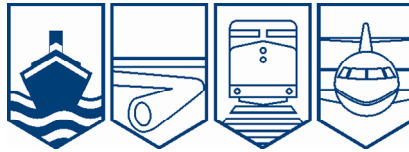


Transportation Safety Board
of Canada



Bureau de la sécurité des transports
du Canada

**MARINE INVESTIGATION REPORT
M10C0043**



GROUNDING

**PASSENGER VESSEL *RIVER ROUGE*
QUARRY RAPIDS, RED RIVER
NORTH OF WINNIPEG, MANITOBA
29 JULY 2010**

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

Grounding

Passenger Vessel *River Rouge*
Quarry Rapids, Red River
North of Winnipeg, Manitoba
29 July, 2010

Report Number M10C0043

Summary

On 29 July 2010, at approximately 1030, Central Daylight Time, the passenger vessel *River Rouge* with 71 passengers and crew on board ran aground in the Quarry Rapids on the Red River, north of Winnipeg, Manitoba. Following an unsuccessful attempt to refloat the vessel, all 63 passengers and 6 of the crew were evacuated by the Canadian Coast Guard. The vessel was refloated 1 week later. There were no injuries, damage to the vessel, or pollution.

Ce rapport est également disponible en français.

Factual Information

Particulars of the Vessel

Name of Vessel	<i>River Rouge</i>
Official Number	322532
Port of Registry	Winnipeg, Manitoba
Flag	Canada
Type	Passenger
Gross Tonnage	450
Length ¹	37.8 m
Draught	Forward: 1.22 m Aft: 1.22 m
Built	1967
Propulsion	2 x 115 BHP Caterpillar diesel engines, twin propellers
Crew	8
Passengers	63 (maximum capacity of 303, including crew)
Registered Owner/ Manager	River Rouge Tours Ltd.

Description of the Vessel

The *River Rouge* is a steel-hulled passenger vessel with a shallow draught and large breadth-to-depth ratio. It has 3 decks (see Appendix B). The lower and middle decks are for passenger use while the upper deck houses lifesaving appliances, a fuelling station, and potable water reservoirs. There is a walkway around the middle deck protected by railings. The vessel is powered by 2 diesel engines with twin screws and rudders, and is equipped with 2 anchors at the bow. The main hull is subdivided by 7 transverse bulkheads.

The wheelhouse is located at the forward end of the middle deck along the centreline, allowing unrestricted visibility from beam to beam. The ship's wheel, located in the wheelhouse, required some effort to turn, as it is mechanically



Photo 1. Vessel aground in the Quarry Rapids

¹ 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.

connected via reduction gearing to a steering quadrant in the steering flat aft. The wheelhouse is fitted with a magnetic compass, port and starboard engine controls, a control panel for the navigation lights, a very high frequency (VHF) radio, and a public address system.

The *River Rouge* carries out day and evening cruises on the Red River between Winnipeg and Selkirk, Manitoba, between May and October.

Red River Waterway and St. Andrews Lock and Dam

The construction of the St. Andrews lock and dam was completed in 1910 at Lockport, Manitoba, 27 kilometres north of Winnipeg. The dam was built to flood the Lister Rapids, the head of a series of 5 rapids situated on the Red River known as St. Andrew's Rapids, stretching for 16 kilometres upstream of the dam between Winnipeg and Lockport to enable shipping between Winnipeg and Lake Winnipeg (See Figure 1). The lock and dam are under the responsibility of Public Works and Government Services Canada (PWGSC). Aside from 3 commercial passenger vessels, the marine traffic transiting the waterway is recreational.

The dam uses wooden "curtains" mounted on movable steel frames, which are raised and lowered to control water flow on the river. When closed, the dam raises the water level over the rapids. When opened, the 16 kilometre reach between the lock/dam and the head of the rapids (Lister Rapids) is often rendered unsafe for transit because the current increases as the depth of the pool of water created by the dam decreases.

The Canadian Coast Guard (CCG) maintains 18 seasonal navigation buoys on the Red River between Winnipeg and Lockport. The buoys are plastic and all but two are moored with a 90 kg anchor. Since the mooring is considered insufficient to withstand the current when the dam is partially or fully opened, the buoys are not placed until water levels and current reach normal² working level. PWGSC informs the CCG when these conditions are met. Over the past 6 years, the buoys have been placed as early as 02 May and as late as 09 September.

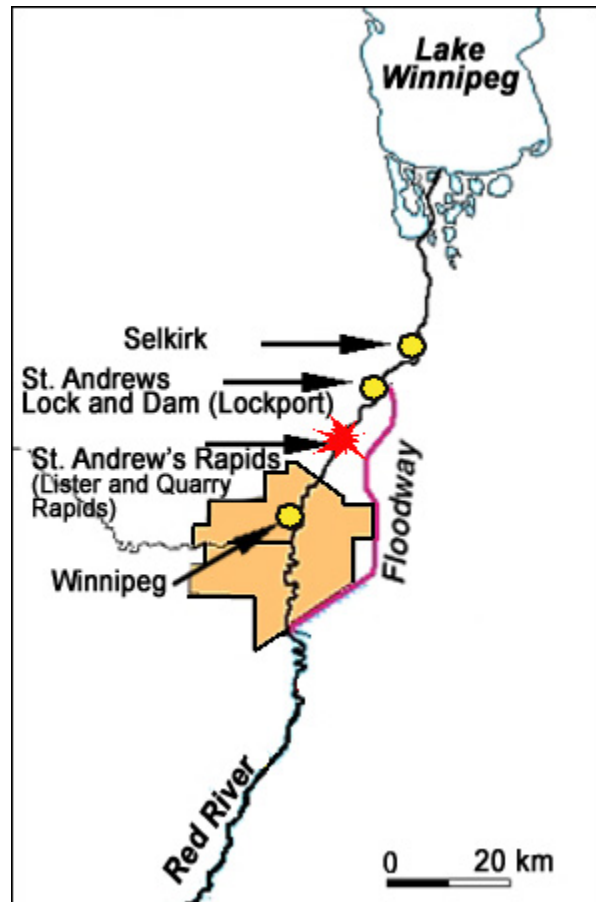


Figure 1. Occurrence location (see also Appendix A)

² Normal is equivalent to a rate of flow less than 12,500 cubic feet per second and a benchmark height at a site located in Winnipeg of no more than 734 feet above sea level.

