



TSB Recommendation M17-02

Explicit requirements and guidance for implementation of risk management processes

The Transportation Safety Board of Canada recommends that the Department of Transport require commercial passenger vessel operators to adopt explicit risk management processes, and develop comprehensive guidelines to be used by vessel operators and Transport Canada inspectors to assist them in the implementation and oversight of those processes.

Marine transportation safety investigation report	M15P0347
Date the recommendation was issued	14 June 2017
Date of the latest response	December 2022
Date of the latest assessment	March 2023
Rating of the latest response	Satisfactory Intent
File status	Active

Summary of the occurrence

On 25 October 2015, at approximately 1500 Pacific Daylight Time, the passenger vessel *Leviathan II* was on a whale-watching excursion with 27 people on board when it capsized off Plover Reefs in Clayoquot Sound, British Columbia. The subsequent rescue operation recovered 21 survivors, which included 18 passengers and 3 crew members. There were 6 fatalities. As a result of the capsizing, approximately 2000 litres of fuel leaked into the water.

The Board concluded its investigation and released report M15P0347 on 14 June 2017.

Rationale for the recommendation

In Canada, there are approximately 4000 registered passenger vessels. These vessels carry passengers on various types of voyages, ranging from ferry crossings and water-taxi transits to dinner cruises and whale-watching trips. Passengers on board these vessels may have varying ages, levels of ability, language needs, and even special needs such as impairments in hearing,

sight, or mobility. As passengers are also likely to be unfamiliar with marine emergency procedures and survival techniques, they are especially vulnerable in a marine emergency.

Depending on the marine environment in which a passenger vessel is operating, it may be subject to any number of hazards. These hazards may result in marine emergencies such as fire, collision, person overboard, grounding, swamping, and capsizing. Although a marine emergency on a passenger vessel may be infrequent, encountering one could put the lives of passengers and crew at risk, with catastrophic results. This makes the risks associated with such operations high.

It is therefore essential that operators of passenger vessels be cognizant of the risks involved in their operations and proactively manage them through the effective implementation of risk management processes, by reducing risks to the lowest possible level. An effective risk management process will help vessel operators identify and evaluate hazards, establish safe operating procedures and policies to mitigate those identified risks, and provide a means to ensure that risks are assessed on an ongoing basis. A fully documented and systematic approach also helps to ensure that individuals at all levels of the organization, including the master, have the knowledge and tools to effectively manage risks, as well as the necessary information to make sound decisions in any operating condition.

Risk management is a key component of a safety management system (SMS). Following an occurrence in 2002, in which the amphibious passenger vehicle *Lady Duck* sank in the Ottawa River and 4 passengers drowned, the Board recommended that

the Department of Transport take steps to ensure that small passenger enterprises have a safety management system.

TSB Recommendation M04-01

TC does not plan to require operators of small vessels (those less than 24 m in length and carrying fewer than 50 passengers) to adopt an SMS. According to TC, safety concerns for this class of vessels are addressed through existing regulations, inspections, and awareness initiatives, including the voluntary Small Vessel Compliance Program for vessels under 15 gross tonnage.

At the time this report was issued, the Board's assessment of TC's response was Unsatisfactory.

Since Recommendation M04-01 was made, the Board has found deficiencies regarding hazard identification and risk management in a number of other occurrences involving Canadian passenger vessels. The issue of safety management processes has been on the TSB Watchlist since 2010. The Watchlist notes that

- there is a lack of a clear regulatory framework requiring all companies to implement formal safety management processes;
- there have been many investigations in which it was found that safety management processes were weak or not used; and

- TC oversight has not identified companies' ineffective processes or intervened when necessary; in addition, there is an imbalance between auditing processes and traditional inspections.

In the current Canadian regulatory framework, there are 2 provisions that address the need for an SMS and/or risk management process. First, the *Safety Management Regulations* require those Canadian vessels to which chapter 9 of SOLAS applies to implement an SMS that is compliant with the ISM Code. Second, the *Canada Shipping Act, 2001* requires that procedures be developed for the safe operation of vessels and for dealing with emergencies.

However, these provisions have not been effective in ensuring that all Canadian passenger vessel operators implement risk assessment processes that effectively identify hazards and mitigate risk on an ongoing basis.

In the first case, the *Safety Management Regulations* refer to the ISM Code, under which the need for specific risk management processes is only implied. According to the Code, the "safety management objectives of the company should [...] assess all identified risks to its ships, personnel and the environment and establish appropriate safeguards." Although separate guidelines published by the International Association of Classification Societies (IACS) suggest that risk assessment is essential to ensure compliance with the Code, and that the method used must be systematic and documented, the ISM Code itself does not provide any explicit requirements for risk management or elaborate any particular approach to the management of risk.

