



SAFETY MANAGEMENT

Some transportation operators in the air, marine and rail sectors are not managing their safety risks effectively, and many are still not required to have formal safety management processes in place. Moreover, those operators that have implemented a formal safety management system (SMS) are not always able to demonstrate that it is working and producing the expected safety improvements.

The situation

Note: In 2018, the TSB originally included "safety management and oversight" as a single issue on the Watchlist. For Watchlist 2020, these two issues have been separated into the issues of **Safety management and **Regulatory surveillance** to allow a greater focus on their individual elements.*

Safety management systems (SMS) are an internationally recognized framework that allows companies to identify hazards, manage risk, and make operations safer—ideally before an accident occurs. Although the issue of safety management has been on the Watchlist since 2010, TSB investigation reports continue to note various deficiencies and concerns in three sectors of transportation, specifically:

AIR – There has been little progress to extend the application of SMS beyond *Canadian Aviation Regulations* (CARs) subpart 705 operators. SMS requirements still do not apply to CARs subpart 702, 703, and 704 operators, flight training units (which operate under CARs subpart 406), or non-certified aerodrome operators. Combined, CARs 702, 703, and 704 operators make up over 90% of all Canadian commercial air operators.

MARINE –To date, only Canadian vessels that operate on international voyages and are subject to Chapter IX of the *International Convention for the Safety of Life at Sea* (SOLAS) must comply with the existing *Safety Management Regulations*. These regulations do *not* apply to the majority of domestic vessels (referred to as "non-convention" vessels), although a recent "tiered" proposal by Transport Canada (TC) would expand their applicability.¹ However, even when operators *do* have safety management processes in place, they are not always able to demonstrate that hazards are being identified and that effective risk-mitigation measures are being implemented.

RAIL – Federally regulated railways have been required to have an SMS since 2001, and regulatory requirements were significantly enhanced in 2015. However, since then, companies' SMS have not produced the expected safety improvements associated with mature safety management and safety culture, as the rate of main-track accidents has increased, and recent TSB investigations have identified numerous shortcomings where hazards were not identified and effective risk-mitigation measures were not taken.³ The TSB believes

¹ Under this proposal, vessels less than 24 m in length, those less than 500 gross tonnage, and those carrying fewer than 50 passengers would require an SMS. However, these systems would not receive external reviews or audits, and their effectiveness would therefore remain unverified. The proposed regulations are expected to be pre-published in the *Canada Gazette, Part 1* in late winter 2021.

³ TSB rail transportation safety investigation reports R17D0123, R17W0267, and R18H0039.





that railway companies' SMS are not yet effectively identifying hazards and mitigating risks in rail transportation.

The risks to people, property, and the environment

AIR – Currently, over 90% of commercial aviation operators in Canada are not required to have an SMS. Many of these are smaller companies and, without the benefit of an SMS, they continue to miss opportunities to improve the safety of their operations. The likelihood of more fatalities and serious injuries therefore remains high.⁴

MARINE – The problem is twofold: First, without a regulatory requirement, the majority of domestic marine companies and vessels may not implement formal safety management processes. Second, as TSB investigations have found, even when formal processes are present, they are often not effective in identifying hazards or reducing the risks.⁵ This leaves many vessels and operators—and notably passenger vessels—without the benefit of an effective system for managing safety.

RAIL – Although all federally regulated railway companies have an SMS, their effectiveness has not been evaluated. Moreover, since the release of Watchlist 2018, the TSB has published three reports with SMS-related findings.⁶ The increasing rate of main track train collisions and derailments poses an ongoing risk to people, property, and the environment.

⁴ For example, from 2010 to 2019, commercial air operators that were required to have an SMS (those operating under CARs subpart 705) were involved in 62 accidents, resulting in 13 fatalities. In contrast, commercial air operators that were not required to have an SMS (those operating under CARs subparts 702, 703, and 704) were involved in 624 accidents and 209 fatalities. Moreover, of the 25 investigations since 2010 in which the Board has made findings relating to safety management, 18 involved operators that were not required to have an SMS. These operators also represent 30 of the 31 fatalities in those investigations.

⁵ Between 2015 and 2019, there were 13 Class 2 and 3 TSB investigation reports with findings related to safety management (TSB marine transportation safety investigation reports M18P0257, M17C0179, M16A0141, M16C0036, M16P0062, M16A0115, M16C0137, M16P0162, M16P0241, M15P0347, M15C0094, M15P0037, and M15A0009). In eight of these 13 occurrences, the operators did not have any SMS processes in place, and in four occurrences, the vessels had voluntary SMS that were not externally audited. In one occurrence, the vessel had a voluntary SMS in place that was externally audited.