The CCG Notice to Shipping (NOTSHIP) C1329, dated 14 July 2010, indicated that “Red River buoys X23 to X77 were off station due to high water levels and strong currents. Mariners are to be advised of buoy placement when water levels return to normal.” The buoys had not yet been placed by the CCG.

The NOTSHIP concerning the buoys was available via the CCG on the continuous VHF broadcast from the Marine Communications and Traffic Services (MCTS) centre in Thunder Bay, Ontario. It was also available on the CCG website and upon request from MCTS Thunder Bay. Those intending to transit through the lock before the dam is installed and the navigation buoys are placed, or during a summer high water event when the dam or portions of it are out, must contact St. Andrews Lock and Dam. This must be done prior to arrival in order to determine whether or not the lock is operational, given the water level required to float the vessel through the south canal. Information on water levels was also available via the websites³ of the City of Winnipeg and Environment Canada.

In recent years, higher than normal water levels in Winnipeg have resulted in later closings of the dam and in unscheduled openings throughout the summer season. This has adversely affected navigation on the river and delayed the placing of the buoys.

Operations at the Start of Season

The *River Rouge* is laid up during winter in Selkirk, located below St. Andrews lock, returning to Winnipeg at the start of each season. The start of the 2010 season was delayed because high water levels prevented the vessel from transiting above the St. Andrews lock. On 26 June 2010, following its annual inspection by Transport Canada (TC), the vessel began offering cruises out of Selkirk until its return to Winnipeg was possible.

It was not until 22 July 2010, when PWGSC deemed that water levels were within acceptable limits at the lock, that the vessel proceeded upstream to Winnipeg. Since the dam was open, the master was required by PWGSC to sign a document accepting responsibility and liability for transit above, below and through the St. Andrews Lock and Dam facility, including the north approach channel, the lock and the south canal. The document stated that water levels were not at the normal summer level and PWGSC was not responsible for the water depth above and below the lock and, in particular, over the Lister Rapids. The document also stated that it is the CCG’s responsibility to place the buoys and, until they are placed, the river is considered unsafe for navigation. The transit was made, however, without incident, and the vessel docked in Winnipeg later that day.

Over the next few days, the vessel began offering day and night cruises in the Winnipeg area without ever descending through the Lister Rapids. During this time, the first officer was replaced and the regular master was not available for every cruise. A relief master (referred to in this report as the master) who had occasionally worked on board during the previous 3 seasons, along with another first officer (1/O) who had worked on board on a few occasions the previous year, were asked to fill in when needed. When they first came on board, there was

³ City of Winnipeg, *River Levels At Winnipeg, Manitoba*, <http://winnipeg.ca/publicworks/pwddata/riverlevels>; Environment Canada, *The Hydrometric Network*, <http://www.ec.gc.ca/rhc-wsc/default.asp?lang=En&n=E228B6E8-1>. Website addresses confirmed accessible as of report release date.

no handover or exchange of information concerning local navigational warnings such as the NOTSHIP concerning the status of buoy placement on the river.

History of the Voyage

The *River Rouge* was scheduled to depart from Winnipeg for a day-long cruise on 29 July 2010 at 0930.⁴ The planned route took the vessel through the rapids and the St. Andrews lock, despite the fact that the dam was still open and that the buoys had not been placed. The relief master was unavailable, at least for the departure and initial leg of the trip, due to a medical appointment concerning an ongoing health issue. Nonetheless, the owner's representative⁵ decided to proceed with the voyage without a master.⁶ The 1/O was not provided with any instructions by the owner or the master as to his responsibilities.

At 0830, 63 passengers boarded the vessel. The passengers were counted as they came aboard and this information was recorded in the logbook. It was also recorded that a crew of 9 was on board, including the master,⁷ 1/O, engineer, deckhand/second mate (hereafter referred to as the deckhand), cook, 2 servers, the owner's representative (who also served as a deckhand) and an additional crew member whose duties were not defined.

At 0915, the 1/O boarded the vessel. The owner's representative provided the passengers with a pre-departure safety briefing using the ship's intercom. After testing the propulsion, the deckhand, who had 12 years cumulative service on board the vessel, manoeuvred the *River Rouge* away from the dock at 0927 in the presence of the 1/O. The 1/O, having not received any specific instructions from the owner's representative or the master and in the absence of vessel specific procedures, allowed the deckhand to manoeuvre the vessel off the dock, turn and proceed downstream. The 1/O and deckhand remained on the bridge together, with the owner's representative occasionally coming in. Using visual navigation, the bridge team maintained the vessel in the approximate centre of the river, equidistant from the shore. At around 0955, the deckhand handed the con of the vessel to the 1/O and went below for breakfast.

At 1005, the *River Rouge* approached the Quarry Rapids. At 1025, the 1/O, alone on the bridge, steered slightly away from the recommended mid-channel and closer to the western bank, not realizing the hazards in this area. Around 1028, the deckhand returned to relieve the 1/O at the wheel and noticed that the vessel was closer to the west bank. Both the 1/O and deckhand agreed there was sufficient water depth for the vessel.

⁴ All times are Central Daylight Time (Coordinated Universal Time minus five hours) unless otherwise stated.

⁵ The owner's representative was the principal shareholder of the company that owned the vessel.

⁶ It was agreed the master would join the vessel later in the day at the St. Andrews lock.

⁷ Although it was indicated that the master was onboard, he did not join the vessel until after the grounding.

At approximately 1030, the *River Rouge* ran aground in the Quarry Rapids, about 2.5 kilometers downstream from Lister Rapids (see Appendix A) on a bottom of mud and rocks, approximately 45 m from the western shore. Upon grounding, the 1/O and the deckhand pushed the throttles ahead and the vessel advanced slightly before stopping. Ahead and astern engine movements to free the vessel were unsuccessful. The engineer examined the vessel and found no damage or ingress of water.

