Transportation Safety Board of Canada

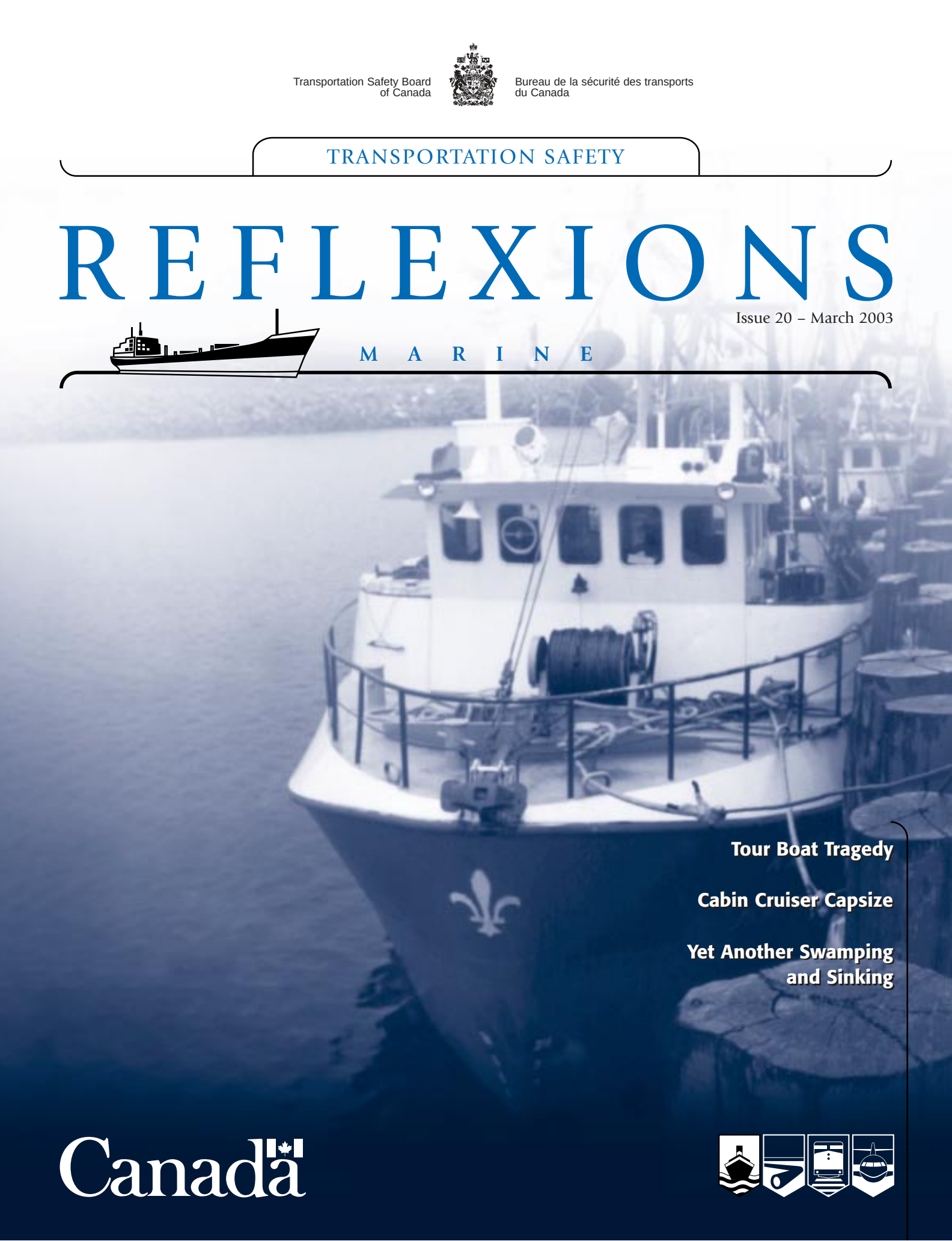
Bureau de la sécurité des transports du Canada

TRANSPORTATION SAFETY

REFLEXIONS

Issue 20 – March 2003

MARINE



Tour Boat Tragedy

Cabin Cruiser Capsize

Yet Another Swamping and Sinking

Canada

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For information on the TSB and its work, including published reports, statistics, and other communications products, please see the TSB Internet site.

REFLEXIONS is a safety digest providing feedback to the transportation community on safety lessons learned, based on the circumstances of occurrences and the results of TSB investigations.

Contents

Acknowledgements

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The *True North II* underway sometime before the sinking.

Tour Boat Tragedy

When the *True North II* left Flowerpot Island, in Georgian Bay, Ontario, bound for Tobermory Harbour, on the morning of 16 June 2000, a combination of rough weather and pre-existing safety deficiencies contributed to its tragic fate. The vessel foundered and sank in high waves, and took the lives of two school children. Eighteen others, including 11 of their school companions, made it to shore.

In its investigation into this fatal accident, the Transportation Safety Board of Canada (TSB) found that modifications to this vessel had compromised its watertight integrity, life-saving equipment was not readily available, and there was only one crew member when two were required. Over the years, none of these and other deficiencies was noted in regulatory inspections. — Report No. M00C0033

On the day prior to the occurrence, a group of 13 school children, two supervisory teachers and two chaperons left their school in Underwood, Ontario, for an overnight camping trip on Flowerpot Island. The small tour boat *True North II* had been used by the school on four previous occasions to ferry grade-seven classes to Flowerpot Island, within Fathom Five National Marine Park. Access to the island is available through commercial tour vessels, which have permits issued by Parks Canada.

During the crossing to Flowerpot Island, it was arranged that the *True North II* would return the next day to pick up the group if conditions were not too rough. No communications arrangements were made in the eventuality that the vessel was unable to return on time.

The *True North II* is a small passenger vessel of closed construction, with a single-chine hull form of all-welded steel, a transom stern, and a wooden open superstructure. The hull below the main deck is a common compartment extending from stem to stern. A watertight steel trunk, arranged on the centreline forward of midships, extends above main-deck level

and encloses clear plastic panels fitted in the bottom shell plating. The clear panels allow viewing of underwater features such as shipwrecks.

The wooden superstructure, which provides shelter for deck passengers, is open at the after end and has large passenger embarkation openings in the port and starboard sides forward of midships. The steering position is on the port side at the forward end of the superstructure. A door on the starboard side of the bridge front gives access to the open foredeck. An inflatable liferaft and two buoyant apparatuses are located on top of the superstructure. Two lifebuoys are stowed inside the viewing-well coaming. Lifejackets are stowed in the upper port side of the main-engine wooden casing.

On the morning of June 16, before he left home, the master (also owner of the vessel) listened to the weather forecast on the Parks Canada Weather and Activities Information radio broadcast, to decide whether he would sail. The forecast indicated winds south, 10 to 20 knots, increasing in the morning to 15 to 25 knots from the south-southwest; a small-craft warning and a thunderstorm advisory were in effect. The master had worked on the *True North II* in the area of the marine park since 1980. During this period, he had experienced a range of weather and sea conditions. While the Ship Inspection Certificate restricted the vessel to sail in "fine clear weather only at master's discretion," the master considered that the operating restriction did not prevent him from proceeding to Flowerpot Island—nor from returning to Tobermory—in the prevailing weather and sea conditions.

At 0930, the *True North II* departed Tobermory and proceeded directly to Beachy Cove, Flowerpot Island, to pick up the school group as agreed. As the vessel approached the south shore of Flowerpot Island, the master observed waves one-metre high, with some white caps and sea spray. The vessel arrived without incident at about 1000.

Return Voyage

After docking the vessel at the Parks Canada dock in Beachy Cove—and prior to loading the vessel with the camping equipment—concern was expressed to the master regarding the prevailing weather and sea conditions. The master gave assurances and proceeded to load the vessel.

At 1012, with 19 passengers (including two adult tourists) on board and gear stowed, the vessel left the cove at slow speed. The bridge front door leading to the foredeck was open.

At about 1022, when clear of the shallow entrance to the cove, the master steered the vessel toward Tobermory, generally bow into the wind and waves. At that point, the wind had increased to about 30 knots. Passengers on the open foredeck became wet from the heavy spray of waves hitting the bow. When the passengers entered the superstructure to seek shelter, the master left the wheel to close the door, secured it with its barrel-bolt latch, and increased speed to approximately seven knots.

The speed of the sinking was such that the master did not have time to give out lifejackets or prepare his passengers to abandon the vessel.

Shortly after the passengers cleared the foredeck, a large wave was shipped over the bow and struck the bridge front door, reaching a height halfway up the front window; about 30 cm of water was trapped inside the bulwarks. Another wave was shipped and the accumulation of water retained on the foredeck reached the height of the bulwark top rail. The vessel became heavier by the bow. The master observed that shipped water was draining slowly through the port and starboard scuppers. He instructed passengers to move aft to help raise the bow as he maintained his course and speed into the waves.

