



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 Occurrence Report

### Striking

of the Ferry Wharf by the  
Passenger Vessel "GRAND FLEUVE"  
Rivière-du-Loup, Quebec  
04 June 1992

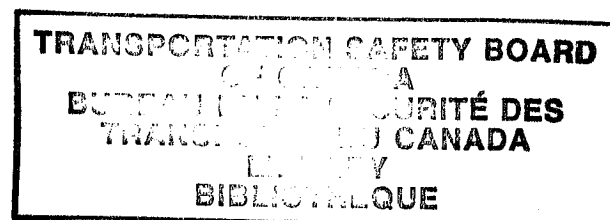
Report Number M92L3011

### *Synopsis*

While manoeuvring to berth alongside the ferry wharf at Rivière-du-Loup on 04 June 1992, the passenger vessel "GRAND FLEUVE", carrying approximately 400 passengers, struck the wharf. The striking resulted in minor damage to the vessel and minor injuries to four passengers.

The Board determined that the "GRAND FLEUVE" struck the wharf as a result of the failure of the starboard main engine to respond to an order for astern propulsion. This failure was attributed to a vibration-caused electrical disconnection in the power supply to the servo-mechanism which controls the engine.

Ce rapport est également disponible en français.



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## 1.0 Factual Information

### 1.1 Particulars of the Vessel<sup>1</sup>

"GRAND FLEUVE"	
Official Number	811523
Port of Registry	Québec, Quebec
Flag	Canadian
Type	Passenger vessel
Gross Tons <sup>2</sup>	460
Length	30.72 m
Draught (at time of occurrence)	F <sup>3</sup> : 1.52 m A: 1.74 m
Built	1989 Port Stanley, Ontario
Propulsion	Two Cummins diesel engines, six cylinders, developing a total power of 597 kW, each driving a fixed-pitch propeller through a reversible reduction gearbox
Owners	Les Investissements Navimex Inc. Québec, Quebec

- 1 Because of major alterations made to the vessel shortly before this occurrence, some of the particulars no longer applied. However, at the time of the occurrence, no notice of alterations had been received by the Registrar of Ships.
- 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.
- 3 See Glossary for all abbreviations and acronyms.
- 4 All times are EDT (Coordinated Universal Time (UTC) minus four hours) unless otherwise stated.

#### 1.1.1 Description of the Vessel

The "GRAND FLEUVE" was built as a two-deck, twin-screw passenger vessel with a passenger capacity of 203. New owners purchased the vessel in March 1992 and immediately undertook several major alterations to increase her power and passenger capacity. At the time of the occurrence, the alterations had not yet been completed.

#### 1.2 History of the Voyage

The "GRAND FLEUVE" departed the Port of Québec on 04 June 1992 with a crew of nine: a master, two officers and six persons who were working on the alterations and who were declared as crew by the owners.

The vessel left the Louise Basin at 0430<sup>4</sup> and reported her departure to Vessel Traffic Services (VTS). She reported again when she passed St-Laurent, Île d'Orléans, and Cap Brûlé.

The "GRAND FLEUVE" docked at Cacouna, Quebec, at 1400 and remained there until 1540. The vessel did not inform VTS of either her arrival or her departure. After leaving Cacouna, the "GRAND FLEUVE" headed toward Rivière-du-Loup, Quebec. She reported to VTS as she passed Île Blanche at about 1550, indicating that she expected to reach Rivière-du-Loup in about 15 minutes. VTS requested that she report on arrival.

The "GRAND FLEUVE" docked at Rivière-du-Loup at about 1615 and immediately boarded about 400 passengers for an excursion to Îles du Pot à

l'Eau-de-Vie, Quebec. During the boarding process, attempts by the steamship inspector to serve a detention order to the master in person were unsuccessful. The vessel departed Rivière-du-Loup as soon as the boarding was completed without informing VTS of either her arrival or her departure.

