



Transportation
Safety Board
of Canada

Bureau de la sécurité
des transports
du Canada



STATISTICAL SUMMARY
MARINE OCCURRENCES 2016

April 2017

© Her Majesty the Queen in Right of Canada, represented by the
Transportation Safety Board of Canada, 2017
Statistical Summary – Railway Occurrences 2016 (Transportation
Safety Board of Canada)

Catalogue No. TU1-2/2013E-PDF
ISSN 1701-6606

This document is available on the TSB website at
<http://www.tsb.gc.ca>

Table of contents

Accidents	2
Overview of accidents and casualties	2
Figure 1. Accidents aboard ship and shipping accidents, 2007–2016.....	2
Figure 2. Marine fatalities and serious injuries, 2007–2016.....	3
Shipping accidents	3
Figure 3. Shipping accidents by accident type.....	4
Figure 4. Shipping accidents by vessel type.....	4
Figure 5. Shipping accidents by region.....	5
Figure 6. Shipping accident rates for Canadian-flag commercial non-fishing vessels, 2007–2016.....	6
Figure 7. Shipping accident rates for Canadian-flag fishing vessels, 2007–2016....	6
Incidents.....	8
Overview of incidents.....	8
Figure 8. Marine incidents by type, 2016.....	8
Definitions.....	9

Statistical Summary

Marine Occurrences in 2016

This document is a summary of selected 2016 marine safety data. It covers commercial vessels, which include all vessels registered or licensed to operate commercially. Pleasure craft occurrences are not normally included unless they also involve a commercial vessel.

The TSB gathers and uses this data during the course of its investigations to analyse safety deficiencies and identify risks in the Canadian transportation system.

The 2016 data were collected according to the reporting requirements described in the TSB Regulations in force during that calendar year.

The statistics presented here reflect the TSB database at 30 March 2017. Since the occurrence data are constantly being updated in the live database, the statistics may change slightly over time.

Also, as many occurrences are not formally investigated, information recorded on some occurrences may not have been verified.

The following series of data tables associated with this annual summary can be found at <http://www.bst-tsb.gc.ca/eng/stats/marine/2015/sser-ssro-2015.asp>

- Marine occurrences (types, vessels and losses involved) 2007–2016
- Details of occurrences, losses and vessels involved by region 2007–2016
- Canadian-flag vessels involved in shipping accidents by vessel category and type of accident 2007–2016
- Foreign-flag vessels involved in shipping accidents by vessel category and type of accident 2007–2016
- Vessels lost by vessel category and age 2007–2016
- Accidents, fatalities and serious injuries by accidents type 2007–2016
- Vessels, fatalities and serious injuries by vessel type 2007–2016

