Transportation Safety Board of Canada

Bureau de la sécurité des transports du Canada

MARINE INVESTIGATION REPORT
M12L0098

RISK OF COLLISION

BULK CARRIER *BULK JAPAN* AND TUG *WILF SEYMOUR* WITH BARGE *ALOUETTE SPIRIT* GULF OF ST. LAWRENCE, QUEBEC 06 AUGUST 2012

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

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Summary

On 06 August 2012, at approximately 1400 Eastern Daylight Time, the bulk carrier *Bulk Japan* was involved in a close quarters situation with the tug *Wilf Seymour* while the tug was pushing the barge *Alouette Spirit* in the Gulf of St. Lawrence near Sept-Îles, Quebec.

Ce rapport est également disponible en français.

Factual Information

Particulars of the Vessels

Name of vessel	*Wilf Seymour*	*Alouette Spirit*	*Bulk Japan*
Registry/licence number	822429	825966	31945-06
IMO number	5215789	None	9310290
Port of registry	Hamilton	Hamilton	Panama
Flag	Canada	Canada	Panama
Type	Tug	Barge	Bulk Carrier
Gross tonnage	442	10 087	42 887
Length [1]	34.46 m	129.59 m	228.99 m
Draught	Forward: 5.95 m Aft: 6.25 m	Forward: 5.08 m Aft: 6.11 m	Forward: 3.79 m Aft: 7.62 m
Built	1961 Gulfport Shipbuilding Corp., United States	1969 Gulfport Shipbuilding Corp., United States	2006 Cosco (Dalian) Shipyard, China
Propulsion	2 diesel engines (4290 kW total) driving 2 fixed-pitch propellers	No propulsion	1 diesel engine (9800 kW) driving 1 fixed-pitch propeller
Cargo	None	Aluminum ingots	Ballast
Crew	10	None	20
Registered owners/ managers	Mckeil Work Boats Limited	Mckeil Work Boats Limited	Common Progress Compania Naviera

Description of the Vessels

Bulk Japan

The *Bulk Japan* is a bulk carrier cargo vessel of steel construction with machinery spaces and accommodations located aft (Photo 1). The vessel is gearless [2] and is fitted with 7 cargo holds

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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.

2 Gearless carriers are vessels without cranes or conveyors.

and hatches. The bridge is fitted with the required navigational equipment. The navigation console is offset from the bridge front wall and includes the steering wheel, which is on the centreline, and a telegraph from which the propulsion can be controlled. The navigation console also comprises of the vessel's 2 radars (3 cm and 10 cm) situated to the left of the steering wheel; both are fitted with automatic radar plotting aids (ARPA). The bridge is equipped with 2 very high frequency (VHF) radiotelephones: one is located to the right of the steering wheel on the navigation console, while the other is mounted on the bridge front wall, approximately 2 m to the left of the vessel's centreline.

Photo 1. *Bulk Japan*

Wilf Seymour and Alouette Spirit

The *Wilf Seymour* is a conventional coastal tug of steel construction with 2 conning stations, one located on the fore part of the main deck and one located in a raised wheelhouse. The upper conning position is used as the main navigation bridge; it allows for an unobstructed view in all directions. The lower conning position has been decommissioned.

The main navigation bridge is equipped with the required navigational equipment, including two 3 cm radars (one of which is equipped with an automatic radar plotter), VHF radiotelephones, a magnetic compass, a gyro compass, and an automatic identification system (AIS). It is also fitted with an additional radar that is equipped with an ARPA and is used solely for night navigation during the winter.

At the time of the occurrence, the vessel was operating with the barge *Alouette Spirit* as an integrated tug/barge unit (Photo 2). The *Alouette Spirit* is a ro-ro/lo-lo [3] multi-purpose barge capable of carrying a wide range of bulk and general cargo on the deck. The barge is equipped with a built-in bow ramp and a bow thruster that is controlled remotely from the tug for enhanced manoeuvrability. The barge has a retractable canopy roof that shields cargo from the elements and 2 side doors, 1 on either side of the vessel, for loading and discharging. The *Alouette Spirit*'s cargo capacity is 10 500 tonnes.

