NIB ANNUAL REPORT 2011

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 2011.

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 within 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.

In Finland the investigation of rail accidents is based on the EU Railway Safety Directive. In January 2009 a working group was appointed to amend legislation applying to accident investigation. The working group submitted its report to the Ministry of Justice in February 2010. The Government submitted the bill to the Parliament on 22 October 2010. The new “Safety Investigation Act” entered into force on 1 June 2011. The current Safety Investigation Act is in harmony with to the Railway Safety Directive.

1.2 Role and Mission

In Finland the Safety Investigation Authority investigates all major accidents regardless of their nature as well as all aviation, maritime and rail accidents and incidents.

The purpose of safety investigation is to promote general safety, the prevention of accidents and incidents, and the prevention of losses resulting from accidents. A safety investigation is not conducted in order to allocate legal liability. The flow of events during the accident, its causes and consequences, as well as the rescue operations are dealt with in the investigation. A report is prepared on the results of the investigation. The report also presents the recommendations, which are based on the conclusions of the investigation. All reports are written in Finnish with English summaries. An English translation of important reports will be available.

In addition the Safety Investigation Authority takes care of the readiness to conduct investigations and of the development of safety investigation methods. The training of investigators, the preparation of guidelines for the process of investigation, publication of the reports and international cooperation are handled by the Safety Investigation Authority.

Safety investigation focuses on the course of events of the accident, its causes and consequences as well as on the relevant rescue measures. Particular attention is paid to whether the safety requirements have been adequately fulfilled in the planning, design, manufacture, construction and use of the equipment and structures involved in the accident. It is also investigated whether the supervision and inspection has been carried out in an appropriate manner. Any eventually detected shortcomings in safety rules and regulations may call for investigation, as well. In addition to the direct causes of an accident, the accident investigation intends to reveal any contributory factors and back-

ground circumstances that may be found in the organization, the directions, the code of practice, or the work methods.

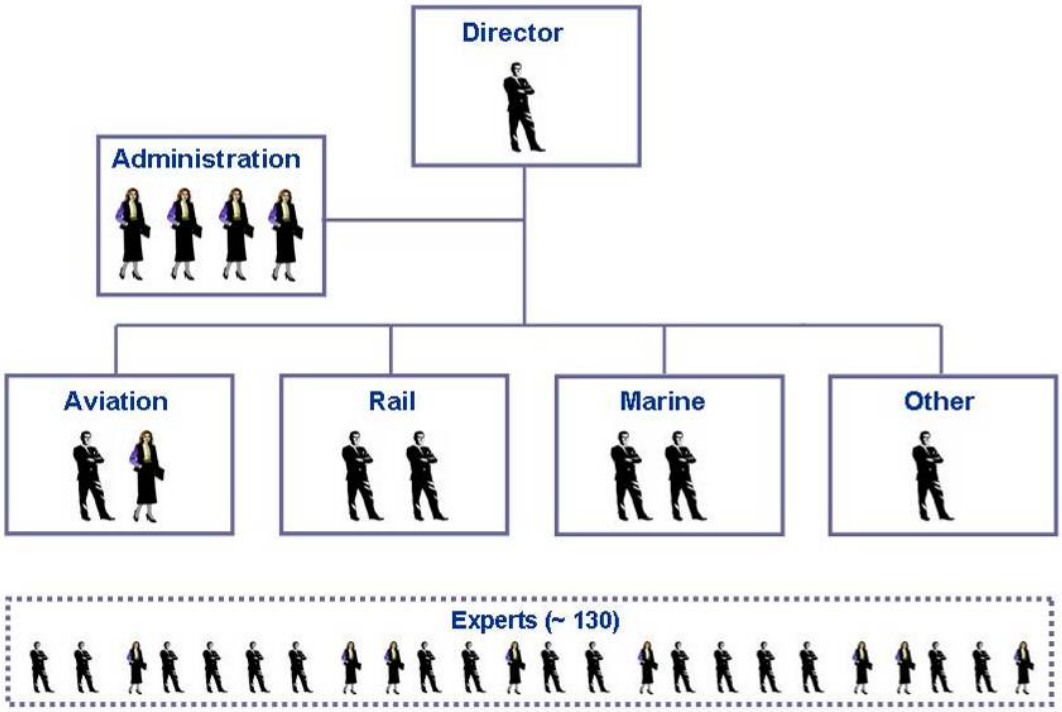
In the decision-making on the commencement of a safety investigation, the degree of seriousness of the incident is considered as well as its probability of recurrence. An incident or accident or hazardous situation, with only minor consequences may also require investigation in case it sets several persons at risk and an investigation is assessed as producing important information in view of the improvement of the general safety and the prevention of further accidents. Generally speaking, the Safety Investigation Authority does not investigate an incident or accident caused intentionally or by an offence.

