# NIB ANNUAL REPORT 2017

Safety Investigation Authority

FINLAND

# PREFACE TO THE REPORT

This is the annual report of railway sector of the Safety Investigation Authority, Finland for calendar year 2017.

## National investigation ID

From the beginning of year 2012 the identifying of accident investigation reports has been changed.

## The new identifier

### Accident/incident categories

L - Aviation accidents and incidents
R - Rail accidents and incidents
M - Marine accidents and incidents
Y - Other accidents and incidents
S - Safety study

### Investigation identifier

Each investigation is designated by an identifier that consists of three parts, such as R2012-01.

- The first part refers the accident category (L, R, M, Y or S).
- The second part refers to the year of the accident.
- The third part is a sequence number referring to the order of the accident within its accident category in the year in question.

## The old identifier

### Terms used in this report:

| Investigation categories | |
|---|---|
| A-investigation | Major accident |
| B-investigation | Accident or serious incident |
| C-investigation | Incident, damage or minor accident |
| D-investigation | Other incident |
| S-investigation | Safety study |

### Investigation identifier:

Each investigation is designated by an identifier that consists of four parts, such as A1/1998R.

The first part refers to the investigation category (A, B, C, D or S).
The second part is a sequence number referring to the order of the accident within its accident category in the year in question.
The third part refers to the year of the accident.
The fourth part indicates the accident category (L, R, M or Y).

E.g. A1/1998R refers to the first major railway accident investigation in 1998.

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# 1 INTRODUCTION TO THE INVESTIGATION AUTHORITY

## 1.1 Legal Basis

The Safety Investigation Authority, Finland was founded in 1996 in connection with the Ministry of Justice. The tasks of the Safety Investigation Authority are specified in the relevant act (525/2011), which also include overall directions on the methods of investigation to be implemented. In Finland the Safety Investigation Authority is a multimodal investigation authority, which investigates aviation, maritime, rail and other accidents and incidents. The Safety Investigation Act also provides for the procedure to be followed in the event of exceptional and very serious events that, while not accident, had threatened or seriously damaged basic function in society.

The current Safety Investigation Act is in harmony with to the Railway Safety Directive.

## 1.2 Role and Mission

**The purpose of the safety investigation is to promote general safety and to prevent any new accidents from occurring.**

The safety investigation is conducted by the Safety Investigation Authority (SIAF). The safety investigation examines the course of events related to the accident or incident, their causes and consequences, and the search and rescue actions as well as the actions taken by the authorities. The investigation specifically examines whether safety had adequately been taken into consideration in the activity leading up to the accident and in the planning, manufacture, construction and use of the equipment and structures that caused the accident or incident or at which the accident or incident was directed. The investigation also examines whether the management, supervision and inspection activity had been appropriately arranged and managed. If necessary, the investigation also examines possible defects in the provisions and orders regarding safety and the authorities. The goal of the investigation is to discover factors and background causes contributing to the accident or incident in addition to its immediate cause, which may be found in e.g. the organisation, the instructions or the working methods.

When making the decision on whether to start the safety investigation, the seriousness of the incident and the probability that it will recur is taken into account. An incident or hazard with only minor consequences should be investigated if it caused a danger to several people and it is judged that the investigation will generate information that is significant in improving general safety and preventing accidents. The Safety Investigation Authority does not normally investigate incidents that have been caused deliberately or occur as a result of an offence.

The end result of the safety investigation is an investigation report. At the end of the report, there are safety recommendations addressed to the appropriate authorities and other agencies. The safety recommendations summarise the views of the investigators on how similar accidents and incidents can be avoided in the future. The Safety Investigation Authority monitors that the recommendations are implemented. The purpose of the safety

investigation is to promote general safety, prevent further accidents and incidents, and prevent losses caused by the accidents.

Safety investigations are not conducted to allocate legal liability. Other authorities and agencies are responsible for that task.

**The task of the Safety Investigation Authority**

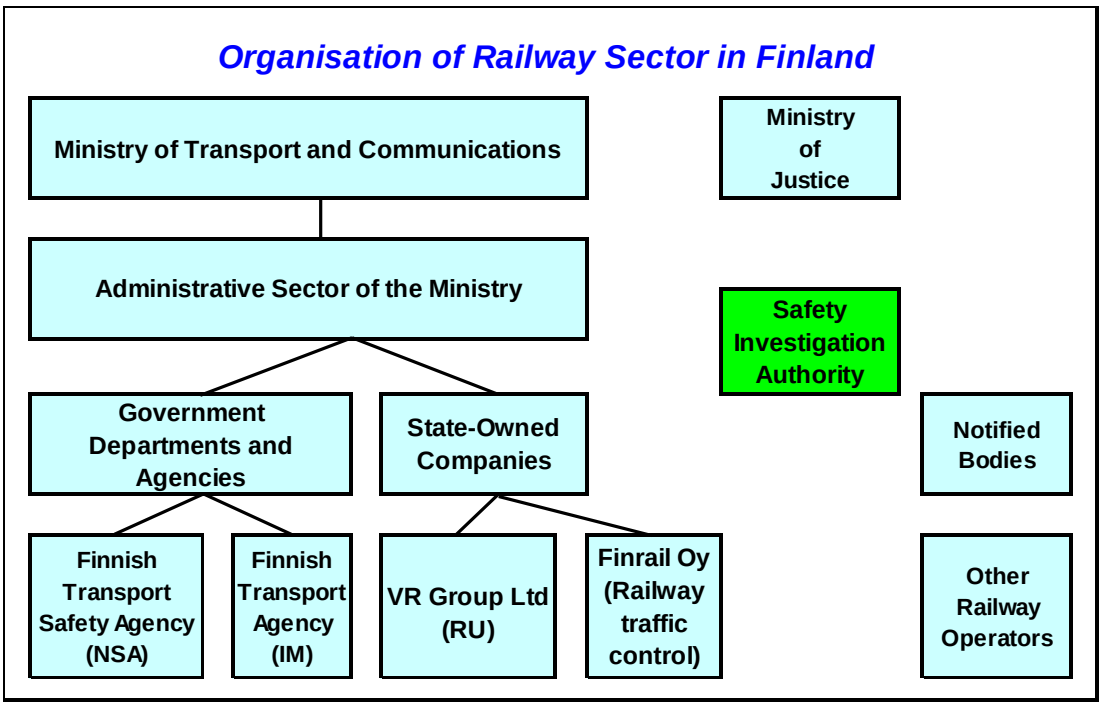
The Safety Investigation Act (525/2011) defines the task and the mandate of the Safety Investigation Authority. The Safety Investigation Act of Finland provides for the types of accidents and incidents investigated by the Safety Investigation Authority and how they are investigated.

**The task of the Safety Investigation Authority is to investigate all major accidents and serious incidents regardless of their type, as well as aviation, rail traffic and maritime traffic accidents and incidents.**

The Safety Investigation Authority

- Ensures the general organisation, planning, guidance, provision of information, and supervision of the safety investigation
- Trains persons suitable to be investigators
- Maintains the readiness to quickly initiate an investigation
- Attends to international cooperation connected with the safety investigation field
- Issues safety recommendations and monitors their implementation.

## 1.3 Organisational flow



# 2 INVESTIGATION PROCESSES

## 2.1 Cases to be investigated

**Accidents and incidents to be investigated:**

- **Rail traffic accident**, which due to deaths or injuries, the extent of damage incurred to the environment, property or assets, or nature of the accident can be regarded as particularly serious (**major accident**)
- **Serious railway accident** as specified in Article 3 of the Directive (EU) 2016/798 of the European Parliament and of the Council on railway safety
  - **train collision** (with another train, a shunting unit or an object or obstacle within the clearance gauge) or **derailment**, resulting in the death of at least one person or serious injuries to five or more persons, or extensive damage to the rolling stock, the infrastructure or the environment (in excess of EUR 2 million)
  - any other railway accident with similar consequences, which has an obvious impact on railway safety (safety regulation or safety management)
    - level crossing accident, resulting train derailment, or resulting in the death of at least one or serious injuries to five or more members of the train crew or passengers, or if the accident was result of failures within the railway system, or which due to deaths or injuries, the extent of damage incurred to the environment, property or assets, or nature of the accident can be regarded as particularly serious
    - **accident to persons** involving rolling stock in motion at a station or railway yard (personnel, passengers), or in connection with a track maintenance operation (personnel)
    - fire in rolling stock when running between the departure station and the destination (including when stopped at the departure station, the interim and destination stops), and re-marshalling operations
    - other type of accident
- and **any similar accident in private or public rail traffic**
  - metro accident
  - tramway accident.

A serious incident and another accident or incident may be investigated in accordance with the Safety Investigation Act. Also, a joint investigation of several similar accidents or incidents may be conducted in accordance with the Act.

## 2.2 Institutions involved in investigations

The Safety Investigation Authority, Finland can investigate all rail accidents. Those investigations are independent and reports are public. According to the Railway Act the Finnish Transport Safety Agency can investigate those occurrences SIAF does not investigate. Investigation reports are not public.

**Level crossing accidents**

The road accident investigation teams investigate all fatal road and off-road traffic accidents in Finland, including level crossing accidents. Preventing them is crucial from the human perspective in particular, but also from the economic perspective. In addition, the teams investigate on a project basis accidents that have caused serious personal injury and property damage to clarify certain specific questions.

The main aim of the investigation is to promote road safety. Accident investigations do not comment on guilt or compensation issues.

Investigation is regulated by legislation on the investigation of road and off-road traffic accidents (Act on the investigation of road and cross-country traffic accidents, 24/2001, since 1.1.2017 Act on the investigation of road and off-road traffic accidents, 1512/2016).

The Finnish Crash Data Institute (OTI) coordinates the work of road accident investigation teams but does not intervene in the independent working of the teams. OTI also takes care of the training of the teams, the use of investigation results, and information services.

There are 20 investigation teams operating in different parts of Finland. They have a total of approximately 300 members. The teams are mainly positioned according to the current regional borders. The teams independently study the reasons for road accidents and make proposals to improve safety. The investigation team members are subject to public liability and a non-disclosure obligation.

The task of the road accident investigation teams is to determine the underlying reasons for an accident and to propose the necessary actions to improve traffic safety. The material collected is used in traffic safety work, the work of public authorities, international co-operation and communication. The teams do not investigate guilt or compensation issues related to accidents.

In addition to that what has been told above about the investigation of road and off-road accidents, we would like to mention, that SIAF can investigate any accident which has taken place in Finland, including road and off-road accidents. When SIAF has initiated an investigation, another authority or instance that has initiated its safety investigation shall transfer to SIAF the investigation materials that it has compiled. SIAF has investigated about 80 level crossing accidents and made four safety studies on level crossing accidents.

# 3 INVESTIGATIONS

## 3.1 Overview of investigations completed, identifying key trends

| Type of accidents investigated | Number of accidents | Number of victims | | Damages in € (approximation) | Trends in relation to previous years |
|---|---|---|---|---|---|
| | | Deaths | Seriously Injured | | |
| **Collisions** | 4 | 0 | 0 | 1 986 00 | |
| **Derailments** | 0 | | | | |
| **Level crossing accidents** | 0 | | | | |
| **Other** | 0 | | | | |

## 3.2 Investigations completed and commenced in 2017

### Investigations completed in 2017

| Date of occurrence | Title of the investigation (Occurrence type, location) | Legal basis | Completed (date) |
|---|---|---|---|
| 23.3.2016 | Collision of a locomotive with a steel slit coil and derailment in Matkaneva 23 March 2016 | I (2) (a) | 17.2.2017 |
| 8.7.2016 | Collision of tank wagons with buffer stop during shunting in Mussalo, Kotka, on 8 July 2016 | I (2) (b) | 9.3.2017 |
| 27.7.2016 | Collision of metro trains in Itäkeskus, Helsinki, on 27 July 2016 | II (2) (a) | 5.5.2017 |
| 13.8.2016 | Collision of a freight train with wagons standing on the tracks in the Oulu freight yard on 13 August 2016 | I (1) | 22.5.2017 |

### Investigations commenced in 2017

| Date of occurrence | Title of the investigation (Occurrence type, location) | Legal basis |
|---|---|---|
| 28.6.2017 | Runaway of a maintenance machine in Ylivieska, Finland, on 28 June 2017 | I (2) (a) |
| 21.9.2017 | Collision between shunting unit and wagons standing on the tracks at Kouvola on 21 September 2017 | I (2) (a) |
| 26.10.2017 | Level crossing accident which led to four deaths at Raasepori on 26 October 2017 | I (1) |

**The Legal Basis for the decision to investigate accident/incident:**

I National rules imposed by implementing of the Directive on railway safety
- (1) in light of Article 20, §1
- (2) in light of Article 20, §2
  - (a) the seriousness of the accident or incident
  - (b) it forms part of a series of accidents or incidents relevant to the system as a whole
  - (c) its impact on railway safety on a Community level
  - (d) requests from infrastructure managers, the safety authority or the Member State
- (3) in light of Article 22
  - (§5) cross-border investigation or request to assistance
  - (§6) other reasons than those referred to in Article 20

II Other national rules/regulations (covering possible areas excluded in Article 2, §2 and §3)
- (2) (a) metros
- (2) (b) trams and other light rail systems

(2) (c) networks that are functionally separate from the rest of the railway system
(3) (a) privately owned railway infrastructure, including sidings, used by the owner or by an operator for the purpose of their respective freight activities or for the transport of persons for non-commercial purposes, and vehicles used exclusively on such infrastructure
(3) (b) infrastructure and vehicles reserved for strictly local, historical or tourist use
(3) (c) light rail infrastructure occasionally used by heavy rail vehicles under the operational conditions of the light rail system, where it is necessary for the purposes of connectivity of those vehicles only
(3) (d) vehicles primarily used on light rail infrastructure but equipped with some heavy rail components necessary to enable transit to be effected on a confined and limited section of heavy rail infrastructure for connectivity purposes only

III Other national rules/regulations not referred to the Safety Directive.

## 3.3 Safety Studies completed and commenced in 2017

### Safety Studies completed in 2017

| **Date of commission** | **Title of the Study** (Occurrence type, location) | **Legal basis** | **Completed** (date) |
|---|---|---|---|
| | | | |

### Safety Studies commenced in 2017

| **Date of commission** | **Title of the Study** (Occurrence type, location) | **Legal basis** |
|---|---|---|
| | | |

## 3.4 Summaries of investigations completed in 2017

**R2016-02**

**Collision of a locomotive with a steel slit coil and derailment in Matkaneva 23 March 2016**

On 23 March 2016 at 11.53 am, a locomotive on its way from Kokkola to Ylivieska collided with a steel slit coil on the track at the speed of 120 km/h near the Matkaneva Station. The locomotive jumped over the slit coil, which was lying on its flat side, and became derailed. After being derailed, the locomotive travelled 185 metres and came to rest tilted over the right rail so that the rail was close to the middle of the locomotive.

The slit coil, weighing approximately 3,500 kg, had fallen on the track from a freight train that had passed the site approximately one hour earlier. The slit coil had rolled to the neighbouring track on the western side and come to rest on its flat side on top of one of the rails. Before the locomotive collided with the slit coil, the passenger train IC50 passed the site on the eastern track at 11.45 am. The driver of the passenger train did not notice the slit coil on the neighbouring track.

The driver of the locomotive that collided with the steel slit coil and was derailed sustained minor injuries. 257 metres of track and track equipment were damaged. The costs of repairs to the locomotive and the track caused by the accident amounted to approximately € 500,000. The damaged track at the site of the accident was repaired and ready for operation by 25 March 2016, and the repairs were completely finished on 11 May 2016. Railway transport of slit coils was interrupted after the accident, and they were transported in lorries until 17 August 2016.

The immediate cause of the accident was the breaking of the radial straps holding the slit coil pack together. The break was preceded by the radial straps becoming loose and displaced during the handling and transport after they were bound at the factory. The loose radial straps allowed the slit coil pack to tilt during transport. The pack fell over and a slit coil fell of the wagon.

In order to avoid similar accidents, the Safety Investigation Authority recommends that the Finnish Transport Safety Agency (Trafi) ensure that the following recommendations on binding slit coil packs, loading them on a wagon as well as collecting and analysing safety information are implemented:

1. SSAB specifies the binding of slit coil packs and verifies it by calculations, taking the stresses due to handling at the factory into account in addition to the lateral accelerations on the coil pack during railway transport.

2. VR finds out the best placement for the coils in the wagons in order to improve the running characteristics of a loaded coil wagon and takes the results into account in the loading instructions.
3. In order to identify risks, SSAB collects information about deviations related to binding, storage handling and transport, and deals with them.

