UNPLANNED/UNCONTROLLED MOVEMENT OF RAIL EQUIPMENT

Unplanned/uncontrolled movements of rail equipment create high-risk situations that may have catastrophic consequences. Between 2010 and 2019, the trend of unplanned/uncontrolled movements was on an upward trajectory.

The situation

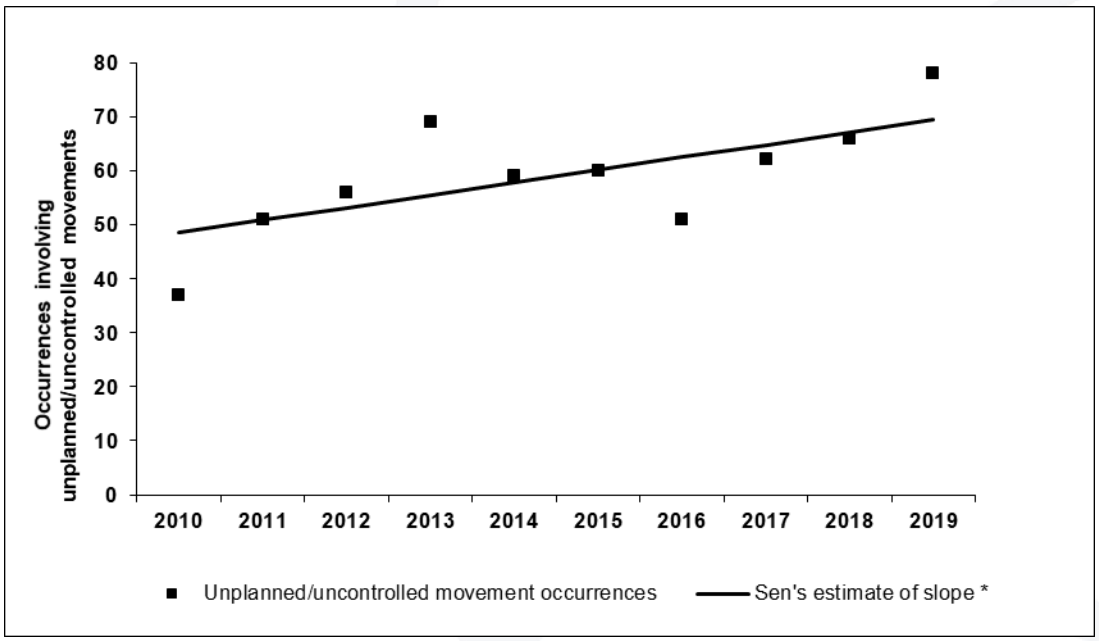
Despite significant safety action taken by Transport Canada and the railway industry since the Lac-Mégantic accident (TSB Railway Investigation Report R13D0054) to reduce the number of unplanned/uncontrolled movements of rail equipment, the number of occurrences has continued to trend upwards, posing a significant risk to the rail transportation system.

How often does this happen?

Uncontrolled movements are low-probability events, but when they occur, either on or off the main track, they can have catastrophic consequences—particularly if they involve dangerous goods. As demonstrated in Lac-Mégantic, the cost to human life and our communities can be incalculable.

Between 2010 and 2019, the trend of unplanned/uncontrolled movements was on an upward trajectory, with a peak of 78 occurrences in 2019.

Figure 1. Occurrences involving unplanned/uncontrolled movement of rail equipment, 2010 to 2019



* Upward trend in occurrences over the period (τb = 0. 6293, p = 0.0119). Sen's estimate of slope is an unbiased estimator of the true slope of the trend line.

The TSB has categorized unplanned/uncontrolled movements into three distinct types:

- **Insufficient securement of rolling stock** when left unattended, which was causal in the Lac- Mégantic disaster and other occurrences[1];
- Uncontrolled movement of cars in rail yards while they are being **switched without the use of air brakes**, was causal in several occurrences[2];
- A **crew member loses control of a train** and cannot stop the movement with the available brakes, was also causal in several occurrences[3].