As the vessel pitched and rolled into the waves, the master reduced engine revolutions and put the rudder to starboard to turn the boat toward the island. Shortly after, a wave was shipped over the bow and stove in the bridge front door and window. Waves were also shipped on the port side through the large side openings in the superstructure. Water retained on the foredeck and in the forward end of the superstructure downflooded through various openings in the main deck. The vessel heeled to port and more shipped water rapidly swamped the deck space. At about 1026, the vessel returned briefly to the upright and quickly sank by the stern.

The rapidity of the sinking was such that the master did not have time to give out lifejackets or prepare his passengers to abandon the vessel. The absence of a pre-departure safety briefing, an inconspicuous lifejacket sign, and lack of an emergency equipment plan resulted in passengers being unaware of the location and use of lifesaving appliances. Some passengers were swept clear by the water. Others swam to the surface after abandoning the vessel by way of the bridge front doorway or the port, starboard and rear openings in the superstructure.

As the vessel heeled and sank, two orange rigid floats—called buoyant apparatuses, and located on the top of the superstructure—floated free. Of the 20 persons on board, the master and five passengers clung to one buoyant apparatus; 12 passengers clung to the other. These apparatuses, pushed by 30-knot winds and 1.5 m waves, drifted separately onto Flowerpot Island. A head count of the passengers was not possible until after the two buoyant apparatuses reached the shore. It was found that two children were missing.

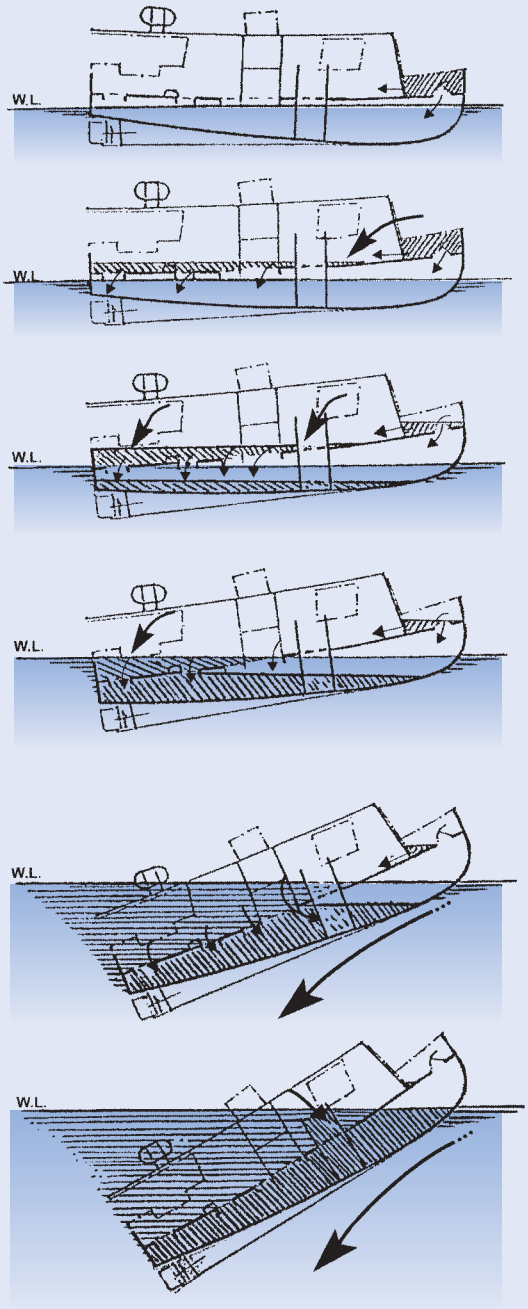
The two schoolchildren who were missing were among the last to be seen on board the vessel. Their egress may have been hindered by floating debris such as bench seats, the shuffle board, wooden panels and camping equipment trapped inside the superstructure as the vessel sank.

No distress call or any emergency radio communication was transmitted from the *True North II* before it sank. The vessel was not required to carry an automatic distress-alerting system such as an emergency position-indicating radio beacon (EPIRB). A delay in alerting the search-and-rescue (SAR) station increased the on-scene response time.

The Vessel, Crew and Equipment

The *True North II* was built in 1948 as a steel-hulled, flush-decked small fishing boat of closed construction, with a wooden deckhouse. The vessel was extensively modified and entered service in 1972 as a passenger vessel. As part of the modification, the original deckhouse and all fishing-related gear were removed, and an open wood-framed plywood superstructure was erected over the main deck.

Downflooding and Sinking Sequence



A Water shipped and retained on foredeck, to the top of the bulwark rail. Vessel trims by the bow. Passengers start to move aft.

B Helm put to starboard as the bridge front door is stove in. Water flows aft and is retained on deck. Downflooding starts.

C Water shipped through port side openings of superstructure. Retained water flows aft. Water accumulates in hull.

D Downflooded water continues to accumulate in hull. After trim increases rapidly as vessel settles.

E Downflooded is general as trim by stern accelerates and reserve buoyancy is reduced.

F All reserve buoyancy is lost and vessel sinks rapidly by the stern.

W.L. – Water Line

Hatch opening in main deck with no sealing gasket or means of securing flush wooden cover.

Subsequent to 1972, additional structural and mechanical modifications were made, *inter alia*:

- installation of transparent panels in the hull bottom for underwater viewing;
- fitting of doors in the side steel bulwarks to provide easy boarding and disembarking;
- installation of an access hatch in the main deck, fitted with a flush-fitting wooden cover and no securing device or watertight gasket; and
- hinged steel flaps of the main deck freeing ports—in the port and starboard side bulwarks near midships—were welded shut.

Since 1981, when the vessel changed ownership, the new owner operated the vessel single-handedly.

From the time of her entry into service as a passenger vessel in 1972 until 2000, the *True North II* was inspected annually to ensure compliance with *Hull Construction Regulations*, *Life Saving Equipment (LSE)* [*Regulations*] and other regulatory requirements. Throughout this 28-year period, various modifications and additions to the structure, propelling machinery and safety equipment were inspected and accepted by regulatory inspectors. In its investigation of this accident, the Board found that modifications to the vessel had compromised its watertight integrity.

The master's certification met the minimum requirements of the *Crewing Regulations* to operate the *True North II* in the trade in which she was engaged. In 1978, the Board of Steamship Inspection required a second crew member for the vessel; however, since 1979, each ship inspection certificate stated that only one crew member was required. Since 1981, when the vessel changed ownership, the new owner operated the vessel single-handedly. After the accident, Transport Canada Marine Safety (TCMS) determined "that it had incorrectly certified the vessel with respect to the number of crew required to be on board during operations."

Lifejackets were stowed in a compartment located along the port side passageway directly above the main engine. The owner had wrapped the lifejackets in opaque plastic bags to protect them. This practice, routinely accepted by TCMS inspectors, made the lifejackets less conspicuous. This situation was not improved by the lifejacket signage. Placement of the sign—and the size of the lettering—was not sufficient to effectively advise passengers of the location of the lifejackets. The inflatable liferaft, stowed on the top of the superstructure, was not readily accessible, and required human intervention for its deployment; the liferaft sank with the vessel. The two buoyant apparatuses, located on top of the superstructure, were not lashed, and floated free from the sinking vessel as designed. Each apparatus was approved for 10 persons.

Follow-on Actions

During its investigation, the TSB sent a Marine Safety Advisory to Transport Canada (TC) indicating serious shortcomings with the inspection of lifesaving equipment and the lack of a float-free arrangement for liferafts on many small passenger vessels operating in Canadian waters. In response, TCMS indicated that an amendment to the *LSE Regulations* had been prepared, requiring vessels under 25 m in length to have liferafts, if fitted,

that will float free if the vessel sinks. In the interim, TCMS drafted a *Ship Safety Bulletin* to address stowage and float-free arrangements for liferafts.

In addition, TCMS initiated a review of its inspection and certification processes and procedures for passenger vessels in the Ontario Region. TCMS made recommendations and is taking action in four key areas: regulatory review and audit, operations and inspections, information management, and training and performance assessment of inspectors. TCMS also found that the use of "fair or fine" weather as a voyage limitation is ambiguous, and that use of the phrase should be discontinued.

Adequacy of TCMS Inspection Regime and Safety Culture

Operators of passenger vessels such as *True North II* may not always have comprehensive knowledge of safe operating practices and the safety requirements of their vessels. As such, the safety of passengers can become dependent upon safety inspections as a means of ensuring that the condition of these vessels is safe for the intended operation, that adequate safety equipment is carried and that all safety requirements are met. This investigation found procedural, performance and management deficiencies associated with the inspection regime of the safety-inspection program.