In its other comments, the Safety Investigation Authority states that the rail traffic operators are to remind the engine drivers that the threshold of reporting observed potential faults related to safety must remain low.

**R2016-03**

**Collision of tank wagons with buffer stop during shunting in Mussalo, Kotka, on 8 July 2016**

A radio-controlled shunting unit collided with a rail barrier and two tank wagons loaded with SPB gasoline were derailed at the port of Mussalo in Kotka on the night of Friday 8 July 2016. As the first wagon was derailed, the end of the second wagon mounted the under-frame of the first wagon. Because the height difference was so great, the override protection on the central buffer coupling was unable to prevent the couplings from detaching from each other. A dent around 25 cm deep and almost a metre in diameter was made in the tank of the first wagon, due to the force exerted by the central buffer coupling of the second wagon. However, no leak occurred. No injuries or disruptions of rail or road traffic occurred as a result of the accident. The total costs caused by the accident were around €30,000.

The shunting foreman directed the shunting movement that led to the collision from an adjacent road, observing from the estimated cut-off point of the wagons. He was around 200 metres from the buffer stop when steering the shunting movement towards it. He stopped the movement and separated the wagons left on the track. He only noticed the accident after performing the next shunting movement.

An emergency call was made to the emergency response centre nine minutes after the derailment. A lot of time was taken to notice the collision and raise the alarm, which was not important in this case, however. The delay was partly caused by the fact that there are differences between the instructions of different operators in the port area on raising the alarm about accidents.

The immediate cause of the accident was the placing of the shunting foreman during shunting, where he could not see the end of the track during the final stage of shunting. The choice of place

from which to control the shunter affected his assumption that the unit's cut-off point would be inside the gate.

The current instructions do not precisely define the placing of the shunting foreman, or observation by radio-control during work. According to regulations, such work should be done in a way that allows the shunting unit to be stopped before reaching any obstacle whatsoever. In general, shunting accidents happen because the control station chosen is incorrect. The safety management system was unable to address this erroneous practice effectively. In the case of shunting, supervision by the foreman does not work as required by the safety management system.

In order to avoid similar accidents in the future, the Safety Investigation Authority, Finland recommends that the Finnish Transport Safety Agency (Trafi) for its part ensure the implementation of the following new recommendations:

1. The Finnish Transport Safety Agency (Trafi) and railway operators should improve the supervision of shunting work.
2. Infrastructure managers are responsible for ensuring that the usable track length in railway yards are consistent regardless of the system.
3. Railway undertakings should comply with local emergency plans in ports and other areas where other companies are also operating.
4. Infrastructure managers should modernise buffer stops on tracks where shunting work is done related to the transport of dangerous goods.

As other observations, the Safety Investigation Authority notes that because the *Government Decree on the Transport of Dangerous Goods by Rail* is reviewed every two years and VR Group Ltd's dangerous goods refresher training is arranged every five years, in the worst-case scenario there could be two amendments of the Decree between refresher training. Such amendments should therefore be covered by refresher Traffic Safety Training (LIITU), for example.


**R2016-04**

**Collision of metro trains in Itäkeskus, Helsinki, on 27 July 2016**

Two metro trains collided at Itäkeskus metro station in Helsinki at 2:00 am on 27 July 2016. The sides of the departing test drive train and the teaching train standing at the turnout area of the station collided and the test drive train was derailed. Nobody was hurt. The costs from the accident amounted to approximately EUR 626,000.

Several test drive trains and teaching trains were operating on the night of the accident. The teaching train had been parked in the turnout area while the drivers and learners took a break. The traffic controller set a route for the test drive train and gave the metro driver an exceptional signal but did not tell the driver the reason for the signal. The driver of the test drive train proceeding according to the exceptional signal thought they could fit past the teaching train that was parked on the adjacent track.

Several different levels of factors created conditions for the accident. The custom in Itäkeskus was to park teaching trains in the turnout area while drivers and traffic controllers took their breaks. Traffic control had not recognised the danger this posed to other traffic.

There was a functional design fault in the safety devices, which had not been noticed previously. This made it possible to form a route despite the teaching train being parked in the turnout area. Moreover, the traffic control system set a different route from the one that the traffic controller had intended. The operator had not fixed this known fault. At the time of the accident, the traffic controller settled for the route formed by the traffic control system.

Due to shortcomings in the safety management system, the metro transport operator had not identified the risk of metro trains colliding and had not prepared for it in terms of safety devices and staff competence.

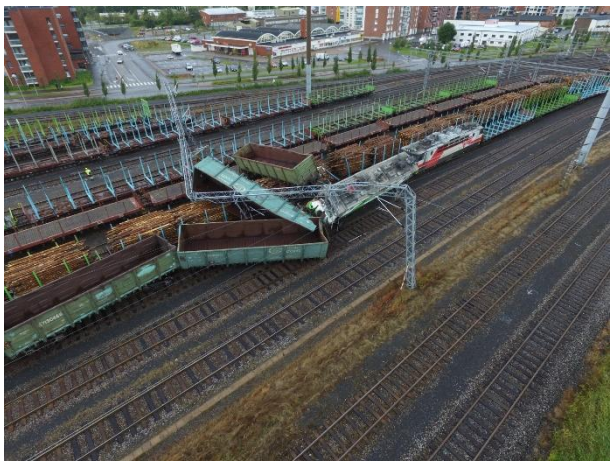
The actions of the driver of the test drive train also contributed to the accident. The driver failed to recognise the fouling point indicator and misjudged the space available for the over-take. The skills of the drivers contributing to the accident were inadequate, which in turn was due to shortcomings in the training system.

In order to improve safety and prevent accidents, the Safety Investigation Authority issues the following recommendations:

1. Helsinki City Transport and the safety device supplier should investigate and analyse the requirements relating to the operational safety of the metro railway system thoroughly in order to avoid potential faults being carried across to the next system in the course of the current safety device revision.
2. The Finnish Transport Safety Agency should ensure that Helsinki City Transport’s safety management system is developed so that it meets the requirements set by the European Railway Agency (ERA) for safety management systems.
3. Helsinki City Transport should schedule night-time metro trains and other units and draw up a driving programme for them.

The Safety Investigation Authority also recommends that Helsinki City Transport ensure that recommendations S265 and S266 given by the Safety Investigation Authority in investigation report B2/2008R are extended to also apply to metro traffic.

- “Tram drivers should be provided with a personalised and logically progressing training programme (B2/08R/S265)."
- “The training programme for driving performance should be documented (B2/08R/S266)."



**R2016-06**

**Collision of a freight train with wagons standing on the tracks in the Oulu freight yard on 13 August 2016**

An empty timber train on its way from Kemi to Kontiomäki was about to arrive at the Oulu freight yard, where it was intended to stop for two hours and change drivers. The traffic controller ordered the switchman to protect the route to the Nokela track 208. The switchman protected the route via track 118 and reported this to the traffic controller.

A freight train arrived on track 118 and collided with the empty wagons standing on the tracks at 16:49 at a speed of 33 km/h. The first two wagons standing on the track reared up due to the force of the impact. The first wagon that reared up broke the right front corner of the first locomotive on the side of its driving table. The second wagon damaged the electric railway portal. Finally, both wagons fell on top of the timber wagons on the neighbouring tracks. The third and fourth wagons standing on the track were derailed. The first locomotive of the train was derailed and tilted heavily to the left. In the accident, the engine driver was injured on the right side of the body.

The accident caused a disturbance mainly affecting traffic in the freight yard, because the main track was constantly in use. Freight trains had to be cancelled from 13 to 15 August 2016. Trains passing through the Oulu freight yard had to be moved using diesel locomotives due to the power cut. Repairs to electrification and rails at the railway yard were completed on 22 August 2016. Damage to stock and equipment due to the accident amounted to a total of €830,000 in value.

The switches at the Oulu railway yard are manually operated, the switches do not have technically implemented position control and there is no indication of occupied tracks on the tracks. Regardless of this, the route was protected for a train.

Risk assessments conducted at the railway yard failed to identify the risks related to the working methods and practices used. For example, overlapping instructions that are not fully consistent were seen as a problem. Some instructions are drawn up for common use, but some of their content cannot be followed everywhere. The instructions are not consistent in all parts, and some of the actors do not know which instructions should be applied to which function.

Neither instructions nor training had been provided on the procedure used to protect a route. The procedure used by the switchman to ensure that the track was unoccupied led to the switchman failing to notice the wagons on track 118. The procedure used in route protection is vulnerable to errors. The switchman alone made the decision to protect the route, and this was not verified in any way.

In addition, the engine driver's attention prior to the collision had been on things other than driving the train. It is likely that greater attentiveness from the engine driver would have either prevented the accident, or at least considerably reduced the damage caused.

In order to avoid similar accidents in the future, the Safety Investigation Authority, Finland, recommends that the Finnish Transport Safety Agency (Trafi), for its part, ensure the implementation of the following new recommendations:

1. The Finnish Transport Agency should restrict trains running on tracks that are not under technical centralised traffic control.
2. The Finnish Transport Agency should harmonise and clarify the instructions on centralised traffic control.
3. The Finnish Transport Safety Agency (Trafi) should order that engine drivers keep a lookout when in train traffic.

In its other comments, the Safety Investigation Authority states that if the intention in Oulu is still to protect the route of a train instead of using shunting operations, a route allowing trains to drive through the Oulu freight yard under the control and monitoring of centralised traffic control could be built at reasonable cost. For example, the route could be built via tracks 121 and 123 to the Nokela track, 208. All 17 switches of the route should be replaced by electrically operated ones, and the tracks should be equipped with indicators showing their unoccupied status.

### 3.5 Comment and introduction or background to the investigations

**Investigations commenced in 2017 and not followed**

| **Date** of occurrence | **Title of the investigation** (Occurrence type, location) | **Legal basis** | **Reason of non-following or suspension of investigations** | **Who, why, when (decision)** |
|---|---|---|---|---|
| | | | | |

## 3.6 Accidents and incidents investigated during last five years (in 2013–2017)

### Rail investigations in 2013–2017

| Accidents investigated | | 2013 | 2014 | 2015 | 2016 | 2016 | TOT |
|---|---|---|---|---|---|---|---|
| Serious accidents (Art 19.1) | Train collision | 0 | 0 | 0 | 0 | 0 | **0** |
| | Train collision with an obstacle | 0 | 0 | 0 | 1 | 0 | **1** |
| | Train derailment | 0 | 0 | 0 | 0 | 0 | **0** |
| | Level crossing accident | 0 | 0 | 0 | 1 | 1 | **2** |
| | Accident to person caused by RS in motion | 0 | 0 | 0 | 0 | 0 | **0** |
| | Fire in rolling stock | 0 | 0 | 0 | 0 | 0 | **0** |
| | Involving dangerous goods[1] | 0 | 0 | 0 | 0 | 0 | **0** |
| Other accidents (Art 19.2) + (Art 21.6) | Train collision | 0 | 0 | 0 | 1 | 0 | **1** |
| | Train collision with an obstacle | 1 | 0 | 0 | 1 | 1 | **2** |
| | Train derailment | 1 | 0 | 0 | 2 | 0 | **3** |
| | Level crossing accident | 0 | 0 | 1 | 0 | 0 | **1** |
| | Accident to person caused by RS in motion | 0 | 0 | 0 | 1 | 0 | **1** |
| | Fire in rolling stock | 0 | 0 | 0 | 0 | 0 | **0** |
| | Involving dangerous goods[1] | 0 | 0 | 0 | 1 | 1 | **1** |
| | Incidents | 0 | 0 | 15[2] | 0 | 1 | **16** |
| **TOTAL** | | **2** | **0** | **16** | **7** | **3** | **28** |

## 3.7 Preliminary investigations

The Safety Investigation Authority has made, in compliance with section 8 of the Safety Investigation Act (525/2011), preliminary investigations. The SIAF has decided on the basis of a preliminary investigation, that the special characteristics of the case do not require the starting of the full investigation, but the report on the preliminary investigation is sufficient from the point of view of the safety advantage to be obtained. In the report is described briefly the events which have led to the accident and the immediate and indirect causes, which have been found in the preliminary investigation. In the reports there are not issued recommendations, but observations and suggestions for the measures to the actors. The reports are published only in Finnish.

In 2013 we started to publish reports of preliminary investigations in SIAF internet pages. In 2017 we developed a new layout of the report.

During the year 2017 SIAF made no preliminary investigations.

[1] Belongs also to another category and is not calculated another time to the total amount.
[2] Cases belongs to the theme investigation on wrong routings in train traffic in 2015.

## 3.8 Fatal level crossing accidents investigated by the road accident investigation teams

In 2017 occurred a total of 25 level crossing accidents, seven of them were fatal. Six of the fatal level crossing accidents happened to a vehicle and one for a pedestrian. Ten persons injured fatally in the accidents, six injured seriously and two injured slightly. The road accident investigation teams investigated the fatal level crossing accidents happened to a vehicle[3]. Below short summaries of the accidents happened to vehicles:

### 1. Fatal level crossing accident in Iisalmi on 5 March 2017

On Sunday, 5 March 2017, a level crossing accident involving a private car and a passenger train (railbus) occurred on the Ronninmäentie level crossing in Iisalmi. Speed of the train was 120 km/h and speed of the car was about 20 km/h. The level crossing was passive. The accident was fatal to the car driver. The car was wrecked beyond repair. The railbus sustained damages in front of the rail bus and in left side.

The direct cause (*the key event*[4]) of the accident was that the car driver drove onto the level crossing when the train was approaching from the right.

The car driver failed to notice the train approaching from the right (*immediate risk factors*[4]).

*Background risk factors*[4]:

- the level crossing was familiar to the car driver
- the car driver may have concentrated on other than driving
- the maximum speed of the train was 120 km/h, but the sightline opened at a distance of only less than 15 metres from the level crossing
- the sightlines were according to the guidelines.

In order to prevent similar accidents, the investigation team made the following improvement *proposals and safety recommendations*:

- level crossings should be removed or equipped with warning installation. The present technology makes the relatively advantageous solutions of warning installations possible
- if the level crossing would not be removed, it would be equipped with avenge signs and STOP sign
- sight lines should open earlier than at present
- to vehicles automatic system which warns of the approaching train
- the trains should use whistle when approaching level crossing
- adding of the attention value of the colouring of the train
- the speed of a train should be considerably less than 120 km/h when approaching level crossing
- information and education about dangers of the crossing of the railway

[3] SIAF has investigated the Raasepori level crossing accident. The road accident investigation teams started to investigate also that case, but according to our legislation stopped the investigation and gave all information they got to SIAF.

[4] Terms used by the road accident investigation teams.

- education to drivers about dangerousness of momentary loss of concentration
- more education in the anticipating driving for car drivers.

### 2. Fatal level crossing accident in Vaasa on 28 April 2017

On Friday, 28 April 2017, a level crossing accident involving a delivery van and a passenger train (Pendolino Sm3) occurred on the Aspholm level crossing in Vaasa. Speed of the train was 90 km/h and speed of the van was about 20 km/h. The level crossing was passive. The accident was fatal to the car driver and passenger. The van was crushed totally. The train sustained damages in front of the train and some side windows were broken.

The direct cause (*the key event*) of the accident was that the van came to the crossing driving line when the train approached from the right.

The car driver failed to notice the train approaching from the right (*immediate risk factors*).

*Background risk factors*:

- when approaching the level crossing, the crossing angle between private road and railway was the first 40 metres 50 degrees and changed 10 metres before the track into 75 degrees
- the driver had to look to diagonally backward to the right
- the seeing was hampered by the coppice and the passenger sitting beside
- the level crossing was not familiar to the car driver; first time on that level crossing
- sightline to the arrival direction of the train was 450 meters.

In order to prevent similar accidents, the investigation team made the following improvement *proposals and safety recommendations*:

- removal of the level crossing and directing of the traffic to the safe level crossing
- two next level crossings should be equipped with half-barrier installation.

*Measures that have been taken*:

- sight lines have been made better
- the allowed maximum speed of train has been reduced
- to the second end of the road has been put a “no through road” sign.

### 3. Fatal level crossing accident in Savonlinna on 8 June 2017

On Wensday, 8 June 2017, a level crossing accident involving a private car and a passenger train (railbus) occurred on the Sahatie level crossing in Savonlinna. Speed of the train was 80 km/h and speed of the car was about 30 km/h. The level crossing was active, automatic with user side warning. The accident was fatal to the car driver. The passenger of the car injured seriously. The car wrecked beyond repair. The front of the railbus sustained minor damages.

The direct cause (*the key event*) of the accident was that the car driver drove onto the level crossing even the warning lights flashed.