Following a telephone conversation between VTS and the steamship inspector, VTS contacted the "GRAND FLEUVE" by very high frequency radiotelephone (VHF R/T) at 1642 and informed her that she was the subject of a detention order. The "GRAND FLEUVE" made some reference to "orders" having been received and advised VTS to refer the inspector to the owners in Québec City. VTS made several other calls to the "GRAND FLEUVE" on channels 12 and 16 but received no response. After completing the trip to Îles du Pot à l'Eau-de-Vie and while manoeuvring to berth, the vessel struck the Rivière-du-Loup wharf at 1805, sustaining slight damage to the port corner of the forward observation platform. Although four passengers were injured, the occurrence was not reported to the authorities. Not until 1810, after the passengers had disembarked the vessel at Rivière-du-Loup, did the "GRAND FLEUVE" resume radio communication. At that time, the vessel informed the ferry "TRANS ST-LAURENT" that she was departing Rivière-du-Loup.

VTS took that opportunity to request the vessel's destination and to inform the vessel that the detention order had not been lifted. The "GRAND FLEUVE" responded that she was operating as a pleasure craft and had only crew on board. She then informed VTS that she had struck the ferry wharf, but neither damage nor passenger injuries were reported. The vessel continued to Québec City and docked there at 0600, 05 June 1992.

### 1.3 Injuries to Persons

	Crew	Passengers	Others	Total
Fatal	-	-	-	-
Missing	-	-	-	-
Serious	-	-	-	-
Minor	-	4	-	4
None	9	396 <sup>5</sup>	-	405 <sup>5</sup>
Total	9	400 <sup>5</sup>	-	409 <sup>5</sup>

The four injured passengers sustained their injuries when they fell while on the vessel's forward observation platform.

### 1.4 Certification

#### 1.4.1 Vessel Certification

Apart from a valid Radio Inspection Certificate issued on 03 June 1992, the "GRAND FLEUVE" did not have any of the certificates or documents required for a vessel of her size and type under the *Canada Shipping Act* or the regulations made pursuant to this act.

Following the occurrence voyage, the "GRAND FLEUVE" was inspected by the Canadian Coast Guard (CCG), and a

5 Approximate numbers

number of irregularities were found that affected the vessel's seaworthiness and compromised passenger safety. The shortcomings were later corrected, and the vessel was issued a provisional Steamship Inspection Certificate for a passenger vessel (SIC 16). The certificate increased her passenger capacity to 371 and assigned a temporary gross tonnage of 496.89 tons.

#### *1.4.1.1 Passenger Vessel Status of the "GRAND FLEUVE"*

The owners maintained that the "GRAND FLEUVE" was operating as a pleasure craft, although she was carrying passengers at the time of the occurrence. This assertion was rejected by the CCG. The vessel was registered as a passenger vessel in 1989, and no change to that status had ever been requested or approved.

#### *1.4.1.2 Alterations to the Vessel*

The major alterations being undertaken by the new owners were:

- installation of a new third engine;
- addition of a 10 m extension to the stern; and
- addition of a large observation platform overhanging the water at the bow.

Work was started on these alterations before the plans were approved by the CCG. Although the inspection process had been initiated by the owners, many items were still unfinished at the time of this occurrence, and no inspection

certificate had been issued. No sea trials were conducted.

Standard-height railings along its perimeter constituted the only handholds provided on the forward observation platform.

#### *1.4.2 Maintenance Records*

As the vessel had been decommissioned for over two years, there was no maintenance performed, nor were there any maintenance records on board. The current owners were the new owners of the vessel. Such vessels do not normally have formal maintenance records.

#### *1.4.3 Personnel Certification and History*

The master held a Canadian Master Minor Waters Certificate issued in 1972. He had over 42 years' sea service.

The chief officer held a Canadian Master Minor Waters Certificate issued in 1951. He had 50 years' sea service.

The chief engineer held a Canadian Engineer Fourth Class Combined Certificate issued in 1991 and had completed a Marine Emergency Duties (MED) course. He had a total of 15 years' sea service and had been previously employed with the CCG for 13 years.

#### 1.4.4 Crew Training

As the "GRAND FLEUVE" is a passenger vessel of under 500 gross tons<sup>6</sup>, there is no regulatory requirement for her to carry lifeboatmen, nor is there a requirement for the crew to take a MED course. However, before a passenger vessel is issued a Steamship Inspection Certificate, the steamship inspector has to be satisfied as to the adequacy of the crew to handle the life-saving equipment involved and to safely evacuate the complement within 30 minutes. With the exception of the chief engineer, none of the crew aboard the vessel had taken a MED course.