At 1035, the passengers were informed of the situation. At 1128, approximately 1 hour after the grounding and after discharging the potable water on board to lighten the vessel and after several more unsuccessful engine movements, the owner's representative contacted the superintendent at St. Andrews lock to inform him of the grounding and request assistance.

The master, who by this time was waiting to rejoin the vessel at the lock, called the owner's representative to enquire as to why the vessel had not yet arrived. When he was informed of the grounding, he made his way to the vessel's location where the lifeboat from the vessel was used to ferry him aboard.

Refloating of the Vessel and Evacuation of Passengers

The vessel had no contingency plans or guidelines in place in the event of an emergency. The only emergency contact number was for a close relative of the owner's representative who also had no plans. The owner's representative, unaware of who could assist, then contacted the St. Andrews lock. He was advised to contact CCG Search and Rescue in Gimli, Manitoba. No one on board the *River Rouge* contacted the CCG for assistance or to advise them of the grounding.

The superintendent at the St. Andrews lock received the call from the *River Rouge* about an hour after the grounding. He later contacted the CCG base in Gimli. The CCG was not aware of the occurrence and requested that the PWGSC workboat *Spoonbill*⁸ be tasked to assist. At 1150, the *Spoonbill* departed to assist the *River Rouge*. The CCG advised the Royal Canadian Mounted Police (RCMP) and TC. The Joint Rescue Coordination Centre (JRCC) in Trenton, Ontario, and the RCMP and TC in Manitoba subsequently contacted the owner's representative to find out more about the situation on board. The JRCC subsequently coordinated the search and rescue (SAR) response.

At approximately 1400, the *Spoonbill* made the first of several unsuccessful attempts to tow the *River Rouge* off. During the final attempt, a miscommunication between the *River Rouge* and the *Spoonbill* resulted in the nylon towing rope being released, fouling the starboard propeller of the *River Rouge*. No further attempts were made to refloat it, and the *Spoonbill* returned to St. Andrews.

At 1606, JRCC tasked the crew from the CCGS *Vakta*, a modified lifeboat used for SAR and aids to navigation work based out of Gimli, to disembark the passengers. Since the vessel was not in immediate danger, the CCG advised the owner's representative that it would assist in removing the passengers. The owner was, however, responsible for refloating the vessel. At 1844, the crew of the CCGS *Vakta* began to transfer the passengers to shore, using their fast rescue craft and assisted by 2 local pleasure craft.

⁸ This PWGSC vessel of 10.4 m in length is normally used for maintenance and removal of debris at the dam.

The last of the passengers and some of the crew were safely brought ashore at 2012. Other crew members disembarked around 2100, leaving the engineer, the deckhand and the cook on board to monitor the vessel.

On 31 July 2010, several more unsuccessful attempts were made to refloat the vessel using heavy equipment ashore. Requests were also made to PWGSC to close the dam in order to raise the water level on the Red River; however, because of the high water level in Winnipeg and high rate of flow on the river, it could not be closed. No commercial marine operators (salvors) were available to provide assistance because the closest was on the northern part of Lake Winnipeg. TC inspectors were unable to contact the owner's representative or determine his intentions to free the vessel. During the 1 week period in which the vessel was grounded, TC inspectors monitored the refloating attempts from shore. Eventually, TC requested a salvage plan, which was submitted on 05 August 2010 and accepted.

On 06 August 2010, when the water level in the Red River was approximately 0.3 m higher and the rope had been removed from the propeller,⁹ the *River Rouge* was refloated successfully using astern engine movements and with the assistance of the workboat *Spoonbill*. Upon its arrival at Winnipeg later that day, the vessel was detained by TC. It was allowed to resume service following an internal inspection to determine the integrity of the hull, and a sea trial to verify the steering gear and assess any damage or vibration from the tail shafts, stern bearings or propellers. The vessel had suffered no damage as a result of the grounding and refloating.

Weather

Visibility on 29 July 2010 was clear with south-south-easterly winds at 7 to 8 knots. The current was at least 4 knots in the rapids.

Lifesaving Equipment

The vessel possessed all necessary lifesaving equipment for 303 passengers and crew, including 303 adult and 55 child lifejackets, 17 buoyant apparatuses (with a capacity of 20 each), a 4-person lifeboat and 6 lifebuoys.

Vessel History and Certification

The vessel was built in 1967 and had been operated by 2 different owners over the years prior to being purchased by its present owner in 2007. The vessel was inspected and certified yearly by TC. The new owner did not have the vessel independently surveyed before its purchase. While it was initially intended to serve as a floating nightclub, difficulties in obtaining a liquor licence and a berth in downtown Winnipeg led the owner to begin offering cruises on the Red River.

The owner's representative had been advised by TC in writing to transfer the vessel's registration following its purchase and then again via a Shipping Inspection Notice.¹⁰ The vessel's registration remained unchanged at the time of the occurrence. On 24 June 2010, at the beginning of the operating season, TC issued an Inspection Certificate following the vessel's

⁹ The deckhand had gone overboard with a line tied around the waist to remove the rope.

¹⁰ *Canada Shipping Act, 2001*, subsection 58(1) provides that the responsibility rests with the authorized representative.

annual inspection. The certificates of competency and medical certificates of those on board at the time were found to be valid.

Personnel Certification and Experience

Master

The master began sailing as a deckhand in 1958. In 1992, he obtained the certificate of Master, Ship of Not More Than 350 tons Gross Tonnage, or Tug, Home Trade. In 2001, he received a continued proficiency endorsement for that certificate, which was not renewed. At the time of the occurrence, the certificate no longer existed under the *Marine Personnel Regulations* and was therefore invalid for use at sea; a replacement certificate had not been sought. The master's medical certificate expired in 2008. He had received Marine Emergency Duty (MED) training. He also had experience on board tugs operating on Lake Winnipeg and in the Arctic, and had worked on board the *River Rouge* full-time from 1967 to 1969 and part-time from 2007 to 2010.

