# NIB ANNUAL REPORT 2014

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 2014.

## 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.

## CONTENTS

# 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**

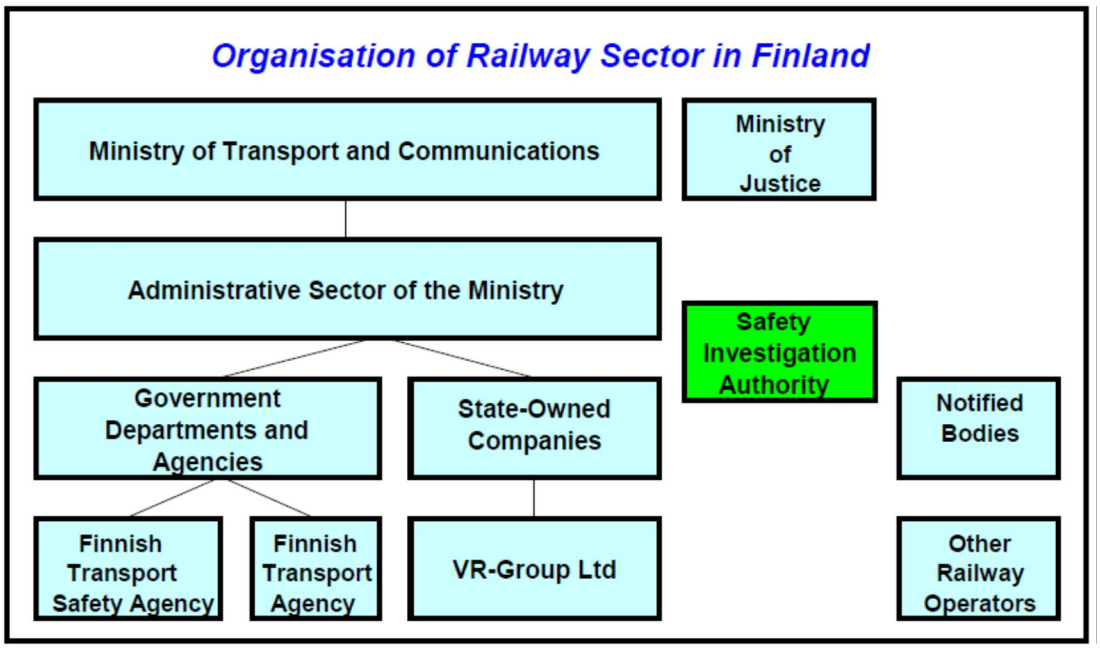
The Safety Investigation Act (525/2011) defines the task and the mandate of the Safety Investigation Authority. The Safety Investigation Act of Finland provides for the types of accidents and incidents investigated by the Safety Investigation Authority and how they are investigated.

**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 of the European Parliament and of the Council 2004/49/EC (Railway Safety Directive)
  - **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 caused by 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.

## 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**

Road accident investigation teams carry out the investigation of severe road and cross-country accidents in Finland, including level crossing accidents. Accidents resulting in serious injuries or only in material damages are also investigated. The objective is to produce information and safety suggestions to improve road safety through studying road and cross-country traffic accidents.

Investigation is regulated by legislation on the investigation of road and cross-country traffic accidents (Act on the investigation of road and cross-country traffic accidents, 24/2001). The investigation is steered and supervised by the Road Accident Investigation Delegation set up by the Ministry of Transport and Communications.

There are 20 investigation teams with a total of approximately 300 members. The members of investigation teams act to subject to liability and they have a duty of secrecy. The investigation teams do not take a stand on issues of liability or compensation.

In road accident investigation, the course of the accident, its risk factors, consequences and conditions are investigated in considerable detail. The investigation teams draws up an investigation report, which includes, for example, a description of the course of the accident, the results of the accident, and safety improvement proposals made by the investigation team.

The Finnish Motor Insurers' Centre takes care of the maintenance support of road accident investigation, the use of the investigation results and the information service. The data in the accident information register may be handed over without charge to be used in scientific and statistical research and in road safety work by the authorities. Unidentified or summed up data can also be used for other road safety work.

In addition to that what has been told above about the investigation of road and cross-country accidents, we would like to mention, that SIAF can investigate any accident which has taken place in Finland, including road and cross-country 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** | 1 | 0 | 0 | 85 000 | |
| **Derailments** | 1 | 0 | 0 | 940 000 | |
| **Level crossing accidents** | 0 | 0 | 0 | 0 | |
| **Other** | 0 | 0 | 0 | 0 | |

## 3.2 Investigations completed and commenced in 2014

### Investigations completed in 2014

| Date of occurrence | Title of the investigation (Occurrence type, location) | Legal basis | Completed (date) |
|---|---|---|---|
| 6.4.2013 | Derailment of 13 wagons of a freight train at Vammala station on 6 April 2013 | I (1) | 20.2.2014 |
| 7.11.2013 | Collision of a freight train with an excavator on the Pännäinen–Kolppi section on 7 November 2013 and other occurrences and incidents caused by the track work in 2013 | I (2) (b) | 11.11.2014 |

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

I National rules imposed by implementing of the Safety Directive
- (1) in light of Article 19, §1 of SD
- (2) in light of Article 19, §2 of SD
  - (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 21 of SD
  - (§5) cross-border investigation or request to assistance
  - (§6) other reasons than those referred to in Article 19

II Other national rules/regulations (covering possible areas excluded in Article 2, §2 of the SD)
- (1) metros, trams and other light rail systems
- (2) networks that are functionally separate from the rest of the railway system
- (3) privately owned railway infrastructure that exist solely for use by the infrastructure owner for its own freight operations.

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

### Investigations commenced in 2014

| Date of occurrence | Title of the investigation (Occurrence type, location) | Legal basis |
|---|---|---|
| | | |

## 3.3 Safety Studies completed and commenced in 2014

### Safety Studies completed in 2014

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

### Safety Studies commenced in 2014

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

## 3.4 Summaries of investigations completed in 2014

**R2013-01**

**Derailment of 13 wagons of a freight train at Vammala station on 6 April 2013**

At 3.22 a.m. on 6 April 2013, 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 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.

There were no personal injuries. A total of 13 wagons derailed during the accident. Two Russian tank wagons were damaged beyond repair after they had derailed and tipped over. The intermediate wagon following the tank wagons, and a wagon loaded with empty containers that came after the intermediate wagon, were badly damaged. The damage caused to the other nine derailed wagons was not as extensive. Tracks were damaged at a distance of 177 metres and the concrete sleepers of one track were damaged at a distance of 249 metres. A small amount of crude tall oil leaked onto the ground from one of the tank wagons that tipped in the accident. The total costs caused by the accident were € 940,000.

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.

Vibration affecting the open switch blade was caused by several factors. The Railex locking device had been adjusted eccentrically, in deviation from the specifications in such a manner that the gap between the open switch blade and the stock rail was 10 mm too small. This allows the inner surface of the flange of a train wheel to impact against the open switch blade. This is more likely in the case of Russian rolling stock, in which the distance between the inner surfaces of the wheel flanges is 5 mm less than in Finnish rolling stock.

Vibration may also be caused by lateral movement in the Russian stock which is, due to the wheel profile, greater than in Finnish stock. This causes the inner surface of the wheel flange to run close to open switch blades more often in Russian stock than in Finnish stock; when the equipment is within the nominal values, it can move a maximum of 5 mm closer. The vibration frequency caused by the speed and axle spacings suited the vibration characteristics of the turnout.

The accident had several causes. It seems to be typical of safety management that, on a general level, the systems and instructions are well described but they are not realised in practice. Detected safety deviations had been systematically left unreported. Repeated trailing notifications had been made for at least twelve months, but had been disregarded. It had become habitual to leave trailing notifications caused by the passage of trains unreported due to their being so common and, on the other hand, because maintenance personnel had been unable to determine the cause of the trailing notifications. In addition, the log data available in the railway safety system had not been examined and analysed. There were deficiencies in the management of competencies related to turnout maintenance. Lately, no training has been provided in turnout maintenance. It also became apparent during the investigation that up-to-date instructions were not sufficiently available to those performing practical work. Quality control of work in the field is insufficient. Additionally, documentation for turnout maintenance was found to be lacking.

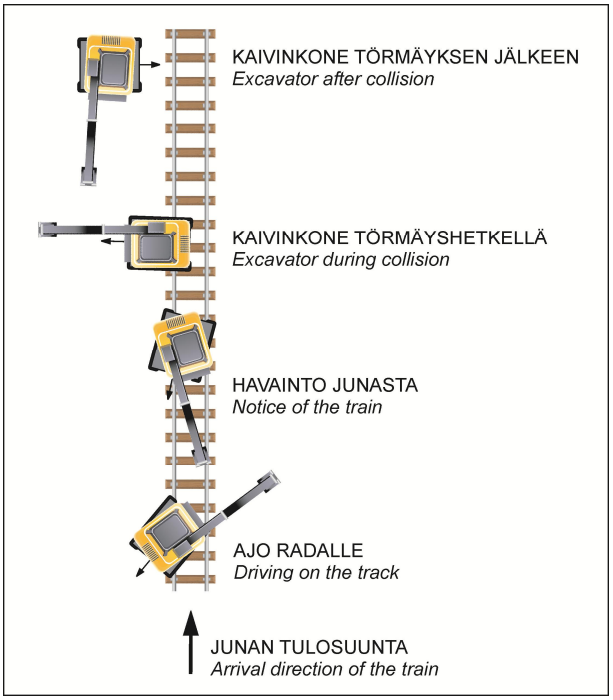
In order to avoid similar accidents in the future, the Safety Investigation Authority, Finland recommends that the Finnish Transport Safety Agency (Trafi) ensure the implementation of the following new recommendations:

- The Finnish Transport Agency should establish a system and methodology for the analysis of error logs of safety systems, to ensure the detection of any repeated flaws endangering safety.
- The Finnish Transport Agency should establish a system to ensure that the reason and justification for using a critical command are recorded. This justification will be used to show that no actual flaw remains in the system after the command has been used.
- The Finnish Transport Agency should convert the electric point machines of the trailable YV60-300-1:9 turnouts used on the main tracks, in order to prevent vibration caused by rolling stock from unlocking the switch lock.