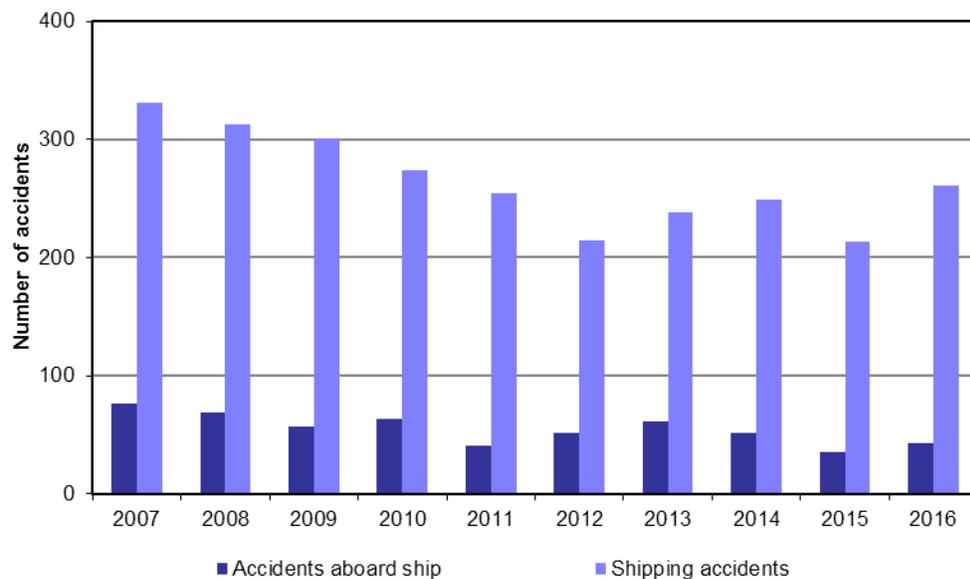
Accidents

Overview of accidents and casualties

In 2016, 304 marine accidents¹ were reported to the TSB, up from the 2015 total of 248, up from the 2011–2015 average of 282, but down from the 2006–2015 average of 327. Over the past 10 years, 83% of marine accidents were shipping accidents, while the remainder were accidents aboard ship.

There were 261 shipping accidents in 2016, up 23% from the 2015 total of 213, up 12% from the 2011–2015 average of 234, but down 4% from the 2006–2015 average of 272.

Figure 1. Accidents aboard ship and shipping accidents, 2007–2016



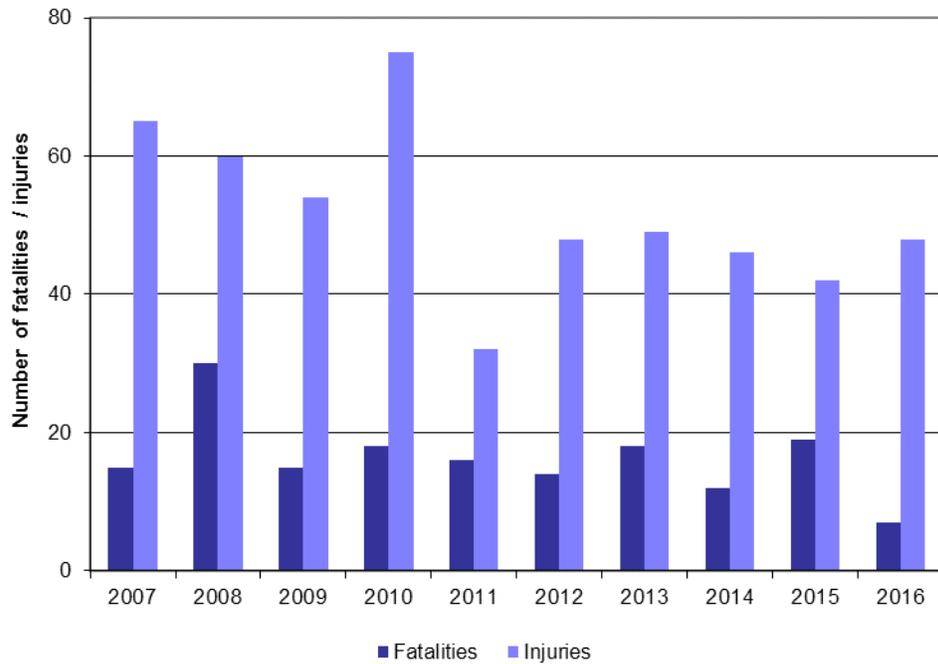
In 2016, there were 43 accidents aboard ship, up from 35 in 2015 but down from the 2011–2015 average of 48 and the 2006–2015 average of 56. The majority of accidents aboard ship occurred on fishing vessels (42%) and cargo vessels (28%).

Marine fatalities totalled 7 in 2016 (Figure 2), down from a total of 19 in 2015, down from the average of 16 in 2011–2015 and the annual average of 18 in 2006–2015. All 6 of the shipping accident fatalities resulted from 2 fishing vessel accidents in 2016. There were no accident aboard ship fatalities on fishing vessels, down from 5 in 2015 and down from the 2011–2015 average of 6 and the 2006–2015 average of 5. The total of 6 fishing vessel fatalities in 2016 was down from the annual average of 11 in 2011–2015 and 11 in 2006–2015.