First Officer

The 1/O began sailing as a deckhand in 1962, transitioning to 1/O in 1972, and then to master. He received his MED training in 1983 and in 2002, permitting him to work on a passenger vessel. He obtained a Master Minor Waters Certificate in 1972. He was issued a medical certificate indicating that he was fit for duty in 2003, but was assessed as medically unfit 2 months later, following a review by TC. He has not been reassessed since. In 2005, using the medical certificate issued in 2003, he obtained a vessel-specific Master Limited Certificate.¹¹ This certificate, which expired on 11 June 2010, was not applicable to the *River Rouge*. He had worked on tugs on Lake Winnipeg and as master on board a passenger vessel on the Glenmore Reservoir in Calgary, Alberta, from 2005 to 2009. While he had worked on board *River Rouge* on a few occasions in 2009, he had not navigated in the Quarry Rapids area in approximately 46 years.

Chief Engineer

The chief engineer began sailing in 1977 as an oiler. In 1982, he first sailed as an engineering officer with a 4th Class engineering certificate. This certificate had been maintained valid, with the most recent endorsement dated 24 July 2009. He had been working on board this vessel for the past 2 years.

Deckhand

The deckhand had approximately 23 years of experience, 12 of which were on board the *River Rouge*. He held the required MED training and was not required to hold a certificate for his formally assigned duties. He occasionally steered the *River Rouge* under the supervision of the master or 1/O.

¹¹ The 1/O's status in the TC database had not been updated to reflect the review that had declared him as medically unfit.

Owner's Representative

The owner's representative had 4 years experience as a deckhand acquired since the vessel was purchased in 2007. He held the required MED training certificate.

Safe Manning and Deck Watch Requirements

Responsibility for ensuring that all crew hold valid certificates for their positions is shared by the authorized representative¹² and the master.¹³ The *River Rouge's* Safe Manning Document, issued by TC, required a certified master, 1/O, engineer and 2 ratings on board. Neither the owner's representative, who was the authorized representative, nor the master on board at the start of the season had verified the crew's certificates as they were required to do under the *Canada Shipping Act, 2001*. There were no records to indicate if such verification was done in previous years. However, the previous year, the owner's representative had requested a dispensation from TC, which was accepted. It allowed for a 1/O, who was not a holder of the proper certification as required by the Safe Manning Document, to work on board. This dispensation lasted only for the previous year's season and for that particular 1/O.

Under the International Maritime Organization convention for Standards of Training, Certification and Watchkeeping (STCW), a marine certificate is maintained valid by receiving an endorsement every 5 years. This requirement came into effect in Canada on 30 July 1997. An endorsement is issued by TC upon presentation of a valid marine medical examination certificate as well as an attestation for the required amount of sea service or service in marine related positions. If a certificate has not been maintained valid, the renewal process may include a practical, oral, written examination, or refresher training, such as MED.

In 2007, with the introduction of the *Marine Personnel Regulations*, certain marine certificates ceased to exist and holders of these certificates were required to exchange them for the equivalent new certificates when renewing an endorsement.

The *Marine Personnel Regulations* specify the number of bridge team members required for a deck watch. At the time of the occurrence, the *River Rouge* required an appropriately certified person in charge of the watch and an additional person.¹⁴ This additional person is a requirement since the bridge did not afford an unobstructed all-round view from the steering position.¹⁵

Medical Fitness

Seafarers who hold certificates of competency are required to also hold a valid medical certificate attesting that, on the date of their last examination, they met the marine medical standards as set out in the *Marine Personnel Regulations*.¹⁶ Full or limited medical certificates may be issued. The process for issuing seafarer's medicals and the review of these assessments

¹² *Marine Personnel Regulations*, Section 211.

¹³ *Canada Shipping Act, 2001*, Section 82.

¹⁴ *Marine Personnel Regulations*, Section 216.

¹⁵ *Marine Personnel Regulations*, Sub-section 216 (3(b)).

¹⁶ *Marine Personnel Regulations*, Section 269 - 270.

has undergone numerous changes since its implementation with the coming into force of the *Canada Shipping Act, 2001* and the *Marine Personnel Regulations* on 01 July 2007.

Prior to the coming into force of the *Canada Shipping Act, 2001* and the *Marine Personnel Regulations*, when a seafarer was declared fit through a medical examination performed by the designated TC medical examiner, the certificate was issued immediately. When these examinations were later reviewed by TC's medical division as part of its oversight role, amendments were not reflected in the TC database. It was therefore possible for a seafarer to submit a medical certificate to TC that had been invalidated through the review process. In this instance, the 1/O obtained a Master Limited certificate despite having submitted an invalid medical certificate. The 1/O was sent a letter advising him of this change to his status. He did not challenge the assessment or apply for a medical certificate at a later date.

Since the implementation of the *Marine Personnel Regulations* in 2007, a provisional medical certificate of 6 months duration is issued by a designated marine medical examiner following an examination if the seafarer is found fit. An official medical certificate is not issued until a review has been performed by TC Marine Medical unit to confirm that the seafarer meets the standards. This certificate must be renewed every 2 years. Additionally, there is a requirement that all physicians report to TC if they believe that a holder of a certificate of competency has a condition that is likely to constitute a hazard to marine safety.¹⁷ TC indicates that very few such reports have been made by physicians unless they were marine medical examiners.

Responsibility for ensuring medical certificate validity is shared by the seafarer and the employer. Under the *Marine Personnel Regulations*, no person shall employ a seafarer unless he or she produces the required marine medical certificate, nor shall the person accept such employment without one.¹⁸ The owner did not ensure that employees had valid medical certificates, nor did the owner monitor the fitness of employees in safety critical positions. In this occurrence, neither the relief master nor the 1/O held a valid medical certificate and both had ongoing medical issues. The adequacy of procedures for monitoring fitness of seafarers has been addressed in previous TSB reports.¹⁹

There is no specific requirement under marine regulations or in the *Canada Labour Code* for an employee to ensure that he or she is fit for duty before undertaking safety critical work or reporting any medical condition that could affect their ability to work. However, in the *Canada Shipping Act, 2001*, crew members are required to "carry out their duties and functions in a manner that does not jeopardize the safety of the vessel or of any person on board." They are also required to report "any change in their circumstances that could affect their ability to carry out their duties and functions safely."²⁰ It does not, however, specifically prohibit them from continuing to carry out their duties. In aviation, however, there is a specific requirement that pilots not undertake their duties if their medical condition has changed.²¹

¹⁷ *Canada Shipping Act, 2001*, Section 90.

