FOLLOWING RAILWAY SIGNAL INDICATIONS

Train crews do not consistently recognize and follow railway signals. This poses a risk of train collisions or derailments, which can have catastrophic consequences.

The situation

For over a century, Canada has relied on a system of visual signals to control traffic on a significant portion of its rail network. These signals convey direction such as operating speed and the operating limits within which the train is permitted to travel. Train crews are required to identify and communicate the signal indications among themselves, and then take required action in how they operate the train.

Sometimes, however, train crews misinterpret or misperceive a signal indication.

How often does this happen?

Between 2008 and 2017, there was an annual average of 33 occurrences in which a train crew did not respond appropriately to a signal indication displayed in the field.[1]

Train signal misinterpretation or misperception has been cited as a cause or contributing factor in numerous rail investigations conducted by the Transportation Safety Board of Canada (TSB).[2] In the United States, the National Transportation Safety Board has investigated similar accidents and has also concluded that additional physical defences are required.[3]

The risks to people, property, and the environment

This issue has been on the Watchlist since 2012. Although the probability of a missed signal leading to an accident may be low, the resulting train collision or derailment could have catastrophic consequences for people, property, and the environment.

---

1 Movements exceeding the speed specified by a signal that did not result in a TSB-reportable occurrence are not included in TSB data.

2 TSB railway investigation reports R98V0148, R99T0017, R07E0129, R09V0230, R10Q0011, R10V0038, R11E0063, R12T0038, R13C0049, R14T0294, R15V0183, R15D0118, R16E0051, and R16T0162.

3 US National Transportation Safety Board accident reports RAB-06-07, RAR-07-01, and RAR-09-02.

Outstanding TSB recommendations

The TSB has made 2 recommendations on following railway signal indications,[4] first in 2000 and again in 2013. Although Transport Canada and the railway industry are studying the issue, their work is not sufficiently advanced to indicate if or when additional physical safety defences will be implemented.

Actions taken

Transport Canada and the Canadian railway industry remain firmly in "study mode." The past few years have seen many meetings but insufficient progress on implementing the solutions that are already known and, in some cases, being applied elsewhere.

Some railways in Europe and the United States, for instance, have train control systems that will sound an alarm in the locomotive cab or even stop the train if the crew does not respond appropriately to a signal displayed in the field. However, similar technology has not yet been implemented on any federally regulated railway in Canada.

Stakeholders here continue to monitor the implementation of positive train control in the United States with the intention of applying lessons learned in Canada. Through analysis of occurrence data, they have determined any implementation will be risk-based and corridor-specific rather than "one size fits all." However, freight rail corridor prioritization has not yet been established, and no concrete actions have been implemented.

For passenger operations, Metrolinx—the largest commuter rail operator in Canada—intends to install a train control system on all its lines in the Greater Toronto area, and VIA Rail is continuing with its proof-of-concept GPSTrain.

Action required

This issue will remain on the Watchlist until Transport Canada requires that railways implement additional physical safety defences to ensure that signal indications governing operating speed and operating limits are consistently recognized and followed.

---

4 TSB recommendations R00-04 and R13-01.