In view of the fact that quality safety inspections and timely identification of unsafe practices and conditions are critical to the safety of crews and passengers —particularly those carried on small vessels—the Board recommended that:

The Department of Transport establish a timetable to expedite the review of the deficiencies in the inspection and certification process, and that it make interim progress reports to the public demonstrating the extent to which these deficiencies have been resolved.
— M01-01, issued May 2001

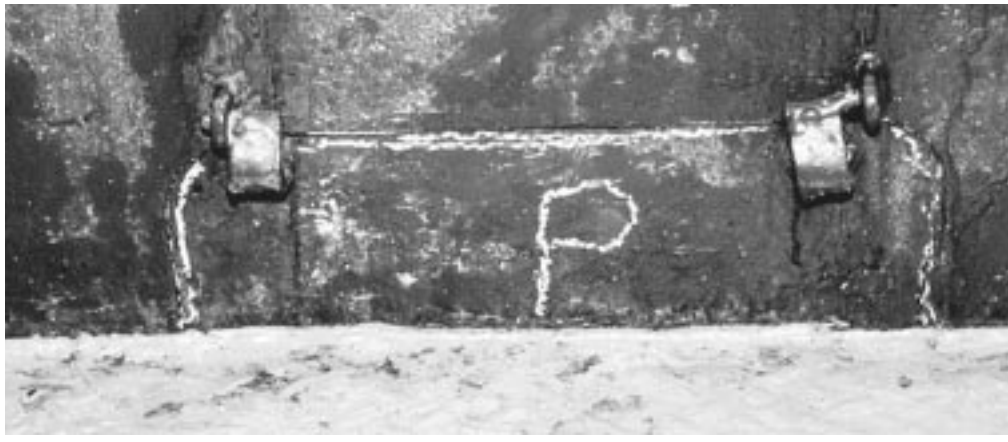
TC agreed with the recommendation and, in reply, indicated that TCMS had developed regulatory amendments to improve the safety of small passenger vessels, and that a number of initiatives had been undertaken to improve the inspection and certification process for these vessels. TCMS began issuing semi-annual progress reports on the status of these initiatives in December 2001.

Even the most rigorous set of rules will not cover every aspect of a safety system. The interpretation and judgment of safety inspectors are necessary to identify unsafe conditions both inside and outside the regulatory framework; therefore, the Board also recommended that:

The Department of Transport, Marine Safety, instill within its organization an approach to safety that would enable management and safety inspectors to identify and address all unsafe practices and conditions and not limit inspection only to compliance with rules.
— M01-02, issued May 2001

In reply, TC indicated support for the intent of this recommendation, stating that while there are certain provisions within the *Canada Shipping Act* to ensure that no certificate is issued to a vessel if there is a reason to believe that it is not seaworthy, the basis of a regulatory inspection must follow the rules of the *Canada Shipping Act*.

Notwithstanding, TCMS instills within its organization a culture that encourages inspectors to look at operations and equipment performance as well as the prescriptive regulations. In short, TCMS reinforces the message to inspectors that safety is always the first priority. A training program, implemented in March 2002, specifically addresses small passenger-vessel inspections.



Main deck freeing port welded shut. Starboard side is similar.

Emergency Preparedness and Survivability

In rapidly developing distress situations, such as those encountered by the *True North II*, it is critical that lifesaving equipment be readily available and accessible for use by crews and passengers. The Board therefore recommended that:

The Department of Transport require small passenger vessels to provide pre-departure briefings, and to be equipped with a liferaft that is readily deployable, life-saving equipment that is easily accessible, and the means to immediately alert others of an emergency situation. ***— M01-03, issued May 2001***

TC agreed with this recommendation and, in reply, listed several actions being taken:

- Amendments to the *LSE Regulations and Small Vessel Regulations* (SVR), which came into effect 14 March 2002 and 01 May 2002 respectively, require all passenger vessels to have safety briefings on or prior to departure.

- Amendments to the *LSE Regulations*, effective 14 March 2002, require all vessels less than 25 metres—which carry liferaftrafts—to have liferafts that float free in the event vessels sink.

- By the end of 2002, TC will bring forward amendments to *LSE Regulations* to explicitly require stowage of lifesaving equipment so that it is readily accessible. In the interim, a *Ship Safety Bulletin* has been issued, 04 September 2001, raising awareness of this issue.

- The Marine Distress Alerting Assessment Study was initiated in January 2002 to consider if current distress alerting methods and requirements for small commercial vessels provide for an adequate and acceptable level of risk, and if not, what is the best way to lower the risk to an acceptable level.

Crew Competency Evaluation and Certification Process

Assessment of the competence of the operator of the *True North II* was based on his possession of an existing certificate, and on his experience working in the Tobermory area for a long time; however, throughout this time, he operated his vessel with a number of unrecognized unsafe conditions and practices that compromised safety.

The Board is concerned that any shortcoming in the evaluation and certification process may result in allowing operators with inadequate competency to maintain and operate vessels, thereby inadvertently placing crews and passengers at undue risk in emergency situations. The Board will be monitoring the situation to determine if appropriate remedial action is being taken, and will assess the need for further action on this issue.

TC replied that there were several initiatives in place to address such concerns:

- A minimum national-standard examination structure relevant to limited master and mate certification is in place.

- Specific mandatory questions will be a requirement in oral examinations.

- A standard method of recording oral examination questions and results is in place.

- Limited certificates will be valid for five years; therefore competency must be demonstrated every five years.

- Continuing competency must be demonstrated by showing relevant sea service: specifically, a minimum of one year sea service in the last five years serving in a capacity for which the certificate was issued.

- The *Examination and Certification of Seafarers*—and the instructions to examiners—has been updated to reflect appropriate changes.

REFLEXION

How do inspections and inspectors fit into your work responsibilities? Are you relying on them to point out what you need to do to meet a minimum standard, or do you use them as a positive reinforcement of your work practices?

A Bayliner pleasure craft similar to the *Sunboy*.

Cabin Cruiser Capsize

An evening out on the water near Vancouver, British Columbia, to watch fireworks ended in tragedy when the pleasure craft *Sunboy* crossed between the tug *Jose Narvaez* and its tow, the coal-laden barge *Texada B.C.* The *Sunboy*, a 40-foot, Washington state-registered cabin cruiser, had 14 persons on board. The operator of the *Sunboy* did not realize that they were approaching a tug/tow combination using a 274 m cable towline and passed between the tug and the barge. The propellers of the *Sunboy* became fouled in the towline, the pleasure craft was struck by the oncoming barge, and capsized. As a result, some people were thrown into the water and others were trapped within the vessel's enclosed spaces. Of the 14 people who had been on board the *Sunboy*, nine were rescued and survived, four drowned and one remains missing and is presumed drowned. Weather was reported as choppy seas, overcast skies, light southeast winds and good visibility.

The Transportation Safety Board of Canada (TSB), in its investigation into this accident, found that the lack of knowledge and understanding of navigation lights by the operator of the pleasure craft *Sunboy*, and the absence of an effective side light on the barge *Texada B.C.*, contributed to the fatal accident in English Bay, British Columbia, on the night of 07 August 1999. The final report on this investigation contained two marine safety recommendations that the Board believes should help alleviate these deficiencies. In addition, over the past 10 years TSB has issued other safety communications concerning the substandard display of navigation lights, especially aboard working barges. Of specific concern have been lights that were incorrectly configured, had insufficient range, or were not functioning. Any of these deficiencies can seriously compromise the ability of mariners to see another vessel and take timely collision-avoidance action. — Report No. M99W0133

Harbour Traffic

The fireworks display on 07 August 1999 was one of four held annually in Vancouver's outer harbour. There are two displays each week for two consecutive weeks in midsummer. Each event begins at 2215 local time and lasts 30 minutes. The four events are known collectively as the *Symphony of Fire*. Before each fireworks event, hundreds of pleasure craft depart numerous mooring sites in greater Vancouver and make their way through Burrard Inlet toward English Bay. Typically, these vessels transit the inlet over a period of between two and four hours leading up to the beginning of the event. When the fireworks end, these same vessels return to their moorings over a much shorter period of between one half and two hours. Often, this leads

to congestion around First Narrows, where numerous close-quarters situations occur, both between pleasure craft and between pleasure craft and commercial vessels.

On August 7, the Marine and Communications Traffic Services (MCTS) routinely made *Notices to Shipping* broadcasts at 0810, 1410 and 2210. The broadcasts advised mariners to exercise caution, to remain clear—where possible—of the area during times of heavy congestion, and gave information on the fireworks display. On the night of the accident, MCTS evaluated commercial vessel traffic as light to moderate; however, an unusually large number of recreational watercraft were observed by radar in Burrard Inlet in the vicinity of the fireworks barge. Some 10 vessels, of various types, were engaged in the task of patrolling English Bay, where the majority of pleasure craft had gathered. The primary task of these vessels was to keep pleasure craft at a safe distance from the fireworks barge, and to inspect pleasure craft for the presence of proper lifesaving equipment.

Vancouver harbour's vessel-traffic separation scheme provides for separation of opposing streams of traffic through the establishment of traffic lanes. The scheme is recommended for use by all ships, particularly those 20 m or more in length. At the time of the collision, the tug and barge had left the outbound traffic lane and entered the traffic separation zone on a southwesterly heading. The pleasure craft was in the process of crossing the same traffic separation zone in a southeasterly direction. Vessels that are deemed to pose a high risk (either to human life, in the case of large cruise ships, or to the environment, in the case of tankers) are routinely escorted. A tug with a tow is not considered a high-risk vessel by either of these criteria, and does not receive an escort as a matter of course. Neither the company nor the master of the *Jose Narvaez* requested an escort vessel, nor was one provided by the Vancouver Port Authority.