*Immediate risk factors:*

The car driver failed to stop before the level crossing. The engine driver thought that the car stops.

*Background risk factors*:

- too high a situational speed to manage to stop before rails
- restricted sight line to the arrival direction of train
- the car driver did not manage to estimate the stopping distance of the car on a slippery road surface
- the car driver had minor driving experience in winter conditions.

In order to prevent similar accidents, the investigation team made the following improvement *proposals and safety recommendations*:

- sight lines should make better
- level crossings should be equipped with half-barriers and the height of the red light should be optimised
- the level crossing should be equipped with avenge signs
- in the driver education the crossing of the level crossing should be practised and the risks which are related to the crossing of the level crossing should be gone through.

### 4. Fatal level crossing accident in Haapajärvi on 10 July 2017

On Monday, 10 July 2017, a level crossing accident involving a tractor and a freight train occurred on the Pekolantie level crossing in Haapajärvi. Speed of the train was 80 km/h and speed of the tractor was less than 10 km/h. The level crossing was passive, equipped with STOP signs. The accident was fatal to the tractor driver. The tractor broke in two and was damaged also otherwise badly. The front of the locomotive sustained damages.

The direct cause (*the key event*) of the accident was that the tractor driver started to drive onto the level crossing when the train was approaching.

*Immediate risk factors:*

The tractor driver failed to notice the train approaching or made wrong observation. To the engine driver the situation came as a surprise because the tractor had stopped to the STOP sign.

*Background risk factors*:

- the tractor driver was possibly in the surge of emotion for the sake of ordinary conflicts
- the physical vigour state can have been fallen because of a stress
- young driver
- there were contradictions in the arrangement of traffic signs
- the crossing angle was 130 degrees
- in the top of the side window of the tractor an abundant number of perfumes hung which may have hampered the perception of the train for its part.

In order to prevent similar accidents, the investigation team made the following improvement *proposals and safety recommendations*:

- the level crossings could be removed by doing replacing road connections to the near level crossings that have been equipped with the warning devices
- reallocation of pieces of land could be used to reduce a need for the level crossings

- the tractors should be brought within the sphere of the regular inspection procedure which corresponds to the regular motor vehicle inspection.

### 5. Fatal level crossing accident in Ylivieska on 14 July 2017

On Friday, 10 July 2017, a level crossing accident involving a private car and a passenger train (railbus) occurred on the Pystylä level crossing in Ylivieska. Speed of the train was 120 km/h and speed of the car was less than 10 km/h. The level crossing was passive. The accident was fatal to the car driver. The left side of the car was pressed in. The front of the railbus sustained damages.

The direct cause (*the key event*) of the accident was that the car driver started to drive onto the level crossing when the train was approaching from the left.

*Immediate risk factors:*

The car driver failed to notice the train approaching or made wrong observation. To the engine driver the situation came as a surprise because the car had stopped before the level crossing.

*Background risk factors*:

- The car driver had a long-time depression and he had suffered from the insomnia which had gotten worse during the lately. The depression was manifested in the tiredness and in the motoric slowness.

In order to prevent similar accidents, the investigation team made the following improvement *proposals and safety recommendations*:

- sight lines should make better by removing trees
- national instructions how the level crossings of private roads are marked and are maintained
- the level crossings should be removed by doing replacing road connection
- tightening of the cooperation of the parties responsible for the health care and improvement of the evaluation of risks.

# 4 RECOMMENDATIONS

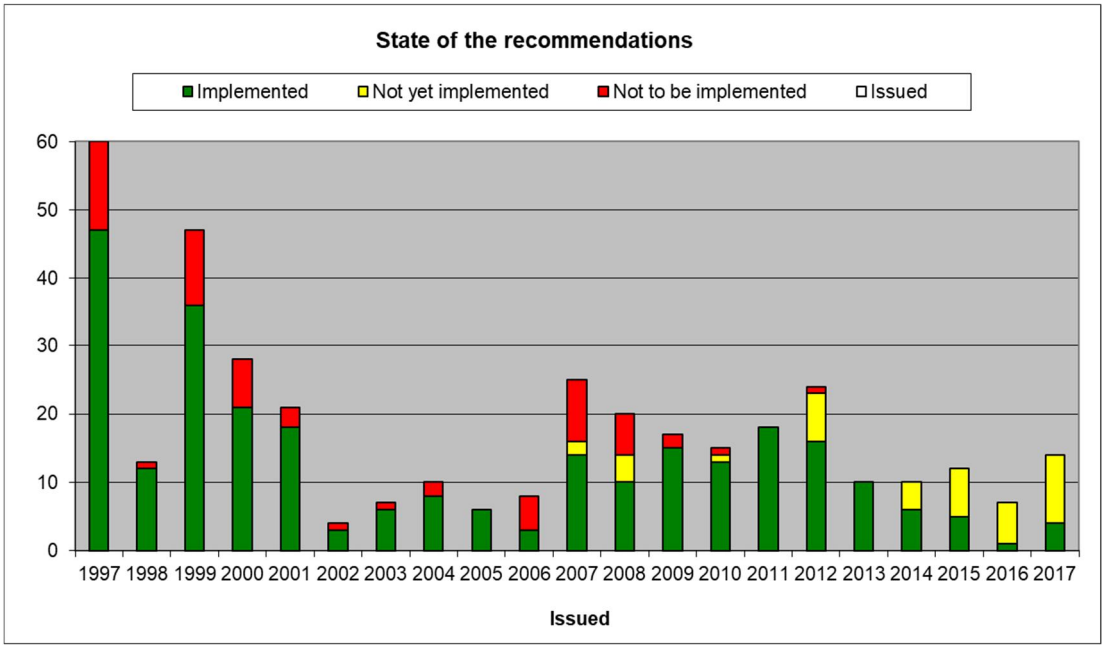
## 4.1 Short review and presentation of recommendations

### Implementation of recommendations during 2007–2017

| Recommendations issued | | Recommendation implementation status | | | | | |
|---|---|---|---|---|---|---|---|
| | | Implemented | | In progress | | Not to be implemented | |
| Year | [No.] | [No.] | [%] | [No.] | [%] | [No.] | [%] |
| **2007** | 25 | 14 | 56,0 | 2 | 8,0 | 9 | 36,0 |
| **2008** | 20 | 10 | 50,0 | 4 | 20,0 | 6 | 30,0 |
| **2009** | 17 | 15 | 88,2 | 0 | 0,0 | 2 | 11,8 |
| **2010** | 15 | 13 | 86,7 | 1 | 6,7 | 1 | 6,7 |
| **2011** | 18 | 18 | 100,0 | 0 | 0,0 | 0 | 0,0 |
| **2012** | 24 | 16 | 66,7 | 7 | 29,2 | 1 | 4,2 |
| **2013** | 10 | 10 | 100,0 | 0 | 0,0 | 0 | 0,0 |
| **2014** | 10 | 6 | 60,0 | 4 | 40,0 | 0 | 0,0 |
| **2015** | 12 | 5 | 41,7 | 7 | 58,3 | 0 | 0,0 |
| **2016** | 7 | 1 | 14,3 | 6 | 85,7 | 0 | 0,0 |
| **2017** | 14 | 4 | 28,6 | 10 | 71,4 | 0 | 0,0 |
| **TOTAL** | **172** | **112** | **65,2** | **41** | **23,8** | **19** | **11,0** |

Implementation status of Recommendations, see Annex 1.

A total of 376 recommendations were issued from the beginning of 1997 until the end of 2017. According to information available at 11 April 2017, 272 (72.3 %) recommendations were implemented and 63 (16.8 %) were decided not to be implemented. Since beginning of 2007 until the end of 2017 a total of 172 have been issued. 112 (65.2 %) have been implemented, 19 (11.0 %) have been decided not to be implemented and 41 (23.8 %) are under implementation.




## 4.2 Recommendations 2017

### S1 Specifying the binding of slit coil packs

The breaking of the radial straps holding the slit coil pack together was preceded by the radial straps becoming loose and displaced during the handling and transport after they were bound at the factory. The loose radial straps allowed the slit coil pack to tilt during transport. In order to ensure that the radial straps are sufficiently tight and that they stay in place, the Safety Investigation Authority recommends that:

> *SSAB specifies the binding of slit coil packs and verifies it by calculations, taking the stresses due to handling at the factory into account in addition to the lateral accelerations on the coil pack during railway transport. [2017-S3]*

It is appropriate to find out the accelerations caused on the load by the railway equipment in cooperation with the railway undertaking using the results from the running characteristics tests of the rolling stock.

### S2 Loading slit coil packs on a wagon

The running characteristics of the steel coil carrying wagons fulfil the requirements of European norms[5], but the lateral accelerations on the frame of the wagons come close to the limit value and may even exceed it for short periods of time. In a calculated estimate of the moment of inertia of a loaded wagon resulting from the placement of the load, it was found that it is more advantageous to put heavy coils in cradles 2 and 4 at the centre

[5] EN 14363.

of the wagon compared to cradles 1 and 5. So that load placement would not cause unnecessary stress to the load's bindings, the rolling stock or the tracks, the Safety Investigation Authority recommends that:

*VR finds out the best placement for the coils in the wagons in order to improve the running characteristics of a loaded coil wagon and takes the results into account in the loading instructions. [2017-S4]*

### S3 Collecting and analysing safety information

Straps have become loose and broken during handling in storage or transport. The problem of the straps becoming loose on coils being rolled and lifted in the storage area had also been identified in SSAB's production. Broken straps had been replaced, but a deviation had not been recorded concerning them. In addition, the investigation found that slit coils had also fallen off or tilted during transport on previous occasions, but information was not available for all cases. So that information on the deviations could be utilised, the Safety Investigation Authority recommends that:

*In order to identify risks, SSAB collects information about deviations related to binding, storage handling and transport, and deals with them. [2017-S5]*

Based on the analysed information, new or incipient risks could also be identified in advance. Deviations that have occurred during railway transport must be handled in cooperation with the railway undertaking.

### S4 Supervision of shunting work

Collisions and derailments occur during shunting work every three days on average. In 2015, there were nine collisions or derailments involving dangerous goods. To improve the safety of shunting work, the Safety Investigation Authority recommends that:

*The Finnish Transport Safety Agency (Trafi) and railway operators should improve the supervision of shunting work. [2017-S6]*

The supervision should be performed as official supervision, as the operator's own monitoring and performed by local superiors.

### S5 The harmonisation of the usable lengths of railway yard tracks

The lengths of railway yard tracks vary depending on the data source and system. During shunting work, this can lead to errors of interpretation which can cause an incident or accident. The consequences of an accident can be significant in railway yards were dangerous goods are being transported. To improve the safety of railway yards, the Safety Investigation Authority recommends that:

*Infrastructure managers are responsible for ensuring that the usable track length in railway yards are consistent regardless of the system. [2017-S7]*

On railway yards where only shunting work is carried out, a use length should be used as the length of the tracks.

### S6 Compliance with the rescue plan

A rescue plan forms the basis of safety in ports and other areas where several companies are operating. The promotion of overall safety in such an area requires consistent actions from all operators. The ensure consistent actions, the Safety Investigation Authority recommends that:

*Railway undertakings should comply with local emergency plans in ports and other areas where other companies are also operating. [2017-S8]*

### S7 Replacement of buffer stops

In railway yards, old buffer stops are of little relevance in stopping wagons. In addition, the transport of dangerous goods in wagons built according to varying standards sets a wide range of requirements for buffer stops. In risk analyses, overshootings have been identified as a potential cause of accidents. Because there has been no change in shunting supervision practices, structural accident prevention should be made more effective, particularly in railway yards where dangerous goods are being handled. To improve the safety of railway yards in which dangerous goods are being transported, the Safety Investigation Authority recommends that:

*Infrastructure managers should modernise buffer stops on tracks where shunting work is done related to the transport of dangerous goods. [2017-S9]*

The Finnish Transport Agency should share its knowledge with other infrastructure managers, to support their renewal of buffer stops.

### S8 Ensuring requirements for the operational safety of the metro

The accident investigation revealed that the safety device design included a fault that has been carried across two generations of devices.
The Safety Investigation Authority issues the following recommendation:

*Helsinki City Transport and the safety device supplier should investigate and analyse the requirements relating to the operational safety of the metro railway system thoroughly in order to avoid potential faults being carried across to the next system in the course of the current safetv device revision. [2016-S22]*

### S9 Development of the safety management system

Helsinki City Transport was not required to have a safety management system until the summer of 2016, following the entry into force of the new Urban Rail Transport Act. This

is why the system was undeveloped. For example, there were shortcomings in the processing of safety deviations, and the risk of metro trains colliding had not been identified.
The Safety Investigation Authority issues the following recommendation:

*The Finnish Transport Safety Agency should ensure that Helsinki City Transport's safety management system is developed so that it meets the requirements set by the European Railway Agency (ERA) for safety management systems. [2016-S23]*

The requirements laid down in the recommendation should be extended to all urban rail transport operators.

### S10 Development of the planning and coordination of night-time traffic

Controlling night-time traffic is challenging. Unscheduled night-time test and teaching traffic had not been planned sufficiently well or coordinated. It was difficult to form a comprehensive picture of the traffic situation. Night-time traffic requires traffic controllers to make quick decisions based on events.
The Safety Investigation Authority issues the following recommendation:

*Helsinki City Transport should schedule night-time metro trains and other units and draw up a driving programme for them. [2016-S24]*

### S11 Development of the training system

In its investigation "Collision of trams on Mäkelänkatu in Helsinki, Finland, on 13 June 2008 (B2/2008R)", the Safety Investigation Authority gave the following recommendations:

*S265 Training programme development*

*Tram driver training includes learning materials from several different teachers and is not organised well enough. The learning materials also overlap in part.*

*"Tram drivers should be provided with a personalised and logically progressing training programme (B2/08R/S265)."*

*The training programme should be based on a detailed analysis of the job and its segmentation into constituent parts.*

*S266 Monitoring of learning progress*

*The driving skills of tram driver trainees are reviewed during an on-the-job learning period, but this is not documented in writing.*

*"The training programme for driving performance should be documented (B2/08R/S266)."*

*Learning progress should be monitored by means of training diaries and checklists, for example (cf. procedures at professional driving schools).*

The Safety Investigation Authority issues the following recommendation:

*Helsinki City Transport should ensure that recommendations S265 and S266 given by the Safety Investigation Authority previously are extended to also apply to metro traffic. [2016-S25]*

### S12 Restricting running as a train on tracks that are not under technical centralised traffic control

A safety risk is involved in the work done by switchmen to protect routes in railway yards without modern technical systems to protect the passage of trains. Route protection by the switchman is not verified in any way, which also constitutes a risk. The faulty procedure used by the switchman made it possible to protect the route of a train on an occupied track. Traffic implemented as shunting operations should be more controlled, in which case the engine driver would also have an obligation to keep a lookout. If, say, for financial reasons it is not possible to equip all railway yards with technical monitoring by centralised traffic control, the Safety Investigation Authority recommends that

*The Finnish Transport Agency should restrict trains running on tracks that are not under technical centralised traffic control. [2017-S28]]*

When applying for capacity, the railway company take the station-specific conditions into account and apply for capacity for shunting operations accordingly.

The Finnish Transport Agency should harmonise and provide instructions on traffic control methods in order to safeguard traffic in such a manner that the operating model would be the same regardless of the traffic controller.

### S13 Renewing the instructions on traffic control

The instructions on traffic control are not consistent in all parts, and some of the actors do not know which instructions should be applied to which function or which instructions should be followed. Some of the instructions refer to other instructions that have already been repealed. To ensure that the instructions on traffic control are up to date and clear for all actors, the Safety Investigation Authority recommends that

*The Finnish Transport Agency should harmonise and clarify the instructions on centralised traffic control. [2017-S29]*

The Finnish Transport Agency be responsible for the instructions on traffic control. The instructions should pay special attention to cooperation between all parties and ensuring that no separate actor-specific sub-instructions are created. In addition to good instructions, consideration should be given to how the instructions are implemented in practice, the related training, and how to ensure that the instructions and working methods have been mastered.

