Annual Railway Safety Report 2022

Traficom Publications
19/2023

Contents

1 Introduction

1.1 Purpose, scope and target group of the Annual Railway Safety Report

The Annual Railway Safety Report 2022 of the Finnish Transport and Communications Agency Traficom describes the status of railway safety in Finland in 2022. In addition, the Annual Railway Safety Report describes the central issues in permit, supervisory and regulatory activities related to railways by Traficom during 2022. The Annual Railway Safety Report is Traficom's annual report on railways referred to in section 17 of the Rail Transport Act (1302/2018). Under the Rail Transport Act, Traficom must each year prepare a report on its operations and the development of railway safety in Finland in the previous year and submit the report to the European Union Agency for Railways (ERA) by the end of September. The report is also submitted to the Ministry of Transport and Communications and published on Traficom's website. The main sources of the safety information presented in this report include the safety reports of infrastructure managers and railway undertakings, railway operators' accident and occurrence reports, and the Safety Investigation Authority's accident investigation reports. Information on Traficom's operations has been gathered from its public officials and by reviewing documents relevant to its operations. The structure of the Annual Railway Safety Report follows the latest version of ERA's reporting guidelines issued in April 2020.

1.2 Summary of the safety situation in 2022

The volume of train transport grew in 2022 compared to the previous year. In 2022, 48.7 million kilometres were travelled by train on the Finnish railways, while a year earlier the same figure was 47.4 million. The number of kilometres by train in goods transport decreased slightly compared to the previous year, while in passenger transport, the traffic volume increased, and it has returned very close to the kilometres travelled by passengers during the years before the coronavirus.

Passenger safety in Finland remains at an excellent level. No fatal accidents involving passengers or personnel occurred in train transport or during shunting in 2022. During track work, one track maintenance worker was unfortunately run over by a train and died.

In 2022, there were 17 significant accidents in accordance with the definition of the EU[1] in the Finnish railways (Figure 1), in which four people died and seven were seriously injured. The number of significant accidents was clearly lower than in 2021. However, when compared to the last 10 years, it was on a very similar level to the previous years. Compared to 2021, the largest reduction involved level crossing accidents (13 accidents in 2021 compared to 5 accidents in 2022). The number of other accidents[2] was also halved.

[1] Significant accident: any accident involving at least one rail vehicle in motion, resulting in at least one killed or seriously injured person, or in significant damage to stock, track, other installations or environment (causing costs of at least EUR 150,000), or extensive disruptions to traffic (lasting at least six hours), excluding accidents in workshops, warehouses and depots.

[2] Other accidents include e.g. collisions and derailments that occur during shunting and track work.

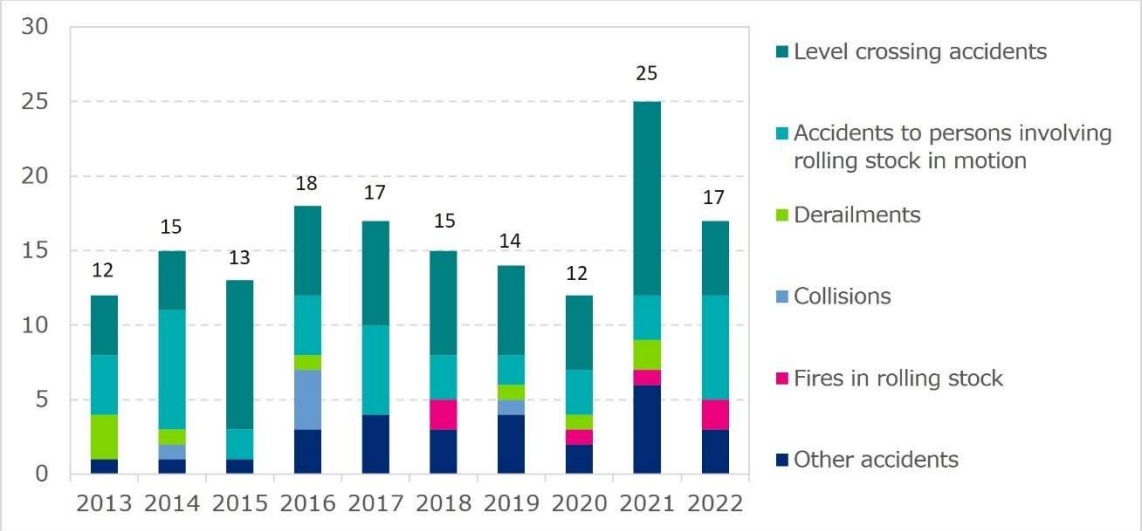

Figure 1. Number of significant railway accidents by accident type in 2013–2022.

In 2022, most (7 accidents) of the significant accidents were accidents resulting in personal injuries caused by rolling stock in motion. Four people were seriously injured and three people died in these accidents. One of the fatalities was a track maintenance worker.

There were five significant level crossing accidents in 2022 in which one person died and three were seriously injured. In one accident, the costs exceeded EUR 150,000. Four of these accidents occurred at passive level crossings and one at a crossing with automatic barriers. There were 15 level crossing accidents in 2022 in total, which is the lowest figure in the entire monitoring history.

In addition to the accidents resulting in personal injuries and level crossing accidents, there were two fires in rolling stock and three accidents categorised as 'Other accidents'. As a result of a fire in a railcar in October, VR Group Plc removed all railcars from traffic and inspected them. Operation was restarted after it had been ensured that the rolling stock was safe to use. Of the cases in the category 'Other accidents', two involved derailments of rolling stock during shunting, and in one case the train collided with an object within the structure gauge.

The annual number of accidents and dangerous situations occurring during shunting has decreased during the last 10 years. Accidents and dangerous situations still occur, however, and in 2022 there were even a few more shunting occurrences than in the previous year. VR Group Plc has noticed this growing trend, and as a result, a shunting occurrence analysis project was started in the spring of 2022.

Most of the deaths on Finnish railways are caused by the person being run over by a train as a result of being on the tracks without authorisation. These accidents cause approximately 50 to 60 fatalities every year. Most of them are deliberate. No clear trend can be observed in the annual numbers of these accidents. In 2021 their number was below average (38), but in 2022 it returned to the previous level (59 cases).

The safe coordination of track work and train traffic has been a key challenge to railway safety for a number of years. Typical occurrences related to track work

include railway work protection errors, unauthorised passing of the boundary of the track work area, working without a track work permit, railway work location errors and neglecting to follow the safety guidelines. The safety of railway infrastructure management has improved during the last monitoring period of five years – there has been a positive development in both the annual number of occurrences in railway infrastructure management as well as the success rate of track work. The improvement compared to 2021 is not large, but when looking at a longer period of time, the situation seems fairly good.

Much work has been done recently to improve the safety of Finnish railways. Focus areas have included the development of expertise and safety culture of the railway employees and companies as well as improving the overall level of safety management by means such as trying to ensure that the practices described in the safety management systems of the operators are adopted in practical operations. Work on these issues will also continue in the future. Changes in ways of working occur fairly slowly, but the development is headed in the right direction.

2 Traficom's safety operations and organisation

2.1 Safety strategy and plans

The use of Traficom's Rail Transport Safety Programme that was in force in the previous years was abandoned at the end of 2021, when the decision was made to replace Traficom's Rail Transport Safety Programme with a target document as of the start of 2022. The Rail Transport Safety Programme was abandoned, because it was found not to meet the requirement of Article 4 of the Railway Safety Directive concerning an annual safety plan, in which the measures required to achieve the common safety targets (CSTs) are confirmed.

This meant that at the end of 2021, work on the goals of Traficom's Rail Transport Services service area for the years 2022–2024 started based on the strategy policies for the level of Traficom as a whole. The focus areas of Traficom's operational strategy at that time were: 1) Forecasting and future needs, 2) Preconditions of the operation and freedom from disturbances, 3) Information and services, as well as 4) Development. Themes specified as important to Rail Transport Services were Reliability, Safety Management, Interoperability, Internal Development Projects and Job Satisfaction. These themes were mirrored to the focus areas of the operational strategy, and based on them, a total of 24 goals for the years 2022–2024 were specified for the operation of Rail Transport Services. The number of goals included in the target document varied by theme (1–7 goals per theme). The goals were very much aligned with the themes of the safety programme for 2021 – important topics included e.g. creating a reliability culture, developing cyber security, risk management, safety culture and monitoring processes as well as standardising permit procedures. Compared to the previous year, the goals in 2022 highlighted Interoperability as well as Internal development projects (seven goals were set for both teams). There were 37 more detailed measures related to the objectives specified, and at least one person responsible was assigned to each of them. The realisation of the measures related to the goals was monitored every three months. With these more detailed measures, Traficom, together with operators in the railway sector, aims to develop the safety of railway traffic.

The development work related to the annual safety plan mentioned in the Railway Safety Directive ((EU) 2016/798) will continue at Traficom during 2023. Traficom has promised to share the experiences from this development work with the European Union Agency for Railways (ERA) and other Member States. The objective would be to draw up a safety plan that covers the whole railway system of Finland used to achieve the common safety targets (CSTs) specified for Finland and that Traficom could also use when determining the goals for its operations in the coming years.