The Safety Investigation Authority is also responsible for the printing and distribution of the investigation reports and their publishing on website *www.sia.fi.*

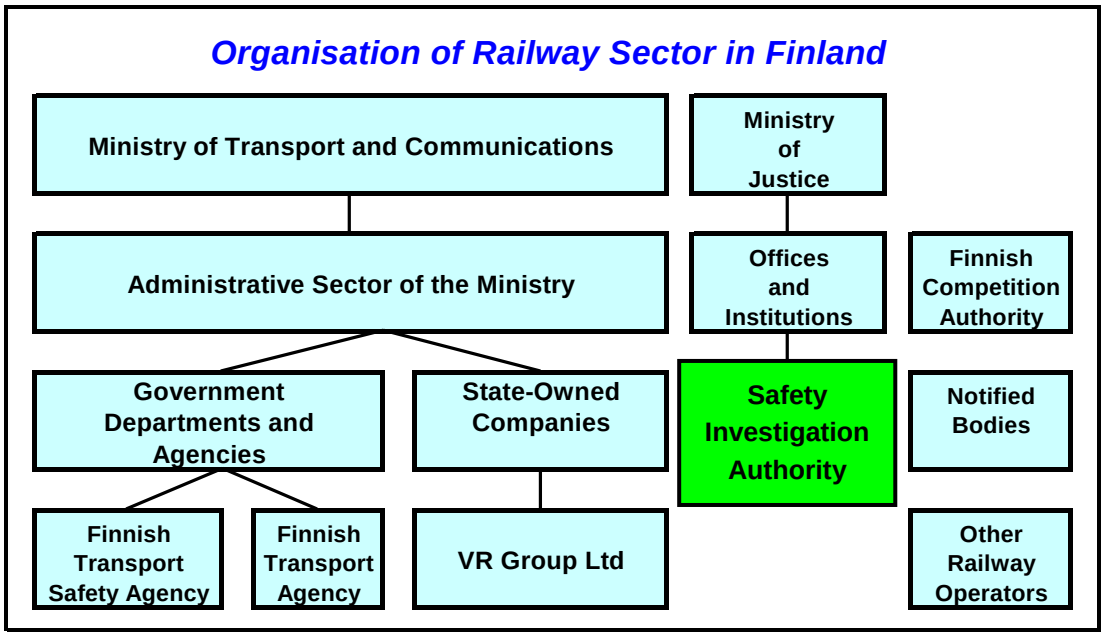
1.3 Organisation

Personnel:

Director	Veli-Pekka Nurmi
Administrative director	Pirjo Valkama-Joutsen
Senior Officer	Mari Haapalainen (1.8.2011→)
Assistant	Sini Järvi
Assistant	Leena Leskelä
Aviation accidents	
Chief Air Accident Investigator	Markus Bergman (→31.7.2011)
	Ismo Aaltonen (1.8.2011→)
Air Accident Investigator	Tii-Maria Siitonen
Rail accidents	
Chief Rail Accident Investigator	Esko Värttiö
Rail Accident Investigator	Reijo Mynttinen
Marine accidents	
Chief Marine Accident Investigator	Martti Heikkilä
Marine Accident investigator	Risto Repo
Other Accidents	
Chief Accident Investigator	Kai Valonen



1.4 Organisational flow



2 INVESTIGATION PROCESSES

2.1 Cases to be investigated

The following shall be investigated in accordance with the Safety Investigation Act:

A serious accident in rail traffic as defined in article 3 of Directive 2004/49/EC of the European Parliament and the Council (Railway Safety Directive) on safety on the Community `s railways and amending Council Directive 95/18/EC on the licensing of railway undertakings and Directive 2001/14/EC on the allocation of railway infrastructure capacity and levying of charges for the use of railway infrastructure and safety certification, and a corresponding accident in other private or public railway traffic;

In addition the Safety Investigation Authority can investigate in accordance with Safety Investigation Act;

- A serious incident and another accident and incident.
- A joint investigation (Safety Study) of several similar accidents or incidents.