Photo 2. *Wilf Seymour* and *Alouette Spirit*

3 Roll-on/roll-off, lift-on/lift-off.

History of the Voyage

Wilf Seymour

The *Wilf Seymour* left Sept-Îles, Quebec on 06 August 2012 at 1155 [4] coupled to the barge *Alouette Spirit*, which was loaded with 10 450 tonnes of aluminum ingots. The tug and barge were upbound for Oswego, New York, United States through the St. Lawrence Seaway.

The bridge team was comprised of the master and the second mate acting as officer of the watch (OOW). At approximately 1255, the master called Marine Communication and Traffic Services (MCTS) Les Escoumins [5] to report the vessel's position. The tug and barge were abeam and clearing Pointe à la Chasse (Appendix A). MCTS acknowledged the call and provided information on traffic. The only immediate traffic in the vicinity was the vessel *Bulk Japan,* which had passed longitude 066°00'00" W [6] and was heading for Port-Cartier, Quebec. Immediately after, the master on the *Wilf Seymour* handed the con over to the OOW and left the bridge; the vessel's course was 216° true (T) and speed was 6.5 knots. [7]

At approximately 1305, the OOW detected a target on the radar; the target was on the *Wilf Seymour*'s port side at about 12 nm. The OOW acquired the target with the automatic radar plotter and, while the system calculated the target data, verified the information on the automatic identification systems (AIS). [8] The AIS identified the target as being the vessel *Bulk Japan* and indicated the closest point of approach (CPA) to be approximately 0.3 nm. The automatic radar plotter confirmed the CPA and indicated the *Bulk Japan* would cross ahead of the *Wilf Seymour*.

Since the *Wilf Seymour* was the stand-on vessel, the OOW maintained course and speed and continued to monitor the *Bulk Japan,* which was the give-way vessel. [9] At 1346 the *Bulk Japan* was within 4.6 nm, and the OOW, concerned about the developing close quarters situation, attempted to call the *Bulk Japan* on VHF radiotelephone channel 14. [10]

Bulk Japan

The *Bulk Japan* departed in ballast from Skagen, Denmark on 28 July 2012 bound for Port-Cartier to load 81 285 tonnes of iron ore concentrate. On the 06 August 2012, the vessel reported to MCTS at 1225 when passing 066°00'00" W at call-in-point 1C. After exiting the traffic lane, the

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

5 All references to MCTS refer to the Les Escoumins centre.

6 066°00'00" W is the eastern limit of the zone covered by MCTS Les Escoumins.

7 All speeds cited are speed over ground.

8 The AIS screen displays the name, bearing, range, and closest point of approach of other vessels similarly fitted with AIS.

9 The stand-on vessel is the vessel which maintains its course and speed, while the give-way vessel must take early action to keep clear. In a crossing situation, the give-way vessel is the one which has the other on its starboard side.

10 VHF radiotelephone channel 14 is the MCTS working channel used in this sector.

vessel altered course to 270°T and continued at a speed of 12.7 knots on its final leg into Port-Cartier anchorage, passing a distance of 5 nm from Corossol Island. At that time, the bridge team of the *Bulk Japan* was comprised of the OOW and the helmsman, who was acting as the lookout. With approximately 1 hour remaining to reach the destination, the vessel was operating in manoeuvring mode.

At 1320, the OOW on the *Bulk Japan* detected a target on the radar and visually observed a tug and barge approaching on the starboard side. The OOW acquired the target with the ARPA; the data indicated that the tug and barge were moving at a speed of 6.5 knots and that the *Bulk Japan* would cross ahead in 52 minutes at a CPA of 1.2 nm. At this time, the OOW ordered the helmsman to change the steering mode from auto to manual and called for an extra crew member on the bridge. Shortly afterwards, the crew member arrived and was instructed by the OOW to act as lookout and visually monitor the tug and barge on the starboard side. The OOW continued monitoring the tug and barge by radar and visual bearings. Between 1320 and 1340, the visual bearing was opening and the CPA was varying between 1.1 and 1.2 nm. During this time, the *Bulk Japan*'s speed increased gradually to 13.7 knots. At 1347, the OOW responded to a call from the *Wilf Seymour* on the VHF radiotelephone.