Serious injuries in 2016 totalled 48, up from 42 in 2015 and up from the annual average of 43 in 2011–2015. Forty three of the 48 serious injuries resulted from accidents aboard ship.

¹ Refer to Appendix for a definition of a reportable marine accident.

Figure 2. Marine fatalities and serious injuries, 2007–2016

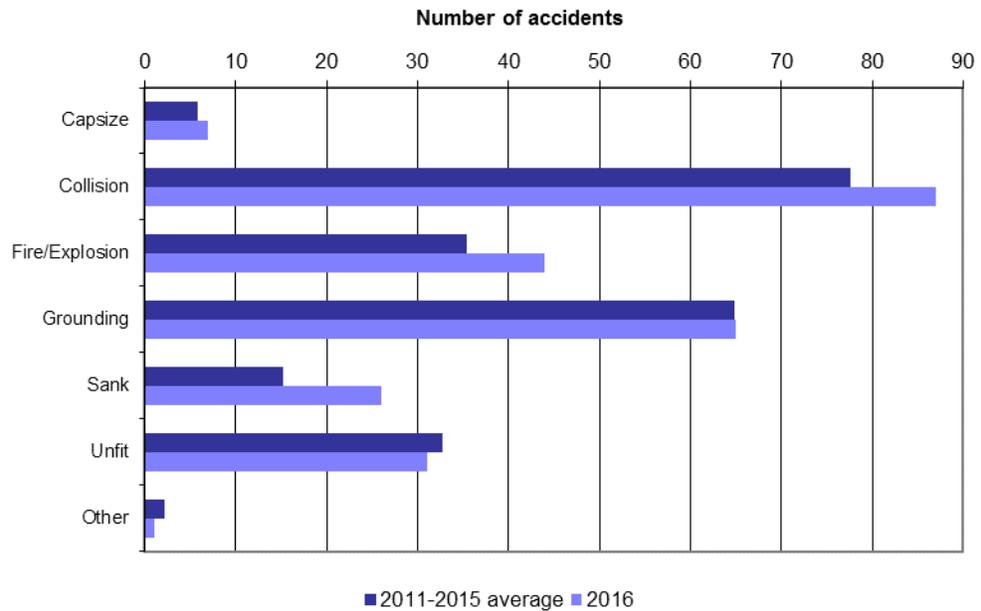


Shipping accidents

Type of accident (Table 1):

As illustrated in Figure 3, the most frequent types of shipping accidents in 2016 were collisions (33%), groundings (25%), fire/explosion accidents (17%), and sustains damage rendering unseaworthy/unfit for purpose accidents (12%). The total number of collisions increased by 12% from the five-year average (from 78 to 87). The number of groundings was unchanged from the five-year average (65). Sustains damage rendering unseaworthy/unfit for purpose accidents decreased by 5% from the five-year average (from 33 to 31). Fire/explosion accidents increased by 24% from the five-year average (from 35 to 44).

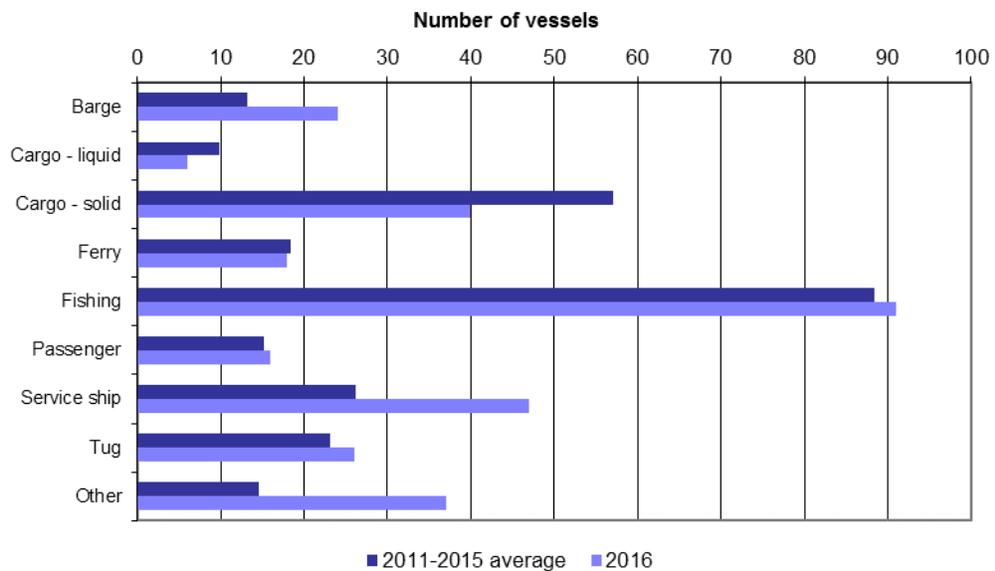
Figure 3. Shipping accidents by accident type