¹⁸ *Marine Personnel Regulations*, Sections 200(7) and 269.

¹⁹ TSB Investigation Report M09M0073 (*Pubnico Explorer*), M04L0105 (*Famille Dufour II*).

²⁰ *Canada Shipping Act, 2001*, Section 113.

²¹ *Canadian Aviation Regulations*, Section 404.06 (1) Prohibition Regarding Exercise of Privileges.

During the time leading up to the occurrence, the 1/O suffered from several serious medical conditions. His family physician was only informed, however, that the 1/O was carrying out light duties and was not in charge of a vessel. The physician was also not aware of the need to report significant health issues to TC.

The master was declared fit by a medical examiner following a medical in 2006. Although TC made subsequent requests to him for further information about his medical condition, no additional information was provided to satisfy these requests, and his health deteriorated in the following years. His medical certificate expired in 2008 and was not renewed.

At the time of the occurrence, the master was recovering from surgery. He rarely steered the vessel because of the difficulty turning the wheel following the surgery. An independent medical assessment was carried out of his medical records up until the date of the occurrence. It was concluded that the master was medically unfit for duty. The family physician was the same as for the 1/O and his expectation was that the master was not working.

Vessel Management

The *Canada Shipping Act, 2001* states that an authorized representative shall “develop procedures for the safe operation of the vessel and for dealing with emergencies.”²² In addition, the *Marine Personnel Regulations* require that authorized representatives provide masters with written instructions that define policies and procedures to ensure that crew members are familiar with and have been trained on the use of vessel equipment, operational instructions for the vessel, and their assigned duties. The master must then ensure that the crew member has received the prescribed training at the beginning of their employment, and that this knowledge is maintained up to date. A record of the training shall be maintained with the date, names of crew members and equipment trained on. This information must be readily available upon inspection by a TC marine surveyor.²³ No written instructions, procedures or record of training had been maintained on board the *River Rouge*, nor were job descriptions available to the crew.

Upon the purchase of the *River Rouge*, the owner’s representative had little knowledge of vessels and the regulations governing its operation, relying instead on TC, through annual inspections and meetings, to provide assistance and guidance on regulatory compliance. The owner/authorized representative is responsible for compliance with all regulatory requirements at all times and TC recommends that new vessel owners and operators make use of a marine consultant to better comprehend their regulatory and operational obligations to safely operate a vessel.

The owner’s representative, engineer and the deckhand oversaw most of the daily operations and maintenance of the vessel. The masters who were working on board that season were retired, and their employment was considered to be part-time. Their involvement in managing the vessel was limited to conning the vessel during a cruise. Previous masters and mates who had been hired to work full-time had not remained with the company. There was thus a high turnover in senior crew on the *River Rouge*.

²² *Canada Shipping Act, 2001*, Section 106, sub-section 1(b).

²³ *Marine Personnel Regulations*, Section 206.

On the day of the occurrence, the vessel sailed without a full crew complement. An examination of logbook entries showed that the vessel had previously sailed without a full crew complement and, on 1 occasion, had exceeded the maximum passenger and crew capacity. After the occurrence, the vessel again sailed without a properly certified complement and was detained and subsequently fined by TC.

The owner was experiencing financial problems. The season had begun late due to the high water levels on the Red River, leading to fewer voyages being undertaken than had been planned. Crew had not been paid for extended periods, and suppliers had outstanding invoices.

Transport Canada Oversight and Vessel Inspection

TC has the role of promoting efficient marine transportation and safe, secure and sustainable marine practices. Vessel owner/operator compliance with the relevant provisions of the *Canada Shipping Act, 2001* and its regulations is monitored by periodic inspections.

Prior to an inspection, an inspector consults the Ship Inspection Reporting System (SIRS) to review the vessel's details and may also consult other pertinent information. The investigation determined that, in practice, ship inspectors use SIRS alone, which was the case during the inspections of the *River Rouge*. In this occurrence, the inspections did not identify the absence of the written procedures and instructions concerning emergency situations and required training that should have been in place. These procedures and instructions have been a requirement under the *Canada Shipping Act, 2001* and the *Marine Personnel Regulations* since 01 July 2007.

SIRS does not document or identify the requirement for procedures for the safe operation of the vessel or instructions for the crew as are required by regulation. The approach used by the inspector who inspected the *River Rouge* from 2008 to 2010 was to focus almost entirely on regulations concerning the mechanical and structural aspects of the vessel, with the exception of reviewing the fire and boat drills as well as the vessel and crew certificates, which follows the SIRS guidelines. Aspects such as vessel operations were not included in the inspector's assessment process, in part because he considered them to be International Safety Management Code (ISM) or Safety Management System (SMS) requirements to which the vessel was not subject.

Subsequent to the sinking of the *True North II* in June 2000, the Board addressed the finding of deficiencies in the TC inspection regime by recommending 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, as part of its response, proposed initiatives addressing 3 areas: regulatory review audits, information management, and training and performance assessments of inspectors. Part of these initiatives included the development of a new SIRS scheduled to be in place for 2002. In view of the actions taken and scheduled, the Board assessed the response to this recommendation as Fully Satisfactory.

Safety Management System

An SMS provides the key roles, responsibilities and procedures for managing safety, emphasizing the role of management and defining the responsibility and authority of the master. Sound management provides for safe operational practices and working environment as well as a continued improvement in safety skills of personnel. Internal and external audits are a fundamental part of an SMS since they help to ensure compliance. The owner of the *River Rouge* did not have an SMS, nor was it required by regulation. In Canada, the *Safety Management Regulations* apply to cargo vessels of 500 gross tons or more and passenger vessels carrying more than 12 persons, engaged in an international voyage subject to the SOLAS Convention.

On 16 March 2010, the Board released its Watchlist identifying 9 critical safety issues investigated by the TSB that pose the greatest risks to Canadians. One issue identified, applicable to air, rail and marine, was the need for the implementation of an SMS to allow transportation companies to identify hazards, manage risks, and develop and follow effective safety processes. With regards to the marine mode, the Watchlist states that “TC should require domestic commercial shipping operations to adopt SMS.”