Close Quarters Sequence

The OOW on the *Wilf Seymour* initially attempted to call the *Bulk Japan* at 1346:19 [11] on VHF radiotelephone channel 14, but was unsuccessful and tried a second time on channel 16. The OOW on the *Bulk Japan* replied on channel 16 and they agreed to switch to channel 8. The OOW on the *Wilf Seymour* then made 2 attempts to contact the *Bulk Japan* on channel 8, but both calls were unsuccessful. At 1353:26, the OOW on the *Wilf Seymour* contacted MCTS requesting a radio check. MCTS confirmed good reception and offered to contact the *Bulk Japan.* MCTS then tried twice to contact the *Bulk Japan* on channel 14 without success.

At 1354:15, the vessels were about 3.3 nm from each other with a CPA of approximately 0.25 nm. The OOW on the *Wilf Seymour* once again contacted the OOW of the *Bulk Japan* on channel 16 and they agreed to switch to channel 14. After switching to channel 14, the OOW on the *Wilf Seymour* asked the OOW on the *Bulk Japan* of his intentions and if he would alter to starboard to pass astern the *Wilf Seymour*. The request was rejected by the *Bulk Japan* who made an alternative proposal to the *Wilf Seymour* that both vessels alter course a little to port in order to increase the CPA. This proposal was rejected by the Wilf Seymour, based on the *International Regulations for Preventing Collisions at Sea* (COLREGS) which indicate the stand-on vessel should not alter course to port for a vessel on her own port side [12].

At approximately 1356, the OOW on the *Wilf Seymour* called the master asking for assistance; the master returned to the bridge immediately. Meanwhile, MCTS had contacted the OOW on the *Bulk Japan* inquiring as to his intentions regarding the crossing situation but were unable to obtain a definitive answer. By that time, the OOW on the *Bulk Japan* had called the master to request his assistance on the bridge. At 1359:49, the OOW on the *Wilf Seymour* called the *Bulk Japan* again, inquiring if the vessel was altering course to starboard. Shortly after, the MCTS traffic regulator requested to speak to the master of the *Bulk Japan*.

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11 Times denoting seconds were obtained from MCTS audio recordings.

12 *Collision Regulations*, C.R.C. c. 1416, Schedule 1, International Regulations for Preventing Collision at Sea, 1972, Rule 17 (c).

When the master of the *Bulk Japan* arrived on the bridge and saw the tug and barge close on the starboard side, he ordered the OOW to reduce speed to half ahead on the telegraph; he then took over the radio from the OOW and responded to MCTS. MCTS advised the master that the *Wilf Seymour* was requesting the *Bulk Japan* alter course to starboard in order to pass astern; MCTS asked if this was their intention. The *Bulk Japan*'s response was that they would try. The time was then 1401, and the vessels were about 2 nm from each other with a CPA of approximately 0.25 nm. Unclear as to the *Bulk Japan*'s intentions, the master of the *Wilf Seymour* sounded 1 short and 1 long blast on the whistle to alert his crew, then reversed engines to stop and let the vessel cross ahead. No manoeuvring or warning [13] whistle signals were sounded; however, the master broadcast the manoeuvre astern on channel 14.

Shortly after, MCTS advised the master of the *Bulk Japan* that the *Wilf Seymour* was reversing engines. The *Bulk Japan* acknowledged the call and replied that they would maintain course and speed and pass ahead of the tug and barge. At approximately 1405, the *Bulk Japan* passed ahead of the *Wilf Seymour* at a speed of 11.4 knots and with a CPA of 1.2 nm.

Area of the Occurrence

The area near Sept-Îles is part of the Gulf of St. Lawrence and is an open water navigational area (Appendix A). The minimum water depth for the area extending up to the southernmost island of Sept-Iles is 50 m. [14] At the time of the occurrence, both vessels were out of the traffic lanes; [15] the *Wilf Seymour* was in the inshore traffic zone, while the *Bulk Japan* had just exited its traffic lane and was in a precautionary area. [16]

Environmental Conditions

On the day of the occurrence, the weather was clear and winds were from the west-southwest at 10 to 15 knots with 1.5 m seas.