- As the infrastructure manager, the Finnish Transport Agency should draw up a clearly defined turnout maintenance training programme and establish a system for continuous monitoring of the competencies of personnel carrying out turnout maintenance and adjustment work.

We also repeat our earlier recommendation S293:

- The installation, inspections and maintenance of switches and their components should be seamlessly documented. [B5/09R/S293]




**R2013-03**

**Collision of a freight train with an excavator on the Pännäinen–Kolppi section on 7 November 2013 and other occurrences and incidents in 2013**

On Thursday, 7 November 2013 at 5.17 p.m., 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.

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.

The excavator driver sustained minor injuries in the collision. The freight train had two Dv12 locomotive. The collision caused a hole into the fuel tank of the first engine, and fuel leaked onto the track. The left steps of both engines were either bent or broken. The excavator was damaged beyond repair. The track and track equipment did not suffer damage. Traffic at the accident site

was interrupted for 3.5 hours. The total costs of the damage to the rolling stock amounted €4,300 and to the excavator €80,000.

The immediate cause of the accident was attributed to incorrect or unclear communication regarding the trackwork permission given during a conversation between the trackwork supervisor and the excavator driver. The confusion was caused by the permission given by the traffic controller and and wording "behind the train", and the trackwork supervisor's location at Pännäinen Station without visual contact with the excavator. Works permission practices had developed between the traffic controllers and trackwork supervisors that expedited trackwork but contributed to hazards. Short-circuit conductors were not used for securing the construction site. The root cause of the accident was a prolonged exceptional situation at Pännäinen Station, which was attributed to the trackwork contract and its delay. The traffic controller and the trackwork supervisor were overloaded with work. The delay in the contract was caused by several factors, such as employee incompetence and problems in communication, management and monitoring.

Of the other accidents and incidents covered by this investigation, four unauthorised trackworks, four cases of machinery driven beyond the authorised construction site and some other isolated cases were analysed in more detail. In addition to human error, lack of knowledge, and deliberate risk-taking was found to have played a role in causing these events. Other underlying factors in a number of cases included problems in communication, and deficiencies in work planning and employee induction.

This investigation focused in particular on the safety training for trackwork, safety culture and safety management, and monitoring. The training leading to a trackwork safety qualification, in line with the instructions issued by the Finnish Transport Agency, and the trackwork supervisor's training, meeting the requirements determined by the Finnish Transport Safety Agency (Trafi) and supplemented by the additional requirements set out by the Finnish Transport Agency, currently fail to ensure compliance with safe practices.

Certain worrying aspects were observed regarding trackwork safety culture, arising from competitive bidding, outsourcing of works, and the resulting subcontracting chains. A weak safety culture was indicated by observations such as those concerning situations where contractors had knowingly disregarded safety instructions and regulations, trackwork had been initiated without appropriate authorisation, trackwork safety areas had been disregarded and tools had been left on the track. The critical nature of safety device for the safety of rail traffic was at times not understood or disregarded.

Safety management and monitoring made by the Finnish Transport Agency were found to be ineffective. Competitive bidding lacked appropriate emphasis on compliance with safety regulations. There is little field monitoring, and if safety deficiencies are detected, by and large the only tools for addressing them are discussions or warnings.

In order to avoid similar accidents in the future, and to improve trackwork safety, the Safety Investigation Authority, Finland recommends that the Finnish Transport Safety Agency (Trafi) ensures the implementation of the following new recommendations:

- *The Finnish Transport Agency will determine stricter minimum requirements for trackwork safety training.*

- *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.*
- *The Finnish Transport Agency will include in all trackwork contracts the detailed financial consequences for the contractor arising from compliance or non-compliance with safety regulations.*
- *The Finnish Transport Agency will ensure that contracts include a separate and sufficient timeframe for planning trackwork and clarifying responsibilities before trackwork is begun.*
- *The Finnish Transport Agency will increase the field monitoring of trackwork safety regulations by allocating appropriate resources for such work.*
- *The Finnish Transport Agency will allocate sufficient resources for developing the careful, systematic and rapid processing of safety deviations.*

In addition, the Safety Investigation Authority, Finland reiterates recommendations issued previously:

- *S312 A single and common accident and deviation database for all those operating the railway system in Finland should be created. (S1/2011R)*
- *S183 Shunting work practices should be developed by regulations, instructions and education in a way that “conditional permissions" to shunting movements or to any other traffic would not be given. The permission to a movement should be given once and only in case the movement is really possible. (C8/2002R)*
- *S119 Short-circuit conductors should be introduced to secure an occupied slot. (C6/1998R)*

- *S173 Working in too short time periods should be avoided. (C5/2001R)*

## 3.5 Comment and introduction or background to the investigations

### Investigations commenced in 2014 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 2010–2014)

### Rail investigations in 2010–2014

| **Accidents investigated** | | **2010** | **2011** | **2012** | **2013** | **2014** | **TOT** |
|---|---|---|---|---|---|---|---|
| Serious accidents (Art 19.1) | Train collision | 0 | 1 | 0 | 0 | 0 | **1** |
| | Train collision with an obstacle | 1 | 0 | 0 | 0 | 0 | **1** |
| | Train derailment | 0 | 0 | 0 | 0 | 0 | **0** |
| | Level crossing accident | 3 | 1[1] | 4[2] | 0 | 0 | **8** |
| | 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[3] | 0 | 1 | 0 | 0 | 0 | **1** |
| Other accidents (Art 19.2) + (Art 21.6) | Train collision | 0 | 1 | 0 | 0 | 0 | **1** |
| | Train collision with an obstacle | 0 | 0 | 0 | 1 | 0 | **1** |
| | Train derailment | 3 | 1 | 3 | 1 | 0 | **8** |
| | Level crossing accident | 1 | 3[1] | 37[2] | 0 | 0 | **41** |
| | 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[3] | 0 | 0 | 0 | 0 | 0 | **0** |
| | Incidents | 0 | 0 | 1 | 0 | 0 | **1** |
| **TOTAL** | | **8** | **7** | **45** | **2** | **0** | **62** |

[1] Investigated in theme investigation S2/2011R Safety study on level crossing accidents 2011.
[2] Investigated in theme investigation R2012-S1 Safety study on level crossing accidents 2012.
[3] Belongs also to another category and is not calculated another time to the total amount.

## 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. At the same time we developed content and layout of the report.

During the year SIAF made two preliminary investigation reports of which were published in the internet:

R2014-E1 Derailment of two wagons of a freight train in Parikkala on 10 January 2014 (published 18.2.2014).

R2014-E2 Derailment of three wagons of a freight train in Tampere on 18 May 2014 (published 2.7.2014).

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

In 2014 occurred a total of 32 level crossing accidents, two of them were fatal. One of the fatal level crossing accidents happened to a vehicle and the other for a pedestrian. Two persons injured fatally in the accidents, one injured seriously and 15 injured slightly. The road accident investigation teams investigated the fatal level crossing accident happened to a vehicle and two other accidents. Below short summary of the fatal level crossing accident:

**Fatal level crossing accident in Eno, Joensuu on 15 December 2014**

On Monday, 15 December 2014, a level crossing accident involving a private car and two diesel locomotives running as a train occurred on the Louhioja level crossing in Eno, Joensuu. The level crossing was passive and it was equipped with STOP-signs. The accident was fatal to the car driver. The car wrecked beyond repair. The locomotive sustained minor damages.

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

It is likely that the car driver completely failed to notice the locomotives approaching from the right and the engine driver didn't see the car approaching to the level crossing (*immediate risk factors*[4]).

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

*Background risk factors*[4]:

- it is possible to drive onto the level crossing when a train is approaching
- there are no barriers or traffic lights at the level crossing to guide road traffic crossing the track
- the crossing angle was not direct; the locomotives approached from behind on the right side
- the vegetation restricted to see to the track in both directions; at the STOP sign the sightlines were adequate
- the car driver didn't follow sufficient carefulness when approaching to the level crossing
- even if the engine driver had noticed the car, he would not manage to halt the locomotives before collision.

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

- At the level crossings must be taken care of good sightlines in the directions of both train and car traffic.
- In the safety campaigns should be told about dangers of level crossings.
- Barriers should be installed in all level crossings, which are not replaced with flyover junction.
- The level crossings without barriers should be removed.
- A new technology should be developed by means of using cheaper warning installations from their operating and installation costs. So they can be used efficiently also in level crossings with less traffic.