#### 1.5 Weather and Tidal Information

At the time of the occurrence, skies were clear, wind and sea were calm, and visibility was good. These conditions were consistent with the forecast. High tide for Rivière-du-Loup was predicted to be at 1830.

#### 1.6 Navigation Equipment

##### 1.6.1 Vessel Equipment

The navigation equipment in use was in good working order.

##### 1.6.2 Charts and Publications

The "GRAND FLEUVE" carried all charts needed for the voyage, but no corrections had been entered on the charts since 1989. The vessel also carried some navigation publications, but no tide tables could be found.

#### 1.7 Canadian Coast Guard (CCG) Action

After several unsuccessful attempts to raise the "GRAND FLEUVE" on VHF R/T, VTS requested information about the vessel from a CCG helicopter that was operating in the vicinity. The pilot advised that he had seen the "GRAND FLEUVE" leaving Rivière-du-Loup with many people on board.

#### 1.8 Life-saving Equipment

There was insufficient life-saving equipment on board for the complement. When the vessel was inspected on 05 June 1992, she was carrying five 20-person liferafts and ten 25-person liferafts, for a total capacity of 350 persons. She also carried 273 lifejackets.

#### 1.9 Vessel Stability

On 01 June 1992, a stability test was carried out on the "GRAND FLEUVE" in the presence of a steamship inspector. The results of the test were submitted to the CCG for approval in June 1992, but approval had not been received by the end of the 1992 season.

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<sup>6</sup> Gross tonnage of the vessel as indicated on SIC 16 (issued following the occurrence) governed regulations that then applied to the vessel.

### 1.10 Coasting Licence

Because the "GRAND FLEUVE" was being operated for hire/reward, she was required to have a valid Coasting Licence issued by Canada Customs. Since no one had either applied for or received such a licence, the master was required to report to the nearest Customs office with proof of all relevant certificates. He had not done so.

### 1.11 Charter

At the time of the occurrence, the "GRAND FLEUVE" was operating under charter to a group of conventioners from Rivière-du-Loup. The contract had been signed at the end of February by the president of the group (charterer), who had relied on the owners' /tour boat operators' reputation and tourist information. The charterer expected the owners/operators of the "GRAND FLEUVE" to provide a properly certificated vessel and crew, thereby ensuring the safety of the charterer's membership (passengers).

### 1.12 Engine Controls

Each engine is electrically controlled from the bridge by means of two servo-mechanisms, one controlling speed, and the other, the direction of the propeller thrust. The control system is powered by a single 12-volt DC power source.

When the vessel was manoeuvring at the Rivière-du-Loup ferry wharf, the starboard engine failed to respond to an

order for astern propulsion, and the vessel struck the wharf. Investigation revealed that the starboard engine servo-mechanism male/female electrical connector had become disconnected as a result of vibration during normal vessel operation. The male/female connector was of an inferior quality and was not provided with a locking device. The publication *Ship Safety Electrical Standards* (TP 127), under the heading "Design of Equipment", outlines the CCG Ship Safety Branch requirement that: "Machines and apparatus shall be so constructed that their efficiency is not impaired by vibration and shock likely to arise under normal service conditions; screws and nuts securing current carrying parts shall be of a type or provided with a device to prevent them from working loose due to vibration."

The servo-mechanism had not been affected by the ongoing alterations.

#### 1.12.1 Engines in Use

Installation of the new centre engine was not yet complete. Only the vessel's starboard and port engines were in operation at the time of the occurrence.

### 1.13 Reporting Requirements

The "GRAND FLEUVE" did not immediately report the occurrence involving passenger injuries to VTS as is required by the TSB Regulations.



### *1.14 Passenger Count*

The "GRAND FLEUVE" had no system for counting the number of passengers. Passenger figures in this report are therefore approximate only.