Furthermore, TSB investigations have found that, despite some vessel operators having an audited and certified SMS, they may not have structured and systematic risk assessment processes in place.

For example, the passenger ferry *Jiimaan* (M12C0058) operated under an SMS that was certified and audited by a recognized classification society. The TSB investigation into the vessel's grounding found that the absence of a risk assessment process within the company's SMS resulted in risks not being identified and mitigated. The investigation also found that the company's proposed risk assessment process (following an external audit of its SMS in 2011) did not reflect the principles for an effective risk assessment process as described by IACS. However, the vessel's proposed risk assessment process was found to be acceptable to the classification society when it conducted an ISM Code audit.

The passenger ferry *Princess of Acadia* (M13M0287) also operated under a certified and audited SMS when it grounded on approach to the dock. The TSB investigation found that the SMS did not provide guidance for the master to proactively identify risks and investigate hazardous occurrences, a factor increasing the risk in the vessel's operation.

To help small vessel operators comply with SMS requirements, Transport Canada has developed plain-language Safety Management Systems guidelines, including sample SMS documentation. These guidelines describe risk management in general terms, encouraging the

use of a reporting process for the ongoing identification of hazards and a “risk register” to document the implementation and monitoring of risk controls. Although these guidelines go some way toward ensuring that all passenger vessel operators have implemented systematic processes to manage risks in their operations, there are some key shortcomings that limit their effectiveness:

- These guidelines are targeted to those vessel operators who may be implementing an SMS on a voluntary basis. Current regulatory requirements require mandatory SMS only for vessels operating on international voyages.
- Many of the “hazards” listed in the sample risk register are actually possible outcomes (such as collision/grounding, fire, environmental) or are general references to types of hazards (such as machinery spaces, water). Since the examples do not identify specific hazards that could contribute to these outcomes (such as high-traffic area on approach to dock, silting of navigable channel, or deterioration of insulation), targeted measures to reduce the likelihood of an occurrence are not identified.

In the second case, with respect to the *Canada Shipping Act, 2001*, paragraph 106(1)(b) concerns the requirement to develop procedures for the safe operation of vessels and for dealing with emergencies applies to all Canadian vessels, including those that are not required to implement an SMS, such as the *Leviathan II*. Although TC may consider risk management to be implicit in the requirement to “develop safe operating procedures,” it is vague. There are no explanatory guidelines or standards concerning implementation of section 106 provided for either vessel operators or TC inspectors. Although TC inspectors may check that there are safe operating procedures on board a vessel, they do not evaluate the procedures themselves or the process by which the procedures were developed. The *Leviathan II* was inspected regularly but did not have any such procedures on board. Following this occurrence, it had not, at the time of publication of this report, incorporated formal risk management techniques to identify and mitigate hazards posed in the area of operation.

In TSB investigations that have identified issues with risk management on passenger vessels (including in this occurrence), there is clearly a fundamental difference between knowing about the existence of a hazard and having the capacity, as an organization, to fully “identify” it as such and then to systematically manage it. Furthermore, the IACS guidelines point to hazard identification as the first and most important step in risk assessment.

Other maritime administrations have taken steps to ensure that risk management processes are implemented in a meaningful way. For example, the Australian Maritime Safety Authority (AMSA) has regulations that explicitly require vessel owners and operators to implement a risk management process to ensure the operational safety of domestic commercial vessels, as part of an SMS. In addition, the AMSA has published detailed and thorough guidelines to accompany the regulations that provide guidance for implementing a risk management process. These guidelines

- are presented in a user-friendly format and written in clear language;
- describe the theory of hazard identification and risk assessment/mitigation;

- provide operators with useful information and tools to help them put the theory of risk management into practice on board their vessel;
- emphasize that the risk management process must be ongoing (addressing previously unanticipated hazards as they arise) and be kept up-to-date (regularly, or as circumstances change);
- highlight the benefits of conducting meaningful risk management exercises;
- make significant use of examples; and
- draw attention to the need to examine the specifics of all vessel operations, including normal and emergency situations.

In Canada, although TC provides guidance for SMS, the need for a comprehensive risk assessment process is not clearly stated, and guidance to the industry on how to implement such a process in their operations is minimal.

Risk management processes are considered a critical means of managing safety on board passenger vessels. As well, clear requirements and guidelines are needed to assist vessel operators and TC inspectors in the implementation and oversight of such processes.