The Safety Investigation Authority decides on the initiation of the safety investigation and on the extent to which the investigation is to be conducted. When considering the initiation of the investigation, account shall also be taken of the following:

- the seriousness and nature of the accident;
- the frequency with which corresponding accidents occur and the probability that they recur;
- the request of authorities supervising safety, of persons involved in the matter and of others for the conduct of an investigation;
- whether the investigation would provide significant information regarding safety;
- whether the accident caused a danger to several persons at the same time;
- whether some other instance is investigating the accident.

The Safety Investigation Authority may, in order to ensure the prerequisites for an investigation, initiate a preliminary investigation already before a decision is made on the initiation of the investigation.

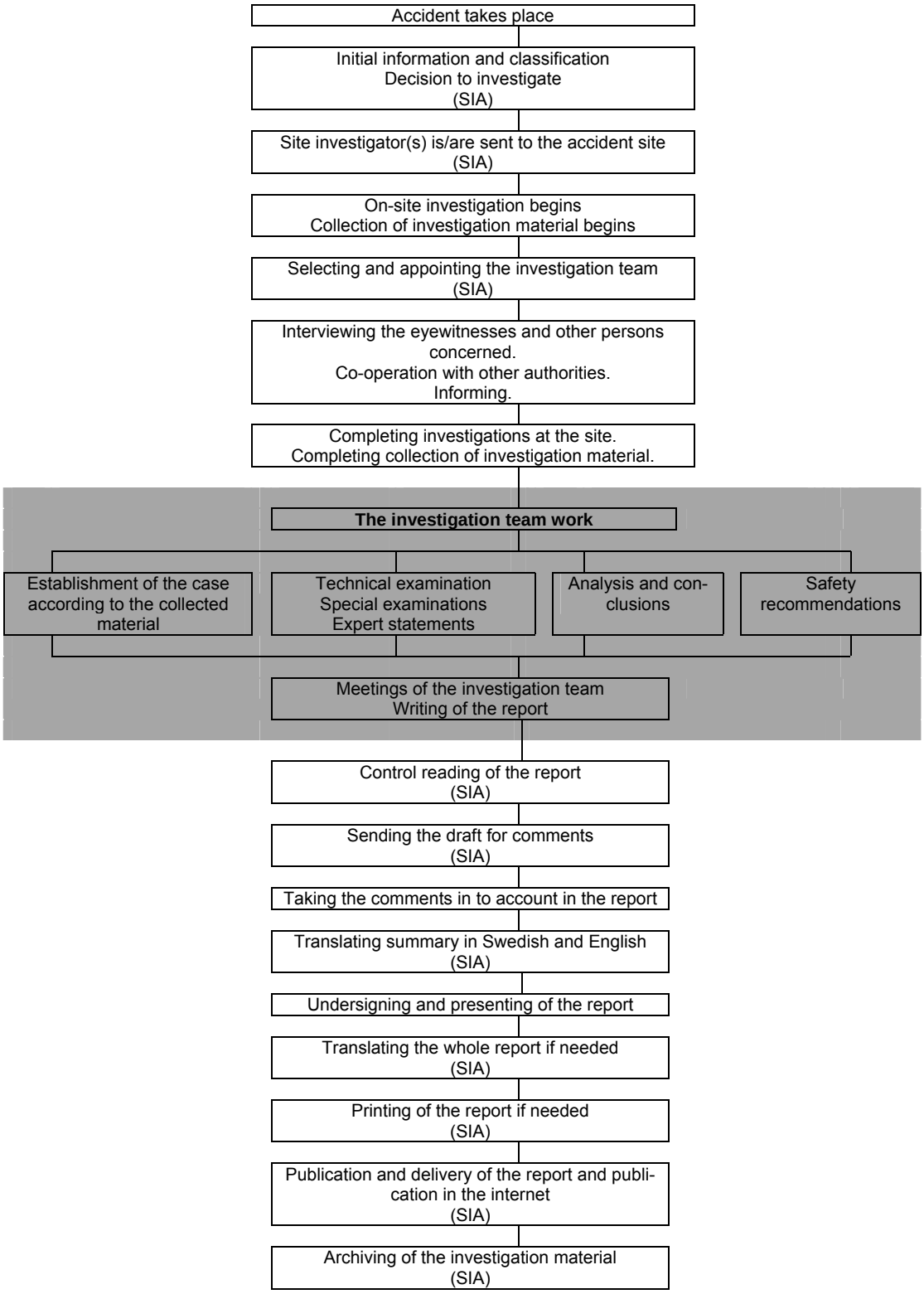
In accordance with the EU Railway Safety Directive, the Safety Investigation Authority has investigated all fatal level crossing accidents involving road vehicles since 2007. In accordance with the relevant legislation on the matter (24/2001), the traffic accident investigation teams of the Traffic Safety Committee of Insurance Companies (VALT) of the Finnish Motor Insurers' Centre investigate all fatal road and terrain accidents in Finland including fatal level crossing accidents.