# 4 RECOMMENDATIONS

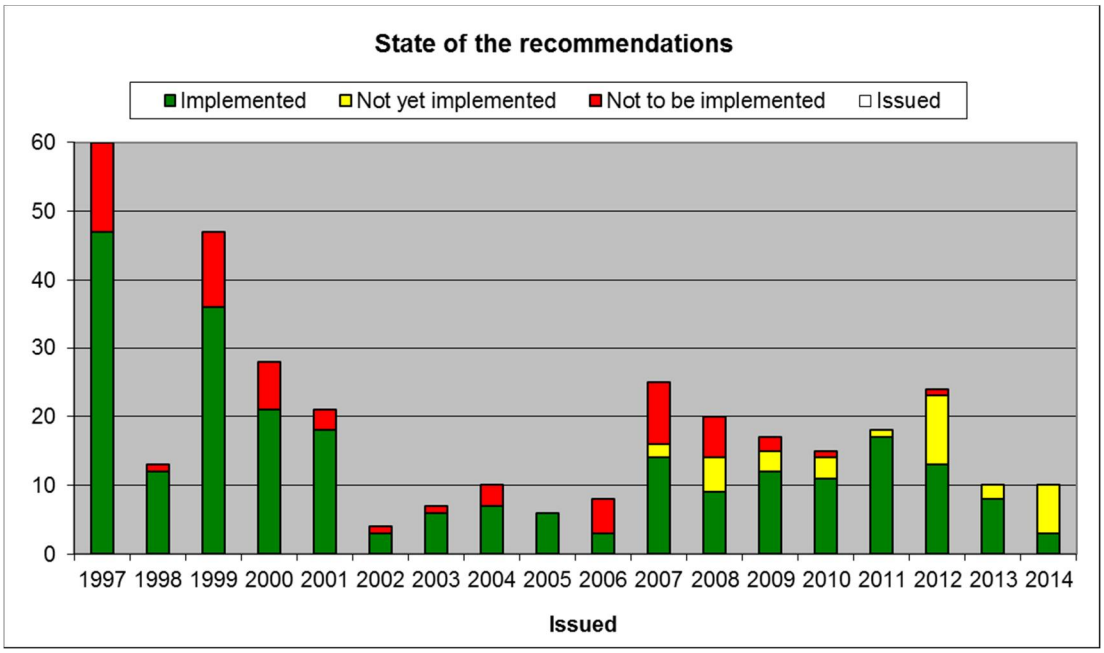
## 4.1 Short review and presentation of recommendations

### Implementation of recommendations during 2007–2014

| 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 | 9 | 45,0 | 5 | 25,0 | 6 | 30,0 |
| **2009** | 17 | 12 | 70,6 | 3 | 17,6 | 2 | 11,8 |
| **2010** | 15 | 11 | 73,3 | 3 | 20,0 | 1 | 6,7 |
| **2011** | 18 | 17 | 94,4 | 1 | 5,6 | 0 | 0,0 |
| **2012** | 24 | 13 | 54,2 | 10 | 41,7 | 1 | 4,2 |
| **2013** | 10 | 8 | 80,0 | 2 | 20,0 | 0 | 0,0 |
| **2014** | 10 | 3 | 30,0 | 7 | 70,0 | 0 | 0,0 |
| **TOTAL** | **139** | **87** | **62,6** | **33** | **23,7** | **19** | **13,7** |

Implementation status of Recommendations, see Annex 1

A total of 343 recommendations were issued from the beginning of 1997 until the end of 2014. According to information available at 25 February 2015, 246 (71.7 %) recommendations were implemented and 64 (18.7 %) were decided not to be implemented. Since beginning of 2007 until the end of 2014 a total of 139 have been issued. 87 (62.6 %) have been implemented, 19 (13.7 %) have been decided not to be implemented and 33 (23.7 %) are under implementation.



## 4.2 Recommendations 2014

### S338 The use of error logs as a preventive tool

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. [R2013-01/S338]*

The maintenance provider has been obliged to collect error log data on a regular basis from the signal box, but its use has not been specified and responsibility for its use has not been assigned to a sufficient degree. For this purpose, clear instructions and a practical analysis method should be drawn up.

### S339 Reporting safety equipment malfunctions requiring a critical command

Detected safety deviations had been systematically left unreported. For at least twelve months before the accident, there had been repeated trailing notifications. The only reaction they elicited was returning the turnout under monitoring using the critical VAP command; they were not reported to the control centre. For this reason, the maintenance provider had not been notified either. When the VAP command is used before someone visits the location, it is impossible to observe any opening in a switch lock. Proactive risk identification and the reporting of all deviations, as emphasised in the safety management systems and in instructions, are not being realised in practice.

*The Finnish Transport Agency should establish a system to ensure that the reason and justification for using a critical command are recorded. This justification will be used to show that no actual flaw remains in the system after the command has been used. [R2013-01/S339]*

Before the VAP command is given, the actual state of the turnout should be checked by visiting the spot and checking the positions of the switch lock and the detectors.

It has become habitual to leave trailing notifications caused by the passage of trains unreported due to their being so common and, on the other hand, because maintenance personnel have been unable to determine the cause of the trailing notifications. No interventions had been made in this practice, which has been allowed to develop as such. The Railway traffic control manual clearly obliges traffic controllers to report all safety device malfunctions and disruptions to the control centre, and all communications and monitoring disruptions to the maintenance provider.

### S340 Preventing the inadvertent opening of switch locks at turnouts on main tracks

Vibration caused by rolling stock can unlock the locking of a trailable point machine.

*The Finnish Transport Agency should convert the electric point machines of the trailable YV60-300-1:9 turnouts used on the main tracks, in order to prevent vibration caused by rolling stock from unlocking the switch lock. [R2013-01/S340]*

The electric point machines at the YV60-300-1.9 turnouts used on the main lines and equipped with Railex locking devices allow trailing, although there is no clear necessity for this. Trailing is rare on main tracks. When trailing occurs at a high speed, damage to the point lock is inevitable. The trailing notifications of main track turnouts are most often caused by trackwork machines, most of which do not constitute actual trailing.

**S341 Competence related to turnout maintenance**

In this case, the incorrect adjustment of a turnout's Railex locking device contributed to the accident. The investigation revealed defects in turnout adjustment on a nationwide scale.

*As the infrastructure manager, the Finnish Transport Agency should draw up a clearly defined turnout maintenance training programme and establish a system for continuous monitoring of the competencies of personnel carrying out turnout maintenance and adjustment work. [R2013-01/S341]*

Turnout installation and adjustment work has not been defined as a traffic safety task, which means that the training or competence of the personnel performing such work is not monitored to the same degree as safety tasks. Responsibility for competence management and maintenance has been assigned to the service provider. Almost no training has been available.

Competence could be controlled through, for example, regular skills tests and quality control of work carried out in the field.

**S342 Developing trackwork safety training**

All persons involved in trackwork must have the trackwork safety qualification (TURVA). The qualification can be acquired during a one-day training course (7 hours), after which a final examination must be passed. The training includes broad subject matters, such as knowledge of trackwork environment, instructions and regulations; trackwork safety; and response to accidents and incidents. A short course with an emphasis on lectures does not encourage profound learning or changes in attitudes.

The investigation concluded that the reasons behind several trackwork incidents involved ignorance or lack of responsibility on the part of the employees. The training should be more comprehensive, dispersed across a longer period of time, and more focused on the responsibility for one's own safety and that of others. The Safety Investigation Authority, Finland recommends that the Finnish Transport Safety Agency (Trafi) ensure the implementation of the following recommendation:

*The Finnish Transport Agency will determine stricter minimum requirements for track-work safety training. [R2013-02/S342]*

As a minimum, the quality and quantity of training must correspond to a high Nordic level. Training should better activate and motivate the participants, in order to provide individuals involved in trackwork with the skills and knowledge required for working on the railways without endangering themselves and others.

### S343 Focus of trackwork supervisors on traffic safety and technical tools

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 Safety Investigation Authority, Finland recommends that the Finnish Transport Safety Agency (Trafi) ensure the implementation of the following recommendation:

*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. [R2013-02/S343]*

Where trackwork supervisors are responsible for other tasks in addition to trackwork permissions, they should have visual contact with the teams whose permissions they are handling. Where the trackwork supervisors' main function is to handle trackwork permissions for a number of teams, they should have access to a GPS-based electronic tool for locating the teams and managing permissions.

### S344 Safety incentives and sanctions in contract agreements

According to current practice, penalties for contract delays may lead to compromises in safety. There are no direct financial incentives for maintaining safety. Contract agreements should therefore specify the financial consequences of compliance and non-compliance with safety regulations. The Safety Investigation Authority, Finland recommends that the Finnish Transport Safety Agency (Trafi) ensure the implementation of the following recommendation:

*The Finnish Transport Agency will include in all trackwork contracts the detailed financial consequences for the contractor arising from compliance or non-compliance with safety regulations. [R2013-02/S344]*

Financial consequences should be sufficiently effective, and they should be applied in practice, in order for the contractors to pay more attention to compliance with safety regulations.

### S345 Preparations for trackwork and clarification of responsibilities

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 Safety Investigation Authority, Finland recommends that the Finnish Transport Safety Agency (Trafi) ensure the implementation of the following recommendation:

*The Finnish Transport Agency will ensure that contracts include a separate and sufficient timeframe for planning trackwork and clarifying responsibilities before trackwork is begun. [R2013-02/S345]*

### S346 Trackwork field monitoring

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 Safety Investigation Authority, Finland recommends that the Finnish Transport Safety Agency (Trafi) ensure the implementation of the following recommendation:

*The Finnish Transport Agency will increase the field monitoring of trackwork safety regulations by allocating appropriate resources for such work. [R2013-02/S346]*

### S347 Developing the processing of rail traffic safety deviations

The Finnish Transport Agency lacks a real-time system for recording rail traffic safety deviations. Consequently, deviation data is not processed systematically. This lack of an occurrence system slows down the analysis of safety deviations, hampers the attempts to learn from them, and impedes the work of the safety authorities. The Safety Investigation Authority, Finland recommends that the Finnish Transport Safety Agency (Trafi) ensure the implementation of the following recommendation:

*The Finnish Transport Agency will allocate sufficient resources for developing the careful, systematic and rapid processing of safety deviations. [R2013-02/S347]*

**RECOMMENDATIONS**

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|---|---|---|---|
| ***Date and time (Code):*** | 30.3.2005, 4.07 (B1/2005R) | | |
| ***Location:*** | Between Saakoski and Jämsänkoski | | |
| ***Type of occurrence:*** | Derailment of car | | |
| ***Train type and number:*** | Passenger train 802, locomotive Sr1 + 7 car | | |
| ***Road vehicle:*** | | | |
| | | ***In the train*** | ***In the road vehicle*** |
| ***Persons on board:*** | ***Crew:*** | 3 | |
| | ***Passengers:*** | ≈50 | |
| ***Fatally injured:*** | ***Crew:*** | 0 | |
| | ***Passengers:*** | 0 | |
| ***Seriously injured:*** | ***Crew:*** | 0 | |
| | ***Passengers:*** | 0 | |
| ***Slightly injured:*** | ***Crew:*** | 0 | |
| | ***Passengers:*** | 0 | |
| ***Damages of rolling stock:*** | Derailed wagon and its bogie damaged. | | |
| ***Damages on track equipment:*** | About 1 200 meters of track were damaged. | | |
| ***Other damages:*** | None | | |

***Summary*:** At Jämsä on the Jyväskylä - Tampere section of line between the Saakoski and Jämsänkoski stations, on Wednesday March 30, 2005 early in the morning an incident occurred where a bogie of a car of the 802 passenger train derailed at a rail breakage. The train was carrying about 50 passengers. Neither the passengers nor the train crew were injured in the incident. The total cost of the accident was 127 600 euros.