Therefore, the Board recommended that

the Department of Transport require commercial passenger vessel operators to adopt explicit risk management processes, and develop comprehensive guidelines to be used by vessel operators and Transport Canada inspectors to assist them in the implementation and oversight of those processes.

TSB Recommendation M17-02

Previous responses and assessments

March 2018: response from Transport Canada

Transport Canada agrees in principle with the recommendation. Further research and analysis is needed to determine whether the development of comprehensive guidelines would be an effective means to supplement the existing requirements.

Transport Canada, as per section 106(1)(b) of CSA 2001 requires that authorized representatives develop procedures for the safe operation of the vessel and for dealing with emergencies.

For vessels that are not subject to the *Safety Management Regulations* (such as small vessels less than 24 metres in length, vessels carrying fewer than 50 passengers), Transport Canada's view is that the safety concerns continue to be best addressed through the existing, hands-on regime of the CSA 2001 regulations, as well as TC's compliance programs, which includes mandatory and risk-based inspections. The risks associated with small vessels tend to be centered on a few fundamental factors (such as hazard identification, developing operational procedures, managing risk), rather than the more complex issues associated with managing larger vessels which formal Safety Management Systems (SMS) are designed to address. TC encourages

owners of domestic commercial vessels to use the developed SMS guidance material available through TC's website, and also encourages them to implement a complete and functional SMS.

Since 2010, TC has extensively consulted stakeholders through the National Canadian Marine Advisory Council (CMAC) regarding changes to the *Safety Management Regulations*. Industry and stakeholder input has been discussed, evaluated and considered. In order to reflect the concerns and advice of industry stakeholders, TC's initial proposal for more extensive application of the proposed safety management regulations has been revised to focus on commercial vessels carrying 50 or more passengers.

Thus, in terms of the explicit risk management processes identified in the above TSB recommendation, SMS guidelines on TC's website cover the necessary elements to build a robust SMS (e.g. hazard identification, assessment of risk and management of risk by identifying mitigating factors, training). TC therefore considers that the first part of the TSB recommendation M17-02 has already been met.

To address the second part of the recommendation, TC proposes to adapt the 2014/15 Concentrated Inspection Campaign (CIC) checklist for domestic vessels carrying less than 50 passengers. This would include reviewing, in further detail, compliance with the CSA 2001 s 106(1)(b). This approach would also provide further guidance to small passenger vessel operators, promote SMS, and ultimately increase safety and security awareness amongst masters and crew.

March 2018: TSB assessment of the response (Satisfactory in Part)

An SMS is an internationally recognized framework for managing risk that, when implemented effectively, enables companies to identify hazards, manage risk, and make operations safer. Transport Canada (TC) reiterated to the Board at a briefing held in early March 2018 that TC is in the process of amending the *Safety Management Regulations* so the requirements for SMS will extend to more vessels, including Canadian passenger vessels that are certified to carry more than 50 passengers.

Although passenger vessels carrying less than 50 passengers will not be covered by the requirement for a mandatory SMS, TC acknowledges that the risks associated with small vessels tend to be centered on a few fundamental factors such as hazard identification, development of operational procedures, and risk management. TC has also acknowledged that the risk to passengers who board small passenger vessels for purposes such as tourism is different from the risk to crew members who board other types of small vessels (e.g. tugs or fishing vessels). Therefore, TC intends to assess the level of risk with respect to different categories of non-convention vessels with a view to determining if the requirements for SMS on such passenger vessels should be treated differently.

While TC has not committed to making explicit risk management processes mandatory for all small passenger vessels, TC intends to re-examine the risk associated with such vessels.

Therefore, the Board considers the response to Recommendation M17-02 to be **Satisfactory in Part**.

January 2019: response from Transport Canada

Transport Canada (TC) agrees in principle with the recommendation. TC is currently undertaking analysis of the Safety Management Regulations to determine if the scope of the proposed amendments could be expanded to capture certain vessels less than 24m, taking into account the safety benefits and cost for smaller businesses. The analysis will consider the size of vessel and the company, the type of vessel and operations, and the type of safety management systems (SMS) (e.g., third-party audit, approval or risk-based monitoring, modelled after ISM or adapted domestic SMS). At the November 2018 National Canadian Marine Advisory Council (CMAC) meeting, the Domestic Vessel Regulatory Oversight Standing Committee requested initial comments from stakeholders on the expansion of mandatory SMS requirements to smaller vessels. TC will collect the comments during the winter and take them into consideration in developing an updated proposal for initial consultation at the spring 2019 CMAC.