### S14 The obligation of an engine driver to keep a lookout in train traffic

Engine drivers do not have an obligation to keep a lookout in train traffic. However, during shunting operations, engine drivers have responsibility in all situations to drive carefully, control their speed and pay attention to the sightline in the direction of travel, so that they can stop the unit before any obstacle. Train traffic also occurs at relatively low speeds, such as in the case in question. The Safety Investigation Authority therefore recommends that

*The Finnish Transport Safety Agency (Trafi) should order that engine drivers keep a lookout when in train traffic. [2017-S30]*

The earlier obstacles on the track are observed, the better the chances there are of preventing an accident or considerably mitigating the damage caused. In addition, this would provide the engine driver with more time to take cover, if necessary. Keeping a lookout and using an ATP device are not mutually exclusive; instead, combined they help the driver to make the right decisions at the right time. Requiring the driver to keep a lookout is not intended to change the prevailing practice of securing a safe route for the train, for which traffic control is responsible. Neither does it mean that the driver must be able to stop the train in any circumstances, upon noticing an obstacle.

**RECOMMENDATIONS**

| | | | |
|---|---|---|---|
| ***Date and time (Code):*** | 17.1.2007, 10.52 (B1/2007R) | | |
| ***Location:*** | Närpiö, Kallmossvägen / Karlå level crossing, unprotected | | |
| ***Type of occurrence:*** | Level crossing accident, freight train – van | | |
| ***Train type and number:*** | Freight train 3273, two Dv12 diesel locomotives and 35 wagons | | |
| ***Road vehicle:*** | Van Opel Astra, 2001 model | | |
| | | ***In the train*** | ***In the road vehicle*** |
| ***Persons on board:*** | ***Crew:*** | 1 | 1 |
| | ***Passengers:*** | 0 | 0 |
| ***Fatally injured:*** | ***Crew:*** | 0 | 1 |
| | ***Passengers:*** | 0 | 0 |
| ***Seriously injured:*** | ***Crew:*** | 0 | 0 |
| | ***Passengers:*** | 0 | 0 |
| ***Slightly injured:*** | ***Crew:*** | 0 | 0 |
| | ***Passengers:*** | 0 | 0 |
| ***Damages of rolling stock:*** | The locomotive suffered minor damage while the van was wrecked beyond repair. | | |
| ***Damages on track equipment:*** | None. | | |
| ***Other damages:*** | Deliverable post was lost and damaged. | | |

***Summary*:** On Wednesday 17 January 2007 at 10.50 a.m. an accident occurred in Närpiö in which a train carrying lumber on its way from Seinäjoki to Kaskinen collided with a van at an unprotected level crossing.

| | |
|---|---|
| ***Final report issued:*** | 23.11.2007 |

| | | |
|---|---|---|
| ***Recommendation Nr. S227*** | Using the safety belt in an accident, even when driving at moderate speeds, may prevent injury or death. | |
| | **Compulsory use of safety belts should be expanded to include delivery vehicle drivers and passengers, irrespective of the driving distance.** | |
| ***Date*** | ***Status*** | ***Comments*** |
| 20.1.2009 | In progress | Finnish Transport and Logistics supports because of safety reasons. |
| 16.6.2011 | In progress | |
| 9.2.2012 | In progress | |
| 19.9.2013 | | |
| 10.3.2014 | | |
| 25.2.2015 | Under implementation | The renewal of the road traffic legislation is in progress. |
| 3.3.2016 | Under implementation | Waiting for the renewal of the road traffic legislation. |
| 28.3.2017 | Under implementation | Waiting for the renewal of the road traffic legislation. |
| 11.3.2018 | Under implementation | Legislative proposal will be presented to Finnish parliament. It does not include mandatory use of safety belt in delivery vehicles. |

| | | | |
|---|---|---|---|
| ***Date and time (Code):*** | 5.3.2007, 14.39 (B2/2007R) | | |
| ***Location:*** | Nivala, Niskakankaantie / Pahaoja level crossing, unprotected | | |
| ***Type of occurrence:*** | Level crossing accident, Passenger train – car | | |
| ***Train type and number:*** | Local train H494, Dm12 rail bus | | |
| ***Road vehicle:*** | Passenger car Renault Laguna Break 1.6, 2000 model | | |
| | | ***In the train*** | ***In the road vehicle*** |
| ***Persons on board:*** | ***Crew:*** | 2 | 1 |
| | ***Passengers:*** | 25 | 1 |
| ***Fatally injured:*** | ***Crew:*** | 0 | 1 |
| | ***Passengers:*** | 0 | 1 |
| ***Seriously injured:*** | ***Crew:*** | 0 | 0 |
| | ***Passengers:*** | 0 | 0 |
| ***Slightly injured:*** | ***Crew:*** | 0 | 0 |

| | | | |
|---|---|---|---|
| | ***Passengers:*** | 0 | 0 |
| ***Damages of rolling stock:*** | Slight damages to the rail bus, the car was completely wrecked. | | |
| ***Damages on track equipment:*** | None. | | |
| ***Other damages:*** | None. | | |
| ***Summary*:** On Monday 5 March 2007 at 2.39 p.m., a level crossing accident took place involving a passenger car and a rail bus travelling from Ylivieska to Iisalmi. Both the driver and the passenger of the car perished, while the train personnel and passengers were unharmed. The accident wrecked the car beyond repair, while the train suffered only minor damage. The total material costs due to the accident were approximately EUR 70,000. | | | |
| ***Final report issued:*** | 23.11.2007 | | |

| | | |
|---|---|---|
| ***Recommendation Nr. S228*** | The Pahaoja unguarded level crossing is situated on a busy private road in Niskakangas which, in addition to the locals, is used by regular taxi traffic and heavy traffic due to farming and industry in the area. For train safety alone, it would be extremely important that the level crossing be equipped with a warning station with automatic gates. This measure would also increase the likelihood that a driver notices an approaching train, thanks to lowered or lowering gates. | |
| | **The Pahaoja unguarded level crossing should be equipped with a half barrier equipment.** | |
| ***Date*** | ***Status*** | ***Comments*** |
| 20.1.2009 | In progress | RHK is not going to install the level crossing with barriers. |
| 16.6.2011 | In progress | Nivala town is of the opinion that the level crossing should be equipped with half barriers. |
| 9.2.2012 | In progress | |
| 19.9.2013 | | |
| 10.3.2014 | | |
| 25.2.2015 | Under implementation | Financing for the improvement of level crossing safety is not granted. |
| 3.3.2016 | Under implementation | No progress. |
| 28.3.2017 | Under implementation | No progress. |
| 11.4.2018 | Under implementation | Level crossing is number 52 at the TOP 100 list of most dangerous level crossings in Finland. New track plan to be approved. |

| | | | |
|---|---|---|---|
| ***Date and time (Code):*** | 6.5.2007, 15.33 (B4/2007R) | | |
| ***Location:*** | Kiuruvesi, Pohja level crossing, unprotected | | |
| ***Type of occurrence:*** | Level crossing accident, passenger train - car | | |
| ***Train type and number:*** | Regional train 746, two Dm12 rail busses | | |
| ***Road vehicle:*** | Car Nissan Almera 4D Sedan, 2005 model | | |
| | | ***In the train*** | ***In the road vehicle*** |
| ***Persons on board:*** | ***Crew:*** | 2 | 1 |
| | ***Passengers:*** | ≈60 | 1 |
| ***Fatally injured:*** | ***Crew:*** | 0 | 1 |
| | ***Passengers:*** | 0 | 0 |
| ***Seriously injured:*** | ***Crew:*** | 0 | 0 |
| | ***Passengers:*** | 0 | 1 |
| ***Slightly injured:*** | ***Crew:*** | 0 | 0 |
| | ***Passengers:*** | 0 | 0 |
| ***Damages of rolling stock:*** | The car was wrecked beyond repair. Equipment of the train's nose and substructure were damaged | | |
| ***Damages on track equipment:*** | The wooden covering on the level crossing sustained minor damage. | | |
| ***Other damages:*** | None | | |
| ***Summary*:** A fatal level crossing accident took place in Kiuruvesi, at the unprotected level crossing of Pohja. This accident occurred when a car travelling along the Pohja private road drove without stopping under a rail bus running from Ylivieska to Iisalmi. There were two passengers in the car; the driver perished and the front seat passenger was seriously injured. | | | |
| ***Final report issued:*** | 29.1.2008 | | |

| | | |
|---|---|---|
| ***Recommendation Nr. S234*** | Since the Pohja level crossing is dangerous with regard to its conditions and very near a safe overpass, the investigation commission recommends: | |
| | **The Pohja level crossing should be closed and a replacement overpass be created at the Hilapparannantie bridge.** | |
| ***Date*** | ***Status*** | ***Comments*** |
| 20.1.2009 | In progress | |
| 19.2.2010 | In progress | |
| 18.8.2011 | In progress | |
| 9.2.2012 | In progress | |
| 19.9.2013 | | |
| 10.3.2014 | | |
| 25.2.2015 | Under implementation | Financing for the improvement of level crossing safety is not granted. |
| 3.3.2016 | Under implementation | No progress. |
| 28.3.2017 | Under implementation | No progress. |
| 11.4.2018 | Under implementation | There are no corrective actions planned for Pohja level crossing. |

| | | | |
|---|---|---|---|
| ***Date and time (Code):*** | 9.3.2007, 16.13 (B3/2007R) | | |
| ***Location:*** | Särkisalmi, Sinkonen level crossing, unprotected | | |
| ***Type of occurrence:*** | Level crossing accident, passenger train -- car | | |
| ***Train type and number:*** | Regional train 746, Dm12-railcar | | |
| ***Road vehicle:*** | Car Mercedes Benz 190D, 1985 model | | |
| | | ***In the train*** | ***In the road vehicle*** |
| ***Persons on board:*** | ***Crew:*** | 2 | 1 |
| | ***Passengers:*** | 34 | 1 |
| ***Fatally injured:*** | ***Crew:*** | 0 | 1 |
| | ***Passengers:*** | 0 | 1 |
| ***Seriously injured:*** | ***Crew:*** | 0 | 0 |
| | ***Passengers:*** | 0 | 0 |
| ***Slightly injured:*** | ***Crew:*** | 0 | 0 |
| | ***Passengers:*** | 0 | 0 |
| ***Damages of rolling stock:*** | The railcar's blockage bumper and automatic coupling were damaged, while the passenger car was severely damaged. | | |
| ***Damages on track equipment:*** | None | | |
| ***Other damages:*** | None | | |

***Summary*:** A level crossing accident involving a passenger car and a rail bus travelling from Savonlinna to Parikkala took place in Särkisalmi on 9 March 2007 at 4.13 p.m. The driver and passenger of the passenger car were killed but the train personnel and passengers escaped uninjured. The passenger car was completely wrecked and the train sustained minor damage.

***Final report issued:*** 12.12.2007

| | | |
|---|---|---|
| ***Recommendation Nr. S237*** | Drivers cross a railway through the Särkisalmi level crossing, equipped with half-barriers, as they drive along Melkonniementie to the Särkisalmi residential area. This route is 200 metres longer than the route taken by the vehicle driver through the Sinkonen level crossing. In order to prevent this dangerous shortcut from being used, the Accident Investigation Board recommends: | |
| | **The Sinkonen level crossing located in the Särkisalmi residential area should be removed.** | |
| ***Date*** | ***Status*** | ***Comments*** |
| 20.1.2009 | In progress | The speed limit area of the track has been lengthened. |
| 16.2.2010 | In progress | Parikkala municipal executive board renews comment that the Sinkonen level crossing should be equipped with warning installations. |
| 16.6.2011 | Not yet implemented | The Parikkala municipality and Finnish Transport Agency do not agree on the matter. |
| 9.2.2012 | Not yet implemented | |
| 19.9.2013 | In progress | In municipal decision making process. |
| 10.3.2014 | | |

| | | |
|---|---|---|
| 25.2.2015 | | |
| 3.3.2016 | Under implementation | No progress. |
| 28.3.2017 | Under implementation | The opinion of the municipality is positive. |
| 11.4.2018 | Under implementation | Replacing road connections are studied, it is also possible that level crossing will be equipped with half barriers. |

| | | | |
|---|---|---|---|
| ***Date and time (Code):*** | 13.8.2007, 15.15 (B5/2007R) | | |
| ***Location:*** | Nurmijärvi, Röykkä, Leppälammentie / Korpi level crossing, unprotected | | |
| ***Type of occurrence:*** | Level crossing accident, Freight train – car | | |
| ***Train type and number:*** | Freight train 3649, 2 Dv12 diesel locomotives and 41 wagons | | |
| ***Road vehicle:*** | Car Ford Sierra 2.0, 1990 model | | |
| | | ***In the train*** | ***In the road vehicle*** |
| ***Persons on board:*** | ***Crew:*** | 1 | 1 |
| | ***Passengers:*** | 0 | 1 |
| ***Fatally injured:*** | ***Crew:*** | 0 | 0 |
| | ***Passengers:*** | 0 | 1 |
| ***Seriously injured:*** | ***Crew:*** | 0 | 1 |
| | ***Passengers:*** | 0 | 0 |
| ***Slightly injured:*** | ***Crew:*** | 0 | 0 |
| | ***Passengers:*** | 0 | 0 |
| ***Damages of rolling stock:*** | Damages to the equipment of locomotive nose, private car entirely wrecked. | | |
| ***Damages on track equipment:*** | None. | | |
| ***Other damages:*** | None | | |

***Summary*:**.. On Monday 13 August 2007 at 3.15 p.m., a level crossing accident occurred in Röykkä, Nurmijärvi, in which a passenger car collided with a freight train en route from Kirkniemi to Riihimäki, resulting in the death of the car's passenger and serious injuries to the car driver.

| | |
|---|---|
| ***Final report issued:*** | 23.6.2008 |

| | | |
|---|---|---|
| ***Recommendation Nr. S241*** | Because the area's growing population is continuously increasing the volume of traffic at the Korpi level crossing, and because fast growing bushes around the crossing do not enable the maintenance of visibility in line with Ministry of Transport and Communications and Finnish Railway Administration requirements, the investigation commission recommends the following: | |
| | **The Korpi level crossing should be equipped with half-barriers.** | |
| ***Date*** | ***Status*** | ***Comments*** |
| 20.1.2009 | In progress | Will be equipped with half barriers, when the financing is ok. |
| 19.2.2010 | In progress | In action and economic plan 2010–2013. |
| 18.8.2011 | Not yet implemented | No funding yet. |
| 9.2.2012 | Not yet implemented | |
| 19.9.2013 | In progress | No funding. |
| 10.3.2014 | In progress | No funding yet. |
| 25.2.2015 | Under implementation | |
| 3.3.2016 | Under implementation | No progress. |
| 28.3.2017 | Under implementation | Municipality has presented the beginning of the realization to ELY Centre. |
| 11.4.2018 | Under implementation | Track plan will most likely be approved at the beginning of year 2019 and will be carried out during summer 2019. |

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| ***Date and time (Code):*** | 21.11.2007 (B7/2007R) |
| ***Location:*** | Lahti, Heikinpellontie level crossing, unprotected |
| ***Type of occurrence:*** | Level crossing accident, freight train – car |
| ***Train type and number:*** | Freight train 2873, Dv12 diesel locomotive |

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|---|---|---|---|
| ***Road vehicle:*** | Car Volkswagen Golf 1.6, 1999 model | | |
| | | ***In the train*** | ***In the road vehicle*** |
| ***Persons on board:*** | ***Crew:*** | 2 | 1 |
| | ***Passengers:*** | 0 | 0 |
| ***Fatally injured:*** | ***Crew:*** | 0 | 1 |
| | ***Passengers:*** | 0 | 0 |
| ***Seriously injured:*** | ***Crew:*** | 0 | 0 |
| | ***Passengers:*** | 0 | 0 |
| ***Slightly injured:*** | ***Crew:*** | 0 | 0 |
| | ***Passengers:*** | 0 | 0 |
| ***Damages of rolling stock:*** | The car was wrecked beyond repair. The front of the locomotive sustained some damage. | | |
| ***Damages on track equipment:*** | None. | | |
| ***Other damages:*** | None. | | |

***Summary*:** On 21 October 2007 at 12.55 p.m., a fatal level crossing accident occurred on an unprotected level crossing along Heikinpellontie road in Lahti. The accident occurred when a car on Heikinpellontie road drove without stopping in front of a locomotive en route from Lahti to Heinola. The driver, who was the sole person in the car, died instantly. The accident occurred because the driver of the car did not see the train. The level crossing in question meets regulations concerning visibility and crossing angles, but does not meet those concerning wait platforms. It is possible that the driver was not sufficiently vigilant due to familiarity with the crossing and the impression that train traffic was infrequent there.