The Accident Vessels

The *Sunboy* is a pleasure craft constructed of glass-reinforced plastic. Atop the superstructure is an exterior command bridge deck with built-in seating and a control station.

At approximately 2100, the *Sunboy* departed from her berth with 14 people on board and made her way towards the fireworks barge anchored in English Bay. Prior to the collision, the *Sunboy* was proceeding at an estimated speed of 14 to 15 knots, on a course of approximately 116°(T). During the voyage, the operator had control of the vessel from the command bridge station, where he was joined by three children, one adolescent and three adults.

The operator of the *Sunboy*... had not attended formal navigation courses and had little boating experience.

The command bridge was equipped with a magnetic compass, a very high frequency (VHF) transceiver and an electric horn. The compass was the only appliance in use at the time of the occurrence; VHF safety communication channels were not being monitored. Navigation lights aboard the pleasure craft conformed to the number and location of those prescribed by the *International Regulations for Preventing Collisions at Sea, 1972* (COLREGS). The lights were on at the time of the occurrence. No radar reflector was observed

The tug *Jose Narvaez*.

at the time of salvage and its presence or absence at the time of the occurrence could not be determined.

The operator of the *Sunboy* did not hold a marine Certificate of Competency, nor was one required under United States federal or Washington state legislation. He had not attended formal navigation courses and had little boating experience. There were no Canadian or United States hydrographic service charts aboard the vessel. On the evening of the occurrence, the operator was navigating with reference to a congregation of lights he saw ahead of him in the distance. He understood them to be those of other pleasure craft gathered in English Bay, awaiting the beginning of the fireworks.

The *Jose Narvaez* is a single screw, steel-hulled tug. The weather deck is fitted with an enclosed deckhouse forward of a main working deck. Atop the deckhouse is the boat deck with an enclosed wheelhouse and centreline helm. Windows provide an unrestricted view ahead but a restricted view astern. The *Texada B.C.* is a flush-decked steel barge used for hauling aggregate and coal products. The hull is painted black and the three-metre-high box walls are painted grey.

The tug was routinely manned by two 5-person crews. At the time of the accident, the onboard crew was beginning a second consecutive week of work. Each deck watch was six hours in length and was kept by two persons: an officer of the watch —who was either the master or mate—and one of two cook/deckhands. An engineer, in charge of machinery, was not part of the watch crew. The master of the *Jose Narvaez* held a valid Certificate of Competency; the engineer and mate also held valid certificates; the on-watch deckhand had no certification, nor was he required to have any. The *Texada B.C.* was unmanned.

The barge *Texada B.C.*

Navigation equipment on the *Jose Narvaez* included two marine radars, a magnetic compass, an auto pilot, two VHF transceivers, a Loran-C receiver and a ship's whistle. At the time of the collision, the tug was on automatic pilot, with all equipment operational except for one radar unit, which was turned off. The *Jose Narvaez* displayed the navigation lights for a vessel of her size and type: three masthead lights, sidelights, stern light and a towing light. The master of the tug was navigating with reference to a Canadian hydrographic service chart.

Originally, the *Texada B.C.* had been fitted with permanent port and starboard sidelights and a stern light. On 05 August 1999, during a nighttime passage, the master noticed that the barge's starboard sidelight was flickering. On August 7, when the barge was prepared for the passage, the deckhand positioned and secured a temporary *Scotty* lantern that had been improvised for use as a portable starboard sidelight. In a test subsequent to the accident, the lantern with a green (starboard) lens was found to have a maximum visibility range of less than four cables (0.4 nm). International regulations required the sidelight to have a minimum visibility range of three nautical miles. At the time of departure and later en route, the master observed the green sidelight of the barge approximately 300 m astern of the tug.

To help ensure that only navigation lights that meet regulatory requirements are used by owners/masters of vessels, the regulations call for proof of compliance, be it in the form of a document or a label. Approval from TC had not been received to permit use of *Scotty* lanterns as a substitute

When the unit was one mile west of First Narrows, the towing cable was lengthened to 274 m and the tug's speed increased to approximately 7.4 knots.

for navigation lights required by regulations. The *Scotty* lanterns sold by manufacturers did not carry a proof of compliance document or label.

Collision

At 2120, as the tug and tow were transiting westward through First Narrows into Burrard Inlet, MCTS advised the tug's master of the large number of pleasure craft and charter vessels gathering in the area in anticipation of the fireworks display. When the unit was one mile west of First Narrows, the towing cable was lengthened to 274 m and the tug's speed increased to approximately 7.4 knots. The on-watch deckhand left the wheelhouse after having been there with the master since departure. By about 2137, the tug and tow were established on a course of 245°(T) to create more sea room between the tug and tow and small-vessel traffic. In so doing, the tug and tow eventually entered the separation zone between inbound and outbound traffic lanes.

The lantern that had been aboard the *Texada B.C.*

On the *Jose Narvaez*, steering was by automatic pilot; her engines were on wheelhouse control. The master decided to summon the deckhand to the wheelhouse. As the intercom was not working, he descended a set of interior stairs and, after a brief search, found the deckhand in the galley. The master then followed the deckhand up to the wheelhouse. Upon his arrival in the wheelhouse, the deckhand glanced out the starboard windows and then walked directly to the port side of the area. As soon as he had done so, both he and the master (who had also entered the wheelhouse) felt a jerk on the towline. The master quickly took all way off the vessel and proceeded directly to the control station located on the after, exterior boat deck; the time was about 2143. When he shone a searchlight upon the port side of the *Texada B.C.*, he saw a grey object laying alongside the barge. The object was later identified as the upturned hull of the *Sunboy*.

At about 2142, having not recognized the significance of the pattern of navigation lights displayed by the *Jose Narvaez*, the operator of the *Sunboy* steered his vessel between the tug and the barge. The pleasure craft came to a stop when, in rapid succession, her propellers and rudders fouled first the towline and then the starboard component of the barge's towing bridle. Within moments, the barge's port forward rake collided with the port side of the pleasure craft's command bridge. The *Sunboy* heeled quickly to starboard and capsized. A speedboat operator who had seen the occurrence proceeded to assist and pick up survivors. The *Jose Narvaez* also stood by to assist.

Actions Taken and Required

Significant actions have been undertaken as a result of the TSB investigation:

- TC is working with industry to develop portable navigation lights that meet COLREGS.
- The *Festival of Fire* developed a search-and-rescue plan, which includes escort vessels to assist in separating commercial and pleasure craft.
- Vancouver MCTS made changes to its operations for special events in the harbour.
- The Canadian Coast Guard contemplated changes to the *Boating Safety Course* syllabus to include information on COLREGS.

- Lafarge Canada (owner of the tug and barge) took initiatives to improve its marine safety operation.

Notwithstanding that navigation lights which meet the prescribed range of visibility are available, that risks associated with the use of substandard lights have been identified, and that steps have been taken by TC to address this safety issue, the Board is concerned that substandard lights are still used and that the attendant risk of collisions continues. As such, the Board has recommended that:

The Department of Transport, in collaboration with the Council of Marine Carriers (CMC) and other industry representatives, ensure that tugs and tows are equipped with navigation lights that meet the safety range of visibility.
— M01-04, issued February 2002

Close collaboration has resulted in the recent acceptance of a new portable barge navigation light.

In reply to this recommendation, TC agreed with the need to work with CMC and others in the marine community to improve navigation lighting-compliance levels in the towing industry. Close collaboration has resulted in the recent acceptance of a new portable barge navigation light. The light was tested against TC standards and provides the required range of visibility.

Lack of adequate navigation knowledge has been identified as a factor in a number of TSB marine accident reports involving small vessel operators, be they fishing vessels or recreational craft. The Board believes that additional measures are warranted to reduce the risk associated with the current situation, both to pleasure boaters and commercial traffic, which allows untrained personnel to operate pleasure craft, and has recommended that:

The Department of Fisheries and Oceans (DFO), in conjunction with the appropriate authorities in the United States, explore ways to ensure that operators of pleasure craft in their respective jurisdictions possess adequate competency and basic knowledge of navigation safety, including the requirements of the International Regulations for Preventing Collisions at Sea.
— M01-05, issued February 2002

The DFO in reply indicated a number of initiatives undertaken to move in the direction of the recommendation. As boater training in the USA is a state responsibility, a formal letter was sent to the Washington State Parks and Recreation Commission, informing them of the recommendation; copies were also forwarded to the USCG Office of Boating Safety in Washington, D.C.

A communication strategy was put in place to inform boaters of the need to recognize light configurations in areas of commercial operations. This plan included modification of the *CCG Safe Boating Guide* with information on recognition of the lighting of tugs and tows, and posting of a Web page in the Pacific Region discussing the risks associated with navigating in the vicinity of large commercial vessels.

REFLEXION

In see-and-be-seen environments, it's vital not only that watchkeepers know what to look for, but also that those who need to be seen are in fact visible!