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.

2.3 Investigation process or approach of the SIA

Chart of the investigation process



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	825 000	
Derailments	4	0	0	2 699 000	
Level crossing accidents	4	5	0	244 500	
Other	1	0	0	0	

3.2 Investigations completed and commenced in 2011

Investigations completed in 2011

Date of occurence	Title of the investigation (Occurrence type, location)	Legal basis	Completed (date)
30.12.2008	Failure in automatic train protection in Korvensuo, Finland on 30 December 2008	III	11.5.2011
16.6.2009	Derailment of a freight train in Toijala, Finland on 16 June 2009	I(a)	4.5.2011
4.1.2010	Collision of passenger cars with a rail barrier and then an office building in Helsinki station, Finland, on 4 January 2010	I(a)	5.5.2011
19.2.2010	Derailment of five tank wagons in Kilpilahti, Finland on 19 February 2010	I(b)(1)	26.4.2011
25.2.2010	Fatal level crossing accident in Pori, Finland on 25 February 2010	I(a)	19.7.2011
24.3.2010	Derailment of three cars in the Joensuu railway yard, Finland on 24 March 2010	III	18.8.2011
14.4.2010	Fatal level crossing accident in Karjaa, Finland on 14 April 2010	I(a)	25.5.2011
26.4.2010	Derailment of a local train at Helsinki station, Finland on 26 April 2010	I(b)(1)	7.4.2011
16.5.2010	Fatal level crossing accident in Kokemäki, Finland, on 16 May 2010	I(a)	27.4.2011
23.6.2010	Level crossing accident in Kyrö, Finland, on 23 June 2010	I(b)(1)	27.4.2011

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

I National rules imposed by implementing of the Safety Directive
- (a) in light of Article 19, §1 of SD
- (b) in light of Article 19, §2 of SD
  - (1) the seriousness of the accident or incident
  - (2) it forms part of a series of accidents or incidents relevant to the system as a whole
  - (3) its impact on railway safety on a Community level
  - (4) requests from infrastructure managers, the safety authority or the Member State
- (c) 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)
- (a) metros, trams and other light rail systems
- (b) networks that are functionally separate from the rest of the railway system
- (c) 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 2011

Date of occurence	Title of the investigation (Occurrence type, location)	Legal basis
21.2.2011	Collision of a freight train with rear end of another freight train in Siuro, Nokia on 21 February 2011	I(a)
2.2.2011	Collision of freight trains in Nurmes on 2 February 2011	I(b)(1)
24.2.2011	Derailment of locomotive bogie wheelset in Kolppi Finland, on 24 February 2011	III

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

I National rules imposed by implementing of the Safety Directive
- (a) in light of Article 19, §1 of SD
- (b) in light of Article 19, §2 of SD
  - (1) the seriousness of the accident or incident
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  - (3) its impact on railway safety on a Community level
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III Other national rules/regulations not referred to the Safety Directive.

3.3 Safety Studies completed and commissioned in 2011

Safety Studies completed in 2011

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

Safety Studies commenced in 2011

Date of commission	Title of the Study (Occurrence type, location)	Legal basis
12.1.2011	Safety study on level crossing accidents in 1991-2010	I(b)(2)
22.6.2011	Safety study on level crossing accidents in 2011	I(b)(2)

3.4 Summaries of investigations completed in 2011

Photo: Eltel

B5/2009R

Derailment of ten wagons of a freight train in Toijala, Finland on 16 June 2009

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.

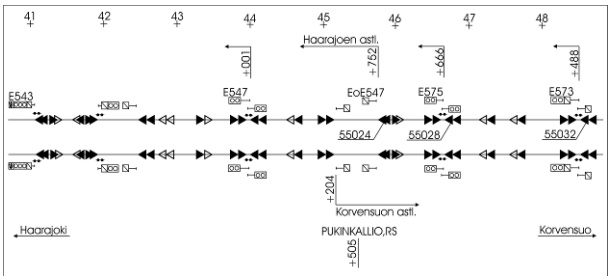
In order to avoid similar accidents in the future, the Accident Investigation Commission recommends the following:

- Adjustments of the locking devices and switch contactors located next to them should be inspected regularly and adjusted according to reference values.
- How the mechanical switch lock become unlocked should be investigated under normal circumstances, as well as control disturbances in the point switches.
- The installation, inspections and maintenance of switches and their components should be seamlessly documented.