***Final report issued:*** 9.9.2008

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| ***Recommendation Nr. S243*** | Track renovation investments have been scheduled for the Lahti–Heinola track within the next few years. The intended focus is on track technology renewal, but it is clear that the investments will also cover raising level crossing safety to the level set in technical track requirements (RATO). Considering the danger posed by the level crossings along the track at the moment, it is recommended that actions to improve level crossing safety are initiated in advance before the investments proper. Such actions include the following: possible replacement of level crossings with alternative road routing, sightline improvements, wait platform improvements and crossing angle adjustments. | |
| | **Actions to improve level crossing safety along the Lahti–Heinola track should be carried out before the initiation of scheduled renovation investments.** | |
| ***Date*** | ***Status*** | ***Comments*** |
| 20.1.2009 | In progress | |
| 19.2.2010 | In progress | In some level crossings there has been reduced speed limit on roads. |
| 18.8.2011 | In progress | Lahti town proposes to make a level crossing plan and to enclose it to the building program in the next few years. |
| 9.2.2012 | In progress | |
| 19.9.2013 | In progress | Lahti town has made a level crossing plan and has decided to equip the worst level crossing with barriers. |
| 10.3.2014 | | |
| 25.2.2015 | Under implementation | |
| 3.3.2016 | Under implementation | Possibly attention devices will be installed. |
| 28.3.2017 | Under implementation | Possibly attention devices will be installed. |
| 11.4.2018 | Under implementation | Level crossing warning devices that are based on new technology, will be installed during 2018. |

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| ***Date and time (Code):*** | 25.6.2008, 16.23 (B3/2008R) | | |
| ***Location:*** | Liperi, Viinijärvi, Huikuri agricultural road / Huikuri level crossing, unprotected | | |
| ***Type of occurrence:*** | Level crossing accident, passenger train – scooter | | |
| ***Train type and number:*** | Regional train 784, Dm12 rail bus | | |
| ***Road vehicle:*** | Scooter: Baotian BT49QT-7-TCAP7/49, 2006 model | | |
| | | ***In the train*** | ***In the road vehicle*** |
| ***Persons on board:*** | ***Crew:*** | 2 | 1 |

| | | | |
|---|---|---|---|
| | ***Passengers:*** | ≈20 | 0 |
| ***Fatally injured:*** | ***Crew:*** | 0 | 1 |
| | ***Passengers:*** | 0 | 0 |
| ***Seriously injured:*** | ***Crew:*** | 0 | 0 |
| | ***Passengers:*** | 0 | 0 |
| ***Slightly injured:*** | ***Crew:*** | 0 | 0 |
| | ***Passengers:*** | 0 | 0 |
| ***Damages of rolling stock:*** | The rail bus was slightly damaged; the scooter was wrecked beyond repair. | | |
| ***Damages on track equipment:*** | The ploughing sign was bent | | |
| ***Other damages:*** | None. | | |

***Summary*:** On Wednesday, 25 June 2008, at 4:22.50 pm, a level crossing accident involving a scooter and a rail bus en route from Joensuu to Pieksämäki occurred at the Huikuri level crossing. The accident was fatal to the driver of the scooter. The personnel and passengers of the rail bus remained uninjured. The scooter was wrecked beyond repair. The rail bus incurred damage to its left front corner and the obstruction clearing device. The repair costs of the rail bus amounted to EUR 1,400.

The direct cause of the accident was that the driver of the scooter drove onto the level crossing without stopping. The driver of the scooter probably did not notice the rail bus at all or saw it too late. Contributing to this were the following factors:

- the level crossing was very close to a highway with substantial traffic
- the driver of the scooter was focusing on maintaining balance as the road surface changed from tarmac to gravel
- the level crossing was not equipped with an active warning installation
- the rail bus was approaching the crossing at 120 km/h
- rail buses are silent and quite neutral coloured, which makes them difficult to see.

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| ***Final report issued:*** | 7.9.2009 |

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| ***Recommendation Nr. S263*** | There are several level crossings in the vicinity of the Huikuri unprotected level crossing through which traffic can be directed. | |
| | **The Huikuri unprotected level crossing should be removed.** | |
| ***Date*** | ***Status*** | ***Comments*** |
| 19.2.2010 | In progress | |
| 18.8.2011 | In progress | |
| 9.2.2012 | In progress | |
| 19.9.2013 | In progress | No changes. |
| 10.3.2014 | | |
| 25.2.2015 | Under implementation | |
| 3.3.2016 | Under implementation | No progress. |
| 28.3.2017 | Under implementation | Municipality does not take the action. |
| 11.4.2018 | **IMPLEMENTED** | Level crossing has been removed in 2017. |

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| ***Date and time (Code):*** | 11.2.2009, 15.12 (B1/2009R) | | |
| ***Location:*** | Pori, Kyläsaari / Teurastamo level crossing, unprotected | | |
| ***Type of occurrence:*** | Level crossing accident, freight train – car | | |
| ***Train type and number:*** | Freight train 3864, diesel locomotive Dv12 | | |
| ***Road vehicle:*** | Private car Volvo S40, 1997 model | | |
| | | ***In the train*** | ***In the road vehicle*** |
| ***Persons on board:*** | ***Crew:*** | 1 | 1 |
| | ***Passengers:*** | 1 | 2 |
| ***Fatally injured:*** | ***Crew:*** | 0 | 0 |
| | ***Passengers:*** | 0 | 2 |
| ***Seriously injured:*** | ***Crew:*** | 0 | 1 |
| | ***Passengers:*** | 0 | 0 |
| ***Slightly injured:*** | ***Crew:*** | 0 | 0 |
| | ***Passengers:*** | 0 | 0 |
| ***Damages of rolling stock:*** | Minor damages to the locomotive. Car was entirely wrecked. | | |
| ***Damages on track equipment:*** | None. | | |
| ***Other damages:*** | None. | | |

***Summary*:** A level crossing accident took place at the unprotected level crossing of Teurastamo on the Mäntyluoto–Pori track and Pikakyläntie road on Wednesday, 11 February 2009, at 3.12 p.m. The engine driver emergency braked 29 metres before the collision, when the car had disappeared from his sight. The locomotive hit the middle of the car's right side, not being able to reduce speed before the collision. The car clung to the front of the locomotive and travelled in front of it for 223 metres, until the locomotive stopped. Two passengers in the car suffered fatal head injuries in the accident, and the driver was seriously injured. The locomotive suffered minor damage, while the car was wrecked beyond repair.
The accident was caused by the car driver noticing the train too late and not having time to stop or otherwise prevent the accident.

| ***Final report issued:*** | 10.3.2010 |
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| ***Recommendation Nr. S277*** | Time was wasted in locating problems between the engine driver and the traffic controller and between the traffic controller and the Emergency Response Centre. Because of these difficulties, the traffic controller had problems clarifying to the ERC operator the location of the level crossing. For the entire duration of the rescue operation, the level crossing was referred to with incorrect names. At their worst, such location problems can lead to treatment procedures being delayed, with fatal consequences. |
|---|---|
| | **A variety of operators should develop systems and implement equipment to facilitate location of an accident site.** |

| ***Date*** | ***Status*** | ***Comments*** |
|---|---|---|
| 18.8.2011 | In progress | Markings on track to demote the location will be improved. |
| 9.2.2012 | In progress | |
| 19.9.2013 | In progress | Emergency Response Centre, VR Group Ltd and Finnish Transport Agency in co-operation are drafting the procedure of best practises. Next meeting last part of this year. |
| 10.3.2014 | In progress | Emergency Response Centre, VR Group Ltd and Finnish Transport Agency in co-operation are drafting the procedure of best practises. |
| 25.2.2015 | Under implementation | Will be handled in the meeting of Finnish Transport Agency, Emergency Response Centre and VR Group Ltd. |
| 3.3.2016 | Under implementation | Finnish Transport Agency, Emergency Response Centre and VR Group Ltd are working with the issue. |
| 28.3.2017 | Under implementation | |
| 11.4.2018 | Partly implemented | Rolling stock has GPS based positioning system. Commissioning of the new ERICA system at emergency response centres has been delayed. |

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| ***Date and time (Code):*** | 1991–2010 | | |
| ***Location:*** | Finland | | |
| ***Type of occurrence:*** | Level crossing accidents | | |
| ***Train type and number:*** | | | |
| ***Road vehicle:*** | | | |
| | | ***In the train*** | ***In the road vehicle*** |
| ***Persons on board:*** | ***Crew:*** | | |
| | ***Passengers:*** | | |
| ***Fatally injured:*** | ***Crew:*** | | |
| | ***Passengers:*** | | |
| ***Seriously injured:*** | ***Crew:*** | | |
| | ***Passengers:*** | | |
| ***Slightly injured:*** | ***Crew:*** | | |
| | ***Passengers:*** | | |
| ***Damages of rolling stock:*** | | | |
| ***Damages on track equipment:*** | | | |
| ***Other damages:*** | | | |

***Summary*:** While the number of level crossing accidents in Finland reduced significantly between 1991 and 1998, since then the number has remained constant and, at times, has even increased slightly. The number of accidents has fallen in the last two years. However, this has not influenced the number of deaths. Since 1993, there has been an average of 10 fatalities per year in level crossing accidents. Compared to other European countries, level crossing safety in Finland is below average.

Some 78 per cent of all fatal accidents occurred on level crossings without warning devices. Accidents on level crossings of this type were generally caused by the vehicle driver misjudging the situation, not by the driver taking unnecessary risks. The road speed limit was typically 80 km/h and the railway speed limit 120 km/h. Most level crossings without warning devices are located on private roads and most fatal accidents occurred on level crossings on such roads. Nearly all level crossings without warning devices fail to meet the related railway regulations. Maintainers of private roads do not have sufficient information on their level crossing maintenance obligations.
Based on statistical analysis, a dangerous level crossing is one without warning devices, with a low road speed limit, and with a high amount of average daily traffic. Such level crossings are typically located in residential areas.

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| ***Final report issued:*** | 13.2.2012 |

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| ***Recommendation Nr. S309*** | Practice has shown that the rate of removal and securing level crossings is governed by allocations granted by the Parliament. The level crossing strategy should be accorded greater importance by moving it under the Ministry of Transport and Communications, which might ease acquisition of the required resources. | |
| | **A new strategy should be drawn up to improve level crossing safety, and a concrete plan with funding arrangements should be drafted based on this strategy.** | |
| ***Date*** | ***Status*** | ***Comments*** |
| 19.9.2013 | | |
| 10.3.2014 | In progress | |
| 25.2.2015 | Under implementation | |
| 3.3.2016 | Under implementation | Transport Agency has begun the operation definition of policy. |
| 28.3.2017 | Under implementation | Financing for the realisation of the strategy is missing. |
| 11.4.2018 | Partly implemented | New level crossing safety plan has been issued in 2018 and additional funding for it has been granted. |
| ***Recommendation Nr. S312*** | Railway actors have no common database for accidents and dangerous situations. According to VTT's research, accident information is saved in the information systems of the railway company, the Finnish Transport Agency, and the Finnish Transport Safety Agency. Merging these accident databases is recommended. | |
| | **A single and common accident and deviation database for all those operating the railway system in Finland should be created.** | |
| ***Date*** | ***Status*** | ***Comments*** |
| 19.9.2013 | In progress | Trafi will in future hold a common database. |
| 10.3.2014 | In progress | Trafi will in future hold a common database. Will be ready in 2014. |
| 25.2.2015 | Under implementation | Nearly ready. |
| 3.3.2016 | Under implementation | Ready in 2016. |
| 28.3.2017 | Under implementation | Database ready to tests. |
| 11.4.2018 | Under implementation | Will be operational at the beginning of year 2019. |
| ***Recommendation Nr. S314*** | The Koululiitu software, which evaluates the dangers of school routes, does not include level crossings, because the road database information used by the software does not contain level crossing information. | |
| | **When planning school transportation, the municipalities should improve safety by avoiding level crossings without warning devices along the routes.** | |
| ***Date*** | ***Status*** | ***Comments*** |
| 19.9.2013 | In progress | |
| 10.3.2014 | In progress | |
| 25.2.2015 | Under implementation | |
| 3.3.2016 | Under implementation | Developed geographic information system. |
| 11.4.2018 | Partly implemented | School transport guide will be updated in 2018. Recommendation will be added as a part of designing new school transports. |

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| ***Recommendation Nr. S315*** | The previously issued recommendation *S216 At a level crossing the maximum speed allowed on the road should be 50 km/h or lower as depending on the locality and the characteristics of the level crossing.* should be reformulated. | |
| | **Clear instructions should be drawn up regarding road traffic speed limits and use of the STOP sign at level crossings.** | |
| ***Date*** | ***Status*** | ***Comments*** |
| 19.9.2013 | In progress | Partially implemented; STOP-sign is missing from the directions. |
| 10.3.2014 | In progress | A new guide to the road administrators is in preparation. |
| 25.2.2015 | Under implementation | On the maintenance of the road on the level crossings there is an instruction but exact instructions for the use of the STOP sign are missing. |
| 3.3.2016 | Under implementation | |
| 11.4.2018 | **IMPLEMENTED** | Finnish Transport Safety Agency has issued new instructions for using STOP-sign at level crossings. |
| ***Recommendation Nr. S316*** | Most fatal level crossing accidents occurred at level crossings without warning devices. Level crossing perceptivity was also noted in VTT's research. To make level crossings perceptible sufficiently early for road users and to ensure correct level crossing use: | |
| | **Ways of improving the perceptivity of level crossings and their conditions of use and technical properties should be specified.** | |
| ***Date*** | ***Status*** | ***Comments*** |
| 19.9.2013 | In progress | Researches made and also on going. |
| 10.3.2014 | In progress | |
| 25.2.2015 | Under implementation | Project for means to improve perceptivity is in progress. |
| 3.3.2016 | Under implementation | Project for means to improve perceptivity is in progress. |
| 28.3.2017 | Under implementation | |
| 11.4.2018 | Partly implemented | Finnish Transport Agency will define measures for improving visibility of level crossings. Focus is on developing and installing warning devices based on new cost-effective technology. |

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| ***Date and time (Code):*** | 21.2.2011, 4.05 (B1/2011R) | | |
| ***Location:*** | Nokia, between Siuro and Suoniemi stations | | |
| ***Type of occurrence:*** | Collision of trains, rear end collision | | |
| ***Train type and number:*** | Freight train 3811, Sr1 electric locomotive and 21 wagons – Freight train 3801, 2 Dv12 diesel locomotive and 24 wagons | | |
| ***Road vehicle:*** | - | | |
| | | ***In the train*** | ***In the road vehicle*** |
| ***Persons on board:*** | ***Crew:*** | 1 – 1 | |
| | ***Passengers:*** | 0 | |
| ***Fatally injured:*** | ***Crew:*** | 1 – 0 | |
| | ***Passengers:*** | 0 | |
| ***Seriously injured:*** | ***Crew:*** | 0 | |
| | ***Passengers:*** | 0 | |
| ***Slightly injured:*** | ***Crew:*** | 0 | |
| | ***Passengers:*** | 0 | |
| ***Damages of rolling stock:*** | *Sr1 electric locomotive and two timber wagons were badly damaged.* | | |
| ***Damages on track equipment:*** | Some sleepers were damaged. | | |
| ***Other damages:*** | None. | | |

***Summary*:** A freight train, which had arrived to assist another freight train travelling to Mäntyluoto, Pori, collided with the end of the other train in Nokia, between Siuro and Suoniemi, at 4.05 am on 21 February 2011. The engine driver of the assisting train fatally injured in the accident. One wagon and the locomotive, which collided the end of the other train, were badly damaged and had to be scrapped. Additionally, one wagon was badly damaged, but was still repairable. The tracks were undamaged. Traffic at the accident site was interrupted for 14 hours.