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| ***Final report issued:*** | 15.1.2007 |

| ***Recommendation Nr. S212*** | **The compliance of the localization data used by the railway with the data system of the Emergency Response Centre Agencies shall be ensured, e.g. by installing the track-kilometre data in the data system of the Emergency Response Centre Agencies.** | |
|---|---|---|
| ***Date*** | ***Status*** | ***Comments*** |
| 20.1.2009 | In progress | Under process. |
| 19.2.2010 | In progress | Will be taken into consideration in ERC Administration's TOTI project. |
| 16.6.2011 | In progress | Emergency Response Centre, VR Group Ltd and Finnish Transport Agency in co-operation are drafting the procedure. |
| 9.2.2012 | In progress | Emergency Response Centre, VR Group Ltd and Finnish Transport Agency in co-operation are drafting the procedure. Next meeting last part of this year. |
| 19.9.2013 | In progress | Will be implemented in the end of year 2014. |
| 10.3.2014 | In progress | Will be implemented in the end of year 2014. |
| 25.2.2015 | **IMPLEMENTED** | The track-kilometre data and level crossings are in the data system of the Emergency Response Centres. |

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| ***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 |

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| ***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.

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

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| ***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. |

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|---|---|---|---|
| ***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.

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

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| ***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 | | |

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| 10.3.2014 | | |
| 25.2.2015 | Under implementation | Financing for the improvement of level crossing safety is not. |

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| ***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 Dm12rail 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. |

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| ***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 |

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| ***Damages of rolling stock:*** | The railcar's blockage bumper and automatic coupling of the rail bus 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.

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| ***Final report issued:*** | 12.12.2007 |

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| ***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 | | |

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| ***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.

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

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| ***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 | |

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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 | | |
| ***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.

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| ***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 and has decided to equip the worst level crossing with barriers. |
| 10.3.2014 | | |

| | | |
|---|---|---|
| 25.2.2015 | Under implementation | |

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|---|---|---|---|
| ***Date and time (Code):*** | 6.10.2008 (B6/2007R) | | |
| ***Location:*** | Kempele, Sohjanantie / Perälä level crossing, unprotected | | |
| ***Type of occurrence:*** | Level crossing accident, Pendolino train – car | | |
| ***Train type and number:*** | Pendolino S52, Sm3 electric motor train, 6 cars | | |
| ***Road vehicle:*** | Car Volkswagen Polo, 1998 model | | |
| | | ***In the train*** | ***In the road vehicle*** |
| ***Persons on board:*** | ***Crew:*** | 3 | 1 |
| | ***Passengers:*** | 38 | 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:*** | Damages to the locomotive nose and the equipment of nose, the car entirely wrecked. | | |
| ***Damages on track equipment:*** | None. | | |
| ***Other damages:*** | None. | | |

***Summary*:** On Saturday 6 October 2007 at 11.36 a.m., a car and a Pendolino train en route from Oulu to Helsinki collided on the Perälä level crossing in Kempele, resulting in the death of the car driver. The train staff and passengers were not injured.
The direct cause of the accident was that the car driver drove onto the level crossing without stopping. It is likely that the driver failed to make any observation of the train approaching from the left.

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| ***Final report issued:*** | 29.12.2008 |

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| ***Recommendation Nr. S251*** | Because the speed limit at the level crossing is 140 km/h and because the track is in heavy use, the Accident Investigation Board recommends the following: **The Perälä unprotected level crossing should be removed or replaced by an interchange.** | |
| ***Date*** | ***Status*** | ***Comments*** |
| 20.1.2009 | In progress | The municipality will remove the level crossing during chancing the town plan. |
| 18.8.2011 | Not yet implemented | Will be removed in context of Seinäjoki-Oulu track project. |
| 9.2.2012 | Not yet implemented | |
| 19.9.2013 | In progress | Will be removed latest in year 2015. |
| 10.3.2014 | In progress | Will be removed latest in year 2015. |
| 25.2.2015 | Under implementation | It will be removed this year during track project. |

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|---|---|---|---|
| ***Date and time (Code):*** | 25.2.2008, 9.53 (B1/2008R) | | |
| ***Location:*** | Laukaa, Notkotie / Kauramaa level crossing, unprotected | | |
| ***Type of occurrence:*** | Level crossing accident, freight train – tractor | | |
| ***Train type and number:*** | Freight train 3359, Dv12 diesel locomotive and 27 wagons | | |
| ***Road vehicle:*** | Tractor Case IH 4240, 1997 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 front of the locomotive sustained some damage, the tractor was totally wrecked. |
| ***Damages on track equipment:*** | None. |
| ***Other damages:*** | None |

***Summary*:** On 25 February 2008 at 9.53 a.m., a fatal level crossing accident occurred on Laukaa's Kauramaa unprotected level crossing. A tractor returning along an agricultural road from ploughing work drove without stopping in front of a freight train en route from Jyväskylä to Suolahti. The only person in the tractor was the driver, who died from his injuries in hospital later that day.
The accident occurred because the driver of the tractor did not observe the approaching train and drove onto the level crossing without stopping. Furthermore, the crossing did not meet level crossing safety requirements on the part of the wait platform and with respect to sightline. Too short a wait platform, in particular, may have caused the driver to focus more than usual on controlling the tractor, to which extra equipment was hitched, as it approached and arrived at the crossing. The driver's visibility may also have been impaired due to the sun shining against him. The agricultural road was intended only for agricultural use and not for through-traffic.

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| ***Final report issued:*** | 26.1.2009 |

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| ***Recommendation Nr. S255*** | Two alternative routes in the vicinity of the Kauramaa level crossing offer safer access to agricultural fields surrounding the track. | |
| | **The Kauramaa level crossing should be removed.** | |
| ***Date*** | ***Status*** | ***Comments*** |
| 19.2.2010 | In progress | Laukaa community seconds the recommendation. |
| 18.8.2011 | Not yet implemented | The municipality of Laukaa and Finnish Transport Agency have not yet started discussions. |
| 9.2.2012 | Not yet implemented | |
| 19.9.2013 | | |
| 10.3.2014 | | |
| 25.2.2015 | Under implementation | |

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| ***Date and time (Code):*** | 25.9.2008, 16.18 (B6/2008R) | | |
| ***Location:*** | Iisalmi, Suurisuo level crossing, protected, equipped with half barriers | | |
| ***Type of occurrence:*** | Level crossing accident, passenger train – car | | |
| ***Train type and number:*** | Passenger train IC78, Sr1 electric locomotive and 7 coaches | | |
| ***Road vehicle:*** | Car Toyota Camry 4D sedan, 1998 model | | |
| | | ***In the train*** | ***In the road vehicle*** |
| ***Persons on board:*** | ***Crew:*** | 4 | 1 |
| | ***Passengers:*** | ≈180 | 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 front and left side of the locomotive were damaged in the collision. The car was wrecked beyond repair. | | |
| ***Damages on track equipment:*** | A column supporting the track's electric cables and its foundations incurred damage. | | |
| ***Other damages:*** | None. | | |

***Summary*:** On 25 September 2008 at 4.18p.m., a level crossing accident leading to two fatalities occurred at the half barrier equipped level crossing of Suurisuo in Iisalmi. The accident occurred when a private car driving slowly westward along Parkatintie road collided with a passenger train en route from Kajaani to Helsinki. The two persons in the car died instantly. The car was wrecked beyond repair.
The direct cause of the accident was that the car driver drove onto the level crossing without stopping. The driver applied the brakes only after the car had driven beneath the lowering barrier and was hit by it, with the result that the car stopped on the track. It is likely that the driver did not notice the level crossing warning signs or the lowering barriers. Potentially contributory factors possibly included the sun shining in the driver's face, a worn windshield, the driver's impaired eyesight, hearing and

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| alertness. | | |
| ***Final report issued:*** | 15.6.2009 | |
| ***Recommendation Nr. S256*** | The visibility of red blinking warning signs should be improved at protected level crossings where bright sunlight from ahead inhibits the visibility of the level crossing warning signs. This has been tested along the Turku-Toijala track by replacing filament lamps with LED lamps, and the results indicate that drivers find the visibility of LED lights good. | |
| | **At the Suurisuo level crossing and similar level crossings, where it has been noted that sunlight hinders visibility, the visibility of barriers and warning signs should be improved by replacing red blinking filament lamps with blinking or flashing LED lights.** | |
| ***Date*** | ***Status*** | ***Comments*** |
| 19.2.2010 | In progress | |
| 18.8.2011 | Not yet implemented | The town of Iisalmi supports the recommendation. |
| 9.2.2012 | Not yet implemented | |
| 19.9.2013 | In progress | The Finnish Transport Agency is not sure if led-light is better than ordinary lights. |
| 10.3.2014 | | |
| 25.2.2015 | Under implementation | Maintainers have determined need for the LED lights. |

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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 | |
| ***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*** |

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| 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 | |

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| ***Date and time (Code):*** | Safety Study S1/2008R |
| ***Location:*** | Kouvola remote control |
| ***Type of occurrence:*** | Incident, traffic control safety deviations |

***Summary***:. On 21 August 2008, the Accident Investigation Board decided to start a safety study on traffic control safety deviations observed in Kouvola, Finland. The basis for the study was a VR Group Ltd letter sent to the Accident Investigation Board, dated 17 June 2008, in which VR Group expressed its concern about the possible route automation and safety system malfunctions observed in Kouvola Centralised Traffic Control.
Initially, the investigation commission was tasked with investigating two safety deviations that had been observed before the initiation of the study. However a third incident occurred during the early stages of the study, and the decision was made to include it within the scope of the study.
The first deviation occurred on 25 April 2008 at Järvelä station on the Lahti–Riihimäki section of line. During shunting, a route automation memory function generated an unexpected train route setting leading to the turning of the turnouts in front of the shunting unit's intended route.
The second deviation occurred on 23 May 2008 on the Lahti–Riihimäki section of line, between the Hakosilta junction and Lahti station. A commuter train that had departed from Lahti station toward Riihimäki was issued with the number and train route of another commuter train that was awaiting its departure time at the station.
The third deviation was observed on 6 September 2008 on the Kerava–Lahti directr line on the southern side of the Hakosilta junction. Two trains were proceeding toward Lahti with only one block section between them. At the boundary between two interlocking areas on the southern side of the junction, the number of the train travelling first was replaced in the traffic control system with the number of the latter train.