Until the SMS regulatory amendments are finalized, the safety culture and safe practices continue to be regulated and promoted by TC through the Canada Shipping Act, 2001 and various regulations (e.g., the Fishing Vessel Safety Regulations, Marine Personnel Regulations, Safe Working Practices, MOSH), programs (e.g., SVCP, SVCP-F) and supporting guidelines.

TC published SSB 09-2018 (“safe operation of commercial passenger vessels”) to remind operators of their obligation to develop safe operating procedures, and in particular to identify, among other safety and environmental factors, areas and conditions conducive to the formation of hazardous waves and to adopt practical risk mitigation strategies to reduce the chances of a passenger vessel encountering such conditions.

A review of the 2014-15 Concentrated Inspection Campaign (CIC) checklist for domestic vessels carrying fewer than 50 passengers is ongoing. As of March 2018, the verification of the existence of safety procedures has been added.

March 2019: TSB assessment of the response (Satisfactory in Part)

The Board notes that Transport Canada (TC) is currently analyzing the *Safety Management Regulations* with a view to determining if the scope of the proposed amendments could be expanded to capture certain vessels less than 24 m and that TC solicited comments from the stakeholders at CMAC in November 2018. The Board also notes that the amendments are still in the initial stages and that TC will develop an updated proposal for initial consultation at the spring 2019 CMAC.

TC’s review of the 2014-2015 CIC checklist for domestic vessels carrying fewer than 50 passengers is still ongoing. Until such time as TC develops comprehensive guidelines to be used by vessel operators and TC inspectors to assist them in the implementation and oversight

of those processes, the Board considers the response to the recommendation to be **Satisfactory in Part**.

January 2020: response from Transport Canada

Transport Canada (TC) agrees with the recommendation. TC updated the 2014-15 Concentrated Inspection Campaign (CIC) checklist in order for it to be used during statutory and risk-based inspections on passenger vessels that are more than 15 GT or carrying more than 12 passengers. The checklist contains a number of questions related to emergency procedures, as well as firefighting and lifesaving equipment availability and readiness. Transport Canada will use the information collected during these inspections to assess the level of compliance with the requirements highlighted in Ship Safety Bulletin 09/2018 and determine if further action is needed.

TC has carried out additional analysis pertaining to the implementation of safety management systems (SMS) throughout the Canadian vessel fleet. An overview of the analysis was presented at the Fall 2019 national Canadian Marine Advisory Council (CMAC) to obtain initial commentary from stakeholders on the expansion of mandatory SMS requirements.

TC is currently developing a regulatory proposal that is expected to be presented at the Spring 2020 CMAC. TC will convene a meeting with the TSB in early 2020 to provide a detailed brief on TC's proposed way forward and to further inform the TSB reassessment of this recommendation. The amended *Safety Management Regulations* are targeted to be published in the *Canada Gazette*, Part I, in June 2020.

March 2020: TSB assessment of the response (unable to assess)

The Board notes that Transport Canada (TC) has updated its Concentrated Inspection Campaign checklist to be used during statutory and risk-based inspections on passenger vessels that are more than 15 GT or carrying more than 12 passengers. TC will use the information collected during these inspections to assess the level of compliance with the requirements highlighted in Ship Safety Bulletin 09/2018 and to determine if further action is needed.

TC has also indicated that it has carried out further analysis of the *Safety Management Regulations* with a view to determining whether the scope of the proposed amendments could be expanded. An overview of the analysis was presented to stakeholders at the 2019 Canadian Marine Advisory Council (CMAC) for initial comments.

On 05 February 2020, TC convened a meeting with the TSB and provided details on the regulatory proposal to be presented at CMAC in the spring of 2020, prior to publishing the amended *Safety Management Regulations* in the *Canada Gazette*, Part I, in June 2020. While TC has made some progress, given that it has not yet consulted with industry on the proposal, the Board presently cannot determine the practicality or effectiveness of the actions proposed to address the safety deficiency in the commercial passenger vessel sector that is the object of this recommendation. As a result, it is not clear whether these actions are making meaningful

progress towards requiring commercial passenger vessel operators to adopt explicit risk management processes.

The Board is **unable to assess** the response to the recommendation.

February 2021: response from Transport Canada

Transport Canada agrees with the recommendation.

The Department convened a meeting with the Transportation Safety Board in the fall of 2020 regarding Transport Canada's proposed way forward for amendments to the *Marine Safety Management System Regulations*. The proposed amendments will expand both Safety Management System and oversight requirements to all domestic passenger vessels. For larger and high-risk vessels, these requirements would be fully aligned with the International Maritime Organization's International Safety Management Code, subject to annual inspection and approval by a Recognized Organization. Smaller vessels will need to put in place an adapted domestic Safety Management System, and be subject to Transport Canada's standard risk-based oversight regime for smaller vessels.