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| According to the running recorder data, the driver of the train which collided had begun emergency braking, at a speed of 46 km/h, five seconds before the impact. The train speed was 43 km/h upon impact. The maximum permitted speed of the train which collided was 50 km/h.<br>The accident was caused by the erroneous location information of the train to be assisted. | | |
| ***Final report issued:*** | 20.2.2012 | |
| ***Recommendation Nr. S321*** | Determining the location of trains is a challenging task. In addition to the improved instructions currently in use: | |
| | **A satellite location system should be implemented as quickly as possible to assist in location.** | |
| ***Date*** | ***Status*** | ***Comments*** |
| 19.9.2013 | In progress | Emergency Response Centre, VR Group Ltd and Finnish Transport Agency in co-operation are drafting the procedure of best practises. Next meeting last part of this year. |
| 10.3.2014 | In progress | Emergency Response Centre, VR Group Ltd and Finnish Transport Agency in co-operation are drafting the procedure of best practises. |
| 25.2.2015 | Under implementation | Will be handled in the meeting of Finnish Transport Agency, Emergency Response Centre and VR Group Ltd. |
| 3.3.2016 | Under implementation | |
| 11.4.2018 | Partly implemented | Rolling stock has GPS based positioning system. Commissioning of the new ERICA system at emergency response centres has been delayed. |
| ***Recommendation Nr. S323*** | The visibility of wagons should be improved. In the reconstruction drive, it was found that a wagon without a reflector on the end can only be seen from a short distance in darkness. | |
| | **Reflectors should be installed on the ends of wagons.** | |
| ***Date*** | ***Status*** | ***Comments*** |
| 19.9.2013 | In progress | Belongs also to the needs of shunting areas. |
| 10.3.2014 | In progress | VR Ltd regards the realisation as challenging. |
| 25.2.2015 | Under implementation | 3400 wagons are installed with reflectors; work is not yet ready. |
| 3.3.2016 | Under implementation | In realisation: in the new wagons and ¼ of the old wagons already have. |
| 28.3.2017 | Under implementation | |
| 11.4.2018 | Partly implemented | 75% of freight wagons owned by VR Group have been fitted with end reflectors. |

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| ***Date and time (Code):*** | 14.1.2012, 0.15 (R2012-01) | | |
| ***Location:*** | Kouvola freight traffic railway yard | | |
| ***Type of occurrence:*** | Derailment | | |
| ***Train type and number:*** | Freight train 2032, Sr1 electric locomotive and 35 wagons | | |
| ***Road vehicle:*** | - | | |
| | | ***In the train*** | ***In the road vehicle*** |
| ***Persons on board:*** | ***Crew:*** | 1 | |
| | ***Passengers:*** | 0 | |
| ***Fatally injured:*** | ***Crew:*** | 0 | |
| | ***Passengers:*** | 0 | |
| ***Seriously injured:*** | ***Crew:*** | 0 | |
| | ***Passengers:*** | 0 | |
| ***Slightly injured:*** | ***Crew:*** | 0 | |
| | ***Passengers:*** | 0 | |
| ***Damages of rolling stock:*** | Two derailed wagons sustained minor damage. | | |
| ***Damages on track equipment:*** | 40 metres of rail were damaged. Turnout 730, the electric railway portal and the electric cables for seven tracks were damaged. | | |
| ***Other damages:*** | A signal post fell down. | | |
| ***Summary*****:** An accident occurred in the Kouvola freight traffic yard at 00.15 hrs on 14th January 2012 when two wagons of a departing freight train were derailed immediately after their departure. One of the derailed wagons struck a signal post, which collapsed onto an electric railway portal ten minutes later. | | | |

The electrical cables for seven tracks were brought down by the portal's collapse. No personal injuries resulted.
The accident was caused by a stop block left under the train. Difficult weather conditions and darkness made it difficult to see the stop block. Additionally, the brake tester responsible for removing the stop block decided to perform an extra shunt on the train in place of standard procedures, because the train had moved too far alongside the shunting signal.

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| ***Final report issued:*** | 24.9.2012 |

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| ***Recommendation Nr. S327*** | It was found in the investigation that the railway yard work instructions do not take account of all situations arising during normal work. Instructions for safety-critical operations should be presented as a checklist, in order to make work as standardised and uniform as possible, instead of working from memory. A checklist would help to avoid a situation where issues are forgotten. | |
| | **The railway yard work instructions should be developed in order to take account of all situations arising from normal work. Safety-critical instructions should be presented as a checklist.** | |
| ***Date*** | ***Status*** | ***Comments*** |
| 19.9.2013 | In progress | In a different way. |
| 10.3.2104 | In progress | Guidelines will be gone through in this year. |
| 25.2.2015 | Under implementation | Instruction and training; nearly ready. |
| 3.3.2016 | Under implementation | Instructions renewed. |
| 28.3.2017 | Under implementation | |
| 11.4.2018 | Under implementation | Responsibility for railway yard instructions should in future be assigned to infrastructure manager therefore that there will be several operators at railyards. |

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| ***Date and time (Code):*** | 6.4.2013, 3.22 (R2013-01) | | |
| ***Location:*** | Vammala railway yard | | |
| ***Type of occurrence:*** | Derailment | | |
| ***Train type and number:*** | Freight train 3703, Sr1 electric locomotive and 43 wagons | | |
| ***Road vehicle:*** | - | | |
| | | ***In the train*** | ***In the road vehicle*** |
| ***Persons on board:*** | ***Crew:*** | 1 | - |
| | ***Passengers:*** | 0 | - |
| ***Fatally injured:*** | ***Crew:*** | 0 | - |
| | ***Passengers:*** | 0 | - |
| ***Seriously injured:*** | ***Crew:*** | 0 | - |
| | ***Passengers:*** | 0 | - |
| ***Slightly injured:*** | ***Crew:*** | 0 | - |
| | ***Passengers:*** | 0 | - |
| ***Damages of rolling stock:*** | 13 wagons damaged. | | |
| ***Damages on track equipment:*** | Two tracks were damaged at a distance of 177 metres, including two turnouts. In addition, the sleepers of one track were damaged at a distance of 249 metres. | | |
| ***Other damages:*** | A small amount of crude tall oil leaked onto the ground. | | |
| ***Disturbances of traffic:*** | The accident caused a traffic interruption that lasted approximately 11 hours. The station was returned to normal use one month after the accident. 11 trains in passenger traffic and 11 trains in freight traffic had to be cancelled. | | |

***Summary*****:** Freight train 3703 en route from Tampere to Rauma derailed at the Vammala station in Sastamala. The train was proceeding as planned, until at the Vammala turnout V003, the rear bogie of wagon 15 or the front bogie of wagon 16 was directed between the switch blades and the stock rails of the turnout. As a consequence, the rear end of the train began to derail. Two Russian tank wagons tipped over and the train broke into two parts. Nine Finnish freight wagons derailed. The intermediate wagon between the Russian tank wagons and the Finnish freight wagons derailed to the left, causing minor damage to the track to the left of the train's direction of travel. The 16 wagons at the end of the train remained on the rails. The front end of the train, the locomotive and 15 wagons continued moving for another 314 metres after the brake pipe was broken. The rear bogie of the last wagon at the front

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| end of the train ran off the rails and broke some sleepers. According to the locomotive's data recorder, the train's speed at the moment of derailment was 67 km/h.<br>The derailment was caused by the switch turning underneath the train. The train caused the open switch blade to move, resulting in the opening of the switch lock, which allowed the switch to turn. When an open switch blade is subjected to vibration or sufficiently powerful impacts, a switch lock that allows trailing may become unlocked. As a result, the closed switch blade opened and the wagon wheels fell between the switch blade and the stock rail. | | |
| ***Final report issued:*** | 20.2.2014 | |
| ***Recommendation Nr. S338*** | The log data available in the railway safety system had not been examined and analysed. | |
| | **The Finnish Transport Agency should establish a system and methodology for the analysis of the error logs of safety systems to ensure that repeated flaws endangering safety are detected.** | |
| ***Date*** | ***Status*** | ***Comments*** |
| 25.2.2015 | Under implementation | Fault situations will be recorded in the POHA system. |
| 3.3.2016 | Under implementation | The instruction is being prepared. |
| 28.3.2017 | Under implementation | |
| 11.4.2018 | Under implementation | Track and safety equipment repair, and measurement data will be integrated to a single system in RAID-E project. |

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| ***Date and time (Code):*** | 7.11.2013, 17.17 (R2013-02) | | |
| ***Location:*** | Pännäinen, Seinäjoki Ylivieska section of line | | |
| ***Type of occurrence:*** | Train collision, Collision with an obstacle, a maintenance machine. | | |
| ***Train type and number:*** | Freight train 5489, 2 Dv12 diesel locomotives and 6 wagons. | | |
| ***Road vehicle:*** | - | | |
| | | ***In the train*** | ***In the road vehicle*** |
| ***Persons on board:*** | ***Crew:*** | 1 + 1 | - |
| | ***Passengers:*** | 0 | - |
| ***Fatally injured:*** | ***Crew:*** | 0 | - |
| | ***Passengers:*** | 0 | - |
| ***Seriously injured:*** | ***Crew:*** | 0 | - |
| | ***Passengers:*** | 0 | - |
| ***Slightly injured:*** | ***Crew:*** | 0 + 1 | - |
| | ***Passengers:*** | 0 | - |
| ***Damages of rolling stock:*** | The collision caused a hole into the fuel tank of the first engine, and the left steps of both engines were damaged. The excavator was damaged beyond repair. | | |
| ***Damages on track equipment:*** | None. | | |
| ***Other damages:*** | 600 liters fuel leaked onto the track. | | |
| ***Disturbances of traffic:*** | Traffic at the accident site was interrupted for 3.5 hours. Delays from hour to four hours for eight passenger trains and effects on several other trains because of waiting. One freight train was cancelled from between Kokkola–Tampere. | | |
| ***Summary*****:** Freight train 5489 collided with an excavator carrying out trackwork on the track section between Pännäinen and Kolppi, on which superstructure and electrification works were being conducted. Located near Pännäinen Station, the trackwork supervisor had requested the traffic controller for permission for an excavator to carry out trackwork. The permission was given for the work to begin on the Pännäinen−Kolppi section "behind a freight train". The trackwork supervisor informed the excavator driver of the permission. At the time, the excavator was located 3.4 kilometres from Pännäinen Station towards Kolppi.<br>Having driven the excavator partially onto the track, the driver noticed the lights of an approaching train and immediately attempted to get off the track. Only moments earlier, the engine driver had realised that signal P523 had been switched to display Stop and had begun emergency braking from the speed of 50 km/h. However, the locomotive’s left buffer hit the left rear corner of the excavator's top carriage and the locomotive’s lower part hit the rear left corner of the excavator's undercarriage. | | | |
| ***Final report issued:*** | 11.11.2015 | | |

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| ***Recommendation Nr. S343*** | In addition to their normal workload, trackwork supervisors may be responsible for requesting trackwork permissions for several teams. This disrupts their focus on their own tasks and endangers trackwork safety. Allocation of sufficient time and opportunities for trackwork supervisors to focus on the traffic safety functions should be ensured in each trackwork project. | |
| | **The Finnish Transport Agency will ensure that trackwork supervisors focus on their traffic safety function and develop better tools for trackwork supervisors for ensuring safety.** | |
| ***Date*** | ***Status*** | ***Comments*** |
| 25.2.2015 | Under implementation | In the safety instructions is entered the maximum number of the teams for track work supervisor; in the future GPS locating. |
| 3.3.2016 | Under implementation | Project started. |
| 28.3.2017 | Under implementation | |
| 11.4.2018 | Partly implemented | New RUMA-application has been taken in to use 12.6.2018. It allows rail work notifications and locations to be applied through map-based user interface that is also visible to traffic controllers. |
| ***Recommendation Nr. S345*** | Currently, trackworks begin without sufficient preparation and clarification of the parties' responsibilities. Initial safety meetings are held in an attempt to ensure that the safety aspects are put right in order for the contractors to begin work. However, much more time should be devoted to such preparation, planning and clarification of responsibilities. Good planning also involves ensuring that communication between the parties is working. | |
| | **The Finnish Transport Agency will ensure that contracts include a separate and sufficient timeframe for planning trackwork and clarifying responsibilities before trackwork is begun.** | |
| ***Date*** | ***Status*** | ***Comments*** |
| 25.2.2015 | Under implementation | In March workshop of track possession planning. |
| 3.3.2016 | Under implementation | Tested in Seinäjoki–Oulu project. |
| 28.3.2017 | Under implementation | |
| 11.4.2018 | Under implementation | The will is to proceed towards this. |
| ***Recommendation Nr. S346*** | Instructions issued by the Finnish Transport Agency define the parties' responsibilities and tasks related to the safety of railway operations. The instructions emphasise monitoring where written forms and reports are used. With the exception of commissioning inspections, site monitoring is rarely carried out on the field. The monitoring of compliance with trackwork safety regulations should be increased. The large number of unauthorised trackworks was a cause for particular concern. These occurrences can be reduced only by increasing field monitoring. An increased risk of getting caught for breaches of regulations efficiently directs the behaviour of both organisations and individuals. Along with this measure, actions that comply with safety regulations should be made financially attractive. | |
| | **The Finnish Transport Agency will increase the field monitoring of trackwork safety regulations by allocating appropriate resources for such work.** | |
| ***Date*** | ***Status*** | ***Comments*** |
| 25.2.2015 | Under implementation | Accepted in the management team; work underway. |
| 3.3.2016 | Under implementation | Safety coordinator training underway. |
| 28.3.2017 | Under implementation | Piloted. Transport Agency tries to develop monitoring. |
| 11.4.2018 | Under implementation | Guide book for supervisors is being prepared. Rail maintenance supervision instruction is ready. Minimum requirements for supervision will be defined during 2018. |

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| ***Date and time (Code):*** | 18.3.2015, 14.58 (R2015-03) | | |
| ***Location:*** | Hyvinkää, Helsinki Riihimäki section of line (line number 112), km 61+293 | | |
| ***Type of occurrence:*** | Incident, risk of derailment | | |
| ***Train type and number:*** | Commuter train 9692, 2 x Sm4 electric train units | | |
| ***Road vehicle:*** | - | | |
| | | ***In the train*** | ***In the road vehicle*** |
| ***Persons on board:*** | ***Crew:*** | 2 | - |
| | ***Passengers:*** | 100 | - |
| ***Fatally injured:*** | ***Crew:*** | 0 | - |
| | ***Passengers:*** | 0 | - |
| ***Seriously injured:*** | ***Crew:*** | 0 | - |
| | ***Passengers:*** | 0 | - |
| ***Slightly injured:*** | ***Crew:*** | 0 | - |
| | ***Passengers:*** | 0 | - |
| ***Damages of rolling stock:*** | None. | | |
| ***Damages on track equipment:*** | None. | | |
| ***Other damages:*** | None. | | |
| ***Disturbances of traffic:*** | None. | | |

***Summary*:** The regional train (the R train) had departed the Riihimäki station at 2.52 p.m. About two kilometers before the Hyvinkää station, at 2.58 p.m., the train ran through a switch at a speed of 156 km/h. The maximum allowed speed over the switch was 80 km/h. The engine's ATP device had not been switched on. The incident did not cause significant personal injuries. One passenger travelling in the rear unit reported having fallen off the seat due to a strong lurch. Loose fluorescent tubes on the overhead rack fell on the floor and broke.

