 lobster traps for the first day of the fishing season.
5. The operator put in the scupper plugs to prevent the ingress of water from the vessel’s scuppers, which would be under the waterline when the lobster traps were loaded on board.
6. The missing crew member was the only one not wearing a PFD. Because the lifejackets were kept in the cuddy, he may not have had time to avail himself of a lifejacket after the first wave hit the vessel.
7. The vessel had been inspected by TC. A certificate was issued based on a crew of three persons, including the operator. Consequently, the life-saving equipment included a four-person inflatable liferaft, three lifejackets, and one lifebuoy. At the time of its sinking, the vessel had a crew of five.
8. The inflatable liferaft was lashed with rope and was not equipped with a quick release device.
9. Canadian regulations do not require the operators or crews of small fishing vessels of 60 GT or less to hold a marine certificate of competency or to undergo marine safety-related training.
10. Neither the operator nor the crew had any formal marine safety-related training, vessel stability training, or certificates of competency. None of the crew were given instructions in the use of life-saving equipment.



## *Causes and Contributing Factors*

The "JOSEPH & SISTERS" capsized and sank because the vessel was overloaded with 160 metal lobster traps that, stacked 2 m high on deck, reduced the static stability of the vessel. When the vessel encountered adverse weather at sea, three successive waves shipped water onto the well deck, causing a free surface effect that further reduced its stability, and it capsized. The vessel then partially righted in a flooded condition and sank stern first.

There are no provisions requiring an operator of a small fishing vessel (of 60 GT or less) to have marine safety-related training. None of the crew had been instructed in the use of life-saving equipment, and the missing crew member was not wearing a PFD.

## *Safety Action*

### *Action Taken*

In December 1998 the Small Fishing Vessel Safety Working Group was established by Transport Canada, Marine Safety (TCMS), to review the 1993 draft *Small Fishing Vessel Safety Regulations*. Subsequent to this occurrence, the TSB forwarded a Marine Safety Information Letter (No. 02/00) to TCMS. The letter indicated that TCMS may wish to ensure that deficiencies associated with survival techniques and unsafe operating practices on board fishing vessels are adequately addressed by the Working Group.

With respect to survival techniques, Section 21 of the *Crewing Regulations* was amended to state that, beginning on 30 July 2002, all fishers, certificated or not, must have completed a minimum of basic MED training (A1) before having completed six months' service, and must obtain a certificate of the crew member's successful completion of basic safety training (A1).

On the subject of unsafe operating practices/crew certification, TCMS noted that, at present, the regulations do not require a fishing vessel under 60 GT to have a certificated master. However, TCMS, in its National Discussion Paper, has indicated that it will require all masters/operators of craft/vessels under TC jurisdiction to have a qualification recognized by TCMS. At present, TCMS is considering extending a modified certificate of service course to all fishers, regardless of the tonnage of their vessels. To date this proposal has been met positively by the fishing industry.

*This report concludes the Transportation Safety Board's investigation into this occurrence. Consequently, the Board authorized the release of this report on 4 January 2001.*



## Appendix B—Cold Water Survival Chart