## 2.0 *Analysis*

### 2.1 *Servo-mechanism Electrical Connector Disconnection*

The vessel had made a number of manoeuvres requiring the use of the main engines before the occurrence which would indicate that the servo-mechanism was functioning satisfactorily. The servo-mechanism male/female connector was found disconnected after the occurrence. As the connector is enclosed in a box which is not easily accessible, the possibility of it becoming accidentally disconnected can be ruled out. Further, because it was not provided with a locking mechanism, the connector could become disconnected as a result of vibration. As there was no evidence of unusual vibrations being experienced by the vessel, the only plausible explanation is that the connector became disconnected during normal operation of the vessel.

### 2.2 *Handholds and Passenger Safety*

Because the railings along the forward observation platform's perimeter were the only handholds and because the large platform accommodates many passengers, the handholds were beyond the reach of some passengers. When the vessel moves in a seaway or during berthing/unberthing operations, passengers who are on the platform could be subjected to additional dangers associated with stumbling/falling because of a lack of sufficient handholds.

## 2.3 *Contractual Commitment*

As the alterations were to increase the passenger capacity to greater than 203 and as the contract called for the carriage of some 400 passengers, the owners elected to use this vessel to fulfil their contractual commitment even though the vessel was not properly certificated. She was subsequently certificated for 371 passengers, a figure still below the number carried on this voyage.



### 3.0 Conclusions

#### 3.1 Findings

1. The "GRAND FLEUVE" was committed to making this voyage under a charter/rental agreement signed some three months before the occurrence.
2. The port and starboard main engines were operating at the time of the occurrence.
3. The starboard engine failed to respond to a command from the bridge for astern propulsion, and the vessel struck the wharf.
4. The power supply to the starboard engine servo-mechanism had become disconnected as a result of normal vibration.
5. The male/female electrical connector was not provided with a locking mechanism.
6. The "GRAND FLEUVE" had recently undergone major structural alterations which included the addition, at the bow, of an observation platform which had railings only around its perimeter and no other handholds.
7. Four passengers standing on the forward observation platform were slightly injured when they fell as a result of the striking.
8. The "GRAND FLEUVE" was registered as a passenger vessel.
9. The "GRAND FLEUVE" did not have sufficient life-saving equipment on board, did not have a valid Steamship Inspection Certificate, and did not have a valid Coasting Licence.
10. The "GRAND FLEUVE" had not undergone sea trials in conjunction with the recent structural alterations.
11. There was no system in place to accurately count the number of passengers boarding the vessel.

#### 3.2 Causes

The passenger vessel "GRAND FLEUVE" struck the wharf at Rivière-du-Loup as a result of the failure of the starboard main engine to respond to an order for astern propulsion. This failure was attributed to a vibration-caused electrical disconnection in the power supply to the servo-mechanism which controls the engine.



## 4.0 Safety Action

### 4.1 Action Taken

In September 1992, as a result of a separate occurrence involving this vessel, a Marine Safety Advisory was forwarded to advise the Canadian Coast Guard (CCG) of the need for adequately trained and qualified crew on passenger vessels. The CCG Board of Steamship Inspection will review its decision No. 4992 regarding certification requirements for lifeboatmen on passenger vessels of less than 500 gross registered tons.

Further, in February 1994, the TSB issued five marine safety recommendations with respect to charter vessels and the circumvention of safety regulations. The Board recommended that:

The Department of Transport conduct a formal safety evaluation of the Canadian charter boat industry to include the adequacy of vessel inspection and crew certification requirements as well as current operational practices;  
(M94-01, issued February 1994)

The Department of Transport expedite its currently proposed amendment to the *Canada Shipping Act* with respect to the carriage of the fare-paying public as passengers on charter vessels;  
(M94-02, issued February 1994)

The Department of Transport encourage all charter vessel operators to equip their vessels with life-saving and emergency communication and/or signalling equipment suitable for the type of operation;

(M94-03, issued February 1994)

The Department of Transport encourage charter boat operators to establish sailing plans and to conduct passenger safety briefings before getting under way; and

(M94-04, issued February 1994)

The Department of Transport initiate research and development into ways of ensuring the accessibility of all emergency equipment, including in a capsizing situation.