Transport Canada hosted virtual consultations on the proposed *Marine Safety Management System Regulations* with various organizations in the summer of 2020. These consultations included key stakeholders, such as the Canadian Ferry Association, Passenger and Commercial Vessel Association (PCVA), and the Canadian Passenger Vessel Association (CPVA). The department offered additional online consultations through the fall of 2020 through Transport Canada's *Let's Talk Transportation* platform. During these consultations, Transport Canada shared its updated regulatory [plan] with stakeholders in August 2020 and an overview of the comments received pertaining to the proposed regulations was presented at the fall 2020 national Canadian Marine Advisory Council (CMAC).

These proposed regulations are targeted to be published in the *Canada Gazette*, Part I, in spring 2021.

March 2021: TSB assessment of the response (Satisfactory Intent)

In the fall of 2020, Transport Canada (TC) met with the TSB to discuss the expansion of both safety management systems (SMS) and oversight requirements to all domestic passenger vessels in its amendments to the *Marine Safety Management System Regulations*. Requirements for larger and high-risk vessels would be aligned with the International Maritime Organization's *International Safety Management Code*, subject to annual inspection and approval by a Recognized Organization. Smaller vessels would need to put in place an adapted domestic SMS and would be subject to TC's standard risk-based oversight regime. TC indicates that amendments to the *Marine Safety Management System Regulations* are targeted to be published in the *Canada Gazette*, Part I, in spring 2021.

Recommendation M17-02 calls for TC to request commercial passenger vessel operators to adopt comprehensive risk management processes and for the department's inspectors to assist

in their implementation. The amendments to the *Marine Safety Management System Regulations* will expand SMS regulations and, since risk management forms an integral part of an SMS, it is expected that the expanded application of these regulations will substantially address this safety deficiency.

The Board considers the response to Recommendation M17-02 to show **Satisfactory Intent**.

December 2021: response from Transport Canada

Transport Canada's proposed way forward for amendments to the *Marine Safety Management System Regulations* will expand both Safety Management System and oversight requirements to all domestic passenger vessels.

March 2022: TSB assessment of the response (Satisfactory Intent)

Transport Canada intends to pre-publish the proposed amendments to the *Marine Safety Management System Regulations* in the *Canada Gazette*, Part I in June 2022. When published, the Board believes the proposed amendments will expand the application of safety management systems (SMS) and, since risk management forms an integral part of an SMS, it is expected that the expanded application of these regulations, in conjunction with SSB 09/2018, will substantially address this safety deficiency.

Therefore, the Board considers the response to Recommendation M17-02 to show **Satisfactory Intent**.

Latest response and assessment

December 2022: response from Transport Canada

Proposed *Marine Safety Management System Regulations* (MSMSR) were published in *Canada Gazette, Part I* in June 2022. Transport Canada is considering potential revisions based on comments received during commenting period, and anticipates publishing in *Canada Gazette, Part II* by fall 2023. With the implementation of these regulations, marine safety culture in day-to-day operations will be enhanced through the expansion of formal Safety Management System (SMS) requirements to a greater portion of vessels operating in Canadian waters. The consistent and appropriate application of SMS in the marine sector will contribute to reduce the likelihood and severity of marine-related accidents and incidents onboard commercial vessels operating in Canadian waters, resulting in fewer fatalities, serious injuries, and pollution incidents.¹

¹ Responses are those of the stakeholders to the TSB in written communications and are reproduced in full. The TSB corrects typographical errors in the material it reproduces without indication but uses brackets [] to show other changes or to show that part of the response was omitted because it was not pertinent.

March 2023: TSB assessment of the response (Satisfactory Intent)

Transport Canada's (TC) response highlights the pre-publication of the new *Marine Safety Management System Regulations* (MSMSR) in the *Canada Gazette*, Part I in June 2022 and its upcoming publication in the *Canada Gazette*, Part II in fall 2023. The Board believes the proposed amendments to the MSMSR will expand the application of safety management systems (SMS). Since the risk management of operating environments forms an integral part of an SMS, it is expected that the expanded application of these regulations, in conjunction with SSB 09/2018, will substantially address this safety deficiency.

The Board considers the response to Recommendation M17-02 to be **Satisfactory Intent**.

File status

The TSB will continue to monitor Transport Canada's proposed actions.

This deficiency file is **Active**.