



UNPLANNED/UNCONTROLLED MOVEMENT OF RAIL EQUIPMENT

Unplanned and uncontrolled movements of rail equipment create high-risk situations that may have catastrophic consequences. Between 2010 and 2021, the number of uncontrolled movements has not shown a downward trend.

The situation

Despite significant safety action taken by Transport Canada (TC) and the railway industry since the Lac-Mégantic accident ([R13D0054](#)) to reduce the number of unplanned and uncontrolled movements¹ of rail equipment, uncontrolled movements continue to occur, 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.

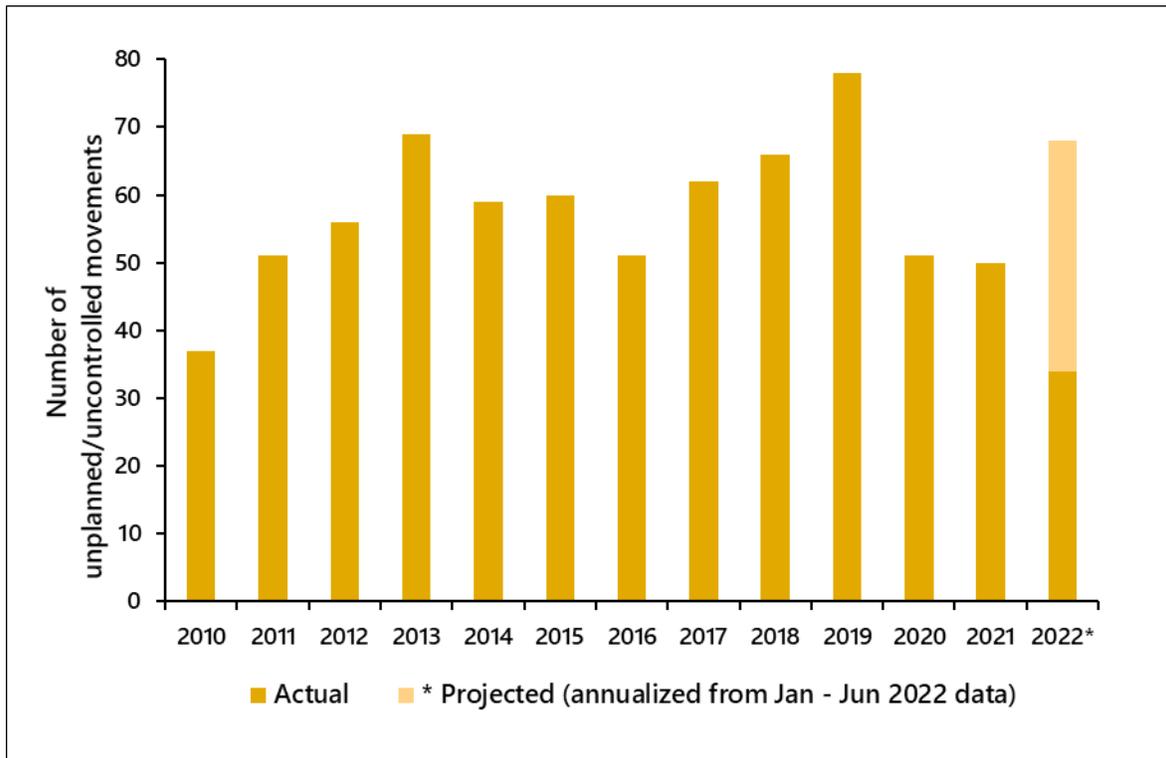
Despite the actions taken to improve safety and prevent uncontrolled movements, the trend of uncontrolled movements between 2010 to 2019 was on an upward trajectory, with a peak of 78 occurrences in 2019 (Figure 1). Although the 2020 and the 2021 data indicate a reduction in the number of such occurrences as compared to previous years, there is no statistically significant trend. Furthermore, this decrease may be due in part to the impact of COVID-19 on the rail industry as well as other disruptions to service. From 01 January to 30 June 2022, there were 34 uncontrolled movements. Annualizing this figure gives a projection of 68 uncontrolled movements for 2022, which shows a return to pre-COVID-19 activity levels.

¹ Unplanned and uncontrolled movements constitute a single category of reportable occurrences under the *Transportation Safety Board Regulations*. For brevity, this document refers to this category of occurrence as uncontrolled movements.





Figure 1. Occurrences involving uncontrolled movement of rail equipment, 2010 to 30 June 2022 (Source: TSB)



The Transportation Safety Board of Canada (TSB) has categorized uncontrolled movements into three types:

- **Insufficient securement of rolling stock** when left unattended, which was causal in the 2013 Lac-Mégantic accident ([R13D0054](#)), as well as other TSB occurrences such as [R15D0103](#), [R16W0059](#), and [R17Q0061](#);
- Uncontrolled movement of cars in rail yards while they are being **switched without the use of air brakes**, was causal in several occurrences, such as the 2018 Edmundston Yard accident ([R18M0037](#)), and TSB occurrences [R15T0173](#), [R16W0074](#), [R17V0096](#), [R17W0267](#), [R18Q0046](#), [R19C0002](#), and [R20V0230](#);
- **Loss of control**, which occurs when a crew member cannot control a locomotive, a car, a cut of cars, or a train with the available brakes, was also causal in several occurrences, such as the 2019 derailment of a grain train near Field, British Columbia ([R19C0015](#)) and TSB occurrences [R16T0111](#), [R16W0242](#), [R18E0007](#), [R18H0039](#), and [R21T0007](#).