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| ***Final report issued:*** | 7.8.2015 |

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| ***Recommendation Nr. 2015-S15*** | If the ATP engine device is not switched on or it malfunctions, a cabin equipment should give the engine driver a clear warning. The Safety Investigation Authority, Finland recommends that the Finnish Transport Safety Agency (Trafi) ensure the implementation of the following recommendation: | |
| | **Cabin equipment should give the engine driver a clear warning if the train's ATP engine device is not operating.** | |
| ***Date*** | ***Status*** | ***Comments*** |
| 3.3.2016 | Under implementation | The realisation decision made; completed 2017. |
| 28.3.2017 | Under implementation | For VR it will be carried out during the year 2017. Fenniarail has already it. |
| 11.4.2018 | Partly implemented | Implemented differently: Some rolling stock has warning lamps on driver's desk, some limit maximum speed if ATC is not on and in some, warning is generated in train software. Will not be applied to obsolescent rolling stock. |
| ***Recommendation Nr. 2015-S16*** | Since the accident risk of an operating train increases if its ATP engine device is not switched on, the maximum speed of the train should be mechanically restricted in order to reduce the consequences of a possible accident. The Safety Investigation Authority, Finland recommends that the Finnish Transport Safety Agency (Trafi) ensure the implementation of the following recommendation: | |
| | **If a train's ATP engine device is not switched on, the train's speed should be restricted to a maximum of 80 km/h.** | |
| ***Date*** | ***Status*** | ***Comments*** |
| 3.3.2016 | Under implementation | Will be only in the new Sr3 locomotives. |
| 28.3.2017 | Under implementation | VR's rolling stock only in the new Sr3 locomotives. Fenniarail already has. |
| 11.4.2018 | Under implementation | Implemented into some series of rolling stock. |
| ***Recommendation Nr. 2015-S18*** | There are currently no instructions for a situation where a train has run through a switch at high speed and the switch has not become trailed. The Safety Investigation Authority, Finland recommends that the Finnish Transport Safety Agency (Trafi) ensure the implementation of the following recommendation: | |
| | **The Finnish Transport Agency should include in the turnout inspection instructions the situations where a train has or is suspected to have been driven** | |

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| | **onto a switch guided to the diverging track at a speed that is clearly higher than allowed for the switch type in question.** | |
| ***Date*** | ***Status*** | ***Comments*** |
| 3.3.2016 | Under implementation | Into instruction RATO 14. |
| 28.3.2017 | **IMPLEMENTED** | In instruction RATO 14. |
| ***Recommendation Nr. 2015-S19*** | The current safety management system and engine driver training have a scarcity of content related to the mastery of human factors. These include, for instance, maintaining situational awareness during the performance of one's work, recovery from shocking situations, and learning from deviations. The Safety Investigation Authority, Finland recommends that the Finnish Transport Safety Agency (Trafi) ensure the implementation of the following recommendation: | |
| | **The Finnish Transport Safety Agency (Trafi) should demand that the subject matter of human factors will be emphasised more in both the safety management systems of railway operators and training in the field.** | |
| ***Date*** | ***Status*** | ***Comments*** |
| 3.3.2016 | Under implementation | Trafi arranges the cooperation forum. |
| 28.3.2017 | Under implementation | In progress. |
| 11.4.2018 | Under implementation | Regulation for contents of safety management system will be renewed as part of implementation of EU 4th railway package. |

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| ***Date and time (Code):*** | 6.2.2015, 9.14 (R2015-01) | | |
| ***Location:*** | Kokemäki, Isotalo level crossing (km 285+145), Kokemäki Pori section of line (line number 344) | | |
| ***Type of occurrence:*** | Level crossing accident, passenger train–tractor | | |
| ***Train type and number:*** | Passenger train 461, Sr1electric locomotive and 3 coaches | | |
| ***Road vehicle:*** | Articulated Hauler (Dumper), Volvo A25D, 2002 model | | |
| | | ***In the train*** | ***In the road vehicle*** |
| ***Persons on board:*** | ***Crew:*** | 2 | 1 |
| | ***Passengers:*** | 25 | 0 |
| ***Fatally injured:*** | ***Crew:*** | 0 | 0 |
| | ***Passengers:*** | 0 | 0 |
| ***Seriously injured:*** | ***Crew:*** | 1 | 1 |
| | ***Passengers:*** | 0 | 0 |
| ***Slightly injured:*** | ***Crew:*** | 0 | 0 |
| | ***Passengers:*** | 0 | 0 |
| ***Damages of rolling stock:*** | Locomotive front was damaged, the dumper was broken from its articulation. | | |
| ***Damages on track equipment:*** | None. | | |
| ***Other damages:*** | None. | | |
| ***Disturbances of traffic:*** | Traffic at the accident site was interrupted for 7 hours. The train to Pori was replaced with bus. Three passenger trains from between Tampere–Pori were replaced with busses. | | |

***Summary*****:** On Friday, 6 February 2015, a passenger train and an articulated hauler collided in Kokemäki. The collision occurred at the unprotected level crossing of a private road and the Kokemäki–Pori railway. The accident happened while workmen were preparing to move a track excavator over the track. The driver of the articulated hauler was driving over the tracks to transport materials required for moving the excavator, when the passenger train came from his left and collided with the trailer of the articulated hauler. Both the hauler driver and engine driver were seriously injured. The articulated hauler is a 21-tonne earthmoving machine. The impact split the hauler in two, the tractor being thrown to the left side of the tracks and the trailer to the right side. The front end of the locomotive was badly damaged. The collision caused no damage to the track. The costs of repairs to the train engine and articulated hauler amounted to about EUR 700,000.

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| ***Final report issued:*** | 19.8.2015 |
| ***Recommendation Nr. 2015-S23*** | The railway maintenance provider issued appropriate instructions to the work supervisors of the earthworks company for how to move the excavator over the tracks. For this purpose, the maintenance provider adapted the trackwork safety instructions, as there are no separate instructions available for non-trackwork-related use |

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| | of level crossings in exceptional circumstances that pose a risk of collision. The Safety Investigation Authority, Finland recommends that the Finnish Transport Safety Agency should ensure the adoption of the following recommendation: | |
| | **The Finnish Transport Agency must draft readily available guidelines for time-intensive, non-trackwork-related use of level crossings or other similar work that poses a risk of a collision.** | |
| ***Date*** | ***Status*** | ***Comments*** |
| 3.3.2016 | Under implementation | Need for new instructions will be taken into account when preparing the next action plan. |
| 28.3.2017 | Under implementation | It has been dealt with different actors. Actors must learn to estimate. |
| 11.4.2018 | Partly implemented | Guide book for special road transports in level crossings will be published in 2018. |
| ***Recommendation Nr. 2015-S24*** | According to Section 88 of the Road Traffic Act, the use of seatbelts in work machines and tractors is not mandatory. In this accident, the articulated hauler driver would probably have suffered less severe injuries if he had worn a seatbelt. Seatbelts should be used in tractors and work machines at least when driving in general traffic. The Safety Investigation Authority issues the following recommendation to the Ministry of Transport and Communications: | |
| | **The Road Traffic Act must stipulate that those operating tractors and work machines must wear seatbelts when driving in traffic.** | |
| ***Date*** | ***Status*** | ***Comments*** |
| 3.3.2016 | Under implementation | The tractors which have seat belt will come within the sphere of the use duty. One cannot require to the old tractors in which have no belts. |
| 28.3.2017 | Under implementation | This is in the amendment of the road traffic act which is on the statement. |
| 11.4.2018 | Under implementation | Mandatory use of safety belt in tractors is included in legislative proposal. |
| ***Recommendation Nr. 2015-S25*** | The engine driver attempted to escape into the aisle and was standing at the moment of impact. He was thrown against the control console. It is possible that he would have suffered less serious injuries if he had dived to the floor. At present, there are no written instructions on what to do in the event of an imminent collision. Such instructions are provided verbally. Clear instructions in writing would standardise training and procedures. Simple, well-internalised operating instructions for specific types of train units and locomotives would shorten reaction times. The Safety Investigation Authority, Finland recommends that the Finnish Transport Safety Agency should ensure that the following recommendation is adopted: | |
| | **Written guidelines for how to react to an imminent collision must be introduced in the training of engine drivers for specific types of train units and locomotives.** | |
| ***Date*** | ***Status*** | ***Comments*** |
| 3.3.2016 | Under implementation | Renewed competency law designed the coming into force 1.3.2017. Orders also on the educations will come to it. Instructions for the operation in the emergencies are made by the actor, it also gives an additional certificate from the education. |
| 28.3.2017 | Partly implemented | Law of competency law will be a part of the Act on Transport Services. VR has implemented. |
| 11.4.2018 | **IMPLEMENTED** | Has been applied to safety management system audits. |

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| ***Date and time (Code):*** | 12.3.2015, 13.19 (R2015-02) | | |
| ***Location:*** | Oulunkylä, Helsinki–Riihimäki section of line (line number 112), km 8. | | |
| ***Type of occurrence:*** | Incident, risk of collision | | |
| ***Train type and number:*** | Commuter train 9676, 2 x Sm4 electric train units – Commuter train 9840, 2 x Sm4 electric train units. | | |
| ***Road vehicle:*** | - | | |
| | | ***In the train*** | ***In the road vehicle*** |
| ***Persons on board:*** | ***Crew:*** | 2 – 2 | - |
| | ***Passengers:*** | 50 – 50 | - |

| | | | |
|---|---|---|---|
| ***Fatally injured:*** | ***Crew:*** | 0 | - |
| | ***Passengers:*** | 0 | - |
| ***Seriously injured:*** | ***Crew:*** | 0 | - |
| | ***Passengers:*** | 0 | - |
| ***Slightly injured:*** | ***Crew:*** | 0 | - |
| | ***Passengers:*** | 0 | - |
| ***Damages of rolling stock:*** | None. | | |
| ***Damages on track equipment:*** | None. | | |
| ***Other damages:*** | None. | | |
| ***Disturbances of traffic:*** | H-train fell behind its schedule for about 24 minutes and Z-train fell behind its schedule about 15 minutes. | | |

***Summary*:** On Thursday, 12 March 2015 at 1.19 pm, an incident occurred at Pukinmäki Station after two Sm4 commuter trains ended up within the same block section. The incident occurred after the H train stopped as a result of a malfunction in safety device on the neutral section following signal E581. The engine driver let the train "roll" backwards in order to exit the neutral section, causing it to enter the block section of the Z train following it on the same track. The H train ran late 24 minutes and the Z train 15 minutes. Other rail traffic was not disturbed. The incident did not cause any damage.

***Final report issued:*** 22.10.2015

| ***Recommendation Nr. 2015-S30*** | In this case the fault of the safety device had not been repaired even though it had been signed repaired. In order that in the future the maintenance would know how to correct the right faults: | |
|---|---|---|
| | **The maintainer of the rolling stock must ensure and instruct the repairs of safety device mal-functions in the rolling stock better than at present.** | |
| ***Date*** | ***Status*** | ***Comments*** |
| 3.3.2016 | Under implementation | VR will settle. |
| 28.3.2017 | Under implementation | VR will settle. |
| 11.4.2018 | Partly implemented | Has been applied partly in VR Group's intelligent maintenance concept. |

| ***Recommendation Nr. 2015-S31*** | The technical support needed in the problem situations of Sm commuter trains to the engine drivers has not been arranged equally well as with goods trains and long-distance traffic. The engine drivers even do not necessarily know where to ask for the technical support and getting the support is not guaranteed all the times of day. To solve the problem: | |
|---|---|---|
| | **The technical support for the Sm commuter trains is moved to the VR Operations Centre.** | |
| ***Date*** | ***Status*** | ***Comments*** |
| 3.3.2016 | Under implementation | Negotiations for an agreement unfinished. |
| 28.3.2017 | Under implementation | VR will move the technical support to transport control of local traffic. |
| 11.4.2018 | Partly implemented | Commuter train driver's technical support has been moved to operations control at Helsinki depot. |

| ***Recommendation Nr. 2015-S32*** | The solving of technical problems does not always succeed because of the drivers' varying experience and the education which has diminished. | |
|---|---|---|
| | **The engine driver training must pay more attention to resolving problems than before.** | |
| ***Date*** | ***Status*** | ***Comments*** |
| 3.3.2016 | Under implementation | Renewed competency law designed the coming into force 1.3.2017. Orders also on the educations will come to it. |
| 28.3.2017 | Under implementation | In VR attention paid in the drivers' repetition training. |
| 11.4.2018 | **IMPLEMENTED** | Has been applied to safety management system audits. |

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| ***Date and time (Code):*** | 2015 (R2015-S1) |
| ***Location:*** | Finland |
| ***Type of occurrence:*** | Wrong routings |
| ***Train type and number:*** | |
| ***Road vehicle:*** | - |

| | | In the train | In the road vehicle |
|---|---|---|---|
| ***Persons on board:*** | ***Crew:*** | | |
| | ***Passengers:*** | | |
| ***Fatally injured:*** | ***Crew:*** | | |
| | ***Passengers:*** | | |
| ***Seriously injured:*** | ***Crew:*** | | |
| | ***Passengers:*** | | |
| ***Slightly injured:*** | ***Crew:*** | | |
| | ***Passengers:*** | | |
| ***Damages of rolling stock:*** | | | |
| ***Damages on track equipment:*** | | | |
| ***Other damages:*** | | | |
| ***Disturbances of traffic:*** | | | |

***Summary*:** The Safety Investigation Authority investigated factors causing wrong routings in train traffic, by examining a number of selected cases and going through all of the wrong routes formed in 2015, based on data made available by the Finnish Transport Agency, Finrail and VR.

***Final report issued:*** 8.7.2016

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| ***Recommendation Nr. 2016-S11*** | Around 80% of the wrong routings were created manually. The use of train number automation would have been possible in over half of these cases. The manual creation of routes is prone to error. | |
| | **The Finnish Transport Agency should, in collaboration with Finrail Oy, ensure that, as a general rule, routes are created by the automated system.** | |
| ***Date*** | ***Status*** | ***Comments*** |
| 28.3.2017 | Under implementation | Transport Agency and Finrail try to implement the recommendation. |
| 11.4.2018 | Under implementation | By improving situational traffic planning, use of automation can be increased in forming train routes. |
| ***Recommendation Nr. 2016-S12*** | Not all wrong routings are reported, or their data is not collected, although this would be possible through IT means. No clear and uniform system exists for reporting on wrong routings that covers all parties: the rail traffic operators, the owner of the railway network and the safety authority. It is not possible to gain an overview of the issue. | |
| | **The Finnish Transport Safety Agency (Trafi) is obliged to create a uniform system for the reporting and classifying of deviations; one covering all actors.** | |
| ***Date*** | ***Status*** | ***Comments*** |
| 28.3.2017 | Under implementation | Trafi is making the system and soon it is possible to test. |
| 11.4.2018 | Under implementation | Will probably be operational at the beginning of year 2019. |
| ***Recommendation Nr. 2016-S13*** | The rapid deregulation of national regulations and references to EU regulations has lately created a situation, where detailed and practical regulations no longer exist. National instructions have been finished too late considering the adoption of the regulations, resulting in several postponements of their adoption. The time traffic controllers have to familiarise themselves with the instructions has been short. Regulations and instructions already rescinded have also been left in use. | |
| | **The Finnish Transport Agency (Trafi) must ensure that the instructions directly affecting the work of traffic controllers are kept up to date and that they are not put into use without sufficient orientation of personnel.** | |
| ***Date*** | ***Status*** | ***Comments*** |
| 28.3.2017 | Under implementation | Transport Agency strives towards this. |
| 11.4.2018 | Under implementation | Finnish Transport Agency has developed and taken into use a new system for controlling changes in instructions. |
| ***Recommendation Nr. 2016-S14*** | Continuous changes and the deployment of incomplete systems increase the workload of the traffic controllers. | |
| | **The Finnish Transport Agency must ensure that new systems or modifications to existing systems are not introduced incomplete, or without sufficient orientation of the staff.** | |
| ***Date*** | ***Status*** | ***Comments*** |
| 28.3.2017 | Issued | |

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| 11.4.2018 | Under implementation | In RUMA-application that will be commenced in summer 2018 criteria for commissioning is clearly defined. |
| ***Recommendation Nr. 2016-S15*** | Traffic controllers feel that they have insufficient say in the creation of new traffic control systems and the development of old ones. Defects that are the responsibility of the Finnish Transport Agency (such as defects in technical equipment) are corrected quickly, but deficiencies and development needs are not necessarily reacted to at all. | |
| | **When procuring traffic control systems, the Finnish Transport Agency must take steps to ensure that any development needs emerging in a system can be implemented smoothly during the system's lifespan.** | |
| ***Date*** | ***Status*** | ***Comments*** |
| 28.3.2017 | Under implementation | Transpot Agency examines if it is working in Riihimäki–Tampere amendment work. |
| 11.4.2018 | Partly implemented | Finish Transport Agency and Finrail have started regular meetings where among other topics the most critical development needs are discussed. |

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| ***Date and time (Code):*** | 3.2.2016, 8.09 (R2016-01) | | |
| ***Location:*** | Uimaharju, (line number 701), km 673+930 | | |
| ***Type of occurrence:*** | Accident to persons involving rolling stock in motion – Track worker hit by a train. | | |
| ***Train type and number:*** | Regional train 760, Dm12 rail bus | | |
| ***Road vehicle:*** | - | | |
| | | ***In the train*** | ***Other*** |
| ***Persons on board:*** | ***Crew:*** | 1 | |
| | ***Passengers:*** | 24 | |
| ***Fatally injured:*** | ***Crew:*** | 0 | |
| | ***Passengers:*** | 0 | |
| ***Seriously injured:*** | ***Crew:*** | 0 | 1 |
| | ***Passengers:*** | 0 | |
| ***Slightly injured:*** | ***Crew:*** | 0 | |
| | ***Passengers:*** | 0 | |
| ***Damages of rolling stock:*** | None. | | |
| ***Damages on track equipment:*** | None. | | |
| ***Other damages:*** | Portable earth radar was damaged. | | |
| ***Disturbances of traffic:*** | Traffic at the accident site was interrupted for 20 minutes. | | |

***Summary*:** The accident happened when one of the cable markers did not notice the approaching train and moved too close to the rails. The cable marker's attention was focused on the cable detector. In addition, the current weather conditions and the train being quiet made the train more difficult to notice. Due to the suddenness of the situation, the engine driver had no chance to avoid the collision.