2.2 Safety recommendations

Figure 2 presents the implementation status of rail transport safety recommendations issued by the Safety Investigation Authority, Finland (SIAF) as of 2010. Most of the recommendations (87.5%) have been implemented. It has been decided not to implement a few of them, and concerning some recommendations, the realisation is still in progress.

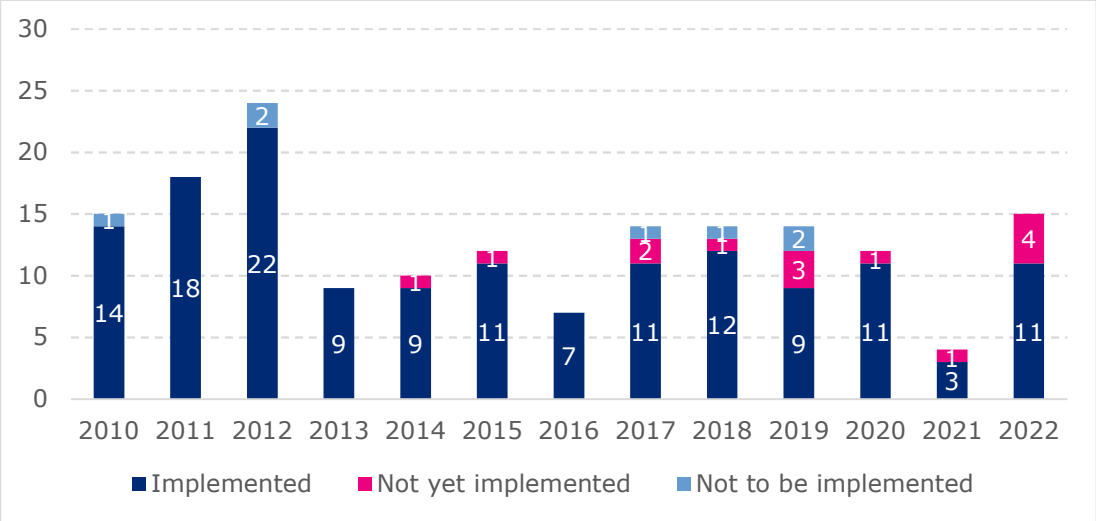

Figure 2. Annual number and status of rail transport safety recommendations issued by the Safety Investigation Authority, Finland in 2010–2022.

In 2022, the Safety Investigation Authority issued 15 safety recommendations, one of which repeated a previous recommendation. Of the recommendations issued in 2022, three were directed at the Finnish Transport and Communications Agency Traficom and one at the ERA (2022-S14: Expanding the supervision possibilities of the national safety authority (NSA)).

2.3 Actions taken on the basis of safety recommendations

The realisation of actions taken on the basis of safety recommendations is monitored in an annual recommendation monitoring meeting led by the Safety Investigation Authority. Participants in said meeting include all the parties to whom recommendations have been issued (e.g. railway undertakings, railway infrastructure managers, rescue services, police, municipalities and road infrastructure managers). In the meetings, the parties review the status of all recommendations that have not been fully implemented. Table 1 presents the actions taken by Traficom regarding the recommendations that were pending in 2022.

Table 1. Actions taken by Traficom based on the Safety Investigation Authority's recommendations.

Safety recommendation	Actions taken based on the recommendation	Implementation status of the recommendation
2022-S20 Updating the risk assessment. When auditing the safety management systems of railway operators, the Finnish Transport and Communications Agency should evaluate whether the assessments are updated as needed in addition to the risk assessment procedures.	The starting point of the rail transport oversight carried out by the Finnish Transport and Communications Agency is verifying the functioning of safety management systems. The audits of safety management systems take account of updating risk assessments and monitoring the methods of reducing risks. In the rail transport oversight plan for 2023, the central safety risks of rail traffic have been specified as one of the key areas of oversight. The Finnish Transport and Communications Agency has also confirmed resources for carrying out risk assessments. In addition to the oversight, reminders have been given on updating the risk assessments and including the right people in the risk assessment; the topics have also been discussed with operators when they have been encountered in other contexts as well as at information events and cooperation meetings targeted at interest groups.	Implemented
2022-S13 The Finnish Transport and Communications Agency develops its operating methods and the focus of its supervision to ensure the functioning of the operators' self-monitoring and handling of deviations in practice.	The starting point of the rail transport oversight carried out by the Finnish Transport and Communications Agency is verifying the functioning of safety management systems. In the rail transport oversight plan for 2023, the usability of the railway network and equipment has been specified as one of the key areas of oversight. In addition to the oversight by the Finnish Transport and Communications Agency, the operators are required to carry out self-monitoring, which is also followed by the Finnish Transport and Communications Agency as a part of the oversight of safety systems. The railway operators and infrastructure managers report on their self-monitoring, its results and the resulting measures to	Implemented

	the Finnish Transport and Communications Agency in an annually submitted safety report.	
2022-S9 The Finnish Transport and Communications Agency emphasises safety management methods when auditing the monitoring of deviations in everyday activities and the assessment and management of risks identified through them in addition to situations involving change.	The starting point of the rail transport oversight carried out by the Finnish Transport and Communications Agency is verifying the functioning of safety management systems. The safety management system audits review the organisation and arrangements of the railway operator or railway infrastructure manager that ensure the continuous management of their functions and the related risks. In addition to the oversight carried out by the Finnish Transport and Communications Agency, the operators are required to carry out self-monitoring, which is one of the methods the operators can use to identify the risks in their activities. In the rail transport oversight plan for 2023, the usability of the railway network and equipment has been specified as one of the key areas of oversight.	Implemented
2020-S31 The Finnish Transport and Communications Agency develops its safety deviation information system so that it can be used to follow the processing of deviations. Furthermore, the Finnish Transport and Communications Agency ensures that all operators in the railway industry have functional deviation management processes.	Safety deviation reporting systems are under development on both the EU and the national level. On the national level, a reform of the information system used for processing deviation information as well as the development of a tool for improving the analysis of the safety deviation information sent to Traficom are in progress at Traficom. Traficom has also renewed its external website, which provides information on the safety of railway traffic. The audits conducted by Traficom review the deviation reporting management processes of operators. In addition to this, reacting to deviation reports and monitoring them is processed by the network of human and organisational factors (HOF) in rail traffic and in connection with safety culture, at the cooperation group for monitoring the safety of rail traffic and in safety dialogues.	Incomplete

2.4 Organisation of railway operations in central government administration and at the Finnish Transport and Communications Agency

In 2022, transport matters in Finland fell within the remit of the Ministry of Transport and Communications, which prepares the policies, strategies and legislation concerning the transport sector. The Finnish Transport and Communications Agency Traficom served as the national railway safety authority. The Rail Regulatory Body, which ensures well-functioning markets and the fair and non-discriminatory treatment of operators, also operated in conjunction with Traficom.

The Finnish Transport Infrastructure Agency was the infrastructure manager of the state-owned rail network and was also responsible for roads and waterways. In addition to the state-owned rail network, there were approximately 150 tracks in Finland owned by industrial plants, ports and municipalities that connect to the state-owned railway network. The length of private sidings varies from spur tracks of less than a hundred metres to networks of dozens of kilometres. In practice, traffic on private sidings is always shunting. Traffic management services were provided by Traffic Management Company Fintraffic Ltd (Fintraffic), a state-owned special task company, whose subsidiary, Fintraffic Railway Ltd, is responsible for traffic management on railways. Other subsidiaries of Fintraffic specific to each mode of transport were responsible for traffic management services for shipping, road traffic and aviation.

In 2022, the largest operator on Finnish railways was VR Group Plc, which carried out both passenger and goods transport. Other goods transport operators included Operail Finland Oy (currently North Rail Oy), Fenniarail and FoxRail Logistics Oy, and heritage train operators also carried out passenger traffic. Other operators included local shunting operators, track maintenance companies as well as operators that moved rolling stock on tracks closed to other traffic.

The Safety Investigation Authority, which operates in conjunction with the Ministry of Justice, was responsible for investigating rail transport accidents in Finland.

In 2021, a new organisational unit, called 'service area,' was created for rail transport; it also continued its operation in 2022. The Rail Transport service area's main responsibilities included the duties of the national safety authority based on the Directives on interoperability, safety and qualifications. In 2022, the service area for rail transport included the following five teams:

- Rail Organisations: The team was responsible, in particular, for the authorisations of operators and the supervision of railways.
- Safety Monitoring and Drivers: The team was responsible for matters concerning the operation of rail transport, competences and qualifications, safety management and rolling stock maintenance, for example.
- Infrastructure and Vehicles: The team's responsibilities included approvals for rolling stock and rail infrastructure, railway plans, matters concerning assessment bodies and the transport of dangerous goods.
- Safety Culture: The team was responsible for promoting safety culture and matters concerning human and organisational factors (HOF) in rail transport.

– Reliability: The team was responsible for preparedness and reliability issues as well as cyber security in the rail transport sector.

At the end of 2022, Traficom had more than 900 employees, and it operated in 15 cities. Approximately 35 Traficom employees worked exclusively with rail transport matters at the end of 2022.