To improve preparedness for accidents and other exceptional situations, the Investigation Commission recommends the following:

- To maintain control of the overall situation, a plan of action for accidents should be drawn up by the infrastructure manager.

To deal effectively with exceptional situations, the forms of cooperation and the distribution of duties and responsibilities should be clearly defined both at national and local level.



C1/2009R

Safety failure in automatic train protection observed on 30 december 2008 on the Kerava-Lahti direction of line, Finland

According to a deviation notification a safety problem was encountered in Korvensuo on 30 December 2008. Engine drivers notified that they were receiving restrictive information. A distant signal was indicating *stop* even though a balise at the previous signal had given to the automatic train protection equipment (ATP) the preliminary information that driving at the fastest speed was permitted (*proceed Fsl*), and, as the train caught sight of the subsequent main signal, it showed the *proceed* aspect.

The reasons for the faulty ATP operation was that an outdated card version had been placed in the IM[1]-module (signal box computer) controlling data transfer between Haarajoki and Korvensuo signal boxes. The wrong flash card had been installed because the software version had not been verified before installing the card. The installers said that this was because verification equipment was not operational due to the transfer of the office to another location. The card had also not been marked sufficiently clearly.

The situation was temporarily fixed once the deviation had become apparent by setting an 80 km/h speed limit in the area. The Thales “Emergency Team” met on 5 January 2009 to analyse the situation. Once the reason for the irregularity was observed, a new flash card was in-

[1] IM = Interlocking Module

stalled in the Haarajoki signal box module on 5 January 2009 at 23.00. The operations were tested and on 7 January 2009 the 80 km/h speed limit was lifted from the area.

In order to prevent the installation of wrong cards, the Accident Investigation Board recommends that signal box adjustment and repair work inspections, and documentation relating to them, should be supervised and the importance of inspections should be emphasised in signal box maintenance training. In addition, component up-to-datedness should be clearly marked on the component and personnel should be made aware of what the latest version in connection with maintenance actions is.

Photo: Police

B1/2010R

Collision of passenger cars with a rail barrier and eventually the wall of an office building at the Helsinki Central Railway Station, Finland, on 4 January 2010

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. Having collided first with the rail barrier and then the wall of the office building, the double-decker coach was so badly damaged that it had to be scrapped. The second, third, and fourth cars in the train suffered minor damage. In the fifth car, a 1,500-volt cable and a UIC cable were broken, and a brake conduit came loose. The other cars were undamaged. The rail barrier at the end of the track was completely crushed, and the concrete buffer stop behind it suffered minor fractures in the corners. The horizontal end beam to which the contact wires are attached was torn off. The office building suffered substantial material damage. The load-bearing primary frame of the building did not suffer significant damage, but the hollow-core slabs were fractured, and they also moved slightly. A meeting room in the impact area on the second floor of the building was completely destroyed, and the street-level entrance suffered substantial damage. Additionally, the building maintenance and safety-technology-related systems in the immediate vicinity of the impact area were damaged. 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.

In order to avoid similar accidents in the future, the Accident Investigation Commission recommends the following:

- Unambiguous instructions concerning the tightening of the screw coupling in various car types should be drawn up.
- To ensure that the cars remain stationary while the brakes are released by 'milking'[2], instructions on the use of the handbrake should be drawn up.
- Training in the use of device, which are important for safety reason, should be organised for restaurant car personnel also.

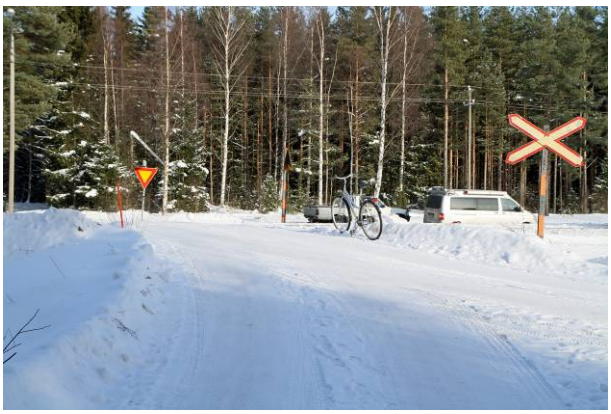
The Investigation Commission further recommends that a preparedness plan for exceptional circumstances should be drawn up for traffic control.