Type of vessel (Table 1):

Ninety one fishing vessels (30% of the total) were involved in shipping accidents (Figure 4), up from the 81 (34%) in 2015 and up from the 2011–2015 average of 88 (33%). After fishing vessels, 47 service ships (15%) and 40 solid cargo solid vessels(13%) were involved most often in shipping accidents in 2016.

Figure 4. Shipping accidents by vessel type



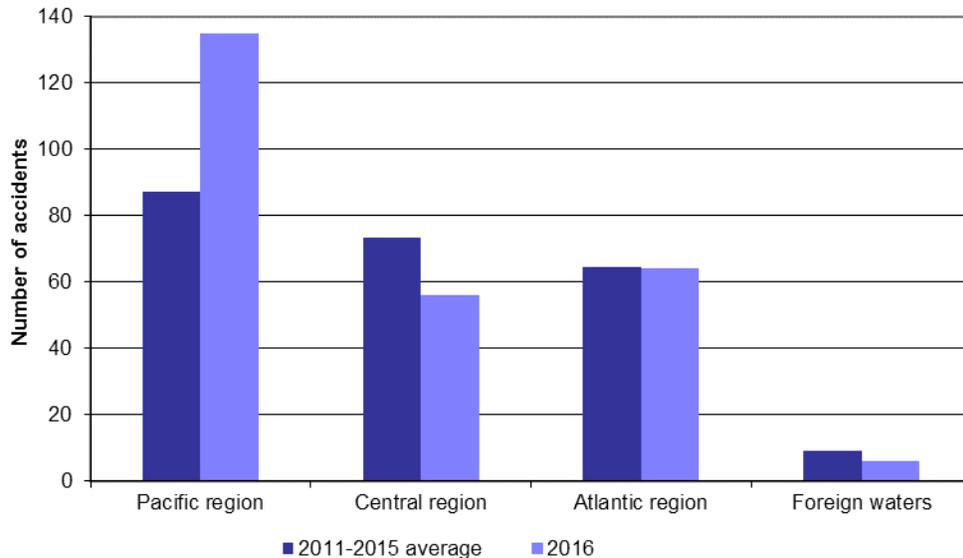
Geographical region (Table 2):

In 2016, 52% of shipping accidents occurred in the Pacific region, 25% in the Atlantic region, 21% in the Central region, and the remaining 2% of shipping accidents took place in foreign waters. In the Pacific region shipping accidents increased 55% from the 2011–2015 average (from 87 to 135), in the Atlantic region shipping accidents were unchanged

from the 2011–2015 average of 64 , and in the Central region shipping accidents decreased by 23% from the 2011–2015 average (from 73 to 56).

Fishing vessels accounted for 60% of all vessels involved in shipping accidents in the Atlantic region, decreasing to 43 from the 2011–2015 average of 48. Fishing vessels accounted for 27% of all vessels involved in shipping accidents in the Pacific region, increasing to 43 from the 2011–2015 average of 33 fishing vessels.