Vessel during refit at Meteghan River, Nova Scotia.

Yet Another Swamping and Sinking

In its final report on the investigation into the swamping and sinking of the scallop dragger *Brier Mist*, the Board identified safety deficiencies related to the inspection of hatch covers on small fishing vessels, the absence of automatic release mechanisms on liferafts and the absence of emergency position-indicating radio beacons. The Board issued four safety recommendations to address these safety deficiencies.

In addition, the Board expressed concern with the lack of safety action taken following recommendations previously issued by the Board on water level detectors, protection from hypothermia and drowning, and marine emergency duties training for fishermen, as well as recommendations on the same issues by the Chief Coroner as a result of this accident. — Report No. M98L0149

The Voyage

On 27 November 1998, while crossing between Les Escoumins and Rimouski, Quebec, in foul weather, the master of the scallop dragger *Brier Mist* informed the Marine Communications and Traffic Services (MCTS) that he thought the hold and afterpeak were taking on water and that the pumps were not able to cope with it. At about 1500 Eastern Standard Time, the vessel foundered some 10 nautical miles (nm) off Rimouski. Despite search-and-rescue (SAR) operations, no trace of the wreck or of three of the five crew members was found. The two recovered victims had drowned.

The 13 metre, 45.8 gross ton *Brier Mist* had departed at 0938 on November 27 with

Subsequently, despite a two-day search in December using sophisticated sonar equipment, no trace of the wreck was found.

a partial load of scallops; the master informed Les Escoumins Canadian Coast Guard (CCG) MCTS that he expected to arrive in Rimouski at about 1400. The distance is about 34 miles. According to the official weather data, at about 0900, a strong northeast wind had turned quickly to the west-northwest (44 km/h). The sea near the north shore of the river calmed, but the swell was still from the northeast. Weather bulletins for the area indicated the following conditions:

- Gale warning in effect
- Winds northwest 25 to 35 knots this evening
- Visibility fair to poor under snow flurries
- Low -4°C, high 2°C

Shortly before 1300, the estimated time of arrival was changed to 1530; the vessel was then 15.5 nm from Rimouski. At about 1340, during a call made on a cellular telephone, the master told his agent in Rimouski that the sea was washing over the vessel and that there was about a foot of water permanently on the deck.

At about 1346, the *Brier Mist* informed the MCTS centre that she was experiencing pumping problems and was taking on water in the hold; the master also believed that the afterpeak was full of water and that the pump was not able to cope. At about 1349, the MCTS centre contacted the *Brier Mist* to ask the master to call every 30 minutes to monitor the situation. After 1358, all attempts to contact the vessel were unsuccessful. At 1410, a SAR operation was initiated.

On November 28, the bodies of two of the victims were recovered. Despite the efforts of a number of search units, the other three victims were not found. The intensive search was called off on November 29 at 1700. Subsequently, despite a two-day search in December using sophisticated sonar equipment, no trace of the wreck was found.

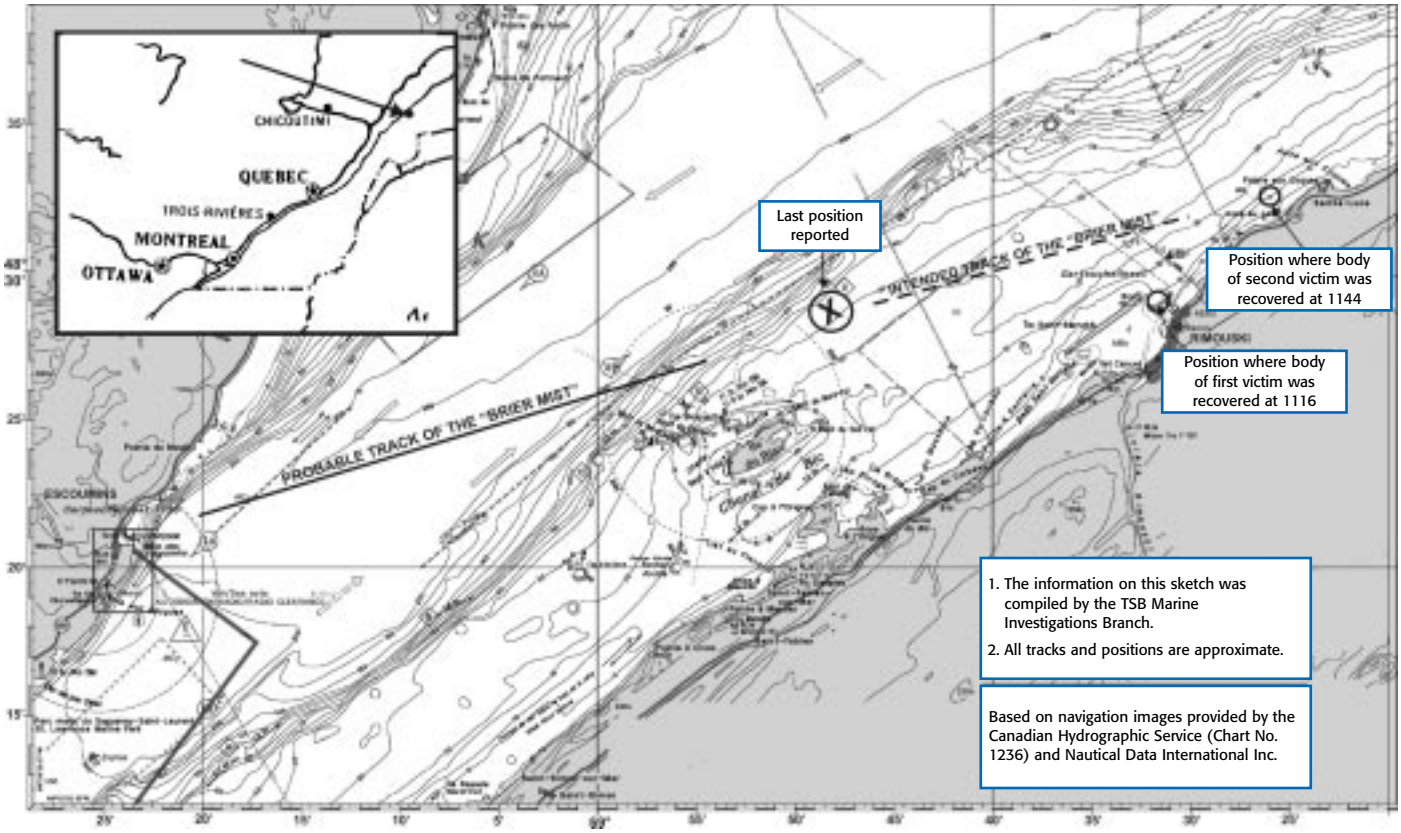
Vessel and Crew

The *Brier Mist* was built in 1981 and had undergone five regular inspections by Transport Canada Marine Safety (TCMS) in Yarmouth, Nova Scotia. At the last inspection on 08 August 1997, a ship inspection certificate (SIC 29) was issued to the vessel. This was a short-term certificate; the original expiry date was 29 October 1997, but it had been extended to 08 August 2001. The inspection report indicates that the condition of the hull and deck was satisfactory. A marine surveyor also had inspected the vessel. According to this inspection report issued on 17 February 1998, the hull was above average and maintenance was average. This report did not mention any shortcomings in the vessel's seaworthiness.

The master of the *Brier Mist* began fishing in 1980, learning his trade from an experienced fisherman in the region. In 1986, he took courses in marine chart work and navigation, first aid, shiphandling and seamanship, marine emergency duties (MED) and radio communications. He passed the Transport Canada (TC) examinations and obtained his certificate as fishing vessel master Class IV in 1986. He purchased the *Brier Mist* in February 1998 from a fishing company in Nova Scotia. This was the vessel's first fishing season in the estuary of the St. Lawrence River.

None of the other four crew members on board the *Brier Mist* had taken MED training. Under regulations, the seamen were not required to hold certificates or take training. The experience of the seamen on board was limited to working as fisherman's helpers for a few seasons on fishing vessels in the region; in the case of the youngest, it was his first trip to sea.

The vessel was equipped with two lifebuoys, one with a light. A six-person inflatable liferaft was located on top of the wheelhouse, exposed to the wind and seas, and was held in a cradle by a gripe attached to a senhouse slip hook; this arrangement would require manual release. The raft had last been inspected by TC on 28 July 1997, and was considered in good condition at the time. Existing regulations did not require the liferaft to be equipped with a hydrostatic



Sketch of the accident area

release unit or any other automatic release device. (The raft was not found during the investigation.) The *Brier Mist*, being less than 20 m long, was not required to carry an emergency position-indicating radio beacon (EPIRB).

The *Brier Mist* did not carry immersion suits, and the *Small Fishing Vessel Inspection Regulations* did not require that immersion suits be carried on board; however, in accordance with regulations, there were at least four lifejackets on board, and even though it was not mandatory, the master had also purchased two nose-to-toes personal flotation devices in addition to the two floater jackets he already owned. These items were usually stored in the wheelhouse and the engine room. One of the two seamen recovered was wearing his own floater suit/worksuit.