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| ***Final report issued:*** | 31.8.2009 |

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| ***Recommendation Nr. S269*** | In the deviation management system currently in use information about a deviation does not always reach all the relevant parties. It is possible that even documented deviations may not be handled. Also, some deviations has been undocumented. The informing of procedures related to the deviation management has been inadequate. |
| | **The organisations responsible for the ownership, use, and maintenance of traffic control and safety equipment systems should improve and clarify the procedures by which deviations are identified and managed.** |

| ***Date*** | ***Status*** | ***Comments*** |
|---|---|---|
| 19.2.2010 | In progress | |
| 16.6.2011 | In progress | VR supports the recommendation. |
| 9.2.2012 | In progress | |
| 19.9.2013 | In progress | Will be implemented in 2014. |
| 10.3.2014 | In progress | Will be implemented in 2014. |
| 25.2.2015 | **IMPLEMENTED** | TURI system has been taken into use. |

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| ***Date and time (Code):*** | 20.10.2008, 16.46 (C6/2008R) | | |
| ***Location:*** | Kerava, Helsinki Riihimäki section of line | | |
| ***Type of occurrence:*** | Incident | | |
| ***Train type and number:*** | Commuter train 9700, Sm4 electrical train | | |
| ***Road vehicle:*** | | | |
| | | ***In the train*** | ***In the road vehicle*** |
| ***Persons on board:*** | ***Crew:*** | 2 | |
| | ***Passengers:*** | ? | |
| ***Fatally injured:*** | ***Crew:*** | 0 | |
| | ***Passengers:*** | 0 | |
| ***Seriously injured:*** | ***Crew:*** | 0 | |

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| | ***Passengers:*** | 0 | |
| ***Slightly injured:*** | ***Crew:*** | 0 | |
| | ***Passengers:*** | 0 | |
| ***Damages of rolling stock:*** | None. | | |
| ***Damages on track equipment:*** | One turnout was damaged. | | |
| ***Other damages:*** | None. | | |

***Summary*:** On Monday, 20 October 2008, at 4:46pm, an incident occurred in the Kerava railway yard when an H-marked local train en route from Riihimäki to Helsinki passed an entry signal that was in the stop position and forced open the turnout.
The reason for passing the entry signal in the stop position and forcing open the turnout was that the H train's driver did not observe the stop signal, drove past the signal, and forced open the turnout after it.

***Final report issued:*** 11.4.2010

| ***Recommendation Nr. S272*** | The bridge structures and the catenary suspension limit the visibility of the stop signal from the locomotive cab. | |
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| | **Signal E681 should be moved to a more visible location.** | |
| ***Date*** | ***Status*** | ***Comments*** |
| 18.8.2011 | In progress | |
| 9.2.2012 | In progress | |
| 19.9.2013 | In progress | Nothing has been done yet. |
| 30.11.2014 | **IMPLEMENTED** | The signal has been moved. |

| ***Recommendation Nr. S274*** | The train driver's advance notification information (ET) did not provide sufficient details about the construction area. The information, for example, did not point out that the signal box was functioning as normal and also did not remind the driver that the visible signals should be followed. | |
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| | **Advance notification (ET) provided to the engine driver should provide more specific information about ATC construction area conditions.** | |
| ***Date*** | ***Status*** | ***Comments*** |
| 16.6.2011 | In progress | ET reported in the main message that the ATP is off. |
| 9.2.2012 | In progress | |
| 19.9.2013 | In progress | In 2015 tablet computers to drivers; will make the situation better. |
| 10.3.2014 | | |
| 25.2.2015 | **IMPLEMENTED** | JETI system has materialized. |

| ***Recommendation Nr. S275*** | The information provided by the locomotive's running control as the train approached the ATC construction area was incomplete. | |
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| | **The running control monitors of locomotives and the information provided via these monitors should be developed in such a way that they provide better information during non-standard situations.** | |
| ***Date*** | ***Status*** | ***Comments*** |
| 18.8.2011 | In progress | |
| 9.2.2012 | In progress | |
| 19.9.2013 | In progress | In 2015 tablet computers to drivers; will make the situation better. |
| 10.3.2014 | In progress | In 2015 tablet computers to drivers. |
| 25.2.2015 | **IMPLEMENTED** | JETI system has materialized. |

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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 |

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| | ***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.

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| ***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. |

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| ***Date and time (Code):*** | 25.4.2009, 13.08 (B3/2009R) | | |
| ***Location:*** | Raasepori, Mustio /Ingvallsby level crossing, unprotected | | |
| ***Type of occurrence:*** | Level crossing accident, freight train – car | | |
| ***Train type and number:*** | Freight train 3534, Dv12 diesel locomotive and 7 wagons | | |
| ***Road vehicle:*** | Car Toyota 4D Corolla Sedan, 2004 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 and the car was entirely wrecked. | | |
| ***Damages on track equipment:*** | None. | | |
| ***Other damages:*** | None. | | |

***Summary*****:** At 1:08 p.m. on Saturday 25 April 2009, a level crossing accident occurred in Mustio in Raasepori involving a car and a freight train en route from Kirkniemi to Karjaa. The accident proved fatal to the car driver, while the engine driver escaped uninjured. While the car was wrecked beyond repair, the train sustained only minor damage.

The direct cause of the accident lay in the car's driving onto the level crossing while the freight train was approaching simultaneously from the right. It has not been ascertained why the car driver drove

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| onto the level crossing. | | |
| ***Final report issued:*** | 15.10.2010 | |
| ***Recommendation Nr. S282*** | The Ingvallsby unprotected level crossing offers a shortcut to Nikuntie, but an alternative route to this destination also exists via road 186. The investigation commission therefore recommends the following: | |
| | **The Ingvallsby unprotected level crossing should be removed.** | |
| ***Date*** | ***Status*** | ***Comments*** |
| 18.8.2011 | In progress | |
| 9.2.2012 | In progress | |
| 19.9.2013 | | |
| 10.3.2014 | | |
| 25.2.2015 | | |

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| ***Date and time (Code):*** | 16.12.2009, 13.26 (B9/2009R) | | | |
| ***Location:*** | Laukaa, Lemettilänmäentie / Lemettilä level crossing, unprotected | | | |
| ***Type of occurrence:*** | Level crossing accident, freight train – van | | | |
| ***Train type and number:*** | Freight train 3365, Dv12 diesel locomotive and 23 wagons | | | |
| ***Road vehicle:*** | Van Volkswagen Transporter, model 1998 | | | |
| | | | ***In the train*** | ***In the road vehicle*** |
| ***Persons on board:*** | ***Crew:*** | | 2 | 1 |
| | ***Passengers:*** | | 0 | 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 front of the locomotive sustained some damage, the van was totally wrecked. | | | |
| ***Damages on track equipment:*** | None. | | | |
| ***Other damages:*** | None. | | | |

***Summary*:** On Wednesday 16 December 2009 at 13:26 p.m., a fatal level crossing accident occurred on the Lemettilä unprotected level crossing in Laukaa municipality. The accident occurred when a van with a couple inside drove in front of a freight train en route from Jyväskylä to Äänekoski. The van's driver and passenger died immediately from the injuries received. The damage caused by the accident to rolling stock amounted to € 1,300.

The cause of the accident was that the van driver drove onto the level crossing without apparently observing the train approaching from the right. A contributing factor was the fact that, when approached, the crossing looks safe, rendered observation more difficult. Special care should have been exercised, however, considering that the road slopes downwards before the level crossing, that there is a road crossing close to the level crossing and that the sun was shining directly towards the approaching van.

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| ***Final report issued:*** | 13.12.2010 | |
| ***Recommendation Nr. S285*** | With the supply of relevant signs and within limitations set by the road maintainer, traffic passing through the Lemettilä unprotected level crossing could be redirected to cross the bridge on road 637 north of the crossing. In addition, given that equipping the crossing with a half-barrier installation is expensive and would not ensure that further accidents are prevented, the investigation commission recommends: | |
| | **The Lemettilä unprotected level crossing should be removed.** | |
| ***Date*** | ***Status*** | ***Comments*** |
| 16.6.2011 | In progress | |
| 9.2.2012 | In progress | |
| 19.9.2013 | In progress | Will possible be removed next year. |
| 10.3.2014 | In progress | |
| 25.2.2015 | Under implementation | |

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| ***Date and time (Code):*** | 16.6.2009, 20.51 (B5/2009R) | | |
| ***Location:*** | Toijala railway yard | | |
| ***Type of occurrence:*** | Derailment | | |
| ***Train type and number:*** | Freight train 3513, Sr1 electric locomotive and 30 wagons | | |
| ***Road vehicle:*** | | | |
| | | ***In the train*** | ***In the road vehicle*** |
| ***Persons on board:*** | ***Crew:*** | 1 | 0 |
| | ***Passengers:*** | 0 | 0 |
| ***Fatally injured:*** | ***Crew:*** | 0 | 0 |
| | ***Passengers:*** | 0 | 0 |
| ***Seriously injured:*** | ***Crew:*** | 0 | 0 |
| | ***Passengers:*** | 0 | 0 |
| ***Slightly injured:*** | ***Crew:*** | 0 | 0 |
| | ***Passengers:*** | 0 | 0 |
| ***Damages of rolling stock:*** | Ten wagons damaged. | | |
| ***Damages on track equipment:*** | 450 metres of track, two turnouts, safety devices and the portal suspension of electric railway were damaged. | | |
| ***Other damages:*** | A safety device and communications cable was damaged. | | |

***Summary*:** Ten wagons of a freight train on its way from Turku to Tampere were derailed in Toijala on 16 June 2009 at 8:51pm. Five of the wagons tipped over. The derailed wagons were the 17th–26th wagons of the total 30 wagons in the train. The speed of the train at the moment of derailment was 70km/h. Safety equipment, parts of the track, and electric railway equipment were damaged in the accident. Safety device and communications connections were disrupted in Toijala and in the nearest operating points.