Figure 5. Shipping accidents by region

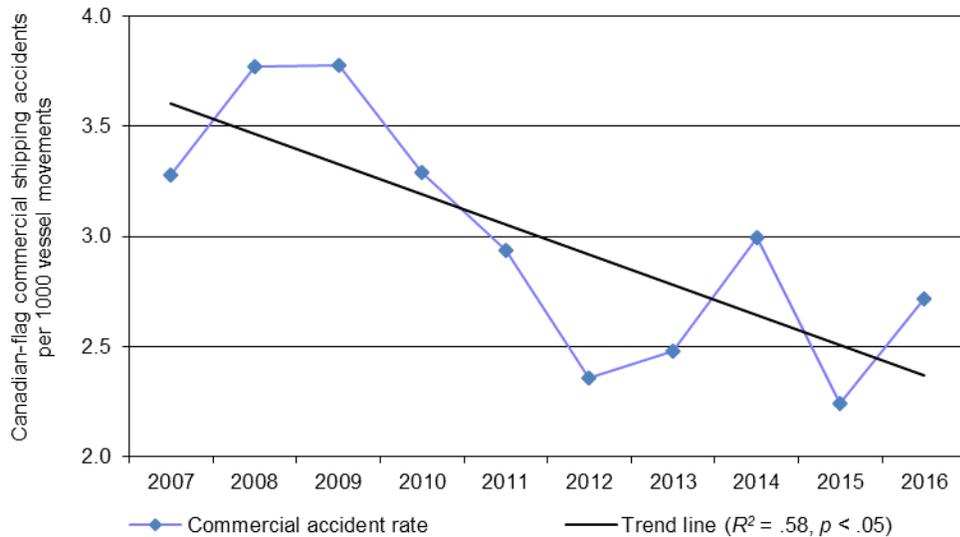


Vessel flag (Tables 1, 3 and 4):

In 2016, 89% of the 305 vessels involved in shipping accidents reported to the TSB were Canadian-flag vessels. In all, 37% of the Canadian-flag vessels were commercial non-fishing vessels, 33% were fishing vessels and the remaining 30% were non commercial vessels, pleasure craft or service vessels.

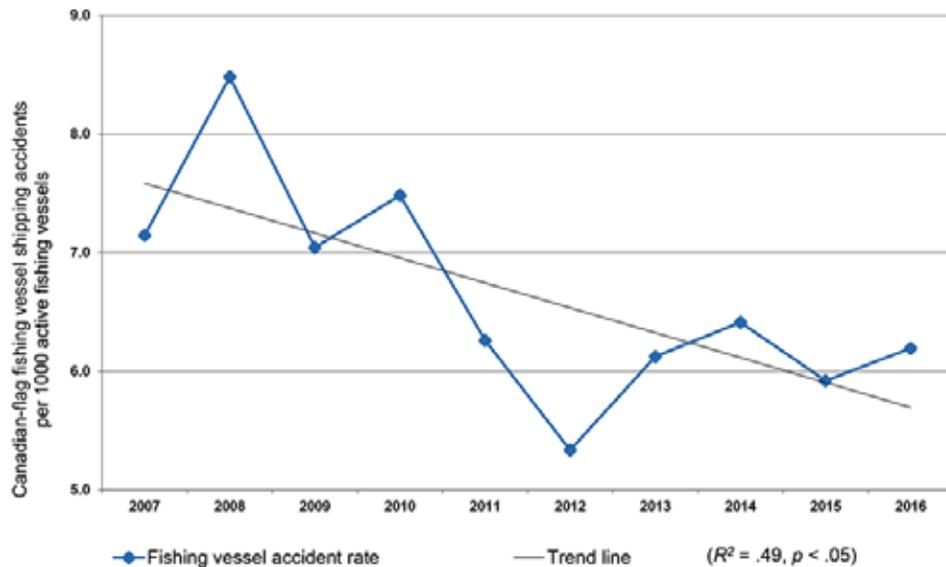
According to information provided by Transport Canada, marine activity for Canadian commercial non-fishing vessels over 15 gross tons (grt) (excluding passenger vessels and cruise ships) was estimated to be 28,700 commercial movements in 2016, which is comparable to the 2011–2015 average of 28,664 commercial movements, but a 3% decrease from the 2006–2015 average of 29,726. This yields a rate of 2.7 shipping accidents per 1,000 commercial movements, up from the five-year average of 2.6 but down from the ten-year average of 3.0. There has been a statistically significant downward trend in the Canadian commercial shipping accident rate over the last 10 years ($p < .05$) (Figure 6).