The Investigation Commission considers the following measures, already taken or in the process of being carried out good and support them:

- To the Helsinki rail depot in Ilmala has been provided a glycol de-icing system to prevent the formation of ice and the accumulation of snow on the structures under the passenger cars.
- New rail barriers have been installed on tracks 13 and 14 at the Helsinki station. The rail barriers are capable of stopping even a heavy train travelling at 35 km/h without the deceleration posing a risk to any passengers in the cars. All tracks at the Helsinki station will be equipped with similar rail barriers.
- The arrival tracks in Helsinki are equipped with ATP[3]-balises[4], which reduce the speed of an arriving train to 20 km/h.
- The Finnish Transport Agency has had emergency stops installed on the tracks that lead from the Ilmala depot to the Helsinki Central Railway Station. In an exceptional situation, a train can be stopped with this equipment.

Additionally, the Investigation Commission would like to issue a reminder that cars and spaces between cars in particular should be de-iced often enough to allow the requisite inspections to be performed. Car inspectors should be reminded that if , because of ice, a space between cars cannot be inspected, the car should always be referred for de-icing.

[2] 'Milking' here refers to the release of the brakes by means of the handle of the decoupling valve.
[3] ATP = Automatic Train Protection.
[4] A balise is a ATP track device which sends its message to ATP device of the locomotive.



B2/2010R

Fatal level crossing accident in Pori, Finland on 25 February 2010

On Thursday 25 February 2010 at 12:42, a fatal level-crossing accident occurred in Pori on the level crossing at the intersection of Tattaritie and the Mäntyluoto-Pori railway line. The driver of the train noticed that a passenger car was approaching the crossing from the right and gave a warning signal. It then became apparent to the driver of the train that the passenger car was not going to stop and the driver of the train put on the emergency brakes. The train ran into the left side of the car, the car jammed into the locomotive and the locomotive forced the car forward for 304 metres until the train came to a halt. The right buffer of the train penetrated the left side window of the car. The driver of the car died immediately from head and chest injuries. A car passenger died later in hospital from head and chest injuries.

The accident occurred because the driver of the car failed to notice the approaching train in time and was no longer able to stop or otherwise prevent the collision. Factors contributing to this were:

- The crossing was familiar to the driver of the car, which is a factor that generally reduces vigilance. The driver had also driven across the level crossing in the other direction moments before the accident.
- The level crossing was not equipped with warning installations.
- The level crossing was not equipped with proper waiting platforms and the road rises before the crossing to such an extent that drivers tend to avoid stopping before the crossing, especially in wet or slippery conditions.
- The car had tyres designated for summertime use.
- For the 30 metre stretch before the level crossing, the road had two intersections with give way signs.

In order to prevent similar accidents the investigation commission recommends the removal of the Tattari level crossing and the building of an alternative route via the residential area through a protected level crossing nearby. This would direct some traffic along a route that does not require a track crossing.

Identifying the location of the accident was not problematic because the location was familiar to the driver of the train, the traffic controller and the emergency response centre operator. The driver of the train made a direct call to the emergency response centre.

With the aim of making this practice the standard response, the investigation commission reiterates recommendation S211 of investigation report B1/2005R and B1/2009R: *That the instructions concerning the placing of emergency alarm calls be developed in such a manner that in all cases in which urgent rescue service assistance is required, a call be made to the general emergency number from the accident site in addition to the notification to traffic control*.

010R

level crossing accident in Karjaa,
nd on 14 April 2010

On Wednesday 14 April 2010 at 4.47pm, a fatal level crossing accident occurred on the Leskinen/Leppämäentie unprotected level crossing in Raasepori, Karjaa. The accident occurred when an SUV[5] leaving a nearby logging site collided with a commuter train (railbus) en route from Hanko to Karjaa. The only person in the SUV was the driver, who died instantly. The damage caused by the accident to track equipment amounted to € 94,500. The SUV was wrecked beyond repair.

The accident occurred because the car driver observed the approaching train too late and was no longer able to stop before the level crossing.

The factors contributing to this were:

- The driver was probably focused on something other than making a safe crossing.
- The crossing was quite familiar to the driver, which usually reduces vigilance when approaching.
- The level crossing was not equipped with warning installations.
- Driving and a safe crossing were hindered by the road being on an incline, the lack of wait platforms, high track embankment and trees surrounding the road.

In order to prevent similar accidents, the investigation commission recommends that the Leskinen/Leppämäki unprotected level crossing should be replaced by an interchange. In addition, the investigation commission reiterates recommendation S211 presented in investigation report B1/2005R concerning the establishment of a direct mobile phone connection from accident site to the emergency response centre.