Table 1. TSB occurrences involving unplanned/uncontrolled movements of rail equipment between 2010 and 2019, by causal category

Type of uncontrolled movement	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
Securement	25	32	44	42	38	37	29	39	34	46	366
Switching without air	10	16	12	24	21	22	18	21	27	31	202
Loss of control	2	3	0	3	0	1	4	2	5	1	21
Total	37	51	56	69	59	60	51	62	66	78	589

The risks to people, property, and the environment

Uncontrolled movements pose a significant risk to railway employees. When such movements involve the main track, the public—including passengers and people in the vicinity of the railway tracks—can also be exposed to risk. The risks increase significantly when a train carries dangerous goods.

The derailment of a crude oil train in Lac-Mégantic, Quebec, in 2013, which directly caused the death of 47 people and destroyed the town's core and main business area, was the result of an uncontrolled movement. Since then, the TSB has published 12 investigation reports on uncontrolled

1 Securement-related occurrences: TSB rail transportation safety investigation reports R13D0054, R15D0103, and R16W0059.

2 Occurrences involving switching without air: TSB rail transportation safety investigation reports R15T0173, R16W0074, R17V0096, R17W0267, R18Q0046, and R19C0002

3 Occurrences involving loss of control: TSB rail transportation safety investigation reports R16T0111, R16W0242, R18E0007, and R18H0039.

movements in which four employees died and two employees were seriously injured,[4] [5]and is currently investigating three additional occurrences[6] in which four employees died.

Outstanding TSB recommendations

The Board has made two recommendations relating to uncontrolled movements:

Recommendation R14-04 states "[t]hat the Department of Transport [should] require Canadian railways to put into place additional physical defences to prevent runaway equipment."

Recommendation R20-01 states "[t]hat the Department of Transport [should] work with the railway 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."

The Board has issued one safety concern relating to uncontrolled movements. As a result of the investigation into the March 2016 uncontrolled movement of equipment that travelled onto the main track in Saskatoon, Saskatchewan (TSB Railway Investigation Report R16W0074), it was determined that, despite TC and industry initiatives, the desired outcome of significantly reducing the number of uncontrolled movements has not yet been achieved. Consequently, the Board issued the following safety concern:

> The Board is concerned that the current defences are not sufficient to reduce the number of uncontrolled movements and improve safety.

Actions taken

Transport Canada has made the following progress in relation to Recommendation R14-04:

Working to amend the *Railway Employee Qualification Standards Regulations* to reflect changes in the evolving railway industry.

Created a remote control locomotive (RCL) guideline recommending action to be taken by the railways regarding the training and qualification of employees in RCL operation.

Continues to revise the *Railway Locomotive Inspection and Safety Rules*, for requirements specific to locomotives equipped with roll-away protection.

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4 One fatality was involved in occurrence R17W0267.

5 Three fatalities and 2 injuries occurred as result of an accident on a provincially regulated railway (TSB Railway Investigation Report R17V0096). This accident is not included in the uncontrolled movement data, which only includes occurrences on federally regulated railways.

6 TSB rail transportation safety investigation reports R18M0037, R19C0002, and R19C0015.

Revised Rule 112 of the *Canadian Rail Operating Rules* (CROR) to include specific instructions on hand brake effectiveness testing and a chart indicating the number of handbrakes required relevant to the length and location of such equipment.

Issued a ministerial order and a new rule, CROR Rule 66, regarding the securement of trains stopped in emergency on heavy and mountain grades.

Transport Canada and the railway industry have taken some significant actions with additional administrative defences to prevent these occurrences, and actions to mitigate them through the use of physical defences such as derail devices where appropriate. However, the desired outcome—to reduce the number of these types of occurrences—has not been achieved. In fact, in 2019, there were 78 uncontrolled movements, the highest annual number in the past 10 years. Over the 10 years from 2010 to 2019, there has been an average annual increase of 2.33 occurrences per year, with 71% of the increase related to switching without air. These uncontrolled movements continue to pose a significant risk to the rail transportation system.

In its 2020 assessment of Recommendation R14-04, the Board considered the response to be Satisfactory in Part. The Board was still assessing TC's response to recommendation R20-01 at the time of publishing Watchlist 2020.

Action required

While all three categories of unplanned/uncontrolled movements share some common causes, they each require unique strategies either to prevent the occurrences from happening or to reduce the associated risks. TC, the railway companies, and labour unions must collaborate, devise strategies, and implement physical and administrative defences to address each type of uncontrolled movement. For the safety of railway workers and the public, the TSB wants to see a downward trend in the number of such occurrences.