Traffic was totally interrupted for 5 hours 20 minutes. When operations were resumed, diesel locomotives were used initially to pass the accident spot, using one track only. The first train passed the accident spot at 2:10am. The first electric train passed Toijala on 18 June 2009 at 3:40pm, that is, some 43 hours after the accident. Close to normal operations were resumed on the main track on 18 June 2009 after 8pm, 48 hours after the accident. Traffic between Turku and Tampere resumed on 19 June 2009 after 6pm, but trains were unable to stop at Toijala. Trains between Turku and Tampere were again able to stop at Toijala on 28 June 2009. Normal operations were resumed 15 days after the accident.

According to VR, 134 passenger trains and more than 100 freight trains had to be cancelled as a result of the accident at Toijala. In terms of direct costs, the damage to rolling stock, track and equipment amounted to more than € 2 million.

No direct environmental damage was caused by the accident. Due to insufficient clearing and cleaning operations, an odour problem and a pest problem later developed in the railway yard. The wagons involved in the accident contained grain and fishmeal, among other things. The cleaning was completed on 21 July 2009, 35 days after the accident.

The derailment of the freight train was caused by a switch turning underneath the train. In the ensuing investigation, it was shown that it was possible to force open the switch lock by exposing the switch blade to mechanic oscillation at the frequency same as caused by the axles of the freight train in question. It also became apparent in the investigation that the Railex locking device had been adjusted eccentrically, and that the switch contactors at the locking device allowed the closed switch blade to move in excess of the reference value. The Investigation Commission considers it likely that as a combined result of track geometry, switch adjustments, the oscillatory properties of the switch, and the rolling stock passing through the turnout, the switch lock became unlocked as the train passed over it.

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| ***Final report issued:*** | 4.5.2011 |

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| ***Recommendation Nr. S293*** | During the investigation it transpired that the documentation of switch maintenance was insufficient. The Investigation Commission therefore makes the following recommendation to the Finnish Transport Agency: |
| | **The installation, inspections and maintenance of switches and their components should be seamlessly documented.** |

| ***Date*** | ***Status*** | ***Comments*** |
|---|---|---|
| 9.2.2012 | In progress | |
| 19.9.2013 | In progress | Project of managing condition of switches started, ready 2014. |
| 10.3.2014 | In progress | Project of managing condition of switches started, ready 2014. |
| 25.2.2015 | Under implementation | Proceeds well, but is not yet nationwide. |

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| ***Date and time (Code):*** | 4.1.2010, 8.28 (B1/2010R) | | |
| ***Location:*** | Helsinki Central Railway Station, track 13 | | |
| ***Type of occurrence:*** | Collision with an obstacle (with a rail barrier and thereafter the wall of a building) | | |
| ***Train type and number:*** | Shunting unit: Passenger train IC71 during shunting to the departure track, Sr2 electric locomotive and 8 passenger cars | | |
| ***Road vehicle:*** | | | |
| | | ***In the train*** | ***In the road vehicle*** |
| ***Persons on board:*** | ***Crew:*** | 1+1+2+1 | 0 |
| | ***Passengers:*** | 0 | 0 |
| ***Fatally injured:*** | ***Crew:*** | 0 | 0 |
| | ***Passengers:*** | 0 | 0 |
| ***Seriously injured:*** | ***Crew:*** | 0 | 0 |
| | ***Passengers:*** | 0 | 0 |
| ***Slightly injured:*** | ***Crew:*** | 1 | 0 |
| | ***Passengers:*** | 0 | 0 |
| ***Damages of rolling stock:*** | One car damaged badly and other four sustained some damage. | | |
| ***Damages on track equipment:*** | A rail barrier, parts of the track and some electric track equipment damaged. | | |
| ***Other damages:*** | The building at the end of the track suffered damage. | | |

***Summary*:** At 8:28am on Monday, 4 January 2010, four passenger cars that had become separated from a train collided with a rail barrier at the end of the track at the Helsinki Central Railway Station at a speed of approximately 35 km/h. The front end of the double-decker coach that was the first in the train was pushed onto the damaged rail barrier and then the concrete buffer stop at the end of the track, eventually hitting the wall of the office building at the end of the track. The car broke the wall and came to a stop partially inside the building. Pushed by a locomotive, the train was being shunted to its departure track at the Helsinki station from the Ilmala depot, 4.5 kilometres away. The security officers at the station managed to evacuate the people from the platform before the collision.

Of the three people in the cars during the collision, one was slightly injured. The total costs of the damage amounted to € 825 000.

The accident was caused by the coupling loop coming loose from the hook during the pushing movement. This caused the train to break into two, and the automatic air brakes engaged once the brake conduit had come off. The conductor released the brakes of the cars to get the train moving. He did not realise that the train had broken into two. The coupling loop come loose because, as the car buffers compressed, the coupling loop, which had frozen solid, rose off the hook. The situation was aggravated by the fact that the screw coupling had not been tightened properly. Seeing the coupling loop was difficult because of poor lighting and the ice and snow in the space between the cars. The train in question had last been de-iced nine days previously, and there was a lot of snow on the bogies and between the cars. Additionally, the water coming from the outlet pipe of the sink in the WC of the car behind the restaurant coach had increased the formation of ice in this space.

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| ***Final report issued:*** | 5.5.2011 |

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| ***Recommendation Nr. S297*** | Currently there are no instructions concerning use of the handbrake in a situation where cars have to be released by 'milking' them to get the train moving. To ensure that cars remain stationary at all times, the Investigation Commission recommends to the Finnish Transport Safety Agency that it ensure that the VR Group take the necessary steps to implement the following recommendation: | |
| | **To ensure that the cars remain stationary while the brakes are released by 'milking', instructions on the use of the handbrake should be drawn up.** | |
| ***Date*** | ***Status*** | ***Comments*** |
| 9.2.2012 | In progress | |
| 19.9.2013 | In progress | Instructions in the making. |
| 10.3.2014 | In progress | Soon ready. |
| 25.2.2015 | **IMPLEMENTED** | |
| ***Recommendation Nr. S298*** | The train waitresses had not been instructed in how to stop the cars in an emergency. To ensure that all train personnel knows how to act in exceptional situation, the Investigation Commission recommends to the Finnish Transport Safety Agency that it ensure that the VR Group and Avecra Oy take the necessary steps to implement the following recommendation: | |
| | **Training in the use of device, which are important for safety reason, should be organised for restaurant car personnel also.** | |
| ***Date*** | ***Status*** | ***Comments*** |

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| 9.2.2012 | | |
| 19.9.2013 | | |
| 10.3.2014 | In progress | Not yet done. |
| 25.2.2015 | **IMPLEMENTED** | |

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| ***Date and time (Code):*** | 2.2.2011, 11.55 (C1/2011R) | | |
| ***Location:*** | Nurmes, Joensuu Kontiomäki section of line | | |
| ***Type of occurrence:*** | Collision of freight trains | | |
| ***Train type and number:*** | Freight train 4720, Dv12 diesel locomotive – Freight train4713, Dv12 diesel locomotive and 8 wagons | | |
| ***Road vehicle:*** | - | | |
| | | ***In the train*** | ***In the road vehicle*** |
| ***Persons on board:*** | ***Crew:*** | 3 | |
| | ***Passengers:*** | 130 | |
| ***Fatally injured:*** | ***Crew:*** | 0 | |
| | ***Passengers:*** | 0 | |
| ***Seriously injured:*** | ***Crew:*** | 0 | |
| | ***Passengers:*** | 0 | |
| ***Slightly injured:*** | ***Crew:*** | 2 | |
| | ***Passengers:*** | 0 | |
| ***Damages of rolling stock:*** | The diesel engine chassis were bent and the buffers, centre buffers with shunting couplers, and engine covers were damaged. | | |
| ***Damages on track equipment:*** | None. | | |
| ***Other damages:*** | None. | | |

***Summary*:** A collision between a freight trains occurred in the direction of Lieksa, two kilometres from the Nurmes yard, on Wednesday 2 February 2011 at 11.55. Both the engine driver and traffic controller in the locomotive were injured, while both locomotives sustained major damage.

The immediate cause of the accident was the cancellation of interlockings necessary to signal box safety, thus allowing the trains to use the same track. The insulation fault, frequency of critical commands, inadequate train location information and inadequate communication all contributed to the accident. Apparently, the traffic controller believed that train 4713 was already at the Nurmes yard. Despite having spoken to the engine driver, the controller did not realise that this train was standing at the entry signal.