***Final report issued:*** 4.10.2016

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| ***Recommendation Nr. 2016-S27*** | The Finnish Transport Agency's cable marking request form does not directly address the need for protective measures during the work. The instructions on cable marking do not discuss work safety sufficiently. At the moment, there is a great variety among cable marking requests, cable marking request forms are not used, and the responsibilities for using the forms are unclear. | |
| | **The Finnish Transport Agency shall renew the instructions on cable marking and adapt the cable marking request form so that the purchaser must comment on the protective measures to be used in the work.** | |
| ***Date*** | ***Status*** | ***Comments*** |
| 28.3.2017 | Under implementation | Not yet ready. |
| 11.4.2018 | Under implementation | Instructions will be updated during 2018. |
| ***Recommendation Nr. 2016-S28*** | Cable marking does not touch the structure of the tracks, and the work usually lasts only for a short time. In this sense, the work is comparable to clearing snow off the switches, for example. The goal of the following recommendation is to ensure that the appropriate protective measures are used in cable marking. | |
| | **The Finnish Transport Agency must also find out if the instructions could be changed so that a trackwork permission could also be requested for cable** | |

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| | **marking without an advance notification (Advance information on train traffic (JETI)), if necessary.** | |
| ***Date*** | ***Status*** | ***Comments*** |
| 28.3.2017 | Issued | |
| 11.4.2018 | **IMPLEMENTED** | Instructions have been included in latest version of rail maintenance safety manual (TURO). |

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|---|---|---|---|
| ***Date and time (Code):*** | 23.3.2016 (R2016-02) | | |
| ***Location:*** | Finland | | |
| ***Type of occurrence:*** | Train collision | | |
| ***Train type and number:*** | Freight train 11375 – Sr1 electric locomotive | | |
| ***Road vehicle:*** | - | | |
| | | | |
| ***Persons on board:*** | ***Crew:*** | ***Crew:*** | ***Crew:*** |
| | ***Passengers:*** | ***Passengers:*** | ***Passengers:*** |
| ***Fatally injured:*** | ***Crew:*** | ***Crew:*** | ***Crew:*** |
| | ***Passengers:*** | ***Passengers:*** | ***Passengers:*** |
| ***Seriously injured:*** | ***Crew:*** | ***Crew:*** | ***Crew:*** |
| | ***Passengers:*** | ***Passengers:*** | ***Passengers:*** |
| ***Slightly injured:*** | ***Crew:*** | ***Crew:*** | ***Crew:*** |
| | ***Passengers:*** | ***Passengers:*** | ***Passengers:*** |
| ***Damages of rolling stock:*** | Damages to the locomotive. | | |
| ***Damages on track equipment:*** | Damage to approximately 250 meters of track and track equipment. | | |
| ***Other damages:*** | None. | | |
| ***Disturbances of traffic:*** | There was interruption of three days in rail traffic in one lane of two lane track. Totally closed for five hours. | | |

***Summary*:** A locomotive on its way from Kokkola to Ylivieska collided with a steel slit coil on the track at the speed of 120 km/h near the Matkaneva Station. The locomotive jumped over the slit coil, which was lying on its flat side, and became derailed. After being derailed, the locomotive travelled 185 metres and came to rest tilted over the right rail so that the rail was close to the middle of the locomotive.

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| ***Final report issued:*** | 20.2.2017 |

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| ***Recommendation Nr. 2017-S3*** | The breaking of the radial straps holding the slit coil pack together was preceded by the radial straps becoming loose and displaced during the handling and transport after they were bound at the factory. The loose radial straps allowed the slit coil pack to tilt during transport. In order to ensure that the radial straps are sufficiently tight and that they stay in place, the Safety Investigation Authority recommends that: | |
| | **SSAB specifies the binding of slit coil packs and verifies it by calculations, taking the stresses due to handling at the factory into account in addition to the lateral accelerations on the coil pack during railway transport.** | |
| ***Date*** | ***Status*** | ***Comments*** |
| 11.4.2018 | Partly implemented | Preliminary calculations have been made, calculations are being checked. |
| ***Recommendation Nr. 2017-S4*** | The running characteristics of the steel coil carrying wagons fulfil the requirements of European norms, but the lateral accelerations on the frame of the wagons come close to the limit value and may even exceed it for short periods of time. In a calculated estimate of the moment of inertia of a loaded wagon resulting from the placement of the load, it was found that it is more advantageous to put heavy coils in cradles 2 and 4 at the centre of the wagon compared to cradles 1 and 5. So that load placement would not cause unnecessary stress to the load's bindings, the rolling stock or the tracks, the Safety Investigation Authority recommends that: | |
| | **VR finds out the best placement for the coils in the wagons in order to improve the running characteristics of a loaded coil wagon and takes the results into account in the loading instructions.** | |
| ***Date*** | ***Status*** | ***Comments*** |
| 12.5.2017 | **IMPLEMENTED** | The coils are placed as middle of the wagon as possible, in which case the directed lateral forces to them in the curves are as small as possible. |
| ***Recommendation Nr. 2017-S5*** | Straps have become loose and broken during handling in storage or transport. The problem of the straps becoming loose on coils being rolled and lifted in the storage | |

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| | area had also been identified in SSAB's production. Broken straps had been replaced, but a deviation had not been recorded concerning them. In addition, the investigation found that slit coils had also fallen off or tilted during transport on previous occasions, but information was not available for all cases. So that information on the deviations could be utilised, the Safety Investigation Authority recommends that: | |
| | **In order to identify risks, SSAB collects information about deviations related to binding, storage handling and transport, and deals with them.** | |
| ***Date*** | ***Status*** | ***Comments*** |
| 10.5.2017 | **IMPLEMENTED** | To verify deviation information instructions have been updated, and it has been gone through with the staff. Protection quarters of the new operations model also have been kept to the staff. |

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| ***Date and time (Code):*** | 8.7.2016 (R2016-03) | | | |
| ***Location:*** | Finland | | | |
| ***Type of occurrence:*** | Train collision | | | |
| ***Train type and number:*** | Shunting unit, Dr14 diesel locomotive and 20 tank wagons | | | |
| ***Road vehicle:*** | - | | | |
| | | | ***In the train*** | ***In the road vehicle*** |
| ***Persons on board:*** | ***Crew:*** | | 2 | - |
| | ***Passengers:*** | | 0 | - |
| ***Fatally injured:*** | ***Crew:*** | | 0 | - |
| | ***Passengers:*** | | 0 | - |
| ***Seriously injured:*** | ***Crew:*** | | 0 | - |
| | ***Passengers:*** | | 0 | - |
| ***Slightly injured:*** | ***Crew:*** | | 0 | - |
| | ***Passengers:*** | | 0 | - |
| ***Damages of rolling stock:*** | Two wagons were damaged. | | | |
| ***Damages on track equipment:*** | Buffer stop damaged. | | | |
| ***Other damages:*** | Few. | | | |
| ***Disturbances of traffic:*** | None. | | | |

***Summary*****:** A radio-controlled shunting unit collided with a rail barrier and two tank wagons loaded with SPB gasoline were derailed at the port of Mussalo in Kotka on the night of Friday 8 July 2016. As the first wagon was derailed, the end of the second wagon mounted the under-frame of the first wagon. Because the height difference was so great, the override protection on the central buffer coupling was unable to prevent the couplings from detaching from each other.

***Final report issued:*** 10.3.2017

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| ***Recommendation Nr. 2017-S6*** | Collisions and derailments occur during shunting work every three days on average. In 2015, there were nine collisions or derailments involving dangerous goods. To improve the safety of shunting work, the Safety Investigation Authority recommends that: | |
| | **The Finnish Transport Safety Agency (Trafi) and railway operators should improve the supervision of shunting work.** | |
| ***Date*** | ***Status*** | ***Comments*** |
| 11.4.2018 | **IMPLEMENTED** | Supervision has been increased in audits and as a part of monitoring. |
| ***Recommendation Nr. 2017-S7*** | The lengths of railway yard tracks vary depending on the data source and system. During shunting work, this can lead to errors of interpretation which can cause an incident or accident. The consequences of an accident can be significant in railway yards were dangerous goods are being transported. To improve the safety of railway yards, the Safety Investigation Authority recommends that: | |
| | **Infrastructure managers are responsible for ensuring that the usable track length in railway yards are consistent regardless of the system.** | |
| ***Date*** | ***Status*** | ***Comments*** |
| 11.4.2018 | Partly implemented | Some infrastructure managers have implemented. Information is missing from some infrastructure managers. |
| ***Recommendation Nr. 2017-S8*** | A rescue plan forms the basis of safety in ports and other areas where several companies are operating. The promotion of overall safety in such an area requires consistent actions from all operators. The ensure consistent actions, the Safety Investigation Authority recommends that: | |

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| | **Railway undertakings should comply with local emergency plans in ports and other areas where other companies are also operating.** | |
| ***Date*** | ***Status*** | ***Comments*** |
| 11.4.2018 | Partly implemented | To be discussed in infrastructure managers co-operation group. |
| ***Recommendation Nr. 2017-S9*** | In railway yards, old buffer stops are of little relevance in stopping wagons. In addition, the transport of dangerous goods in wagons built according to varying standards sets a wide range of requirements for buffer stops. In risk analyses, overshootings have been identified as a potential cause of accidents. Because there has been no change in shunting supervision practices, structural accident prevention should be made more effective, particularly in railway yards where dangerous goods are being handled. To improve the safety of railway yards in which dangerous goods are being transported, the Safety Investigation Authority recommends that: | |
| | **Infrastructure managers should modernise buffer stops on tracks where shunting work is done related to the transport of dangerous goods.** | |
| ***Date*** | ***Status*** | ***Comments*** |
| 11.4.2018 | Partly implemented | Some infrastructure managers have studied the situation and made action plan for replacement. Information is missing from some infrastructure managers. |

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| ***Date and time (Code):*** | 27.7.2016 (R2016-04) | | |
| ***Location:*** | Finland | | |
| ***Type of occurrence:*** | Train collision | | |
| ***Train type and number:*** | Metro trains | | |
| ***Road vehicle:*** | - | | |
| | | ***In the train*** | ***In the road vehicle*** |
| ***Persons on board:*** | ***Crew:*** | 1 | - |
| | ***Passengers:*** | 0 | - |
| ***Fatally injured:*** | ***Crew:*** | 0 | - |
| | ***Passengers:*** | 0 | - |
| ***Seriously injured:*** | ***Crew:*** | 0 | - |
| | ***Passengers:*** | 0 | - |
| ***Slightly injured:*** | ***Crew:*** | 0 | - |
| | ***Passengers:*** | 0 | - |
| ***Damages of rolling stock:*** | | | |
| ***Damages on track equipment:*** | | | |
| ***Other damages:*** | | | |
| ***Disturbances of traffic:*** | | | |

***Summary*:** Two metro trains collided at Itäkeskus metro station in. The sides of the departing test drive train and the teaching train standing at the turnout area of the station collided and the test drive train was derailed.

***Final report issued:*** 8.5.2017

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| ***Recommendation Nr. 2017-S22*** | The accident investigation revealed that the safety device design included a fault that has been carried across two generations of devices. | |
| | **Helsinki City Transport and the safety device supplier should investigate and analyse the requirements relating to the operational safety of the metro railway system thoroughly in order to avoid potential faults being carried across to the next system in the course of the current safety device revision.** | |
| ***Date*** | ***Status*** | ***Comments*** |
| 11.4.2018 | Partly implemented | Helsinki City Transport (HKL) has started to use notified bodies to improve safety devices design and installation. Safety devices will be unified. |
| ***Recommendation Nr. 2017-S23*** | Helsinki City Transport was not required to have a safety management system until the summer of 2016, following the entry into force of the new Urban Rail Transport Act. This is why the system was undeveloped. For example, there were shortcomings in the processing of safety deviations, and the risk of metro trains colliding had not been identified. | |

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| | **The Finnish Transport Safety Agency should ensure that Helsinki City Transport's safety management system is developed so that it meets the requirements set by the European Railway Agency (ERA) for safety management systems.** | |
| ***Date*** | ***Status*** | ***Comments*** |
| 11.4.2018 | Partly implemented | Finnish Transport Safety Agency and Helsinki City Transport (HKL) have together improved safety management system of Helsinki City Transport. |
| ***Recommendation Nr. 2017-S24*** | Controlling night-time traffic is challenging. Unscheduled night-time test and teaching traffic had not been planned sufficiently well or coordinated. It was difficult to form a comprehensive picture of the traffic situation. Night-time traffic requires traffic controllers to make quick decisions based on events. | |
| | **Helsinki City Transport should schedule night-time metro trains and other units and draw up a driving programme for them.** | |
| ***Date*** | ***Status*** | ***Comments*** |
| 11.4.2018 | Partly implemented | There is still room for development in maintenance planning and track reservations. |
| ***Recommendation Nr. 2017-S25*** | Driver training includes learning materials from several different teachers and is not organised well enough. The learning materials also overlap in part.<br>The driving skills of driver trainees are reviewed during an on-the-job learning period, but this is not documented in writing. | |
| | **Helsinki City Transport should ensure that recommendations S265 and S266 given by the Safety Investigation Authority previously are extended to also apply to metro traffic.** | |
| ***Date*** | ***Status*** | ***Comments*** |
| 11.4.2018 | **IMPLEMENTED** | Training plan for metro drives has been updated 21.9.2017. |

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| ***Date and time (Code):*** | 13.8.2916 (R2016-06) | | |
| ***Location:*** | Finland | | |
| ***Type of occurrence:*** | Train collision | | |
| ***Train type and number:*** | Freight train 5316, 2 x Sr1 electric locomotives and 24 wagons | | |
| ***Road vehicle:*** | - | | |
| | | ***In the train*** | ***In the road vehicle*** |
| ***Persons on board:*** | ***Crew:*** | 1 | - |
| | ***Passengers:*** | 0 | - |
| ***Fatally injured:*** | ***Crew:*** | 0 | - |
| | ***Passengers:*** | 0 | - |
| ***Seriously injured:*** | ***Crew:*** | 0 | - |
| | ***Passengers:*** | 0 | - |
| ***Slightly injured:*** | ***Crew:*** | 1 | - |
| | ***Passengers:*** | 0 | - |
| ***Damages of rolling stock:*** | Locomotive and three wagons damaged badly. Seven wagons damaged less severely. | | |
| ***Damages on track equipment:*** | Track damaged about 100 meters and the portal suspension of electric railway damaged. | | |
| ***Other damages:*** | None. | | |
| ***Disturbances of traffic:*** | Railway yard traffic disrupted due to a power outage. | | |
| ***Summary*:** An empty timber train on its way from Kemi to Kontiomäki was about to arrive at the Oulu freight yard, where it was intended to stop for two hours and change drivers. The freight train arrived on track 118 and collided with the empty wagons standing on the tracks at a speed of 33 km/h. | | | |
| ***Final report issued:*** | 23.5.2017 | | |
| ***Recommendation Nr. 2017-S28*** | A safety risk is involved in the work done by switchmen to protect routes in railway yards without modern technical systems to protect the passage of trains. Route protection by the switchman is not verified in any way, which also constitutes a risk. The faulty procedure used by the switchman made it possible to protect the route of a train on an occupied track. Traffic implemented as shunting operations should be more controlled, in which case the engine driver would also have an obligation to keep a lookout. If, say, for financial reasons it is not possible to equip all railway yards with technical monitoring by centralised traffic control, the Safety Investigation Authority recommends that | | |

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| | **The Finnish Transport Agency should restrict trains running on tracks that are not under technical centralised traffic control.** | |
| ***Date*** | ***Status*** | ***Comments*** |
| 11.4.2018 | Under implementation | A test is in process where a part of trains route is run according to shunting operation rules. A report will be made from this test and decisions will be based on it. |
| ***Recommendation Nr. 2017-S29*** | The instructions on traffic control are not consistent in all parts, and some of the actors do not know which instructions should be applied to which function or which instructions should be followed. Some of the instructions refer to other instructions that have already been repealed. To ensure that the instructions on traffic control are up to date and clear for all actors, the Safety Investigation Authority recommends that | |
| | **The Finnish Transport Agency should harmonise and clarify the instructions on centralised traffic control.** | |
| ***Date*** | ***Status*** | ***Comments*** |
| 11.4.2018 | Partly implemented | Railway yard traffic control instructions and train traffic control instructions have been combined to a single document. |
| ***Recommendation Nr. 2017-S30*** | Engine drivers do not have an obligation to keep a lookout in train traffic. However, during shunting operations, engine drivers have responsibility in all situations to drive carefully, control their speed and pay attention to the sightline in the direction of travel, so that they can stop the unit before any obstacle. Train traffic also occurs at relatively low speeds, such as in the case in question. The Safety Investigation Authority therefore recommends that | |
| | **The Finnish Transport Safety Agency (Trafi) should order that engine drivers keep a lookout when in train traffic.** | |
| ***Date*** | ***Status*** | ***Comments*** |
| 11.4.2018 | **IMPLEMENTED** | Implemented differently: Railway operators have included the subject to their instructions. |