The vessel was not equipped with a water-level detector in the fish hold, and it was not required to have one.

The fish hold of the *Brier Mist* had four circular scuttles, approximately 35 cm in diameter, and a hold hatch one-metre square with a coaming about 40 cm high. To close the fish hold, the main hatch was covered by two fibreglassed wood covers. These covers were simply placed on the coaming flange. There was no watertight seal for the main hatch. One of the two covers became dislodged and was found on the shore 100 km downstream of the sinking. TC had not required the two covers to be watertight. The only watertight covers were the four scuttles on the deck; however, according to information available, when the crew washed the deck, water entered through the seal in at least one of these scuttles.

The vessel was not equipped with a water-level detector in the fish hold, and it was not required to have one.

Investigation Conclusions

As the *Brier Mist* crossed the river, the effect of the northwest wind over the more open water increased the height of the waves from that experienced near the north shore. The vessel was sailing in a 25-knot northwest wind, and seas broke on

the deck at such a rate that the vessel was unable to clear the water. As the *Brier Mist* settled, she became more vulnerable to shipping seas.

There were no watertight seals on the covers and no means to effectively secure the hatch covers to the coaming. Water was able to enter through a gap between the two panels covering the main hatch. During the events culminating in the sinking of the vessel, the hatch covers lifted off the coaming, leaving the hold open. The bilge pumping system was not able to control the flooding, and after being downflooded, the vessel eventually lost all reserve buoyancy and sank.

The liferaft, which was not recovered and presumably sank with the vessel, could not deploy automatically as it was not fitted with a hydrostatic release and, as a result, did not provide lifesaving support to persons in the water.

Needed Actions

The sinking of the *Brier Mist* demonstrates the risks to which small fishing vessel crews may be exposed. Between 1975 and 1999, 125 Canadian fishing vessels either capsized or foundered, resulting in 260 fatalities. A large number of these accidents involved downflooding due to inefficient, defective or ineffectively secured hatch and/or scuttle covers.

The Board is concerned that TC's efforts have not been entirely effective in achieving industry compliance with the safety requirement of ensuring that fish holds can be made watertight. In its response to recommendations from the coroner's inquest into this accident, TC indicated that it is aware of problems with the watertight integrity of some small fishing vessel hatch covers, and that action will be taken to ensure that openings on fishing vessel decks are adequately protected. However, given the deficiencies noted over the past 10 years in the design, manufacturing, installation, maintenance and inspection of small fishing vessel hold-closure systems, the Board is still very concerned about the loss of lives in this sector of the marine industry and has recommended that:

The fishing industry and the Department of Transport give increased attention to small fishing vessel hatch covers to help ensure that these covers are watertight and can be effectively secured.
— M00-06, issued March 2001

TC, in reply, agreed with the recommendation, and stated that although small fishing vessels are subject to TC inspections every four years, since this occurrence, the department has conducted targeted inspections at randomly selected ports on certified fishing vessels to ensure—among other things—that all openings on deck are adequately protected. TC also issued several *Ship Safety Bulletins* (SSBs) addressing the issue, including SSB No. 06/98, *Responsibilities of Shipowners and Masters Respecting Maintenance of Watertight Integrity of their Vessels.* Moreover, the Standing Committee on Fishing Vessel Safety, at its inaugural meeting in May 2001, discussed the practicality of high water-level alarms.

The crew's chances of survival in an emergency depend on the capacity, reliability and availability of lifesaving equipment.

The crew's chances of survival in an emergency depend on the capacity, reliability and availability of lifesaving equipment. More deficient liferafts have been identified in the last five years, suggesting that there is a significant number of inadequate lifesaving survival craft aboard small fishing vessels.

The Board has previously expressed its concern that the absence of automatic liferaft release mechanisms on small fishing vessels needlessly compromises the chances of crew survival in an emergency at sea when the liferaft goes down with the vessel. As the chances of survival on abandoning a vessel depend on successfully launching a liferaft—and considering the extremely difficult conditions in which an abandonment is often carried out—the Board is of the opinion that liferafts should be easy to release when the vessel sinks in order to allow the crew members to access the liferafts on abandoning ship, and has recommended that:

The Department of Transport alert builders and owners of fishing vessels to the need for the liferafts on all vessels to be stowed with a launching system fitted with a release mechanism that allows the inflatable liferaft to be easily released when the vessel sinks.
— M00-07, issued March 2001

The Department of Transport examine the effectiveness of liferaft automatic release mechanisms to prevent premature activation of these mechanisms on small fishing vessels in rough sea conditions.
— M00-08

TC accepted Recommendation M00-07 and subsequently issued SSB No. 03/01, 25 April 2001, entitled *Stowage of Liferafts and Inflatable Rescue Platforms*. TC noted Recommendation M00-08 and indicated that the issue of float-free arrangements would be discussed at the Canadian Marine Advisory Council (CMAC) as part of its work on safety and equipment carriage requirements by the Standing Committee on Fishing Vessel Safety.

In a distress situation where a vessel sinks and the EPIRB is deployed and emits a signal, SAR resources are alerted to initiate action. The signal includes an identifier that provides the SAR controller with valuable information about the vessel and owner. Further, as SAR craft respond to the site, the beacon continues to send its position, allowing SAR craft to home in, thus substantially reducing search time and improving the probability of survival.

In the sinking of the *Cape Aspy* off Nova Scotia on 30 January 1993, the EPIRB signal was picked up a few moments after the vessel sank, and the Halifax Rescue Coordination Centre was therefore able to undertake a SAR operation in less than 10 minutes. The saving of several lives has been attributed mainly to the automatically deploying EPIRB.

The Board is of the opinion that all fishermen should have the same distress-alerting capability that should not rely on human intervention. Further, fishermen forced into the water or survival craft should have the capability to continuously update their position to SAR coordinators and responders as the effects of wind and current cause them to drift. The Board has therefore recommended that:

The Department of Transport require small fishing vessels engaging in coastal voyages to carry an emergency position-indicating radio beacon or other appropriate equipment that floats free, automatically activates, alerts the search and rescue system, and provides position updates and homing-in capabilities.
— M00-09, issued March 2001

In noting this recommendation, TC stated that as part of consultations to amend *Ship Station Radio Regulations*, the department considered requiring small vessels engaged on all coastal voyages to carry EPIRBs. In consultation with the fishing industry, it was agreed that all such vessels would carry only the VHF radio with digital selective calling. In addition, those small vessels operating more than 20 miles offshore would also be required to carry EPIRBs; vessels of more than 15 gross tonnage would be required to carry float-free EPIRBs.

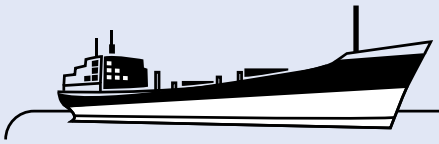
The Board is concerned by the lack of safety action taken on water-level detectors, protection from hypothermia and drowning, and MED training for fishermen, following recommendations previously issued by the Board as well as recommendations issued last year by the Chief Coroner as a result of this accident. The Board will continue to assess the safety action taken by TC in these areas.

Post Script: Subsequent to the release of the TSB's final report into the sinking of the *Brier Mist*, the location of the sunken vessel was found in November, 2002. The TSB has since reviewed an underwater video of the vessel, and has determined that no further investigation is warranted at this time. It was noted, however, that the liferaft was seen to be still in its cradle on top of the wheelhouse.

Marine Occurrence Statistics

	2002 Jan.-Nov.	2001	2000	1997–2001 Average
Total Marine Accidents	**436**	**517**	**527**	**559**
Shipping Accidents	**407**	**458**	**450**	**494**
Collision	14	16	16	17
Capsizing	13	6	15	12
Foundering/Sinking	24	37	38	34
Fire/Explosion	47	84	64	71
Grounding	126	114	123	127
Striking	59	88	68	83
Ice damage	2	4	6	11
Propeller/Rudder/Structural damage	42	19	31	29
Flooding	49	70	51	65
Other	31	20	38	45
Accidents Aboard Ship	**29**	**59**	**77**	**65**
Vessels Involved in Shipping Accidents	**439**	**506**	**492**	**538**
Cargo	19	31	25	26
Bulk carrier/OBO	48	57	59	64
Tanker	8	12	14	14
Tug	23	39	33	39
Barge	23	28	30	30
Ferry	16	24	26	22
Passenger	24	16	20	20
Fishing	229	246	238	267
Service vessel	16	27	23	28
Non-Commercial	20	18	13	15
Other	13	8	11	13
By Vessel Flag	**439**	**506**	**492**	**538**
Canadian (Non-fishing)	167	197	179	196
Canadian (Fishing)	223	232	227	257
Foreign	49	77	86	86
Vessels Lost (By Gross Tonnage)	**21**	**48**	**36**	**48**
1,600 grt and over	1	1	0	1
150 to 1,599 grt	1	3	1	3
60 to 149 grt	3	7	3	5
15 to 59 grt	4	15	13	13
Less than 15 grt	7	16	16	18
Unknown tonnage	5	6	3	8
Fatalities	**23**	**34**	**31**	**33**
Shipping Accidents	17	17	16	19
Accidents Aboard Ship	6	17	15	14
Injuries	**62**	**69**	**94**	**82**
Shipping Accidents	29	17	23	22
Accidents Aboard Ship	33	52	71	60
Reported Incidents (Mandatory)	**158**	**239**	**248**	**197**
Close-quarters situation	27	60	57	45
Engine/Rudder/Propeller	52	99	105	82
Cargo trouble	3	4	5	5
Personal incidents	9	8	6	5
Other	67	68	75	60

Figures are preliminary as of December 16, 2002.
All five year averages have been rounded. Totals sometimes do not coincide to the sum of averages.