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| ***Final report issued:*** | 30.1.2012 |

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| ***Recommendation Nr. S306*** | In the MiSO TCS system, the axle counting system emergency release function for line sections with low traffic volumes has been set to release the section without special conditions. In some parts of the railway network, the axle counting emergency release function must detect at least one axle leaving the section. Emergency release of the axle counting system is possible only after this has occurred. The purpose of this is to ensure that the last event was a unit leaving the section. | |
| | **It should be a prerequisite for the emergency release of all axle counting sections, that the last axles counted at an axle counting point must be axles exiting the section.** | |
| ***Date*** | ***Status*** | ***Comments*** |
| 19.9.2013 | In progress | In Traffic control handbook. New specification will be made in 2013. |
| 10.3.2014 | In progress | Risk management study concerning resetting in progress. |
| 25.2.2015 | **NOT TO BE IMPLEMENTED** | The condition is not necessarily reasonable. The securing must be made in other ways. |

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| ***Date and time (Code):*** | 24.2.2011, 4.55 (C2/2011R) | | |
| ***Location:*** | Pedersöre, Kolppi statin, Seinäjoki–Ylivieska section of line | | |
| ***Type of occurrence:*** | Derailment, wheelset of the locomotive | | |
| ***Train type and number:*** | Freight train 5478, Dv12 diesel locomotive and 29 wagons | | |
| ***Road vehicle:*** | - | | |
| | | ***In the train*** | ***In the road vehicle*** |
| ***Persons on board:*** | ***Crew:*** | 1 | |
| | ***Passengers:*** | 0 | |

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| ***Fatally injured:*** | ***Crew:*** | 0 | |
| | ***Passengers:*** | 0 | |
| ***Seriously injured:*** | ***Crew:*** | 0 | |
| | ***Passengers:*** | 0 | |
| ***Slightly injured:*** | ***Crew:*** | 0 | |
| | ***Passengers:*** | 0 | |
| ***Damages of rolling stock:*** | Damagages to the locomotive. | | |
| ***Damages on track equipment:*** | A turnout was damaged and the rail was broken at three points. Elastic rail fas-teners were loosened and 163 concrete sleepers were damaged. | | |
| ***Other damages:*** | None. | | |

***Summary*****:** The front bogie wheelset on the second locomotive of a freight train travelling from Kokkola to Pietarsaari derailed. The locomotive, one turnout, and 163 sleepers were damaged, with total repair and clearance costs amounting to 132,000 euros. The accident prevented all traffic on the section of line for nine hours.

The bogie wheelset was derailed by an SA3 automatic coupler on the track. This coupler had been dragged there by another freight train, as a result of incorrect procedures in reaction to the train's decoupling into two parts. The engine driver had believed that the uncoupling lever chain would break when the train set off and that the automatic coupler would remain in place. Trusting the engine driver's assessment, the traffic controller gave the train permission to drive. The automatic coupler separated from the car after the detachment of the bolted key holding the coupler in place, due to a missing screw and the remaining hex screw being too short and without a hex nut. With the poorly secured key installation going unnoticed, wagon maintenance was not performed in line with the related instructions.

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| ***Final report issued:*** | 8.2.2012 |

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| ***Recommendation Nr. S307*** | In the case of SA3 automatic coupler draft clips without screw holders, the hex screws supporting the bolted key can slide out of place when the nut is missing. In the version with the screw holder, the head of the hex screw enters the holder, preventing the screw from sliding and falling off when the nut is detached. Only a fraction of all SA3 automatic coupler draft clips have no screw holder. | |
| | **SA3 automatic coupler draft clips without screw holders should be replaced by ones with such holders.** | |
| ***Date*** | ***Status*** | ***Comments*** |
| 19.9.2013 | In progress | Not yet done |
| 10.3.2014 | In progress | |
| 25.2.2015 | **IMPLEMENTED** | |

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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. Ac-cidents

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| 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.<br>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. | | |
| ***Final report issued:*** | 13.2.2012 | |
| ***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 | |
| ***Recommendation Nr. S311*** | No single up-to-date level crossing database exists, but there are several databases with partially incomplete information. | |
| | **Databases on level crossing and their conditions should be merged into one and the database should be kept up to date.** | |
| ***Date*** | ***Status*** | ***Comments*** |
| 19.9.2013 | In progress | Not yet done. There will be just one database. |
| 10.3.2014 | In progress | Not yet done. Trafi will collect data from other infrastructure managers. |
| 25.2.2015 | Under implementation | Connection between Tasoristeys.fi and level crossing database will be ready this year. |
| ***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. |
| ***Recommendation Nr. S313*** | In some cases, insufficient consideration is taken of level crossing safety in traffic safety plans devised by the Centres for Economic Development, Transport and the Environment (ELY Centres) and the municipalities.<br>Stronger account should be taken of level crossing safety in the traffic safety planning instructions. | |
| | **Level crossing safety should also be included in the provincial and municipal traffic safety plans.** | |
| ***Date*** | ***Status*** | ***Comments*** |
| 19.9.2013 | In progress | Finnish Transport Agency can order Centres for Economic Development, Transport and the Environment to contact municipalities. |
| 10.3.2014 | | |
| 25.2.2015 | **IMPLEMENTED** | |
| ***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. | |

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| | **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 | |
| ***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; STO-mark 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 mark not. |
| ***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. |
| ***Recommendation Nr. S320*** | It seems that nobody is responsible for the Rescue Services' risk evaluation instructions used by the Emergency Response Centres. These instructions have not been changed since their publication. Each rescue department of the Rescue Services area is responsible for these instructions, but the related change needs have not been coordinated nationally. | |
| | **Emergency Response Centre risk assessment instructions should be continuously up-dated and a national operator responsible for the instructions should be assigned.** | |
| ***Date*** | ***Status*** | ***Comments*** |
| 19.9.2013 | | |
| 10.3.2014 | In progress | |
| 25.2.2015 | Under implementation | Nearly ready. |

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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 | |

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| ***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.
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.
The accident was caused by the erroneous location information of the train to be assisted.

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| ***Final report issued:*** | 20.2.2012 |

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| ***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. |
| ***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. |
| ***Recommendation Nr. S324*** | The calculations show that a distance of 130 metres would have been sufficient to stop the train from a speed of 23 km/h, with normal braking and 32 km/h with emergency braking, when both the reaction time and brake delay are taken into account. | |
| | **The speed of the assisting unit should be limited to 35 km/h, when it is driving to assist a train on the line.** | |
| ***Date*** | ***Status*** | ***Comments*** |
| 19.9.2013 | In progress | Trafi has not made new orders. VR limited by using shunting rules when assisting. |
| 10.3.2014 | In progress | Will concern all actors after the regulations have changed. |
| 25.2.2015 | **IMPLEMENTED** | Instruction for assisting given by Finnish Transport Agency: speed limit 35 km/h. |

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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 | |

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| ***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. |

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| ***Date and time (Code):*** | 22.5.2012, 3.09 / 28.6.2012, 13.20 (R2012-02) | | |
| ***Location:*** | Riihimäki station railway yard / Kouvola railway yard | | |
| ***Type of occurrence:*** | Derailment | | |
| ***Train type and number:*** | Freight train 3605, Sr2 electric locomotive and 33 wagons / Freight train 2482, Sr1 electric locomotive and 20 wagons | | |
| ***Road vehicle:*** | - | | |
| | | ***In the train*** | ***In the road vehicle*** |
| ***Persons on board:*** | ***Crew:*** | 1 / 1 | |
| | ***Passengers:*** | 0 / 0 | |
| ***Fatally injured:*** | ***Crew:*** | 0 | |
| | ***Passengers:*** | 0 | |
| ***Seriously injured:*** | ***Crew:*** | 0 | |
| | ***Passengers:*** | 0 | |
| ***Slightly injured:*** | ***Crew:*** | 0 | |
| | ***Passengers:*** | 0 | |
| ***Damages of rolling stock:*** | One turnout transport wagon and the following wagon carrying turnout equipment were damaged in the accident. / One turnout transport wagon was damaged in the accident. | | |
| ***Damages on track equipment:*** | Three turnouts were damaged. 120 concrete sleepers had to be replaced. / 136 meters of rail was damaged and 62 sleepers had to be replaced. Two turnouts were damaged, with parts having to be replaced. | | |
| ***Other damages:*** | The turnout elements carried by the wagon that fell over were damaged beyond repair. / The turnout elements carried by the wagon that fell over were damaged beyond repair. | | |
| ***Disturbances of traffic:*** | The accident significantly hindered traffic for one day. The tracks were returned to full normal use after nine days. / *No significant hinder to traffic.* | | |

***Summary*:** At 3:09 a.m. on Tuesday 22 May 2012, a turnout transport wagon, positioned as the 16th wagon of a freight train and carrying two turnout elements with concrete sleepers, was derailed at the southern end of the Riihimäki railway yard.
About a month later, at 1:20 p.m. on 28 June 2012, a similarly loaded turnout transport wagon was derailed in the Kouvola railway yard. This wagon was the last car in a 20-car train. It was derailed when travelling through the turnout and finally toppled onto the adjacent track.
Imbalanced loading caused the sideways load balance distribution of the turnout transport wagon to be very uneven. In the Riihimäki accident, the head of the rail was cracked at the spot where the derailment occurred. In Kouvola, the turnout at the derailment spot was in poor condition, featuring wear exceeding the allowed measurement values. Moreover, the track featured dents of varying depth around the turnout.