Figure 6. Shipping accident rates for Canadian-flag commercial non-fishing vessels, 2007–2016



In 2016, there were an estimate 13,563 active fishing vessels in Canada². The shipping accident rate for Canadian fishing vessels increased from 5.9 shipping accidents per 1000 active fishing vessels in 2015 to 6.2 in 2016 and increased from the five-year average of 6.0. However, there has been a statistically significant downward trend in the Canadian fishing vessel shipping accident rate over the last 10 years ($p < .05$) (Figure 7).

Figure 7. Shipping accident rates for Canadian-flag fishing vessels, 2007–2016



For Canadian-flag fishing vessels in 2016, groundings (34%), sinkings (19%), and fire/explosion accidents (18%) were the most frequent shipping accident types. Canadian-

² Commercial fishing vessels landing a catch (Source: DFO).

flag commercial non-fishing vessels were mostly involved in collisions (47%) or groundings (21%).

In 2016, 35 foreign-flag vessels were involved in shipping accidents in Canadian waters, 31 of which were commercial non-fishing vessels. According to information provided by Transport Canada, marine activity for foreign commercial non-fishing vessels was 26,380 commercial movements in 2016, comparable to the 2011–2015 average of 26,274 commercial movements but down 3% from the 2006–2015 average of 27,074. This yields an accident rate of 1.0 commercial vessels involved in shipping accidents per 1000 commercial movements, down from the five-year average of 1.3 and the ten-year average of 1.5.

Vessels lost (Tables 1 and 5):

In 2016, 16 vessels were reported lost, down from 23 in 2015, and down from the 2011–2015 average of 22. Twelve of the 16 vessels lost in 2016 were fishing vessels. Ten of the 16 vessels lost were less than 15 grt³, and 38% were at least 20 years old. During the past 10 years, fishing vessels under 60 grt have accounted for more than 60% of the vessels lost in Canada.

³ The majority of vessels classified under “unknown tonnage” were vessels known to be 15 gross tons or less.

Incidents

Overview of incidents

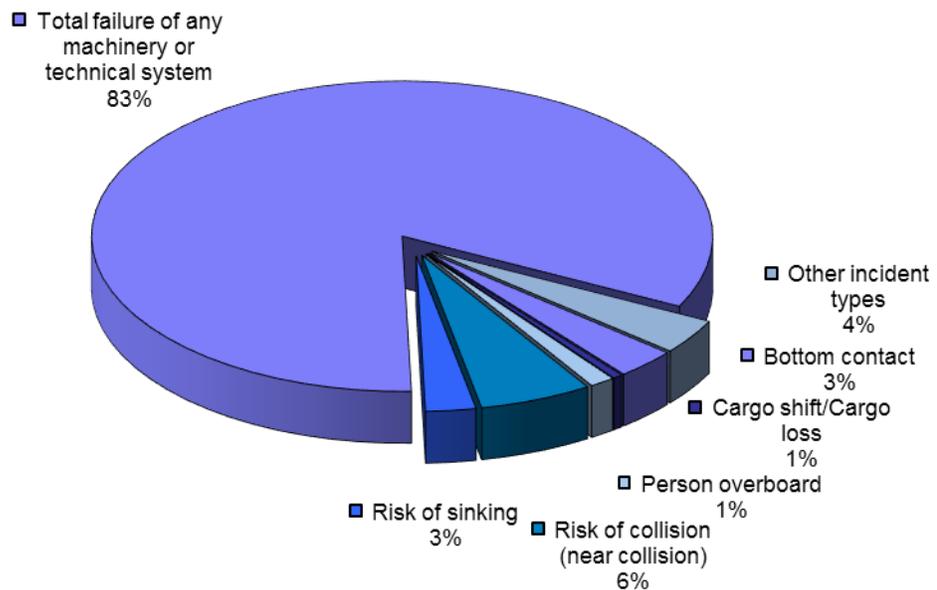
In 2016, 768 marine incidents⁴ were reported to the TSB, up from a total of 708 in 2015, and up from the annual average of 535 in 2011–2015 and the annual average of 404 in 2006–2015. On March 12, 2014, the TSB issued new regulations that changed the reporting requirements effective July 1, 2014. The new regulations clarify the reporting requirements for a total failure of any machinery or technical system, leading to an increase in this category since 2014. The 2013 increase was related to the clarification of the threshold used to classify the engine / rudder/propeller incident category, which is now included in the total failure of any machinery or technical system incident category.