MARINE Occurrence *Summaries*

The following summaries highlight pertinent safety information from TSB reports on these investigations.

AN INFORMATION VOID

The timely exchange of pertinent information is an important consideration in contributing to the safe navigation of a vessel. Without it, the time available to permit crews to evaluate close-quarters or risk of collision situations is reduced. Adequate communications ensure that crews share a common understanding of a situation and of each party's intentions. The Board is concerned that without it, crews will continue to make decisions based on incomplete information, thereby putting themselves and their vessels unnecessarily at risk.

As demonstrated by the following occurrence, lack of an exchange of information can result in unsafe decision making based on insufficient information.

The bulk carrier Atlantic Huron *was proceeding eastwardly across Lake Erie at night on 25 September 2000. The speed was 12 knots and visibility was good. As the vessel neared the Pelee Passage light, the course was altered to starboard for a port-to-port passage with an approaching vessel, the* Lady Sandals. *Further course alterations to starboard were made to provide more sea room. In doing so, the* Atlantic Huron *struck the Canadian Coast Guard vessel* Griffon, *which was at anchor. Both vessels were damaged but there was no pollution. Four people sustained minor injuries on board the* Griffon.
— Report No. M00C0069

Pelee Passage is the main shipping channel for commercial vessels crossing western Lake Erie (see Figure 1). The fixed light is situated south of the light buoys at the north end of Middle Ground Shoal. A radar beacon (RACON) is fitted above the light.

Near the eastern entrance to Pelee Passage is a voluntary calling-in point (CIP) located south of the Southeast Shoal light. Vessels that arrive at the CIP may choose to report to Marine Communications and Traffic Services (MCTS), but are not required to do so. As reporting to MCTS was not mandatory, MCTS did not volunteer traffic information to vessels unless specifically requested to do so.

The *Griffon* was at anchor approximately four cables east of the Pelee Passage light and had reported its position to MCTS. Its fore and aft anchor lights were lit, as were lights on the flight deck, poop deck, main deck and forecastle, and on the bridge deck at each side of the vessel's funnel. Some upper-deck lights were extinguished to prevent reflection on wheelhouse windows. Two floodlights were also lit to provide extra lighting on the main deck. The investigation determined that vessels transiting the passage saw the target trace of the Pelee Passage light on radar but did not see the target trace indicating the presence of the *Griffon*.

The officer of the watch (OOW) of the *Atlantic Huron* had no prior indication that the *Griffon* was anchored near the tower, or that the target of the *Griffon* was not evident on the radar; therefore, his mental model of the situation likely did not include the vessel's presence. Even though the OOW detected lights in the vicinity of the light tower, they did not fit his mental model, and taken with the other cues, were not sufficient to alter his mental model.

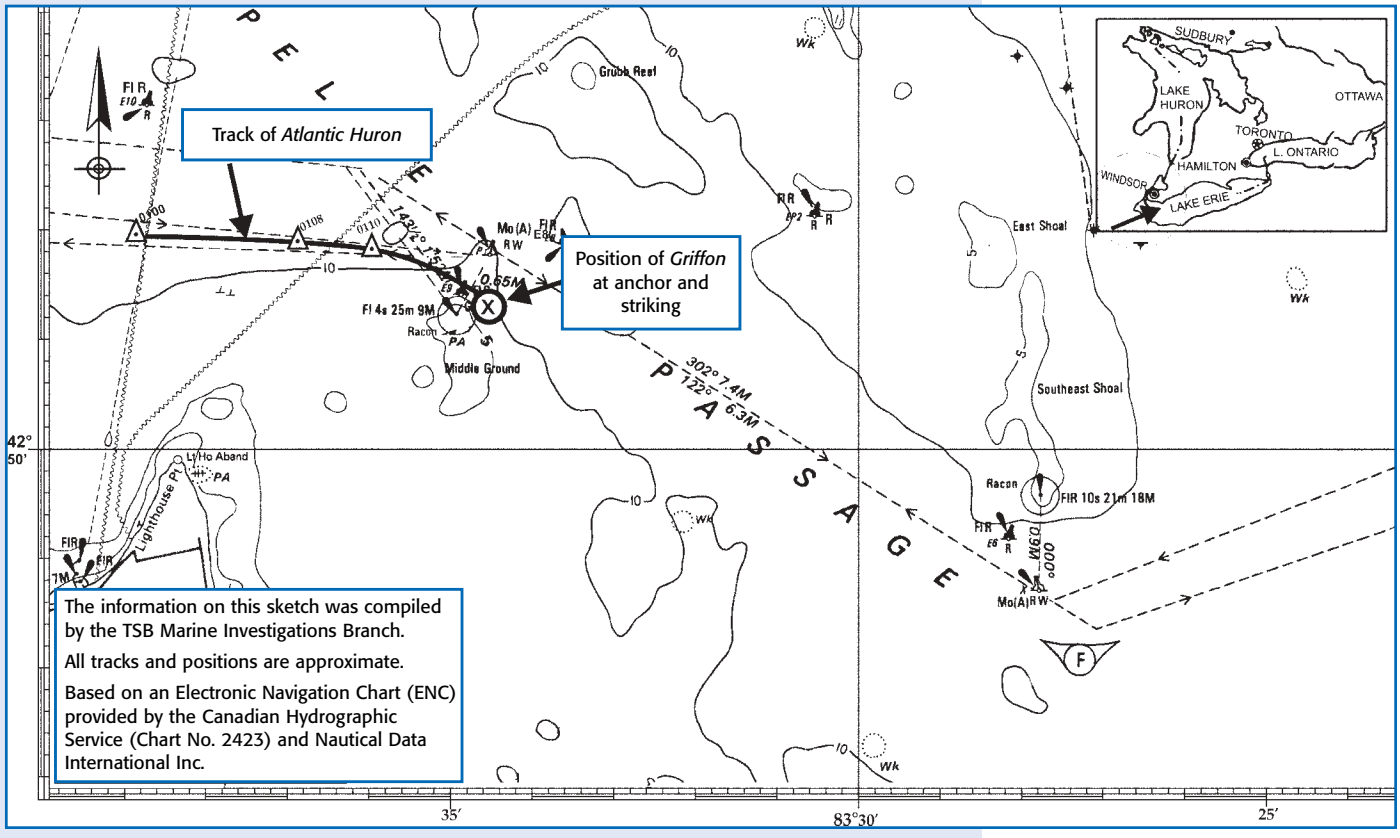


Figure 1. Sketch of occurrence area.

The OOW of the *Atlantic Huron* believed that the *Lady Sandals* was a large vessel, and was concerned about sufficient sea room for a port-to-port passage; however, he did not use the VHF radiotelephone to full advantage to seek additional information, or make use of the ship's whistle to indicate such doubt. It is likely that the OOW did not realize the inaccuracies of his mental model until the *Lady Sandals* had passed and the danger of collision with that

vessel had receded. The rapidly looming lights of the *Griffon* then most probably captured his attention and led to his initiation of emergency action.

The OOW of the *Griffon* was aware that the *Atlantic Huron* would pass within three cables, but he did not take any action to attract its attention until it was less than two cables away. Also, the radiotelephone was not used to communicate with the *Atlantic Huron*. The navigating personnel of the *Griffon* had previously tracked other vessels passing two to four cables off their anchored position, and had become accustomed to such close passages to the extent that it was expected that a vessel would pass close by. Furthermore, because their vessel was lit up at night, the bridge team assumed that transiting vessels would take appropriate action to avoid coming dangerously close. A SÉCURITÉ call was not broadcast by the *Griffon*, nor was a NOTSHIP initiated by either the vessel or broadcast by MCTS to warn transiting vessels of the presence of the *Griffon*. Consequently, the *Atlantic Huron* and the *Lady Sandals* were unaware of information necessary to the safety of vessels operating in the area.

REFLEXION

The sharing of relevant information benefits all concerned. Consider this exchange as an exercise in defensive driving.

HAD THE TRAINING, BUT.....?