Traficom continued to develop its competence management in 2022, and this also affected rail transport. In addition, the importance of preparedness, reliability and cyber security was highlighted due to the unstable geopolitical situation caused by the expansion of Russia's offensive war. Rail transport had its own development projects in progress related to matters such as supervision, licence management and the management of operator information. The progress of the Digirail project[3] was also monitored actively by participating in national working groups and project meetings as well as international meetings.

3 Status of railway safety

3.1 Safety of train traffic

Accidents in train traffic

VR Group Plc reported 95 collisions with obstacles and 10 fires in rolling stock in train traffic in 2022 (Figure 3). In 2021 and 2022, a considerably higher number of collisions of rail vehicles with obstacles were reported than in previous years. This is likely partially explained by the fact that in recent years train drivers have been requested to actively report collisions with banks of snow. In 2022, there were 10 fires in rolling stock in train traffic, two of which were classified as significant accidents. The yearly number of fires in rolling stock has remained largely at the same level in recent years. During the five years preceding 2022, an average of nine fires in rolling stock occurred per year. Fires in rolling stock typically start in the locomotive engine rooms, wagon brakes or passenger carriages' heating equipment.

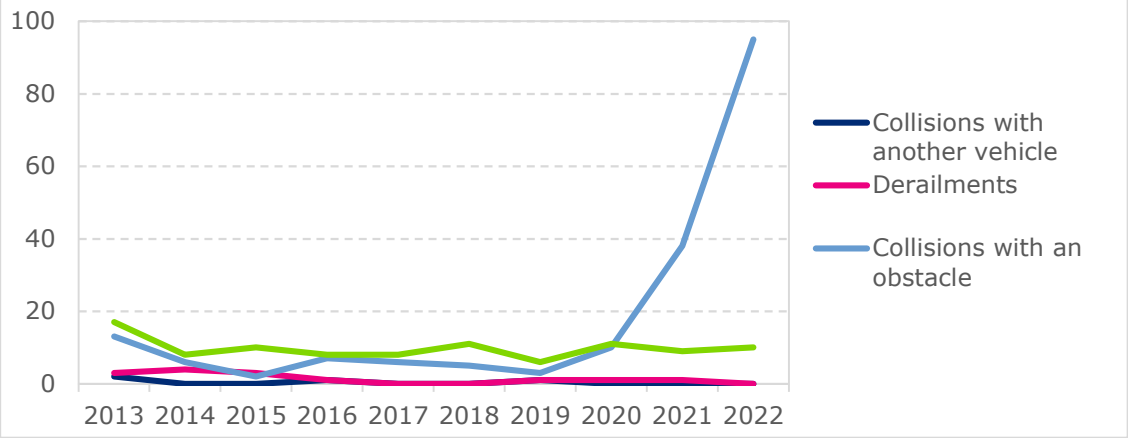

Figure 3. Number of train traffic accidents in VR Group Plc's statistics by accident type in 2013–2022.

[3] The Digirail project involves renewing the technical railway systems related to train control. Our new train control system will comply with the joint requirements of the EU on rail transport. Further information: https://digirata.fi/en/.

No collisions between vehicles or the derailment of vehicles were reported during the year 2022. In fact, such cases have been fairly rare in recent years. Starting from 2016, a maximum of one derailment or collision between vehicles has occurred in train traffic.

Incidents in train traffic

Accidents in train traffic are rare, which means that random variations play a major role in their yearly numbers. As a result, the development of the yearly number of accidents is not the best indicator for the development of safety in the short term. Incidents occur more frequently than accidents, which means that monitoring their number and severity makes it possible to obtain a clearer picture of the safety development trends than when looking at accidents. However, it is important to note that a change in the yearly number of reported incidents may indicate not only changes in the safety situation but also in the culture of reporting occurrences.

In 2022, there were 73 incidents in accordance with the EU Common Safety Indicators[4] in Finnish railways (Figure 4). The total number of incidents clearly decreased compared to the previous year (166 incidents in 2021).

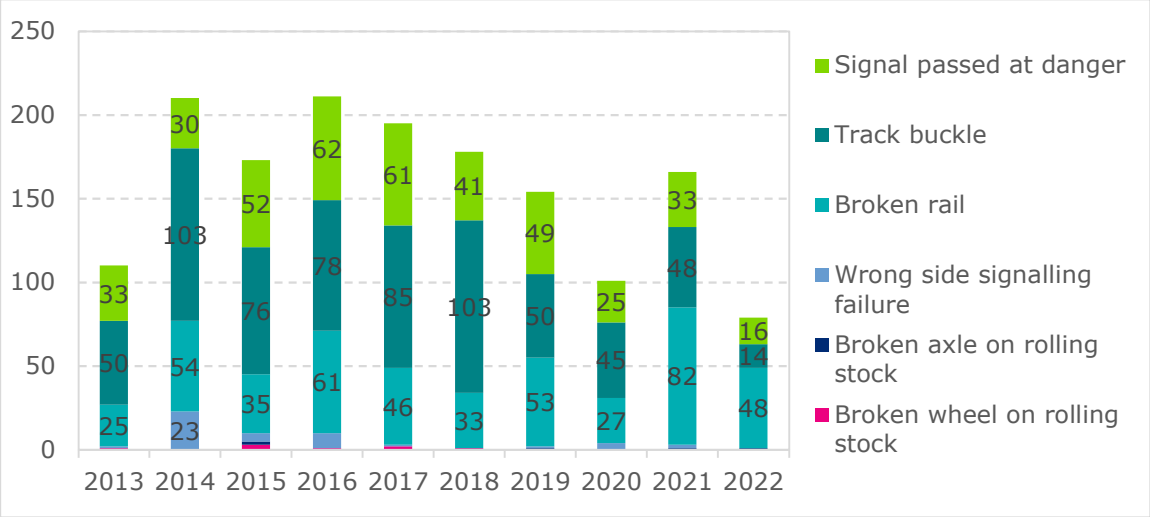

Figure 4. Number of incidents on railways by the precursor according to the EU Common Safety Indicators in 2013–2022. Numbers less than ten are not shown on the columns in the figure.

In 2022, there were 16 cases of signal passed at danger in train traffic. There were 33 cases of signal passed at danger in 2021 and 25 cases in 2020. In 2015–2019, there were 53 of such cases on average per year. This means that the number of cases of signal passed at danger in train traffic has decreased clearly in recent years. The factors that have contributed to the reduction are not known. These incidents typically occur at low speeds, and the automatic train protection (ATP) device stops the rolling stock as soon as the signal has been passed. The risks associated with passing a signal at danger are higher when operating without ATP.

[4] The EU Common Safety Indicators have been specified in Annex I to the Directive (EU) 2016/798 of the European Parliament and of the Council (Railway Safety Directive).

In 2022, the Finnish Transport Infrastructure Agency was notified about 48 broken rails and 14 track buckles. The numbers of both broken rails and track buckles decreased compared to 2021 (in 2021, there were 82 broken rails and 48 track buckles). The number of track buckles and other sudden changes in track geometry decreased significantly compared to the previous years. Large annual variation has been identified in the reporting of geometry errors – there may be mistakes in the classification of cases, and it is not certain if all cases have been reported as safety occurrences. Therefore, caution should be exercised considering the annual numbers of geometry errors and changes in the numbers. In 2022, the number of broken rails was lower than in 2021 by nearly a half; however, the level was very similar to the preceding years. In 2016–2020, there were 44 cases of broken rails on average per year. The reasons for the higher number in 2021 are not known. In 2022, the Finnish Transport Infrastructure Agency has, among other things, drawn up welding instructions to reduce welding errors and held welding days to improve the quality of welds in order to prevent broken rails. Maintenance has also enhanced its supervision of matters related to welding.

3.2 Safety of shunting

Shunting refers to the moving and sorting of vehicles to support train traffic. More accidents and incidents usually occur in shunting work than in train traffic because, unlike in train traffic, technical safety systems play only a minor role in shunting, and the responsibility for ensuring the safety of the work mainly lies with shunting staff. Because of the low speeds involved, however, the consequences of shunting accidents are typically less serious than those occurring in train traffic. Nonetheless, extremely serious accidents may occur in shunting, too, because of the great masses of the vehicles and the potential of dangerous goods being present.

The number of shunting occurrences in 2022 was slightly higher than the year before (160 in 2022 vs. 142 in 2021). There was a slight growth in the annual number of both collisions and derailments (Figure 5). According to the statistics[5] of VR Group Plc, there were 69 cases of derailment and 48 collisions during shunting in 2022. The corresponding figures were 50 and 41 in 2021 and 49 and 32 in 2020. VR Group Plc has noticed this growing trend, and as a result, a shunting occurrence analysis project was started in the spring of 2022. Said project reviewed approximately 140 shunting occurrences in 2021. Based on the results received, recommended measures were drawn up to prevent such occurrences in the future. Among other things, these recommended measures involved improving the quality of occurrence investigation (incl. HOF classification[6] and the development of root cause analysis) as well as a more systematic work orientation.