(M94-05, issued February 1994)

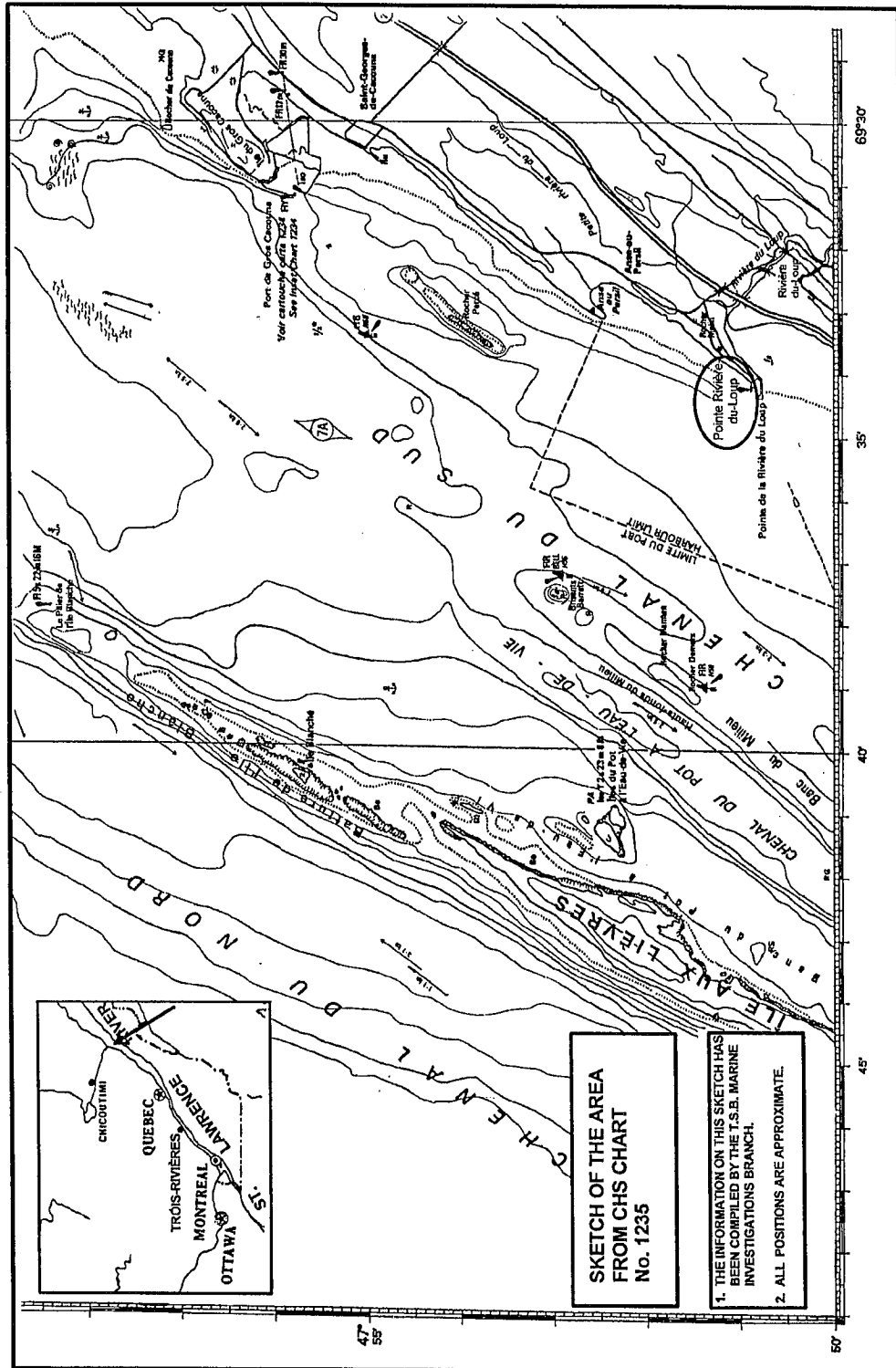
In response, Transport Canada indicated that:

- an all-region Working Group has been formed to address charter vessel safety issues;
- appropriate amendments to the *Canada Shipping Act* (CSA) are being considered, and drafting of the legislation will commence in a short time;
- a Ship Safety Bulletin (SSB) will be issued shortly to identify the obligation of charter vessel operators to operate their vessels in compliance with appropriate crewing and technical standards.