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| ***Final report issued:*** | 26.6.2013 |

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| ***Recommendation Nr. S331*** | The Finnish Transport Agency is responsible for monitoring the condition of turnouts. A system providing information on the condition of turnouts and potential replacements needs has been developed for this reason. However, this information is not being utilised in a manner that would result in the repair or replacement of all turnouts that have been found to be in poor condition. | |
| | **In the turnout condition monitoring system, turnouts that have been found to be in poor condition should be repaired or replaced to ensure that they fulfil the measurement values and other requirements set for turnouts.** | |
| ***Date*** | ***Status*** | ***Comments*** |
| 10.3.2014 | In progress | Maintenance project ready 2015. |
| 25.2.2015 | Under implementation | A pilot of the condition control system is in use. |
| ***Recommendation Nr. S332*** | Monitoring of the condition of turnouts is largely based on the results of inspection measurements, performed at regular intervals. In addition to limit values, all turnout measurement values have acute limits, which allow for greater deviations. According to the railroad regulations and instructions (RATO), measurement values may not exceed acute limits. Unambiguous operational instructions should exist for cases in which normal maintenance limit values are exceeded, and these instructions should be strictly adhered to. | |
| | **Unambiguous operational instructions regarding maintenance and traffic limitations should exist for cases in which the measurement values and acute limits determined for turnouts are exceeded.** | |
| ***Date*** | ***Status*** | ***Comments*** |
| 10.3.2014 | In progress | Maintenance project ready 2015. |
| 25.2.2015 | **IMPLEMENTED** | The limit values have been updated. |

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| ***Date and time (Code):*** | Year 2012 (R2012-S1) | | |
| ***Location:*** | Finland, level crossings | | |
| ***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:*** | 0 | Tot 4 |
| | ***Passengers:*** | 0 | Tot 1 |
| ***Seriously injured:*** | ***Crew:*** | 0 | Tot 6 |
| | ***Passengers:*** | 0 | 0 |
| ***Slightly injured:*** | ***Crew:*** | Tot 1 | Tot 5 |
| | ***Passengers:*** | 0 | 0 |
| ***Damages of rolling stock:*** | | | |
| ***Damages on track equipment:*** | | | |
| ***Other damages:*** | | | |

***Summary*:** In 2012, a total of 51 level crossing accidents occurred. This is around 30 per cent higher than the average for the previous five years. All of the accidents leading to serious personal injury occurred on the railways, where the average speed of railway vehicles is usually high (80–140 km/h). Six people died in the five fatal accidents. Six people were seriously injured. Over a third of the accidents occurred during shunting work, where the speed of railway vehicles is usually low (35 km/h at maxi-

mum). The majority of shunting work related accidents occurred in harbour and industrial areas.
For accidents that occurred at level crossings without warning devices and a STOP sign, 75 per cent of these accidents were caused by the vehicle driver's failure to properly observe or assess the scene, while 20 per cent were caused by too high a speed and the resulting slide on the tracks despite attempts to brake.

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| ***Final report issued:*** | 22.8.2013 | | |
| ***Recommendation Nr. S333*** | Equipping a level crossing with an automatic gate station is expensive, and removal of level crossings is not always possible at a reasonable cost. Alternative methods should be used to improve level-crossing safety. According to international experiences, it is possible to improve safety by means of warning devices that are less expensive than conventional safety devices. | | |
| | **SIA recommends that the Finnish Transport Safety Agency enables the implementation of low-cost warning devices and ensures that the Finnish Transport Agency continues its research into the suitability of low-cost warning devices and begins implementing these devices.** | | |
| ***Date*** | ***Status*** | ***Comments*** | |
| 10.3.2014 | In progress | 20 low-cost warning devices to experiment in 2014. | |
| 25.2.2015 | **IMPLEMENTED** | An attention device is in use on the Toijala–Valkeakoski track. Research has been done and it will be continued with attention devices with different techniques. | |

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| ***Date and time (Code):*** | 19.10.2012, 16.38 (R2012-03) | | |
| ***Location:*** | Vammala station | | |
| ***Type of occurrence:*** | Incident | | |
| ***Train type and number:*** | Freight train 3742, Sr1 electric locomotive and 38 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:*** | None. | | |
| ***Damages on track equipment:*** | None. | | |
| ***Other damages:*** | None | | |
| ***Disturbances of traffic:*** | *A* passenger train suffered a minor delay. | | |

***Summary*****:** At 4.38 pm, an incident developed at Vammala station when, according to its route, a freight train approaching the Vammala railway yard from Äetsä was supposed to switch to secondary track 043, to await oncoming traffic. Upon arriving at the Vammala station entry turnout, the engine driver noted the presence of the machinery on the safety track to the left and, soon after, that track 043 was also full of maintenance machines. At this point, the machinery was around 100 metres away. The engine driver braked and the train stopped around 50 metres from the machines on the track.
The direct cause of this incident was the release of the track sections occupied by the maintenance machines with emergency release commands. A factor in the incident was the trackwork supervisor's forgetting to notify the traffic controller of the machinery on the track – the traffic controller was therefore unaware of its presence. Protection command enabled by the railway safety device system were not used in order to protect the work site – such a system could have been used to maintain information on the track's occupied status or to prevent to set train routes.

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| ***Final report issued:*** | 29.8.2013 | | |
| ***Recommendation Nr. S335*** | No set of clear instructions exists for resetting an axle counting system after trackwork. | | |
| | **The Finnish Transport Agency should identify the best practices for resetting axle counting after trackwork and should include these practices in the railway traffic control manual.** | | |
| ***Date*** | ***Status*** | ***Comments*** | |
| 10.3.2014 | In progress | Risk assessment under way. | |
| 25.2.2015 | Under implemen- | Done research project; results to the railway traffic control | |

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| | tation | manual in this year. |
| ***Recommendation Nr. S336*** | A traffic restriction notification (TR notification) exists for such situations. Among other details, in the case of a TR notification, its existence should be marked in the related trackwork (TW) notification. Such a notification should be valid for as long as the factors restricting rail traffic last. While valid, TW and TR notifications must be kept in sight of the traffic controller. | |
| | **The Finnish Transport Agency should ensure that traffic restriction notifications are also used when stock is stored on tracks in traffic usage.** | |
| ***Date*** | ***Status*** | ***Comments*** |
| 10.3.2014 | In progress | Is taken into account in the Safety instructions of the track maintaining. |
| 25.2.2015 | **IMPLEMENTED** | In safety instruction of the track holding, to power 5/2015. |
| ***Recommendation Nr. S337*** | During the YTM (General Safety Procedure) for the trackwork project, risks to train safety were identified and the related risk management measures were logged, but in practice these were not implemented in full. | |
| | **The Finnish Transport Safety Agency should ensure that concrete instructions are created for planned risk management procedures, that those executing the procedures are familiarised with them, and that the implementation of risk management procedures is monitored.** | |
| ***Date*** | ***Status*** | ***Comments*** |
| 10.3.2014 | In progress | Audits. |
| 25.2.2015 | **IMPLEMENTED** | Risk management is one of the subject of audits. |

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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 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.

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

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| 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. |
| ***Recommendation Nr. S339*** | Detected safety deviations had been systematically left unreported. For at least twelve months before the accident, there had been repeated trailing notifications. The only re-action they elicited was returning the turnout under monitoring using the critical VAP command; they were not reported to the control centre. For this reason, the mainte-nance provider had not been notified either. When the VAP command is used before someone visits the location, it is impossible to observe any opening in a switch lock. Proactive risk identification and the reporting of all deviations, as emphasised in the safety management systems and in instructions, are not being realised in practice. | |
| | **The Finnish Transport Agency should establish a system to ensure that the reason and justification for using a critical command are recorded. This justification will be used to show that no actual flaw remains in the system after the command has been used.** | |
| ***Date*** | ***Status*** | ***Comments*** |
| 25.2.2015 | Under implementation | Fault situations will be recorded in the POHA system. |
| ***Recommendation Nr. S340*** | Vibration caused by rolling stock can unlock the locking of a trailable point machine. | |
| | **The Finnish Transport Agency should convert the electric point machines of the trailable YV60-300-1:9 turnouts used on the main tracks, in order to prevent vibration caused by rolling stock from unlocking the switch lock.** | |
| ***Date*** | ***Status*** | ***Comments*** |
| 25.2.2015 | **IMPLEMENTED** | Development work done 2014. Changes will be first made on critical routes. All will be changed during 7 years. |
| ***Recommendation Nr. S341*** | In this case, the incorrect adjustment of a turnout's Railex locking device contributed to the accident. The investigation revealed defects in turnout adjustment on a nationwide scale. | |
| | **As the infrastructure manager, the Finnish Transport Agency should draw up a clearly defined turnout maintenance training programme and establish a system for continuous monitoring of the competencies of personnel carrying out turnout maintenance and adjustment work.** | |
| ***Date*** | ***Status*** | ***Comments*** |
| 25.2.2015 | **IMPLEMENTED** | A training center will be built in Kouvola (will be completed in summer 2016) in which the validity is trained and admitted. |

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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 | - |

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| ***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.

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.

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| ***Final report issued:*** | 11.11.2015 |

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| ***Recommendation Nr. S342*** | All persons involved in trackwork must have the trackwork safety qualification (TURVA). The qualification can be acquired during a one-day training course (7 hours), after which a final examination must be passed. The training includes broad subject matters, such as knowledge of trackwork environment, instructions and regulations; trackwork safety; and response to accidents and incidents. A short course with an emphasis on lectures does not encourage profound learning or changes in attitudes.<br>The investigation concluded that the reasons behind several trackwork incidents involved ignorance or lack of responsibility on the part of the employees. The training should be more comprehensive, dispersed across a longer period of time, and more focused on the responsibility for one's own safety and that of others. | |
| | **The Finnish Transport Agency will determine stricter minimum requirements for trackwork safety training.** | |
| ***Date*** | ***Status*** | ***Comments*** |
| 25.2.2015 | **IMPLEMENTED** | New training materials and proof tests. |
| ***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. |
| ***Recommendation Nr. S344*** | According to current practice, penalties for contract delays may lead to compromises in safety. There are no direct financial incentives for maintaining safety. Contract agreements should therefore specify the financial consequences of compliance and noncompliance with safety regulations. | |
| | **The Finnish Transport Agency will include in all trackwork contracts the detailed financial consequences for the contractor arising from compliance or non-compliance with safety regulations.** | |
| ***Date*** | ***Status*** | ***Comments*** |
| 25.2.2015 | Under implementation | On agenda of this year. |
| ***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. | |

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| | 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. |
| ***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. |
| ***Recommendation Nr. S347*** | The Finnish Transport Agency lacks a real-time system for recording rail traffic safety deviations. Consequently, deviation data is not processed systematically. This lack of an occurrence system slows down the analysis of safety deviations, hampers the attempts to learn from them, and impedes the work of the safety authorities. | |
| | **The Finnish Transport Agency will allocate sufficient resources for developing the careful,<br>systematic and rapid processing of safety deviations.** | |
| ***Date*** | ***Status*** | ***Comments*** |
| 25.2.2015 | Under implementation | |