[5] The statistics by VR Group Plc do not cover all shunting carried out in Finland. However, they are currently the most comprehensive statistics on the topic.

[6] HOF = Human and Organisational Factors.

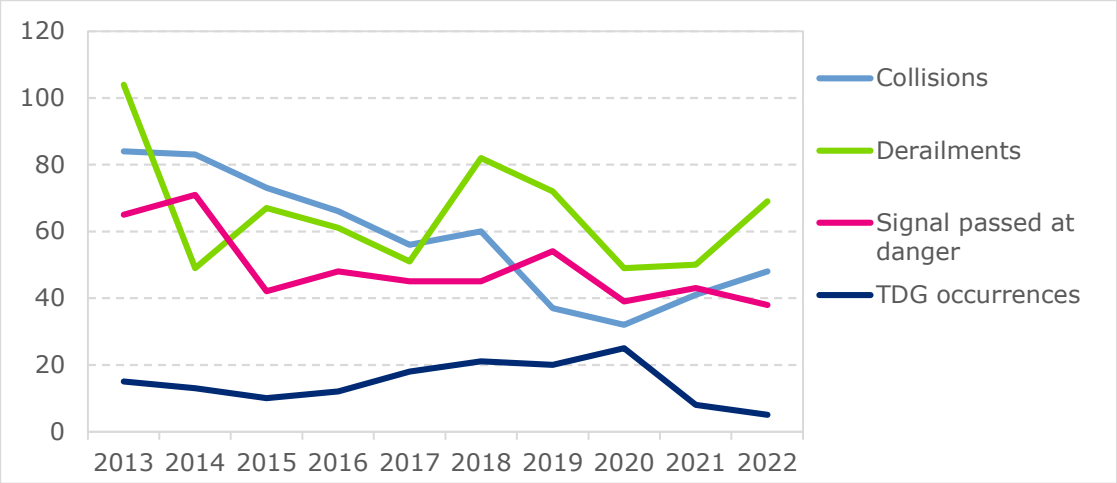

Figure 5. The number of shunting occurrences in statistics compiled by VR Group Plc by type of occurrence in 2013–2022.

In 2022, there were slightly fewer cases of signal passed at danger and occurrences related to the transport of dangerous goods than in the previous years. In 2022, there were 38 cases of signal passed at danger and five occurrences related to transport of dangerous goods (including collisions, derailments and leaks of wagons for transport of dangerous goods). The transport volumes of hazardous substances have decreased significantly after 2020 (further information in section 3.2).

Figure 5 shows that the annual number of accidents and dangerous situations occurring during shunting has decreased during the last 10 years. Efforts have been made in recent years to improve shunting safety, e.g. by promoting a good safety culture and ensuring the use of safe work practices. Factors affecting the positive safety development of shunting include the development of instructions and working methods as well as the improvement of the condition of private sidings. In November 2022, VR Transport initiated a trial aiming at lowering shunting speeds, in which 20 km/h was adopted as the speed of shunting driven by railway logistics drivers instead of the previous 35 km/h, with a few exceptions. Even though it has been possible to improve the safety of shunting somewhat in recent years, plenty of accidents and incidents still happen, which means that there is a need to continue the work to improve safety.

In 2022, two derailments classified as a significant accident occurred during shunting. The first one took place on 12 January 2022 in Vuosaari and the second on 14 December 2022 in Varkaus. Both caused damage amounting to more than EUR 150,000.

3.3 Safety of transport of dangerous goods

The volumes of dangerous goods transported have decreased from the level in the 1990s. In the late 1990s, nearly seven million tonnes of dangerous goods were transported per year, and in the 2010s, the transport volumes remained at around five million tonnes. In 2021, the amount of dangerous goods decreased from over five million tonnes in 2020 to nearly 4.2 million tonnes, and in 2022, the total amount continued to decrease to approximately 4 million tonnes. A large share of the transport of dangerous goods on railways passes over the eastern

border, and therefore the reduction in 2021 can be assumed to be at least partially due to the coronavirus (it is possible that Russia has used its own ports in the Gulf of Finland more for e.g. the transport of liquids), and the additional reduction in 2022 due to Russia's offensive war and the resulting collapse of traffic on the eastern border. VR Group Plc ended the traffic to Russia completely by the end of 2022.

VR Group Plc is responsible for most of the transport of dangerous goods in Finland. Out of the total amount of four million tonnes transported in 2022, VR Group Plc transported 3,677,919 tonnes, of which 1.25 million tonnes consisted of flammable liquids, 0.9 million tonnes of corrosive substances and 0.5 of gases. Because VR Group Plc is responsible for most of the transport of dangerous goods in Finland, its railway safety report provides a fairly comprehensive picture of occurrences during the transport of dangerous goods.

According to the reports of VR Group Plc, nine dripping leaks occurred during the transport of dangerous goods in 2022. One of these leaks occurred in Riihimäki, in which several tank wagons leaking ammonia were found in a set of wagons previously used in transports to Russia. The largest leak was removed from the wagon using special methods, which caused a hindrance to rail transport. In addition, the event caused approximately EUR 150,000 in direct costs to the Finnish Transport Infrastructure Agency.

In addition to dripping leaks, three derailments of a wagon carrying dangerous goods occurred:

- 28 January: The derailment of an empty diesel wagon in Joensuu
- 23 February: The derailment of two butyl acetate wagons in the private siding of Advario Finland Oy, Mussalo/Kotka
- 14 December: The derailment of a diesel wagon, Akonniemi/Varkaus

The derailment in Akonniemi, Varkaus, was classified as a significant railway accident in accordance with the EU Common Safety Indicators, because it caused over EUR 150,000 of damage to the track infrastructure. Another significant accident involving dangerous goods was the level crossing accident on 16 September, in which a freight train transporting wagons with dangerous goods collided with a passenger car in a passive level crossing on the section of track between Turku and Uusikaupunki. The accident did not cause any leaks of hazardous substances. The accident was classified as significant, because the driver of the car that had been passing through the level crossing was seriously injured in the accident.

According to the reports by VR Group Plc, most of the safety occurrences related to transport of dangerous goods take place during shunting. Leaks of hazardous substances occur the most frequently. In train traffic, leaks of hazardous substances classified as safety occurrences occur fairly rarely (0–3 per year during the last five years). In 2018–2020, a bit over twenty safety occurrences per year related to dangerous goods occurred during shunting. In 2021–2022, the number in question was reduced by over a half (in 2022, five occurrences involving dangerous goods were reported; see section 3.2).

The consequences of these occurrences are typically minor; derailments do not usually result in leaks, and any leaks are mainly relatively minor ones through valves. As a rule, the dangerous goods most often involved in accidents and

incidents are the same as the ones most commonly transported over the railway network – flammable liquids, gases and corrosive substances.

Until 2020, VR Group Plc was the only operator on the Finnish railways carrying out transport of dangerous goods. In 2021, Operail Finland Oy (currently North Rail Oy) and FoxRail Logistics Oy in addition to VR Group Plc transported dangerous goods. In 2022, the group of operators expanded to also cover Fenniarail, which started transporting dangerous goods at the start of 2022. However, due to the impact of Russia's offensive war, Fenniarail's traffic volumes decreased rapidly and the company's transport of dangerous goods ended completely by the end of 2022.

3.4 Safety of work on tracks

Track work refers to work carried out on the tracks or in their vicinity that may affect the safety of train traffic. In fact, the safe coordination of track work and train traffic has been a key challenge to railway safety for a number of years.

The majority of track work in Finland is carried out on the state-owned railway network, which is managed by the Finnish Transport Infrastructure Agency. The Finnish Transport Infrastructure Agency reviews the development of safety occurrences in track maintenance by occurrence group. In Table 2, the starting point for the change is the number of safety occurrences in 2017, which is used as a basis for comparison with the numbers for 2021 and 2022. Table 2 shows that the total number of safety occurrences in 2022 is slightly lower than in 2021 (reduction: -52% in 2022 vs. -50% in 2021). There have been reductions in the three lowest occurrence groups. A slight increase can be detected with regard to working without a track work permit and unauthorised passing of the track work area, with a slightly larger increase in collisions that have occurred in or been caused by track work.

Table 2. Development of the number of safety occurrences in track maintenance in 2017–2021 and 2017–2022 by occurrence group (Annual Railway Safety Report 2022 of the Finnish Transport Infrastructure Agency).

Safety occurrence group	Change 2017 → 2021	Change 2017 → 2022
Collisions during track work or collisions due to obstacles due to track work	-60%	0%
Working without a track work permit and unauthorised passing of the track work area	-44%	-40%
Errors involving the track work location and the opening of the track work site to traffic, other mistakes in the actions of the person in charge of track work	-54%	-66%
Error in security guard operation	-52%	-60%
Speed limit and automatic train protection (ATP) errors	-61%	-64%
All occurrences	**-50%**	**-52%**

In its safety report, the Finnish Transport Infrastructure Agency reviews the development of track work safety through the number of key occurrences and the success rate (Figure 6). The success rate is calculated by dividing the number of key occurrences by the track work permits granted. In 2022, the success rate of track work improved slightly compared to the previous year. The change compared to 2021 is very slight, but as Figure 6 shows, there has been positive development for several years already in both the yearly number of key occurrences and the success rate.