Personnel Certification and Experience

Wilf Seymour

The master had sailed with the *Wilf Seymour*'s company since 1988 and had held the position of master on various tugs and barges since 1997. The OOW had been sailing as a deck officer since August 2010, the date at which he joined the *Wilf Seymour.* The crew members were all properly certified for their positions on board.

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13 *Collision Regulations*, C.R.C. c. 1416, Schedule 1, International Regulations for Preventing Collision at Sea, 1972, with Canadian Modifications, Rule 34 (a) and Rule 34 (d). The former requires that 3 short blasts be sounded when operating astern propulsion, and the latter requires that 5 short blasts or more be sounded when a vessel operator is in doubt of another vessel's intentions or actions.

14 Department of Fisheries and Oceans, Canadian Hydrographic Services, *Chart 1221: Pointe de Moisie à/to Île du Grand Caouis*, *Quebec*, 07 January 2005.

15 Traffic lanes are determined by Transport Canada and establish the direction of traffic flow.

16 Precautionary areas are areas where numerous traffic separation schemes merge.

Bulk Japan

The master had served on various vessels as master since 1990 and had served as master on the *Bulk Japan* since January 2012. The OOW had been sailing as a deck officer since October 2005, and joined the *Bulk Japan* as an OOW in January 2012. The crew members were all properly certified for their positions on board.

Vessel Certification

Wilf Seymour

The *Wilf Seymour* was certificated and equipped in accordance with existing regulations.

Bulk Japan

The *Bulk Japan* was certificated and equipped in accordance with existing regulations.

International Regulations for Preventing Collisions at Sea

The *International Regulations for Preventing Collisions at Sea* (COLREGS) are an international convention that establishes, among other things, the rules of conduct to follow at sea when a risk of collision exists between vessels. The rules have been adopted by Canada and "apply to all vessels upon the high seas and in all waters connected therewith navigable by seagoing vessels." [17] Governments or states may adopt special rules for their waterways. These special rules, however, shall conform as closely as possible to the COLREGS. [18]

Risk of Collision/Close Quarters Situation

There is no set distance at which a close quarters situation first applies; [19] it may depend on many factors and perceptions may differ depending on the perspectives of the personnel conning the vessels involved. *Farwell's Rules of the Nautical Road* identify a number of factors that must be considered in weighing the risk of collision, including "the range between the vessels, their closing speed, projected CPA, visibility, and the presence of other navigation or collision hazards." [20] As these variables change, an individual's perception of the risk should also change. In some cases, a risk of collision may not be evident, or the risk may be assessed as being minimal. However, when in doubt as to whether a risk of collision exists, the COLREGS specify that the risk "shall be deemed to exist." [21]

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17 *Collision Regulations*, C.R.C. c. 1416, Schedule 1, International Regulations for Preventing Collision at Sea with Canadian Modifications, 1972, Rule 1(a).

18 Ibid, Rule 1(b).

19 A. N. Cockcroft and J. N. F. Lameijer Cockroft, *A Guide to the Collision Avoidance Rules* (Great Britain: MPG Books Ltd, 2004): 139.

20 Craig H. Allen, *Farwell's Rules of the Nautical Road*, (Annapolis: Naval Institute Press, 2005): 215.

21 *Collision Regulations*, C.R.C. c. 1416, Schedule 1, International Regulations for Preventing Collision at Sea with Canadian Modifications, 1972, Rule 7(a).

As perceptions of risk change, bridge standing orders [22] may be used to provide an OOW with guidance in assessing a close quarters situation or risk of collision. Although the *Bulk Japan* had standing orders, these orders did not contain specific instructions from the master on managing a close quarters situation.

In this occurrence, the CPA [23] varied between 1.2 and 0.25 nm, and the closing speed was changing as the vessels approached each other (Table 1). Both OOWs initially assessed the situation differently based on the time and variables present when each first acquired the other vessel.