On 10 August 2000, the Algoeast, *a 8545 gross ton oil tanker, departed Nanticoke Harbour, on Lake Erie, loaded with 8863 tonnes of bunker, bound for Sarnia, Ontario. The master developed and approved the vessel's voyage plan from a generic computerized voyage plan. The voyage plan included navigating three sets of range lights to transit Amherstburg Channel. — Report No. M00C0053*

At 2037 Eastern Daylight Time, when the vessel approached the east outer channel, the master had the conduct of the vessel. The bridge team consisted of the master, the third officer—who was manning the starboard radar and handling radio communications —and the wheelsman. The ship's officers held certificates appropriate for both the type of vessel and the geographic area of operation. A trainee-master and an evaluator were also on the bridge; the evaluator was a representative of the ship's owner, who was assessing the master's piloting capabilities through the Amherstburg Channel.

When the *Algoeast* approached buoys *D56* and *D57*, the master was looking for the next range on which to steer—that of the fixed yellow lights of the Amherstburg Reach Range. Between buoys *D56* and *D57*, the shipping channel changes direction by 17.5 degrees. At this location, the master delayed altering course to port because he saw two large white lights ahead that he thought could be a range of which he was unaware. The other officers of the bridge team also saw the lights, but recognized them as a vessel further upstream

crossing the channel. There was no exchange of information concerning the lights by bridge team members until the officer manning the starboard radar indicated that there was a vessel ahead. By that time, the lights of the Amherstburg Reach Range were coming into line.

The master then ordered helm to "port 10", and followed quickly with "port 20." At 2142, as the vessel altered to port, it made contact with the bottom, east of the eastern charted limit of the deep-draught portion of the channel. The vessel sustained damage to its forepeak and double bottoms. No one was injured and there was no release of pollutants. Bridge navigating team members reported weather conditions at the time of the occurrence as clear visibility and light winds.

Although most of the navigating personnel had received bridge resource management (BRM) training, BRM principles were not applied at the time of the occurrence. There had been no formal follow-up evaluation of their training to ensure that BRM principles were integrated into daily operations. Furthermore—although the roles of the evaluator and the trainee-master were not clearly established in advance, and they were not part of the bridge team or responsible for the vessel's navigation—these individuals would have spoken out in an effective BRM environment upon recognizing deviations from established practices affecting the vessel's safety.

Subsequent to this occurrence, the vessel owner:

- adopted and implemented the Algoma Central Marine Pilotage Program for liquid-bulk vessels,
- issued a directive to vessels stating that BRM principles must be exercised regardless of the situation, and
- proposed that evaluators be issued written instructions stating his objectives and that he is part of the bridge team.

REFLEXION

Is safety in your workplace being compromised by differences between what is taught in the classroom and what is practised on the job?

JURY-RIGGED AND MAKESHIFT GEAR

On 06 September 2000, the owner/operator of the aluminum trawler Star Queen *was fishing alone off the mouth of the Fraser River, British Columbia. During the daytime harvesting operation, it appears that his loose clothing became entangled in the net, ropes, or machinery and he was drawn into the turning winch drum. He died as a result of his injuries. — Report No. M00W0230*

At the time of the occurrence, the owner of the vessel was wearing bib-style rain pants and a rain jacket over a tee shirt and sweat pants. This protective rain gear was loose fitting; there was no evidence of the open sleeves or flaps of his jacket having been tightly secured to his body. He was working in very close proximity to rotating machinery, where wire rope, nylon rope, and fishing net were in the process of being stowed. The owner/operator was working alone and, after the accident, had no means of raising an alarm or calling for help.

Though the *Star Queen* was relatively new, some of the deck machinery had not been well maintained, and some elements had fallen into disrepair. There were examples of jury-rigged and makeshift gear; the emergency stop/hold-to-run control had been disconnected, and hydraulic oil had leaked from machinery on deck. With the hold-to-run-control disconnected, there was no automatic or remote means of stopping the winch in the event the operator became incapacitated. Moreover, the control valve for the hydraulic winch did not move freely, and did not automatically return to the neutral or stop position.

Being less than 15 gross registered tons (GRT), the *Star Queen* was exempt from quadrennial inspections by Transport Canada, Marine Safety (TCMS); however, the vessel had to comply with all applicable conditions and regulations of the *Canada Shipping Act*, and was subject to spot checks and random inspections by TCMS. As a result of numerous accidents on board fishing vessels, Transport Canada has now appointed Small Vessel Inspectors in its offices to inspect this class of vessel. Further, the department is in the process of forming a Small Vessels Group, which will carry out spot checks and random inspections on all vessels below 60 GRT.

In British Columbia, the Workers' Compensation Board (WCB) has jurisdiction over workplaces and equipment aboard vessels engaged in the business of fishing. Consequently, WCB conducts random inspections on fishing vessels, gives educational presentations, and issues hazard alerts to educate fishing vessel operators about dangers. Potentially hazardous and unsafe conditions are effectively targeted for corrective action.

In May 2001, the WCB of British Columbia entered into a memorandum of understanding (MOU) with TCMS. The MOU demarcates areas of jurisdiction, establishes areas of joint responsibility and the sharing and mutual exchange of acquired information on a continuous basis.

Investigations

The following is *preliminary* information on all the occurrences under investigation by the TSB that were reported between 01 October 2001 and 30 November 2002. Final determination of events is subject to the TSB's full investigation of these occurrences.

DATE	LOCATION	VESSEL (S)	TYPE	GRT	EVENT	OCCURRENCE NO.
OCTOBER 2001 26	Cape Scott, B.C.	*Kella-Lee*	Fishing	35	Foundering	M01W0253
NOVEMBER 16	Off Portneuf, Que.	*Cedar*	Bulk carrier	16 807	Grounding, taking water	M01L0129
MARCH 2002 17	Off Belle Isle, Nfld.	*Katsheshuk*	Fishing trawler/ dragger	2674	Fire	M02N0007
19	N. of Magdalen Islands, Que.	*Lake Carling*	Bulk carrier	17 464	Fracture	M02L0021
APRIL 01	Sechelt Rapids, B.C.	n/a	Small craft	n/a	Capsizing	M02W0049
13	Gabriola Island, B.C.	*Bowen Queen*	Ferry passenger/ vehicle	1476	Broke mooring	M02W0061
21	St. Lawrence River, near Morrisburg, Ont.	*Progress* *Pitts Carillon*	Tug Barge	123 260	Striking	M02C0011
MAY 15	Anstruther Lake, Apsley, Ont.	No name	Workboat	n/a	Swamping	M02C0018
22	Western end of Lapierre Island, Que.	*Vaasaborg*	General cargo	6130	Grounding	M02L0039
JUNE 11	Malaspina strait, B.C.	*Bruce Brown*	Small craft	n/a	Capsizing	M02W0089
23	N. of Hull Marina, Que.	*Lady Duck*	Amphibious vehicle	n/a	Sinking	M02C0030
JULY 08	Near Brasseau Bay, B.C.	*Fritzi-Ann*	Fishing	29	Capsizing	M02W0102
16	Traverse Verchères, St. Lawrence River	*Kent*	Bulk carrier	17 825	Fall from lifeboat	M02L0061
AUGUST 04	White Islets, B.C.	*Statendam*	Passenger	55 451	Fire in engine room	M02W0135
13	Sandheads, B.C.	*Cap Rouge II*	Fishing	47	Capsizing	M02W0147
OCTOBER 12	South Shore Canal, St. Lawrence River, Que.	*Stellanova* *Canadian Prospector*	General cargo Bulk carrier	4962 18 527	Collision and grounding	M02C0064

Final Reports

The following investigation reports were approved between 01 October 2001 and 31 December 2002.

DATE	VESSEL(S)	EVENT	REPORT NO.
98-08-02	*Federal Fraser*	Grounding	M98L0097
99-04-23	*Jean Parisien*	Bottom contact	M99C0008
99-06-02	*Sheena M, Rivtow 901*	Striking	M99W0078
99-07-15	*Siyay*	Striking	M99W0116
99-08-07	*Sunboy, Jose Narvaez*	Collision	M99W0133
99-10-23	No name	Swamping and sinking	M99C0048
00-03-13	*C-JOY*	Accident on board	M00W0059
00-04-11	*Millenium Yama*	Main engine failure	M00L0034
00-08-10	*Algoeast*	Bottom contact	M00C0053
00-08-25	*Avataq*	Foundering	M00H0008
00-09-06	*Star Queen*	Fatal accident	M00W0230
00-10-01	*Flying Swan VI*	Capsizing	M00M0104
00-10-18	*Fossnes*	Grounding	M00L0114
01-01-09	*Alligator Victory*	Fatal accident	M01W0006
01-02-03	*Thebaud Sea*	Fire	M01M0005
01-06-30	*Lady Duck*	Taking on water and sinking	M01C0033
01-07-29	*Cast Privilege*	Grounding	M01L0080
01-08-11	*Bridge 11, Windoc*	Striking and fire	M01C0054
02-09-25	*Atlantic Huron, Griffon*	Striking	M00C0069

TRANSPORTATION SAFETY
REFLEXIONS
MARINE

Issue 20 – March 2003

Subscription

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Bureau de la sécurité des transports du Canada

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Fax: (902) 426-5143
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Phone: 1-800-426-8563)

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Phone: (418) 648-3576
Fax: (418) 648-3656

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