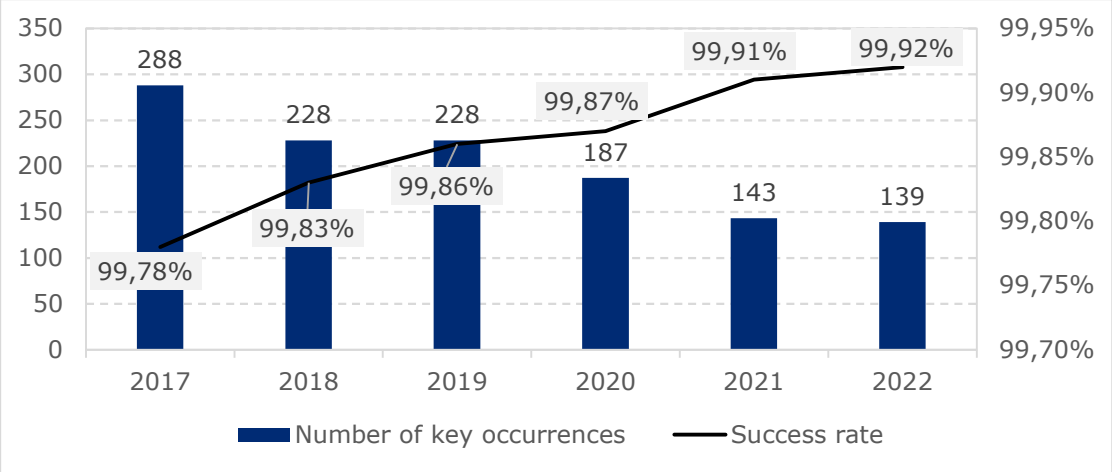

Figure 6. Developments in track work safety (number of key occurrences & success rate) in 2017–2022. (Annual Railway Safety Report 2022 of the Finnish Transport Infrastructure Agency).

The most common safety occurrences that occur during track work include track work protection errors, unauthorised passing of the boundary of the track work area, working without a track work permit, track work location errors and neglecting to follow the safety guidelines. In addition to these, some cases such as damage caused by track work also occur (e.g. broken signals or cut cables).

The most serious occurrence in track maintenance in 2022 was the death of a track maintenance worker on 17 January 2023. The person in question was on the track after the track work permit had expired and was run over by a train.

3.5 Level crossing safety

There were 15 level crossing accidents in 2022, which is the lowest figure in the entire monitoring history (Figure 7). Of these accidents, 13 occurred in the state-owned rail network. In the level crossing accidents in 2022, one person died and three were seriously injured. An exceptionally large number of level crossing accidents occurred in 2021, and they caused several personal injuries. The positive safety situation in 2022 moves the development back towards the declining trend of level crossing accidents shown in Figure 7.

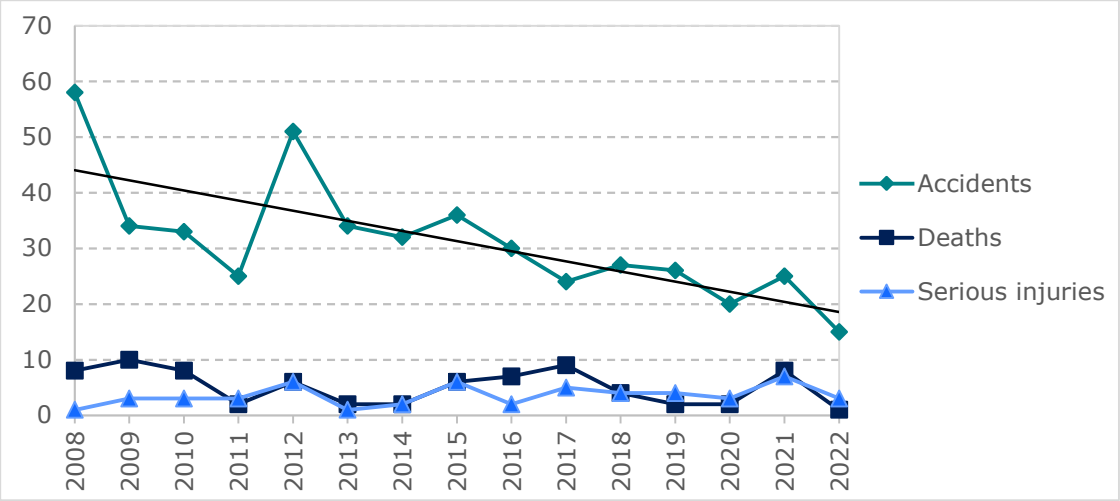

Figure 7. Numbers of level crossing accidents and resulting casualties in 2008–2022.

Despite the declining trend in the number of level crossing accidents over the long term, they still constitute one of the greatest safety issues in the Finnish railway system. Of the significant railway accidents that occurred in 2022, a bit under a third were level crossing accidents.

Of the level crossing accidents that occurred in 2022, five were classified as significant railway accidents: four due to the personal injuries they caused (in one accident, the user of the level crossing died, and in three accidents one person was severely injured) and one due to the extensive material damage caused by the accident (costs exceeding EUR 150,000). One of the accidents that led to a serious injury occurred at a crossing with automatic barriers and the rest of the significant level crossing accidents took place at passive level crossings.

A key actor in improving the safety of level crossings is the railway infrastructure manager, the Finnish Transport Infrastructure Agency, which has drawn up a level crossing removal and improvement programme for 2019–2025. The aim is to implement improvement measures at 465 level crossings during the programme. In 2022, the safety of 69 level crossings was improved. This was slightly fewer than planned, because at some level crossings the start of the improvement measures had to be delayed to 2023. This was due to the fact that dealing with the backlog of deliveries created by the pandemic in the level crossing programme was still in progress. In addition to the level crossing removal and improvement programme, the safety of level crossings was improved by means such as track maintenance, providing information about the winter management of level crossings to the owners of private roads and those who maintain them, and using animation as a way to share information about the safety of level crossings in social media.

3.6 Personal injuries in railway accidents

An exceptionally large number of people died in railway accidents in 2021. In 2022, the situation improved and returned back to the same level as in 2018–2020 (Figure 8). What made the statistics of 2022 exceptional was that one of the deceased was a track maintenance worker who had stayed on the tracks after the expiration of the track work permit and who was run over by a train.

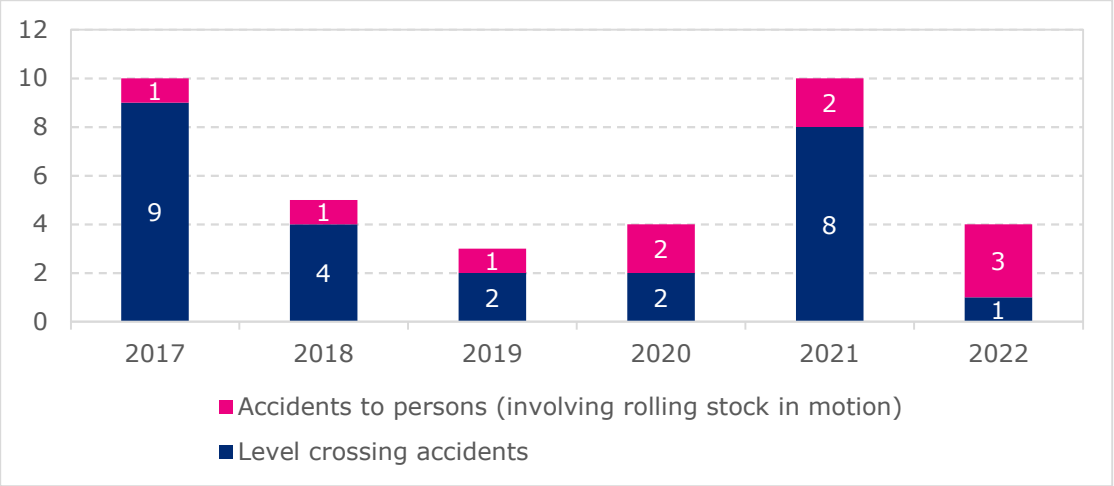

Figure 8. The number of people who have died in railway accidents by type of accident in 2017–2022.

In 2022, seven people were seriously injured in railway accidents – three in a level crossing accident and four in an accident involving rolling stock (Figure 9). The number is slightly lower than in 2021, but higher than in 2018–2020. In the accidents resulting in personal injuries, two of the seriously injured people were passengers, one person had been in the platform area and one had been crossing the track at an unauthorised location.