In 2016, incidents in the Atlantic region represented 44% of all marine incidents followed by 38% in the Pacific region, and 16% in the Central region. The remaining 2% of reported incidents took place in foreign waters.

The majority of reportable incidents (637 of 768) consisted of total failure of any machinery or technical systems (83%). The Atlantic region had the largest number of total failure of any machinery or technical systems incidents (48%), and the Pacific region had 26 of the 45 risk of collision incidents (56%).

In 2016, vessels most often involved in total failure of any machinery or technical systems incidents were fishing vessels (61%) and cargo-solid vessels (18%).

Figure 8. Marine incidents by type, 2016



⁴ Refer to Appendix for a definition of a reportable marine incident.

Definitions

The following definitions apply to marine occurrences that are required to be reported pursuant to the Canadian Transportation Accident Investigation and Safety Board Act and the TSB regulations.

Marine occurrence

- any accident or incident associated with the operation of a ship and
- any situation or condition that the Board has reasonable grounds to believe could, if left unattended, induce an accident or incident described above.

Marine accident

An accident resulting directly from the operation of a ship other than a pleasure craft, where

Accident aboard ship

- a person is killed or sustains a serious injury as a result of
 - boarding, being on board or falling overboard from the ship, or
 - coming into direct contact with any part of the ship or its contents;

Shipping accident

- the ship
 - sinks, founders or capsizes,
 - is involved in a collision (includes strikings and contacts)
 - sustains a fire or an explosion,
 - goes aground,
 - sustains damage that affects its seaworthiness or renders it unfit for its purpose, is missing or abandoned

Marine incident

- a person falls overboard from the ship;
- makes unforeseen contact with the bottom without going aground,
- fouls a utility cable or pipe, or an underwater pipeline,
- is involved in a risk of a collision,
- sustains a total failure of
 - the navigation equipment if the failure poses a threat to the safety of any person, property or the environment,
 - the main or auxiliary machinery, or
 - the propulsion, steering, or deck machinery if the failure poses a threat to the safety of any person, property or the environment;
- all or part of the ship's cargo shifts or falls overboard; or
- is anchored, grounded or beached to avoid an occurrence,
- a crew member whose duties are directly related to the safe operation of the ship is unable to perform their duties as a result of a physical incapacitation which poses a threat to the safety of persons, property or the environment;
- there is an accidental release on board or from the ship consisting of a quantity of dangerous goods or an emission of radiation that is greater than the quantity or emission levels specified in Part 8 of the Transportation of Dangerous Goods Regulations.

Serious injury

- (a) a fracture of any bone, except simple fractures of fingers, toes or the nose;
- (b) lacerations that cause severe hemorrhage or nerve, muscle or tendon damage;
- (c) an injury to an internal organ;
- (d) second or third degree burns, or any burns affecting more than 5% of the body surface;
- (e) a verified exposure to infectious substances or injurious radiation; or
- (f) an injury that is likely to require hospitalization.