The TSB has repeatedly emphasized the advantages of safety management systems in the marine industry, citing numerous deficiencies in safety management in various occurrences over the last 12 years. TC recognizes the advantages of safety management systems and supports their implementation domestically.²⁴

TC has proposed²⁵ modifications to the present *Safety Management Regulations* that would require all vessels to have an SMS in place. The proposed regulations will refer to the ISM Code for the detailed requirements of the SMS itself. However, they will adopt a 3-tier framework for the certification scheme:

- Tier I represents those vessels already subject to ISM. There would be no change since they would continue to be audited and certified by Classification Societies.
- Tier II is for vessels greater than 24 m in length or carrying more than 12 passengers that are not subject to SOLAS. Their SMS would be audited by a Classification Society or Organization authorized by TC and the operating companies would be issued with a Domestic Document of Compliance and vessels with Domestic Safety Management Certificates.
- Tier III represents vessels not subject to Tier I or Tier II. The authorized representative of these vessels would be obliged to comply with the *Safety Management Regulations*; however, they would not be subject to a safety management system certification scheme. Compliance with the *Safety Management Regulations* would be verified by a TC inspector during a vessel inspection.

²⁴ The New Wave – Marine Safety Strategic Plan 2009-2015, TP13111.

²⁵ The specifics of the proposed regulations are posted on the Canadian Marine Advisory Council’s (CMAC) website and were presented at regional CMAC meetings held in 2011.

Under the proposed framework, the *River Rouge* would require certification as per Tier II, which may be withdrawn in the event of a major non-conformity. A major non-conformity is an identifiable deviation that poses a serious threat to personnel, safety of the ship, or a serious threat to the environment and requires immediate correction. In addition, the lack of effective and systematic implementation of a requirement of the ISM Code is considered a major non-conformity.

Analysis

Grounding

When the vessel entered Quarry Rapids, the master was not on board. The vessel was under the conduct of the 1/O, who was alone on the bridge and had not sailed in the area for over 4 decades. Information concerning the water levels and absence of aids to navigation had not been provided to the 1/O. Without the benefit of guidance from the master, aids to navigation, understanding of the conditions caused by the open dam, or established on-board procedures, both the 1/O and deckhand were unaware of the developing situation as the vessel came closer to the western shore. Consequently, no action was taken to return the vessel to mid-channel and the vessel grounded.

Vessel Management

Regardless of size, an organization requires a structured and efficient management of personnel and equipment in order to operate effectively. Otherwise, deficiencies in management will have an effect on all aspects of the operation, including safety. There were clear deficiencies in the overall management and operation of the *River Rouge*:

- The reporting relationships, roles and responsibilities of crew members, including the masters, were unclear.
- No information was exchanged between crew members when being relieved, or when joining and departing the vessel.
- Crew members were assigned duties for which they had not received training.
- The vessel's complement did not always meet the requirements of the Safe Manning Document for certification or minimum manning.
- Crew members were hired without holding valid medical certification.
- During the 2010 season, the vessel had sailed with a complement and crew that exceeded the number of persons authorized to be carried.
- Employees on board were not being regularly compensated and suppliers had long outstanding invoices.
- Despite commencing its fourth season since a change in ownership, the registration of the vessel had not been finalized.

These management and operational deficiencies manifested themselves on the day of the occurrence. In other words, under the direction of the owner's representative, the voyage went ahead despite being undermanned and lacking a qualified master. Furthermore, the remaining crew was not properly briefed or provided with relevant information necessary to conduct a safe voyage.

Weakness in knowledge of vessel operations when owners are directly involved is likely to adversely affect the safety of the vessel. In this occurrence, the masters, who would normally run shipboard operations on behalf of the owner, were employed on a part-time and sporadic basis. For this reason, they were not fully engaged in the operation and safety of the vessel and the overall management of the vessel was overseen by the owner's representative.

The owner's representative had little marine experience when the vessel was first acquired by the company. However, after 3 operating seasons, he had gained some competency in marine matters, which included the feedback provided during the vessel's annual inspections and meetings with TC. As a result, he would most likely have been aware of the consequences of sailing with an undermanned and under qualified crew. For example, posted aboard the vessel was the Safe Manning Document stating how many crew members should be present on board and what qualifications they were meant to have. He had also demonstrated an awareness of the qualification requirements for crew members when he requested a dispensation from TC for an exemption the previous season that allowed a 1/O to work on board during that time without proper certification.

At the time of the occurrence, the owner was facing financial difficulties and the full day trip, which had been pre-booked, was expected to yield revenue. The decision to proceed with the voyage was made despite safety issues, such as the absence of the master and hazards related to the open dam.

Safety Management

Effective safety management requires large and small organizations to be cognizant of the risks involved in their operations, to competently manage those risks and to be committed to operating safely. In order to accomplish this, a vessel operator must evaluate existing and potential risks, establish safety policies and related procedures to mitigate those identified risks and provide a means to continuously gauge performance through audits, so as to improve organizational safety where necessary. The resulting documented, systematic approach helps ensure that individuals at all levels of an organization have the knowledge and the tools to effectively manage risk, as well as the necessary information to make sound decisions in any operating condition. This includes both routine and emergency operations.

At present, there is no requirement for a domestic passenger vessel like the *River Rouge* to have an SMS. The *River Rouge's* approach to safety demonstrated minimal compliance with regulations. Therefore, requiring an SMS may not have prevented the management deficiencies seen in this investigation. However, it would have provided a means for TC to identify these deficiencies and oblige the operator to address them.

TC is consulting with industry on the implementation of SMS for the domestic fleet and has been actively encouraging domestic vessel operators to adopt SMS on a voluntary basis. Voluntary adoption of SMS will increase operators' understanding of safety management and ease the domestic marine industry's transition into mandatory SMS. In the absence of an SMS

on domestic passenger vessels, there is an increased probability that risks will go unidentified and that vessels will be operated in an unsafe manner.

Transport Canada Oversight and Vessel Inspection

In the absence of an SMS, there are nonetheless requirements under the *Canada Shipping Act, 2001* and *Marine Personnel Regulations* concerning the safe management of ship operations by shore-based personnel. These include the requirement to develop and provide written policies and procedures for dealing with emergencies, as well as the familiarization and training of crew and the associated record-keeping.