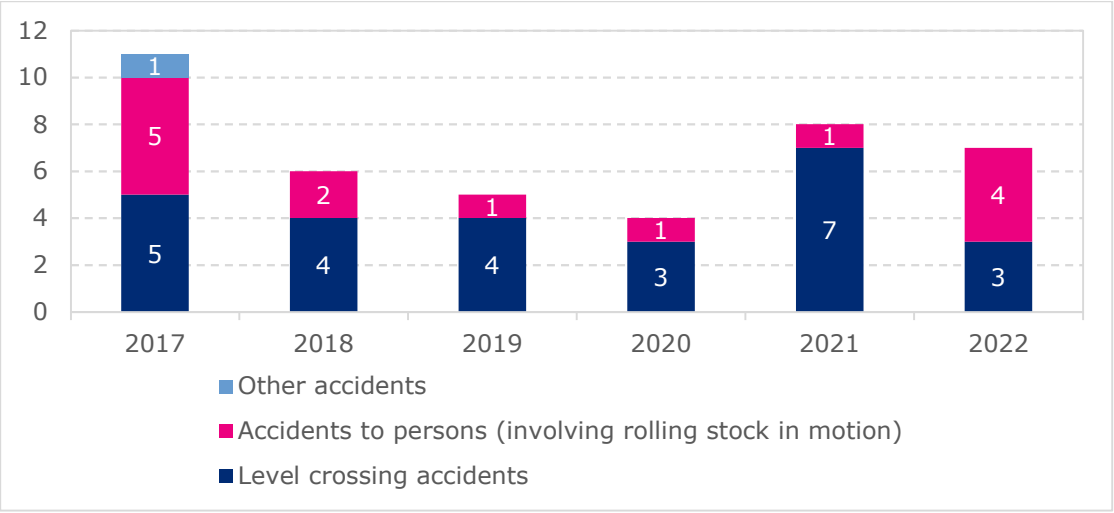

Figure 9. The number of people who were seriously injured in railway accidents by type of accident in 2017–2022.

Table 3 shows the safety occurrences related to trespassing on railway premises in 2017–2022 compiled by the Finnish Transport Infrastructure Agency. Almost invariably, a person trespassing on railway premises being run over by the train leads to the death of that person. As a result, most of the deaths on Finnish railways are caused by the person being run over by a train due to being on the tracks without authorisation. Most of these are deliberate. The yearly number of persons being run over by a train has remained on a very similar level for several years, and there is no clear trend visible. In 2021, there were slightly fewer cases of a person being run over than before, but in 2022, the number returned to the previous level. There is no clear explanation for the lower number of cases of a person being run over in 2021 than in other years. In 2022, the number of

incidents involving persons and rolling stock in motion was slightly higher than in the last few years, but on the same level as in 2017–2018. There were clearly fewer cases of trespassing on railway premises reported in 2022 than in previous years. It is known that trespassing on railway premises and unauthorised crossing of the tracks occur much more often than they are reported annually (see for example Kallberg & Silla, 2017[7]). In fact, it is very probable that the changes in the reported number of cases of trespassing on railway premises reflect a change in the reporting frequency of such incidents rather than the frequency of the incidents themselves. Table 3 also shows that fewer occurrences related to vandalism were reported in 2022 than in previous years. However, this does not necessarily mean that less vandalism occurred in the rail network than in the preceding years. One of the challenges with regard to monitoring cases of vandalism is that some of the occurrence reports include several cases of vandalism (e.g. occurrences detected during one week).

Table 3. Safety occurrences related to trespassing on railway premises in 2017–2022. (Annual Railway Safety Report 2022 of the Finnish Transport Infrastructure Agency).

Accidents involving personal injuries and trespassing	2017	2018	2019	2020	2021	2022
Accident involving persons and rolling stock in motion	70	61	62	56	38	59
Incident involving persons and rolling stock in motion	55	50	16	9	19	53
Trespassing on railway premises	108	124	171	194	254	82
Other accident involving personal injury[1]				32	10	9
Other personal injury[2]	3	4	3			
Vandalism	299	205	205	394	251	166
Total	**535**	**444**	**457**	**685**	**572**	**369**

[1] Includes all other accidents involving personal injury related to the railway system excluding accidents involving a person being run over (including accidents involving personal injury previously reported with other accidents).

[2] As of 2020, all personal injuries are reported in the summary for accidents involving personal injury.

Preventing cases of persons being run over by a train and the related cases of trespassing on railway premises as well as unauthorised crossing of the tracks is challenging. For instance, cases of unauthorised crossing of the tracks are dependent on the location, and the preventive measures should be tailored to the specific location in question and the factors behind the crossing of the tracks in each location in order for the implemented preventive measures to be effective (Silla, 2007)[8]. Silla and Luoma (2012)[9] have stated that preventing persons from being run over requires a system-oriented, comprehensive approach, in which

7 Kallberg, V-P. & Silla, A. 2017. Prevention of railway trespassing by automatic sound warning—A pilot study. Traffic Injury Prevention, 18, 3, 330–335.

8 Silla, A. 2007. Measures for prevention of trespassing on Finnish railways. Publications of Finnish Rail Administration A 7/2007. Finnish Rail Administration, Railway Network Department, Helsinki.

9 Silla, A. & Luoma, J. 2012. Main characteristics of train-pedestrian fatalities on Finnish railroads. Accident Analysis and Prevention, 45, 61–66.

actors from a broad front are involved in planning and implementing effective preventive measures, such as representatives of railway organisations, healthcare professionals, city land use planners, police officers, representatives of the educational system, etc. In 2019, a cooperation group aiming to prevent persons from being run over by a train started its operations, convened by Traficom; its goals include improving the exchange of information between the different actors and promoting the implementation of research and preventative measures related to the topic. In addition to operators in the railway industry, representatives of parties such as the police, research institutes and the social welfare and healthcare sector participate in the operation of the cooperation group.

4 Changes in legislation

The Rail Transport Act (1302/2018) was amended in 2022 by the Act on Amending the Rail Transport Act and its Temporary Amendment (476/2022), which entered into force on 22 June 2022. This act amended the rail transport regulations related to the monitoring of the safety and interoperability of the railway system with regard to preparedness for exceptional situations and disturbance management in particular. The duty of the Finnish Transport and Communications Agency is to monitor that the railway operators and railway infrastructure managers operate in accordance with their safety management and security management systems.

At the same time, an exception on the national use of vehicles arriving from the Russian Federation to Finland, valid until the end of 2026, was also added to the Rail Transport Act. Vehicles intended for timber and tank transport registered in the OSJD area[10] may also be used for timber and chemical transport within Finland until the end of 2026, if the owner of the vehicle is a company or corporation operating in Finland, a subsidiary operating in a third country that is wholly owned by a company operating in Finland, or if the consigner operating in Finland has drawn up a long-term rental agreement on the use of the rolling stock with the owner of the vehicles located in the European Economic Area. Some smaller specifications were also made to the Act.

In 2022, Traficom also issued a regulation on the rolling stock on railways. The regulation includes national regulations supplementing the technical specification on the interoperability of rolling stock with regard to open issues and special cases, as well as national regulations with regard to those types of rolling stock that are not included in the scope of application of the technical specification mentioned above.

As in previous years, Traficom informed stakeholders about regulatory amendments, e.g. by organising cooperation group meetings and an information session to ensure that the drafting process would be as open and transparent as possible. Topics highlighted in the discussions with stakeholders still included the development of cyber security and reliability, among other things. In the changed

[10] OSJD = Organisation for Cooperation between Railways (Further information: https://osjd.org/). An organisation established in 1957, the members of which include railway operators in Eastern Europe, Asia and countries in those areas. The largest members of the organisation are China and Russia, and in addition to these, 23 other countries have joined the organisation. Among other things, the organisation aims to expand the railway connections from Western Europe to Asia and modernise the technologies being used.

security situation, the cooperation was good and necessary for the successful development of both the operations and the regulation.

5 Certificates and authorisations

5.1 Safety certificates and authorisations

Safety certificates

In 2022, 17 single safety certificates were issued to the following rail transport operators: VR Group Plc, Sweco Finland Ltd, GRK Rail Oy, NRC Group Finland Oy, Destia Rail Oy, Haapamäen Museoveturiyhdistys ry, Höyryveturimatkat 1009 Oy, Pohjois-Suomen Rautatieharrastajat ry, Höyryraide Oy, Sinisten vaunujen ystävät ry, Pieksämäen Höyryveturiyhdistys ry, Keitele-Museo Oy, Porvoon Museorautatie ry, Ratarahti Oy, Metsä Board Simpele Oyj, Aurora Rail Oy and RP Logistics Oy.

The most significant observation that emerged in the processing of the authorisations was that the Registers of Complementary Certificates of the applicants were not fully compliant with the requirements. On the general level, deficiencies also came up in the traffic management instructions, the procedures for the identification, assessment and management of risks, as well as integrating human and organisational factors as a part of the safety management systems. In addition to these, individual application-specific deficiencies were found throughout the procedures related to the safety management system.

Safety authorisations

In 2022, safety authorisations were granted to two railway infrastructure managers: Kvarken Ports Ltd and VR Group Plc. At the end of 2022, there were 41 operators with a valid railway infrastructure manager's safety authorisation. The number of safety authorisations decreased as in the previous year, because most of the infrastructure managers of private sidings transferred to the lighter notification procedure in accordance with the national legislation. At the end of 2022, there were 100 notifications of infrastructure managers of private sidings in accordance with the national regulations in force.