Subsequently, SSB No. 4/95, *Recommended Safety Communication Measures for Small Craft* (including fishing and charter vessels) was issued in January 1995. The SSB advises all small craft to file sail plans to enable Rescue Coordination Centres to carry out an effective Search and Rescue operation in case of emergency. It further recommends that charter vessels conduct safety briefings on the use of life-saving equipment and on emergency procedures for passengers before sailing. The SSB also explains procedures for emergency communication using cellular telephones.

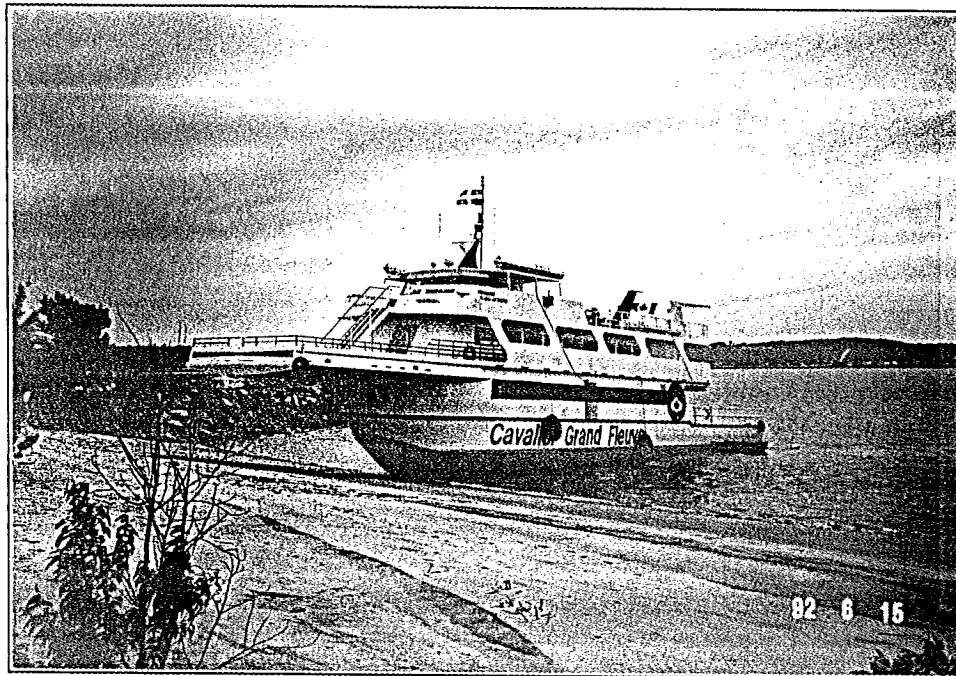
*This report concludes the Transportation Safety Board's investigation into this occurrence. Consequently, the Board, consisting of Chairperson, John W. Stants, and members Gerald E. Bennett, Zita Brunet, the Hon. Wilfred R. DuPont and Hugh MacNeil, authorized the release of this report on 15 March 1995.*

# Appendix A - Reduced Section of Canadian Hydrographic Service Chart No. L/C 1236







*Appendix B - Photograph*

"GRAND FLEUVE"

NOTE:

1. Change to the name of the vessel.
2. Observation platform added to the vessel.



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## Appendix C - Glossary

A	aft
CCG	Canadian Coast Guard
CSA	<i>Canada Shipping Act</i>
DC	direct current
EDT	eastern daylight time
F	forward
IMO	International Maritime Organization
kW	kilowatt(s)
m	metre(s)
MED	Marine Emergency Duties
SI	International System (of units)
SIC	Steamship Inspection Certificate
SSB	Ship Safety Bulletin
TSB	Transportation Safety Board of Canada
UTC	Coordinated Universal Time
VHF R/T	very high frequency radiotelephone
VTS	Vessel Traffic Services