⁶ TSB rail transportation safety investigation reports R17D0123, R17W0267, and R18H0039.





TSB recommendations

There are nine relevant recommendations supporting this issue.

Table 1. TSB recommendations relevant to the Watchlist 2020 issue of safety management, and their 2020 ratings

Transportation sector	Recommendation number	Recommendation	Assessment in 2020
Air	A16-12	TC to "require all commercial aviation operators in Canada to implement a formal safety management system."	Unable to assess
Air	A16-13	TC to "conduct regular SMS assessments to evaluate the capability of operators to effectively manage safety."	Satisfactory in Part
Air	A19-03	Aviation industry associations to "promote proactive safety management processes and safety culture with air-taxi operators ... through training and sharing of best practices, tools, and safety data."	Unable to assess
Marine	M04-01	TC to "take steps to ensure that small passenger vessel enterprises have a safety management system."	Unable to assess
Marine	M17-01	TC to ensure that commercial passenger vessel operators off Vancouver Island identify areas of risk "and adopt practical risk mitigation strategies" to reduce the likelihood of encountering certain conditions.	Satisfactory in Part
Marine	M17-02	TC to "require commercial passenger vessel operators to adopt explicit risk-management processes, and to develop comprehensive guidelines to ... assist them in the implementation and oversight of those processes."	Unable to assess
Rail	R14-05	TC to audit railways' SMS "in sufficient depth and frequency to confirm that the required processes are effective and that corrective actions are implemented to improve safety."	Satisfactory Intent
Rail	R17-01	TC to study factors increasing "the severity of the outcomes for derailments involving dangerous goods, identify appropriate mitigating strategies" and amend railway rules accordingly.	Satisfactory Intent
Rail	R20-01	TC to work with the industry and its labour representatives "to identify the underlying causes of uncontrolled movements that occur while switching without air, and develop and implement strategies and/or regulatory requirements to reduce their frequency."	Not yet assessed



Actions taken

Issues on the Watchlist are complex and difficult to solve, requiring action from many stakeholders including operators and the regulator. Even when more needs to be done, some initial steps have often been taken. These are listed here.

AIR – Although there has been some progress in responding to the three TSB recommendations on this issue, that progress has been piecemeal, and TC is not planning to either modify or extend SMS to other sectors of Canadian commercial aviation until its ongoing SMS policy review has been completed.

Some industry associations, meanwhile, are promoting and providing tools for the development of SMS to their members. Additionally, industry feedback to the TSB indicates that operators that are not required to have an SMS are nonetheless making efforts to implement scaled versions of SMS; these efforts, however, are sometimes hindered by insufficient human resources or expertise, cost, and complexity.

MARINE – TC began the process of amending the regulations to include some classes of non-convention vessels in 2010. These classes include domestic vessels over 500 gross tonnage) or those carrying more than 10 passengers. TC has also begun a cost-benefit analysis to determine the feasibility of including domestic vessels less than 24 m in length. However, as of 2020, these amendments are not yet finalized.

A small number of operators, meanwhile, have voluntarily adopted SMS, though without external auditing or verification, the effectiveness of these systems to identify and mitigate risks is unknown.

RAIL – TC recently completed a cycle of comprehensive audits, reported its findings, and received company corrective action plans. TC now possesses the internal capability to assess the effectiveness of railway company SMS and safety outcomes, and plans to do so starting in 2020–21.

In October 2018, TC and the Railway Association of Canada hosted a second SMS workshop with industry and other stakeholders to share ideas and best practices. Efforts are now underway to determine ways to conduct a third workshop, though these have been limited by restrictions associated with COVID-19.

Industry and TC have also agreed to maintain the commitment to work collaboratively to improve SMS and safety culture.

Actions required

This issue will remain on the Watchlist for the **air** and **marine** transportation sectors until:

- TC implements regulations requiring *all* commercial operators to have formal safety management processes; and
- Transportation operators that do have an SMS demonstrate to TC that it is working—that hazards are being identified and effective risk-mitigation measures are being implemented.

This issue will remain on the Watchlist for the **rail** transportation sector until:

- Safety data is collected and analyzed to reliably determine risk assessment and risk mitigation, leading to measurable safety improvement.