Authorisations for placing vehicles in service or on the market

Since mid-2019, Traficom has mainly granted authorisations of placing vehicles on the market in accordance with the new Directive that are processed at the One-Stop Shop (OSS) of the European Union Agency for Railways. For vehicles governed by national regulation, authorisations for placing in service may also still be issued. However, many authorisations based on national regulation were also granted via the OSS. No vehicle authorisations were cancelled in 2022.

In 2022, vehicle authorisations were granted to the following six applicants:

- VR Group Plc: First authorisation[11], 2 pcs and authorisations for placing on the market based on conformity to a type, 13 pcs
- Operail Finland Oy: First authorisation, 1 pc

[11] First authorisation refers to a completely new type approval, i.e. usually a completely new vehicle type. A new authorisation is involved when the aim is to change an approved vehicle type, which requires a new authorisation according to the legislation.

- Fenniarail Oy: New authorisation, 1 pc
- GRK Suomi Oy: First authorisation, 1 pc
- Sundström Ab Oy Entreprenad: New authorisation, 1 pc
- Teräspyörä-Steelwheel Oy: New authorisation, 3 pcs and authorisations for placing on the market based on conformity to a type, 2 pcs

Traficom has made an effort to engage in active and instructive interaction with applicants throughout the authorisation process. Consequently, there have not been any major problems with the actual applications and none have been rejected.

5.2 ECMs

In 2022, there were two certified Entities in Charge of Maintenance (ECM) of rolling stock in Finland. In addition, there are four ECMs operating in Finland that maintain rolling stock solely for their own operations and that are not required certification based on a derogation under the ECM Regulation (779/2019/EU). In addition to the above, there are eight ECMs responsible for the maintenance of rolling stock in historical use that are not required certification based on a national derogation (Rail Transport Act, 1302/2018, section 74). The number of ECMs has decreased from the previous year, because Traficom has instructed the keepers of rolling stock to update the information in the European Vehicle Register (EVR) of the European Union Agency for Railways to correspond to the actual situation. Updating the EVR information continues in 2023.

The ECM certificate of both certified ECMs was changed in 2022 by expanding maintenance to apply to locomotives, train units, passenger carriages and track work machinery in addition to freight wagons. The changes did not affect the validity of the ECM certificate.

In the monitoring of the certified ECMs in 2022, one deviation was reported regarding the definition of safety responsibilities and ensuring the qualifications and resources required to carry out the duties in accordance with the responsibilities during a change in the responsible persons of the organisation.

In 2022, a part of the operation involved railway traffic between Finland and Russia, which took place within the framework of an agreement on a direct international rail link between the two countries. Under this agreement, the freight wagons used in traffic between the countries are inspected at the border crossing before being used on the Finnish railway network. As vehicles approved and registered in Russia do not have an ECM determined under EU regulation, three railway undertakings (VR Group Plc, Fenniarail Oy and Operail Finland Oy) have been granted a derogation from the ECM obligations under Article 15 of the Railway Safety Directive.

5.3 Train driving licences

In 2022, Traficom issued 142 new train driving licences and renewed one licence. Three previously issued licences were updated/amended and 96 licences were revoked. Reasons for revocation included the driver's retirement, moving to other tasks and failure to meet the medical requirements. The validity of two licences was restored once the licence conditions were once again met.

In total, 2,925 train driving licences had been issued in Finland by the end of 2022, and 2,069 licences were valid at year's end.

5.4 Authorisations for placing structural subsystems in service

In 2022, Traficom issued 26 authorisations for placing structural subsystems in service. This figure is similar to the numbers of authorisations issued in previous years. The scope and complexity of railway projects issued with authorisations for placing in service varied from comprehensive track improvement projects to smaller-scale sites concerning individual tracks. During 2022, no authorisations for placing in service were granted to new track routes in Finland.

Authorisations for placing structural subsystems in service are processed as set out in the Interoperability Directive (2016/797/EU) and the national Rail Transport Act (2018/1302).

5.5 Information exchanges between Traficom and operators

An effort has been made to keep the threshold for information exchanges between Traficom and railway operators low. Channels for liaising with the operators include information events organised by Traficom (for e.g. heritage train operators and railway infrastructure managers), one-to-one meetings between Traficom and operators, and direct discussions between Traficom's public officials and an operator's representatives. Traficom holds regular one-to-one cooperation meetings and engages in safety dialogues with the largest operators to discuss topical issues and other themes the operators wish to address. There is also a great deal of more informal cooperation where necessary, and contacts with VR Group Plc and the Finnish Transport Infrastructure Agency, in particular, are very frequent.

Traficom coordinates cooperation groups on various topics for discussing topical issues and sharing information about them. These include e.g. the network for human and organisational factors in rail transport, the rail transport safety and analysis group, the group on preventing accidents to persons involving rolling stock in motion and the cooperation group concerning matters related to operation and competences. In addition to the cooperation groups, there were also discussions with stakeholders with practical questions concerning safety authorisations, safety certificates and other licences.

6 Monitoring

6.1 Strategy, plan and decision-making

The three-year rail transport oversight strategy acts as the top-level document guiding the oversight of rail transport; it describes and guides the planning and implementation of Traficom's rail transport oversight and describes the key principles affecting Traficom's oversight of rail transport. The oversight strategy specifies e.g. the objectives of the oversight, its principles, oversight arrangements, focus areas and methods of oversight as well as the execution of oversight. The oversight implemented in 2022 was guided by the rail transport oversight strategy drawn up for 2022–2024; its key objective is that the rail transport oversight implemented by Traficom promotes safe and responsible operation in the Finnish rail transport system.

The annual oversight plan and the focus areas of oversight that guide the oversight work in practice are drawn up based on the oversight strategy mentioned above. The oversight plan specifies the annual oversight measures and other measures complementing the oversight and describes how the realisation of the oversight plan is assessed and monitored. The goal is to target the oversight so that its impact in improving the safety of rail transport is as large as possible. Therefore, the goals and annual focus areas of the oversight are determined using a risk-based approach, meaning that they are focused on the aspects of the railway system, in which safety challenges have been detected. In the plan for 2022, the objective was set so that during the year in question:

- 96 operator-specific assessments related to compliance with the requirements would be carried out in connection with granting and renewing safety authorisations and certificates, and the assessment of notifications by infrastructure managers of private sidings would be carried out;
- 43 audits or inspections (including all operator groups) would be conducted;
- methods to supplement the oversight would be used 18 times (safety dialogues, safety culture assessments and surveys)

The starting point of the rail transport oversight carried out by Traficom is verifying the functioning of safety management systems. When planning and developing rail transport oversight, needs that have emerged in discussions with the national safety authorities of other EU Member States, among other things, will be taken into account.

In 2022, the following were specified as the focus areas of rail transport oversight: 1) Documentation and implementation of operative procedures, 2) Risk management, 3) Following the development of self-monitoring, and 4) Competence management. Special attention was paid to these aspects in the oversight during 2022. The focus areas were taken into account on an operator-specific basis when planning the oversight measures.

Traficom's key oversight measures are audits and inspections. During the audit, Traficom strives to arrive at a shared view with the audited organisation of the audit observations and possible deviations. Methods supplementing the oversight include safety dialogues, safety culture assessments, safety discussions, monitoring the operator's service provider and surveys. The primary focus of oversight is on auditing railway operators' and infrastructure managers' safety management systems and inspecting their operations. In addition, Traficom also monitors the operation of ECMs, the educational institutions in the field as well as the operation of railway doctors and psychologists.

The realisation of the rail transport oversight plan is monitored quarterly by Traficom. If necessary, the schedule of the oversight plan can also be adapted and targets prioritised during the period of validity of the plan. The emergence of new risks and exceptional events, for example, may make it necessary to update the plan. The safety recommendations issued by the Safety Investigation Authority can also guide the targeting of the oversight.

In addition to the oversight by Traficom, the operators are required to carry out self-monitoring; its application is described in more detail in section 7.3 of this annual report.

6.2 Oversight results

In 2022, Traficom carried out safety management audits on three rail transport operators and two railway infrastructure managers. Individual deviations were recorded regarding the compliance of the Register of Complementary Certificates with requirements, the documentation of the safety management system, the track maintenance plan, risk management, self-monitoring and internal audits. All operators have submitted plans for correcting the deviations.

In 2022, nine inspections of infrastructure managers of private sidings were carried out based on national legislation. In nearly all of the inspections, deficiencies were discovered in risk management and self-monitoring procedures. In most of the inspections, deficiencies were also discovered in procedures concerning operation and the moving of vehicles. Inspections concerning the transport of dangerous goods were carried out at five separate train depots. Concerning the audits, two deviations regarding the functioning of firewater systems were highlighted. There were two audits of certified Entities in Charge of Maintenance (ECM) in 2022. In the monitoring, one deviation was reported regarding the definition of safety responsibilities and ensuring the qualifications and resources required to carry out the duties in accordance with the responsibilities during a change in the responsible persons of the organisation.

In addition, three audits were implemented on ECMs for which certification is not required due to a derogation in the ECM Regulation or the national legislation. It was found that the operators had challenges with creating and implementing a maintenance system in accordance with the requirements. In addition to the deviations reported in the audits, Traficom aims to use a self-assessment form sent to the operators to find out what kind of further measures are required to make the maintenance systems compliant with the requirements set on them.