[5] Sports Utility Vehicle

B4/2010R

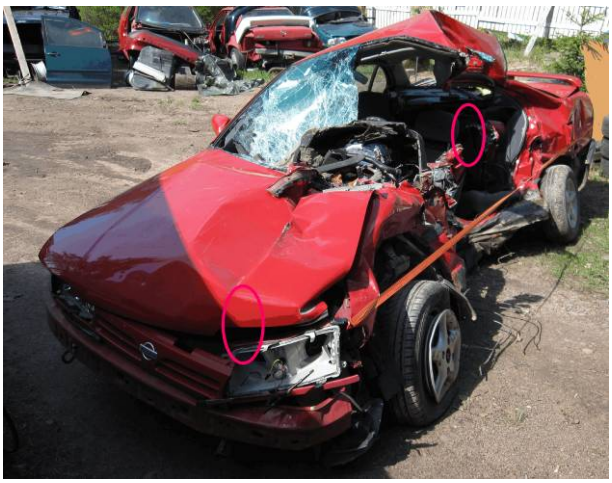
Derailment of a commuter train at Helsinki station, Finland on 26 April 2010

On Monday 26 April 2010 at 5:10 pm, a commuter train was derailed in Helsinki at a turnout. The train was approaching track 6 at Helsinki station when a turnout along the route turned underneath the train causing the train to be derailed. The rearmost unit of the three-unit train derailed and collided with a catenary support, with the result that the portal fell on the train's roof causing extensive power outage at Helsinki railway yard. The derailed unit was damaged and there was also damage to track equipment. There were no personal injuries.

The cause of the derailment was that the turnout turned underneath the train. This was due to emergency commands issued from the signal box control. The traffic controller issued the commands to a turnout other than the one intended. Contributing to this was the fact that insulated track section faults had been common at Helsinki railway yard. Due to these faults, traffic control was using shunting routes for which emergency commands could be issued. This had become almost daily practice. Methods with stripped security were being used so as not to disturb the flow of traffic. Partly contributing to the accident was the fact that the traffic controller had very little experience with the task.

In order to prevent the occurrence of similar accidents, the investigation commission recommends that the party responsible for the upkeep of the track should systematically monitor and, when required, improve track maintenance and techniques for determining track availability so that security is not unnecessarily compromised. In addition, the commission recommends that traffic control job rotation should ensure that demanding posts are familiar to traffic controllers by means of training and sufficient task rotation. With regard to training in the identification and handling of disturbances, and response procedures relating to them, special attention should be given to practices that do not compromise safety.

It became apparent during the investigation that information about disturbances experienced by traffic control is forwarded to maintenance, but not to parties responsible for safety. The keeper of the track and the contractor responsible for track maintenance did not fully recognise the significance of the insulation faults for traffic control, and the controllers had become used to them. For this reason, the commission proposes that, in order to prevent similar situations, the parties responsible for rail traffic should improve their information exchange. It should be better monitored that exceptional procedures do not become established practice.



B5/2010R

Fatal level crossing accident in Kokemäki on 16 may 2010

On Sunday 16 May 2010 at 7.57 pm, an Sr2 electric locomotive en route from Rauma to Tampere collided with a car at the Koskinen unprotected level crossing in Kokemäki. The accident was fatal to the car driver and a passenger. A second passenger was slightly injured. The car was wrecked beyond repair and the front of the locomotive suffered minor damage.

The accident occurred because the car driver noticed the approaching train too late and despite braking was not able to stop the car before the level crossing. As the car approached the track the driver was driving too fast in relation to how visible the track was from the road. Contributing to this were the inexperience of the driver and the fact that there was little indication that a level crossing was approaching: there were no warning installations, and there was a curving road before the crossing and a level crossing sign pointing in the wrong direction. Underlying factor to the accident was also that visibility to the track was poor when approaching and insufficient sightline towards the approaching train made the observation more difficult. The evening sun was shining low on the horizon from the direction of the approaching train.

The investigation commission is not issuing any safety recommendations as a result of the accident, but states that sightlines at the crossing should immediately be cleared in such a way that they meet regulations. In addition, the party responsible for road maintenance should reduce the speed limit to 20 km/h in the vicinity of the crossing, place warning signs on the road before the crossing and also place relevant STOP signs at the crossing. The Finnish Transport Agency should take effective action to ensure that road maintenance staff are sufficiently aware of proper level crossing maintenance as well as the installation of the relevant warning signs.