Table 1. CPA in relation to *Bulk Japan*'s average speed

Time	CPA	Speed
1303 to 1320	0.3 nm	12.7 knots
1320 to 1348	1.2 nm	13.6 knots
1348 to 1359	0.25 nm	13.3 knots

Crossing Situations

The COLREGS state that when there is a risk of collision between 2 vessels in a crossing situation, the "vessel which has the other on her own starboard side shall keep out of the way and shall, if the circumstances of the case admit, avoid crossing ahead of the other vessel." [24] If it becomes apparent the vessel required to keep out of the way is not taking action to comply with these rules, the stand-on vessel may take action by her manoeuvre alone. [25] The COLREGS also state that "when in doubt whether sufficient action is being taken by the other vessel to avoid collision, the vessel in doubt shall immediately indicate such doubt by giving at least 5 short and rapid blasts on the whistle." [26]

Use of VHF Radiotelephone in Collision Avoidance

A Canadian modification to the COLREGS states that "if positive mutual identification of the vessels has been made…a vessel may use a bridge-to-bridge radiotelephone instead of the prescribed whistle signals to reach agreement in a meeting, crossing, or overtaking situation. If agreement is not reached, then whistle signals shall be exchanged in a timely manner and shall prevail." [27]

In the Great Lakes, it is a common practice for vessels to use VHF radiotelephone to reach an agreement when meeting, crossing, or overtaking another vessel. The *Wilf Seymour* sailed primarily on the Great Lakes and the St. Lawrence River; therefore, the OOW and master were accustomed to using the radiotelephone to reach agreement in such situations. However, VHF radiotelephone is not routinely used internationally for collision avoidance and may prolong a

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22 Bridge standing orders are the master's instructions to the OOW on how the watch is to be conducted.

23 The CPAs have been calculated based on the vessel's relative positions from each other. These positions were obtained from the historic AIS data provided by the Canadian Coast Guard.

24 *Collision Regulations*, C.R.C. c. 1416, Schedule 1, International Regulations for Preventing Collision at Sea with Canadian Modifications, 1972, Rule 15(a).

25 Ibid, Rule 17.

26 Ibid, Rule 34(d).

27 Ibid, Rule 34(l).

close quarters situation or risk of collision when perceptions differ and agreement is not reached immediately.

In this occurrence, nearly 15 minutes elapsed between the time the *Wilf Seymour* initiated the first call to the *Bulk Japan* and the time the *Wilf Seymour* reversed engines. The MCTS audio recordings indicate that during this time, the OOW on the *Bulk Japan* and the OOW on the *Wilf Seymour* were engaged in VHF radio communications for 7 and 10 minutes respectively.

In 2006, the United Kingdom's Maritime and Coastguard Agency issued a Marine Guidance Notice which states that ''valuable time can be wasted whilst mariners on vessels approaching each other try to make contact on VHF radio instead of complying with the *Collision Regulations*.'' [28] The notice also mentions a judge's decision in a collision case in which it was found that ''it is very probable that the use of VHF radio for conversation between these ships was a contributory cause of this collision, if only because it distracted the officers on watch from paying careful attention to their radar.'' [29]

Marine Communications and Traffic Services

MCTS provides communication and traffic services for the marine community to ensure the safe and efficient movement of vessels. MCTS coordinates communications related to distress and safety situations and regulates vessel traffic movements. [30]

In fulfilling its role, MCTS officers may give traffic recommendations when it becomes evident that a vessel should take, but has not yet taken, appropriate action in response to information provided. [31] The MCTS standards manual specifies that MCTS officers shall at no time have, or attempt to have, the conduct of a vessel; MTCS communication shall be expressed in such a manner as to ensure that they cannot be regarded as assuming conduct of a vessel. [32] In this occurrence, the MCTS officer assisted in the communications by relaying messages from the *Wilf Seymour* to the *Bulk Japan.*

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28 Maritime and Coastguard Agency, United Kingdom, *Radio: Operational Guidance on the Use of VHF Radio and Automatic Identification Systems (AIS) at Sea*, Marine Guidance Note (MGN 324 [M+F]), July 2006.