For most aspects of a ship's inspection, inspectors are guided by the Ship Inspection Reporting System (SIRS) as an aide memoire for the items to be inspected. However, the SIRS database does not identify the need to assess the vessel's procedures and policies. In this instance, the *River Rouge* did not have the required on-board procedures and the existence of these procedures was not verified by TC during its inspections. Consequently, the inspections of the *River Rouge* did not include this critical aspect of vessel safety.

TC has not developed standards or guidance for the verification of ship-board procedures and policies during inspections. As such, inspectors who are verifying these elements have to make subjective assessments that may be difficult to defend. Consequently, some may develop a simple rule based absence/presence verification of the procedures. Without a reference in SIRS to the verification of a vessel's procedures and policies or guidelines for the assessment of their adequacy, inspectors may not include this critical aspect of vessel safety. Without an adequate means/process of identifying and highlighting significant risks to be monitored by the TC inspector, crucial safety elements, such as the absence of on-board policies, procedures or guidelines, may go unnoticed during the inspection. This appears contrary to TC's response to TSB Recommendation M01-01, where, among other things, TC agreed to have the changes in regulations reflected in the inspection process. Additionally, this vessel continued to be inspected and certified by TC annually despite the vessel's registration having not been modified to reflect the change of ownership in 2007.

As part of its oversight, TC examines and certifies officers and crew members of vessels, where required, to ensure their competency to perform their assigned tasks or duties. This verification of competencies does not extend to owners/operators, despite their potential involvement in many operational aspects of vessels. With respect to this occurrence, there was no systematic assessment of the owner/operator's management or operational capabilities.

It is worth noting that a similar gap was recognized in the aviation industry, although the mode of transportation is different and the associated risks may vary as well. There is a regulatory requirement in the aviation industry, where significant numbers of passengers are carried, for management to have knowledge of operations, regulations and standards necessary to ensure safety.²⁶ The operation must also have a system in place that can effectively manage the safety of the operation.²⁷ TC provides oversight to ensure that operations are effectively managed and requires operating management personnel to pass examinations before they accept their appointment. In the absence of such a requirement in the marine mode, there is a risk that

²⁶ *Canadian Aviation Regulations* 2010-2, section 724.07 (2).

²⁷ *Canadian Aviation Regulations* 2010-2, section 704.07 (1).

passenger vessels in Canada may be purchased and directly operated by owners with little knowledge of marine regulations and safety, leading to the development of unsafe operational practices.

Medical Fitness

It is imperative that operators of transportation vehicles who occupy safety critical positions are fit for duty, encompassing the full range of tasks that they may be expected to undertake, including emergency duties. TC requires the medical examination of certificated mariners. However, once the examination has been completed, the system relies on crew members, masters, vessel owners, doctors, and TC to verify that crew members remain fit for duty.

In this occurrence, the master and 1/O on board the *River Rouge* were medically unfit for duty, yet continued to work on the vessel. As such, the methods for verifying medical fitness had failed in the following ways:

- Although regulations stipulate that crew members must not work in a way that jeopardizes the safety of the vessel or its passengers, both crew members continued to work with expired certificates and while medically unfit.
- While the master of a vessel is responsible, under section 82 of the *Canada Shipping Act, 2001*, to ensure that all crew on board hold valid certificates, the master did not verify the fitness of his crew members in this case.
- The owner's representative had no procedures in place to identify out-of-date medical certificates and chose to allow an employee to continue working despite knowing the employee was recovering from major surgery.
- The family doctor for both crew members was unaware of the requirement to report any medical condition of a patient that is likely to pose a hazard. In this case, the doctor was also unaware that they were continuing to work in safety critical positions.
- While TC verifies the certificates of crew members during an inspection, neither the master nor the 1/O were part of the ship's complement at the time of the most recent inspection.

The problems with these verification methods are not isolated to this occurrence. For example, the TSB investigation into the 2009 sinking of the small fishing vessel *Pubnico Explorer* found that there was no verification of the master's certification or medical fitness by the vessel owner.²⁸ TC also noted that the doctors most likely to come forward with reports of seafarers being medically unfit were marine medical examiners, which indicates that family doctors may not be aware of this requirement.

The failure to verify the ongoing medical fitness of crew members may result in medically unfit seafarers in safety critical positions continuing to work, thereby placing the vessel, crew and passengers at risk.

Emergency Reporting

Canadian regulations require that occurrences be reported as soon as possible to the closest appropriate authority while transiting in Canadian waters.²⁹ This allows response resources to be put on standby or activated.

In this occurrence, the vessel was in the Red River outside of Winnipeg. The master was, therefore, required to report the grounding to either the RCMP or the CCG. The owner's representative instead requested assistance from the superintendent at St. Andrews lock an hour after the occurrence. The superintendent then contacted the CCG who advised the RCMP. The RCMP and the CCG both eventually succeeded in contacting the vessel in order to determine the nature of the occurrence and the assistance required.

The passengers were evacuated later in the day by the CCG when it became apparent there was little else that could be done to refloat the vessel. In this instance, while there were no injuries or loss of life, there was a failure to report the occurrence to the appropriate authorities during the emergency. Failure to report an occurrence can prevent a timely and coordinated response.

Conclusions

Findings as to Causes and Contributing Factors

- 1) High water levels on the Red River necessitated that the dam at St. Andrews be kept open and this prevented the navigation buoys from being placed.
- 2) The master was not on board and neither the first officer (1/O) nor the deckhand were certified or qualified to con the vessel.
- 3) The decision to proceed with the voyage was made despite safety issues such as the absence of the master and hazards due to the open dam.
- 4) Neither the 1/O nor the deckhand recognized the importance of maintaining the vessel in the centre of the channel given the low water levels at the rapids and the absence of the navigation buoys.
- 5) The vessel was steered off the recommended mid-channel course and ran aground.