Table 1. TSB occurrences involving uncontrolled movements of rail equipment from 2010 to June 2022, by type

Type of uncontrolled movement	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022*	Total
Securement	25	32	44	42	38	37	29	39	34	46	31	33	18	448
Switching without air	10	16	12	24	21	22	18	21	27	31	19	16	16	253
Loss of control	2	3	0	3	0	1	4	2	5	1	1	1	0	23
Total	37	51	56	69	59	60	51	62	66	78	51	50	34	724

* To 30 June 2022.

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 2013 derailment of a crude oil train in Lac-Mégantic, Quebec ([R13D0054](#)), which directly caused the death of 47 people and destroyed the town’s core and main business area, and the 2019 derailment of a grain train near Field, British Columbia ([R19C0015](#)), which caused the death of 3 crew members, were both the result of uncontrolled movements. Since 2013, the TSB has published 18 investigation reports involving uncontrolled movements in which eight employees died and two employees were seriously injured,^{2,3} and is currently investigating one additional occurrence.⁴

Active TSB recommendations

The Board has made four recommendations relating to uncontrolled movements:

TSB Recommendation [R14-04](#) calls on TC to require Canadian railways to put into place additional physical defences to prevent runaway equipment.

TSB Recommendation [R20-01](#) calls on TC to work with the railway industry and its labour representatives to identify the underlying causes of uncontrolled movements that occur while

² One fatality was involved in occurrence [R17W0267](#), one fatality was involved in occurrence [R18M0037](#), and three fatalities were involved in occurrence [R19C0015](#).

³ 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 include occurrences on federally regulated railways.

⁴ TSB Rail Transportation Safety Investigation [R22T0045](#).



switching without air, and develop and implement strategies and/or regulatory requirements to reduce their frequency.

TSB Recommendation [R22-01](#) calls on TC to establish enhanced test standards and requirements for time-based maintenance of brake cylinders on freight cars operating on steep descending grades in cold ambient temperatures.

TSB Recommendation [R22-02](#) calls on TC to require Canadian freight railways to develop and implement a schedule for the installation of automatic parking brakes on freight cars, prioritizing the retrofit of cars used in bulk commodity unit trains in mountain grade territory.

The Board has also 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 ([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. The safety concern states that “The Board is concerned that the current defences are not sufficient to reduce the number of uncontrolled movements and improve safety.”

Action taken

Issues on the Watchlist are complex and difficult to solve, requiring action from many stakeholders, including operators and the regulator. Although some steps may have been taken, more needs to be done. These are some of the steps that have been taken to date.

Over the past several years, a number of initiatives were put in place by TC and by industry to address the issue of uncontrolled movements and the Board’s recommendations.

For uncontrolled movements caused by insufficient securing of rolling stock

- Rule 112 of the *Canadian Rail Operating Rules* (CROR) was revised to include specific instructions on hand brake effectiveness testing and a chart indicating the number of handbrakes required depending on total tonnage and the average grade of the track.
- TC is working with the Railway Association of Canada to implement Ministerial Order (MO) 21-01, which requires the implementation of safety measures that are designed to prevent the unintentional release of air brakes.
- As mandated by MO 21-02, the *Railway Locomotive Inspection and Safety Rules* were revised to incorporate design and performance parameters for locomotives equipped with rollaway protection. The CROR were also revised to develop a precise definition of attended versus unattended equipment as well as to incorporate requirements on the use of rollaway protection to reduce the risks of an uncontrolled movement. Both of these revisions came into effect in October 2022.



For uncontrolled movements involving switching without air

Revisions to the CROR now prescribe

- when air brakes must be used during switching operations to ensure a consistent approach across the railway system (Rule 113.3);
- measures to ensure that stationary equipment is secured during switching operations to prevent uncontrolled movements (rules 113.1 and 113.2); and
- speed restrictions when switching is conducted with a remotely controlled locomotive (Rule 70).

For uncontrolled movements involving a loss of control

- Rule 112 of the CROR was updated to establish stronger safety requirements and ensure a consistent industry-wide approach to securement. These updates included specifying employee responsibilities related to the securement of equipment and differentiating securing requirements for equipment on different types of tracks (i.e., main tracks, non-main tracks, and yard tracks), as well as specifications for effective safety procedures to be applied to all trains that come to emergency stops on heavy and mountain grades.
- Rule 66 of the CROR was approved by TC to ensure that effective safety procedures are applied to all trains that come to emergency stops on heavy and mountain grades.
- As required by MO 20-08 and MO 21-04, railway companies must report instances of emergency brake applications and their circumstances to TC in order to better understand and identify measures to address the risks stemming from these occurrences.
- Due to concerns with the effectiveness of air brake systems on freight cars operating in cold ambient temperatures, the Association of American Railroads amended Rule 4.A.3 of the *Field Manual of the AAR Interchange Rules*. As of July 2021, air brake valves on all coal, grain, and tank car unit trains operating above the 37th parallel must be changed when the manufacture or recondition date (whichever is later) is more than 14 years old.

Other action taken

TC held a workshop with industry and labour representatives on the subject of uncontrolled movements and is working to modernize the *Railway Employee Qualification Standards Regulations*. These changes will reflect operational experience gained over the years, the evolving safety environment, technological advancements, new operating positions, recommendations, guidance as well as best practices in the rail industry.

In summary, TC and the railway industry have added a number of administrative defences to prevent these occurrences. Physical defences to mitigate them, such as derail devices where appropriate, are also being used. 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. Although the 2020 and 2021 numbers are lower, those years were marked by a pandemic affecting the entire transportation industry, as well as by other service disruptions. Furthermore, from 2010 to 2021, there has been no statistically significant trend in



the number of occurrences: in other words, no clear improvement. Uncontrolled movements continue to pose a significant risk to the rail transportation system.

Action required

Although all three types of 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 not just administrative defences, but also physical defences to address each type of uncontrolled movement. For the safety of railway workers, the environment, and the public, the TSB wants to see a downward trend in the number of uncontrolled movements.