29 Ibid.

30 MCTS, *Marine Communications and Traffic Services Standards Manual*, Version 1.0, 16 June 2003, Foreword.

31 Ibid, C9-12.

32 Ibid, C9.1-5.

Analysis

Managing the Close Quarters Sequence

As the *Wilf Seymour* and *Bulk Japan* approached one another, both OOWs interpreted the crossing situation differently. The OOW on the *Wilf Seymour* acquired the *Bulk Japan* at approximately 1305; at this time, the CPA was 0.3 nm, crossing ahead of the *Wilf Seymour*. The *Wilf Seymour*, which was the stand-on vessel as per the *Collision Regulations* (COLREGS), monitored the *Bulk Japan,* expecting it to take action to stay clear. About 15 minutes later, the OOW on the *Bulk Japan* acquired the *Wilf Seymour.* The CPA was 1.2 nm, with the *Bulk Japan* crossing ahead of the *Wilf Seymour* in 52 minutes time. Not perceiving a risk of collision and without specific standing orders to indicate the minimum acceptable CPA, the OOW on the *Bulk Japan* maintained course, intending to pass across the bow of the *Wilf Seymour*.

The COLREGS state that, if the circumstances of the case admit, the give-way vessel should avoid crossing ahead of the other vessel, take early and substantial action to keep clear, and pass at a safe distance. In this crossing situation, the COLREGS indicate that the *Bulk Japan* alter course to starboard or reduce speed in order to pass astern at a safe distance. With the sea room available to the *Bulk Japan*, altering course to starboard involved less risk than crossing the bow of the *Wilf Seymour*, especially given that the CPA can change, as in this occurrence.

At 1346, the OOW on the *Wilf Seymour* attempted to contact the *Bulk Japan* using VHF radiotelephone. Approximately 15 minutes elapsed while the *Wilf Seymour* attempted to contact and reach an agreement with the *Bulk Japan*, during which time the distance between the 2 vessels decreased from 4.6 to 2.1 nm. After initial contact by the *Wilf Seymour*, the OOW on the *Bulk Japan* spent 7 minutes engaged on the VHF radiotelephone. The duration of the communication and the locations of the VHF radiotelephones on the *Bulk Japan*'s bridge may have precluded the OOW from continuously monitoring the radar and appreciating any changes in CPA.

As the distance between the vessels reduced, no action was taken by the *Bulk Japan* to avoid the close quarters situation, nor were the vessel's intentions clear to the *Wilf Seymour,* which maintained course and speed. When vessels approaching one another are in doubt as to whether sufficient action is being taken, the COLREGS state that such doubt shall be indicated by at least 5 short and rapid blasts on the whistle. Although the *Wilf Seymour* was unsure of the *Bulk Japan*'s intentions, no such whistle signals were sounded.

When the master of the *Bulk Japan* arrived on the bridge and saw the *Wilf Seymour* close on the vessel's starboard side, he immediately ordered the speed to be reduced to half ahead without being briefed by the OOW as to the situation. The order to decrease speed resulted in a change of speed of 1.9 knots over 6 minutes. This decision, without an initial assessment, caused a reduction of the CPA, aggravating the risk of collision.

When it became apparent that the *Bulk Japan* was not taking action to avoid a close quarters situation, the *Wilf Seymour* reversed engines to let it cross ahead with a CPA of 1.2 nm.

Findings

Findings as to Causes and Contributing Factors

1. The *Bulk Japan* maintained course to pass across the bow of the *Wilf Seymour* without taking action to avoid the close quarters situation, resulting in a risk of collision.

2. Following VHF radiotelephone communications, the *Wilf Seymour* remained unclear as to the *Bulk Japan*'s intentions and did not sound the appropriate whistle signals to indicate their doubts. The *Wilf Seymour* maintained course and speed until it became apparent that the *Bulk Japan* was not taking action.

3. Upon arriving on the bridge, the master on the *Bulk Japan* reduced the vessel's speed prior to assessing the situation, further reducing the CPA.

Findings as to Risk

1. The prolonged use of VHF radiotelephone communications in collision avoidance situations may preclude the bridge team from adequate monitoring, increasing the risk of collision.

This report concludes the Transportation Safety Board's investigation into this occurrence. Consequently, the Board authorized the release of this report on 19 September 2013. It was officially released on 2 December 2013.

Visit the Transportation Safety Board's website (www.bst-tsb.gc.ca) for information about the Transportation Safety Board and its products and services. You will also find the Watchlist, which identifies the transportation safety issues that pose the greatest risk to Canadians. In each case, the TSB has found that actions taken to date are inadequate, and that industry and regulators need to take additional concrete measures to eliminate the risks.

Appendices

Appendix A – Area of the Occurrence