Findings as to Risk

- 1) Without a Safety Management System (SMS) requirement for domestic passenger vessels, there is an increased probability that risks will go unidentified and vessels will be operated in an unsafe manner.
- 2) Without a reference in the Ship Inspection Reporting System (SIRS) to the verification of vessel procedures and policies or guidelines for the assessment of their adequacy, Transport Canada (TC) inspectors may not include this critical aspect of vessel safety.

²⁹

Shipping Casualties Reporting Regulations SOR/85-514, section 4(1-2).

- 3) Without an assessment of an owner/operator's ability to effectively manage operations, there is a risk that passenger vessels in Canada may be operated with little knowledge of marine regulations and safety, leading to the development of unsafe operational practices.
- 4) The failure to verify the ongoing medical fitness of crew members may result in medically unfit seafarers in safety critical positions continuing to work, thereby placing the vessel, crew and passengers at risk.
- 5) Failure to report occurrences to appropriate authorities during an emergency can prevent a timely and coordinated response.

Safety Action Taken

Transport Canada

The vessel was re-certified in the spring of 2011. TC Marine Safety is working with the master, engineer and authorized representative to correct the outstanding regulatory deficiencies, including those relating to the development of procedures for the safe operation of the vessel, dealing with emergencies, and crew/passenger safety training.

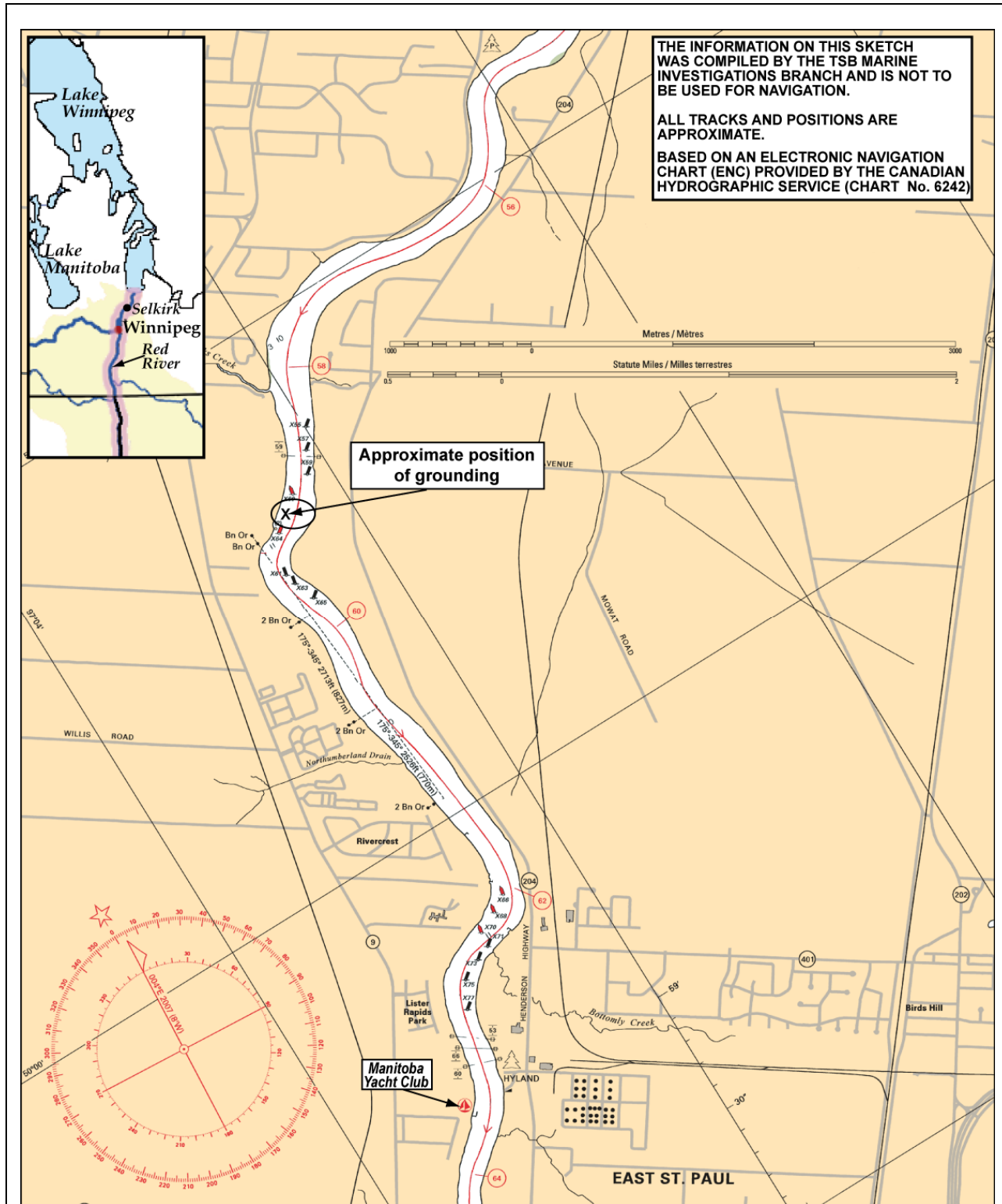
In June 2011, TC advised ship inspectors that they must verify the accuracy and validity of the Certificate of Registry before conducting inspections and issuing certificates of inspection. Modifications to the SIRS database were made to include additional checkboxes for inspectors to use during inspections, including a checkbox for Certificate of Registry verification. Additionally, inspectors must ensure the presence of on-board written procedures, records of training, and emergency drills. Each checkbox in SIRS references the applicable regulation. TC communicated the changes made to SIRS to all ship inspectors in August 2011.

In July 2010, TC created a working group called "Internal Domestic Vessel Regulatory Oversight" to modernize and standardize the ship inspection process through the implementation of a risk-based inspection regime. The long term goal of this group is to enhance the regulatory compliance of domestic vessels throughout the life of the vessel and not just at the time of inspection.

This report concludes the Transportation Safety Board's investigation into this occurrence. Consequently, the Board authorized the release of this report on 07 September 2011.

Visit the Transportation Safety Board's website (www.bst-tsb.gc.ca) for information about the Transportation Safety Board and its products and services. There you will also find links to other safety organizations and related sites.

Appendix A – Area of the Occurrence



Appendix B – Profile Plan