In 2022, one audit of an educational institution and one reliability audit were carried out.

Traficom has been interacting constantly with the largest operators. In addition to audits and inspections, matters related to oversight were discussed at one-to-one cooperation meetings and in safety dialogues between Traficom and the operators. Topics of the safety dialogues in 2022 included safety strategy and setting safety targets, self-assessment of the safety management system, developing railway safety indicators, occurrence and disturbance management procedures, resilience and taking advantage of simulator operations in driver training.

6.3 Supervisory cooperation with national safety authorities in other EU Member States

Traficom did not carry out cooperation related to oversight with the railway safety authorities of other EU Member States in 2022.

7 Application of Common Safety Methods

7.1 Application of the Common Safety Method for safety management systems

There is variation in the level of safety management of railway operators, because the field of railway operators in Finland is diverse and consists of operators of very different sizes. The level of safety management is greatly influenced by factors such as the resources available for safety work, the role of railway operations son the scale of the organisation as a whole, and general interest in investing in the safety of the railway system.

In general, the quality of the operators' safety management system is starting to be fairly high. The challenge is often including the methods described in the system as a part of the operations in practice. This may be due to issues such as an external consultant that does not necessarily participate in the daily operation of the company being responsible for building and updating the management system and implementing certain procedures. For some operators, the challenge involves integrating the methods of the safety management system as a part of the other systems that guide the operation of the organisation. It would be important for the operator's personnel participating in the railway operations to be aware of the contents of the safety management system and committed to following the procedures described in the system.

Typically, the largest railway operators have more resources for safety management, which makes them better equipped for developing their activities than organisations with scarce resources. In large organisations, challenges may be posed by the complexity of operations and taking safety management practices from the management level to the level of practical work. Low hierarchies, on the other hand, enable closer cooperation between the management and employees, and the practical implementation of safety management may be easier than in large organisations.

Operators have begun focusing more on human and organisational factors (HOF), but improvements are still needed regarding HOF-related competences and the definition of a comprehensive approach as well as implementing the measures in practice.

7.2 Application of the Common Safety Method for risk evaluation and assessment

Assessments of the significance of changes are mainly carried out in connection with railway projects, but also when operational or organisational changes affecting the railway system are made. An assessment of the significance of changes must be made in connection with changes made to a subsystem of the railway system, which is also taken into account in the potential authorisation process. If the change is considered significant, the operator must comply with the CSM for risk evaluation and assessment in risk management (402/2013). Otherwise, i.e. when the change is considered not significant, the risks are managed in accordance with the applicant's safety management system. Most changes are considered not significant.

If the change is considered significant, an independent assessment body must assess the risk management process related to the change. This increases the costs of the project, which may in part mean that changes are assessed more readily as not significant. The significance of the change is assessed based on six criteria, which leave operators with scope for interpretation when making the decision. The experts present during the assessment process make the final assessment. There is variation in the number and expertise of people participating in the assessment of the significance of changes, which is visible in the differences in quality of assessments of the significance of changes. The quality of the assessment may also be affected by the level of risk management expertise of the party drawing up the assessment and the persons participating in it.

The infrastructure projects of the Finnish Transport Infrastructure Agency, which is the infrastructure manager of the state-owned rail network, involve changes, some of which are considered to be significant and others not significant. The Finnish Transport Infrastructure Agency carries out the assessment of the significance of changes by using a form template, which guides the assessment of the significance of changes based on predefined criteria. Many of the changes are considered not significant, but the largest projects are considered significant changes. It is important to note that even small projects may involve significant risks to railway safety, which should be taken into account when carrying out assessments of the significance of changes.

In 2022, there were no changes assessed as significant by infrastructure managers of private sidings. Through oversight, it has been noticed that the risk management principles of small operators may rely completely on following the CSM in connection with changes. If the risk management of current functions is deficient and changes are assessed as not significant in principle, the risk management of the operator as a whole may be very deficient.

There are approximately one hundred infrastructure managers of private sidings following the notification procedure in Finland that are not obliged to comply with the CSM for risk evaluation and assessment in risk management (402/2013). These operators must also have change management procedures that take account of the management of risks caused by the change.

In 2022, the Finnish Transport Infrastructure Agency adopted its own instructions for the assessments of the significance of changes in technical and safety instructions in accordance with the CSM Regulation; as a result, the number of assessments of the significance of changes in instructions increased. Otherwise, no changes were made to the national guidelines or processes related to the CSM for risk evaluation and assessment in 2022.

7.3 Application of the Common Safety Method for self-monitoring

Traficom has published guidelines for operators on preparing safety reports (TRAFICOM/89239/03.04.02.01/2019). The guidelines include a short description of what operators should state in the report in terms of self-monitoring actions. Almost all of the operators who submitted a safety report also reported on self-monitoring. There is still major variation in the scope and level of detail of reporting the results of self-monitoring between different operators (railway infrastructure managers and railway undertakings). In 2022, some operators followed the

guidelines issued very carefully, while others reported the results of self-monitoring fairly briefly.

In 2022, Traficom did not conduct any surveys related to self-monitoring. The self-monitoring procedures of operators were monitored in connection with the safety certificate assessments – in 2022, there were 17 safety certificates granted. In addition to the safety certificate assessments, Traficom monitored the self-monitoring procedures of infrastructure managers of private sidings through inspections on the infrastructure managers; during 2022, nine such inspections were conducted. All infrastructure managers of private sidings that were inspected had a self-monitoring plan. Among other things, documentation of the self-monitoring carried out and setting self-monitoring targets based on the risk were identified as development targets.

Regarding the field of operators in general, it can be stated that self-monitoring is used to monitor functional processes and procedures more than e.g. organisational procedures or risk management measures. The operators who have conducted internal audits of safety management systems have done so with the intent to use the results obtained for the continuous improvement of their operations. In the oversight carried out by Traficom, it has been noted that some of the operators still have challenges with implementing internal audits. The operators that have not conducted an internal audit may not necessarily have a full picture of their own performance. In addition, challenges are created by ensuring the competence and independence of the parties carrying out internal audits.

There are also variations in the quality of the self-monitoring by the operators. The operators that can invest resources in the work on safety can also carry out more self-monitoring during the year. In contrast, some of the smaller organisations that do not necessarily have much resources available for work on safety use external experts for their self-monitoring. In these cases, self-monitoring is typically carried out and reported once per year. The aim is to ensure that self-monitoring is proactive and that it is carried out regularly during the year.

In the view of Traficom, there is still work to be done among the field of operators regarding whether self-monitoring is used proactively to develop one's own safety and operations, or whether the aim is only to meet yet another requirement among others. In addition, Traficom has noticed during its oversight that the self-monitoring targets may remain largely the same year after year. It would be good to choose self-monitoring targets based on risks, and in fact, the results of previous risk assessments should be taken into account in choosing the targets. The Regulation on CSM for Monitoring emphasises the targets being based on the risks.

In its safety certificate and authorisation assessments and practical oversight, Traficom aims to promote the further development of the operator's self-monitoring procedures.

7.4 Participation in EU-wide activities

Traficom did not participate in any EU projects during 2022.

8 Safety culture

8.1 Evaluation and monitoring of safety culture

In 2022, the development and status of the safety culture of the rail transport sector and operators was monitored on the national level through e.g. safety dialogues as well as other cooperation, such as the HOF network[12]. The focus of safety dialogues is on the aspects of safety and safety culture selected with the operator; issues related to them are reviewed through discussion and by offering support. In the HOF network, the field of operators is broadly represented, and at each meeting, the topic selected by the network is introduced and discussed and news about every operator's HOF and safety culture as well as information about best practices are heard. In 2022, a way to assess the safety culture of operators in connection with the safety management system audit was also planned. More information about safety culture and the related development work was shared, and the topic was discussed between Traficom's rail transport experts at events such as the safety status reviews that are held four times per year.

8.2 Safety culture development projects

In 2022, Traficom started a project with the main goal of providing information for rail transport operators and railway infrastructure managers about how the development and monitoring of the safety culture can be integrated as a part of the safety management system. Another goal of the project was to support Traficom's oversight operations by developing the safety culture assessment method further. The work was done by Teemu Reiman (Lilikoi Consulting). The report 'Safety culture in rail traffic safety management systems' on the work was published in the Traficom Research Reports publication series on 17 February 2023. The article '*Safety culture and safety management systems – An authority perspective*' was also drawn up on the project for the conference of the International Railway Safety Council (IRSC) in 2022. Regarding the other goal of the project, in 2022 a foundation was created for a method for observing safety culture as a part of the safety management system audits.

8.3 Communication about safety culture development projects

Traficom informed operators in the rail sector about projects concerning the development of safety culture and about safety culture and HOF during 2022 in the rail transport HOF network. The network includes operators associated with rail transport, such as the Safety Investigation Authority, education and training institutions, railway undertakings, railway infrastructure managers and consultants. At network meetings, the operators also shared information about their own projects concerning safety culture and HOF.

[12] HOF = Human and Organisational Factors.

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