Vessels covered

This report covers commercial vessels that include all vessels either registered or licensed to operate commercially. Pleasure craft occurrences are not normally included unless they also involved a commercial vessel.

Vessel categories

Commercial Vessels: include cargo vessels, ferries, passenger vessels, tugs and barges.

Fishing Vessels: include vessels involved in commercial fishing.

Other Vessels: include research vessels, oil exploration, exploitation and support vessels, government vessels and pleasure craft.

Miscellaneous

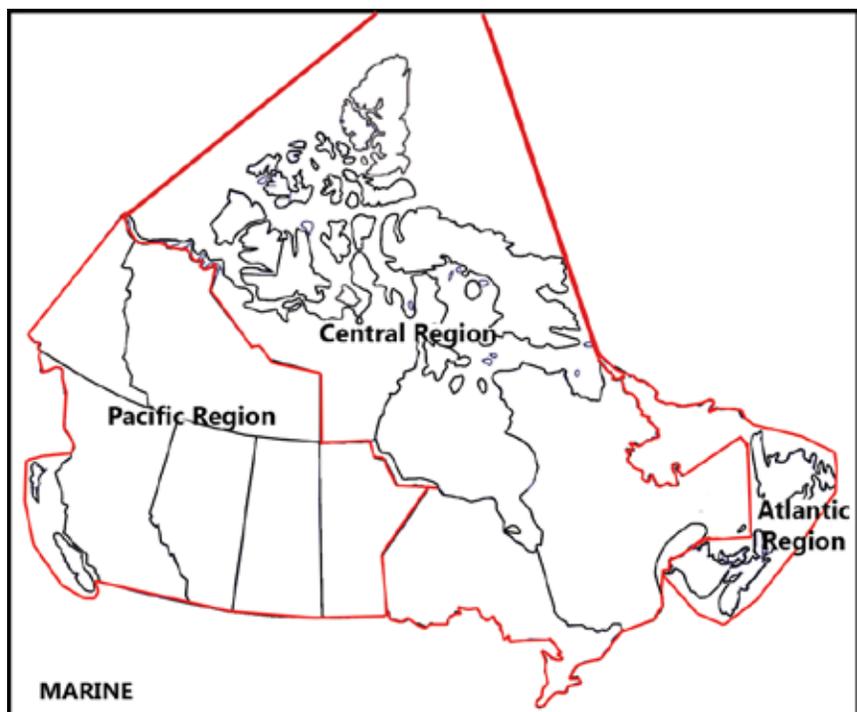
Gross tons (grt): A measure of vessel capacity in cubic feet of the spaces within the hull, and of enclosed spaces above deck available for cargo, stores, fuel, passengers and crew, with certain exclusions. One hundred cubic feet is equivalent to one gross ton.

Movement: A vessel's travel segment between ports with at least one port being a domestic port.

Dangerous goods involvement

An accident is considered to have dangerous goods involvement if any car in the consist carrying (or having last contained) a dangerous good derails, strikes or is struck by any other rolling stock or object. It does not mean that there was any release of any product. Also included are crossing accidents in which the motor vehicle involved (e.g. tanker truck) is carrying a dangerous good.

Regional limits



Pacific Region's area of responsibility consists of the provinces of British Columbia, Alberta, Saskatchewan, and Manitoba, the Yukon and the Northwest Territories south of the 70th parallel, as well as the waters adjacent to these provinces and territories.

Central Region's area of responsibility consists of the provinces of Ontario and Quebec (including the Magdalen Islands), the territory of Nunavut, and the Northwest Territories north of the 70th parallel, as well as James Bay, Hudson Bay, the St. Lawrence Seaway, and the Great Lakes waterways up to the Canada-US border.

Atlantic Region's area of responsibility consists of the provinces of New Brunswick, Nova Scotia, Prince Edward Island, and Newfoundland and Labrador, as well as the waters adjacent to these provinces.