Actions leading to safety improvement were completed in the surrounding area following another accident in 2004, namely the number of level crossings in the area was reduced and traffic was redirected to the Koskinen level crossing. Redirecting traffic is generally a good solution but it also necessarily increases traffic at other level crossings, and therefore such actions should also include the equipment of remaining level crossings with appropriate half-barrier installations.

The investigation commission also notes that there was uncertainty as to which party was responsible for level crossing maintenance and the clearing of sightlines.

Photo: Police

B6/2010R

Level crossing accident in Kyrö, Finland, on 23 June 2010

On Wednesday 23 June 2010 at 3.44pm, an accident involving a freight train and a timber-carrying articulated vehicle occurred at a half-barrier equipped level crossing in the Kyrö area of Pöytyä municipality. The timber-carrying articulated vehicle started to manoeuvre past the half barriers, which were in the lowered position, when the freight train, which had departed from Kyrö railway yard in the direction of Tampere, collided with articulated vehicle's trailer.

There were no serious personal injuries. Both locomotives of the train were derailed and the front and chassis of the frontmost locomotive was damaged. The articulated vehicle's trailer was damaged beyond repair. The barrier installations of the level crossing were also severely damaged. The repair costs arising from the damage to track equipment and the level crossing amounted to EUR 150,000.

The accident occurred because the articulated vehicle started to manoeuvre past the lowered half barriers, as a result of which the train collided with the vehicle's trailer.

The decision by the vehicle driver to start manoeuvring past the barriers was apparently influenced by the pressure resulting from being in a queue. The driver felt pressure building because the long wait in the queue put extra burden on schedules and also because the driver felt that the articulated vehicle was blocking the pedestrian crossing and partly also access to a nearby store. The decision to proceed was probably also made in part because other drivers were manoeuvring past the barriers, which gave confirmation to the notion that the barrier installations were not functioning properly.

The queues grew to a significant size while the barriers were lowered for too long because the engine driver did not give due regard to the signal and therefore did not notice that the remote controller had given permission to depart. Lack of formal communication between the remote controller and the engine driver led to a misunderstanding and the train did not depart as soon as permission was given. Once the alarm had been issued that the barriers had been lowered too long time, the remote controller failed to contact the engine driver or take any other action to ease the queue at the level crossing before the departure of the train.

Several studies and plans have been initiated from 1996 onwards with regard to improve safety at the Kyrö level crossing. These plans have focused on building an underpass at the Kyrö level crossing or equipping it with double barriers. The investigation commission is not issuing new recommendations but rather notes that an underpass should be built as soon as possible in order to solve the traffic problems now encountered at the crossing.

C1/2010R

Derailment of five tank wagons during shunting work in Kilpilahti, Finland on 19 February 2010

On Friday, 19 February 2010, five tank wagons pushed by a shunting unit bumped against a rail-barrier stop on track 204 at the Neste Oil Oyj unloading terminal in Kilpilahti, Finland. The first barrier wagon fell down the embankment, hitting a gas pipeline at the bottom. The second protection wagon came to a stop at the edge of the embankment, and the three Russian wagons behind it, containing industrial gasoline, were derailed. Neither the gas pipeline nor the wagons suffered any leaks. The wagons containing industrial gasoline had to be emptied before clearance work could begin.

The immediate cause of the accident was the shunting foreman's failure to escort the wagons all the way. He was under the impression that there was enough room for the wagons on the track. The shunting foreman's activities were influenced by the following factors:

- While trying to disengage the brakes, the conditions for the shunting foreman were hot. They were then cold during the long (3 km) pushing movement
- It was the foreman's third night shift in a row and he was very tired
- It was the foreman's first shift as an independent shunting foreman at Kilpilahti
- The shunting foreman had not received sufficient training to act as a shunting foreman at the unloading terminal.

To avoid similar accidents in the future, the Accident Investigation Board recommends that long and heavy rows of wagons should be pulled into the unloading terminal in Kilpilahti. It is further recommended that work orientation be carried out such that the person receiving orientation training accompanies the shunting unit as an additional crew member. This would enable the person receiving the orientation training to familiarise him or herself with the duties of a shunting foreman. An orientation plan and an orientation training card should also be provided.

C2/2010R

Derailment of three freight train cars at the Joensuu railway yard, Finland on 24 March 2010

On Tuesday, 24 March 2010, at 1:12pm, three unloaded Finnish freight train cars derailed in the Peltola section of the Joensuu railway yard. The derailment occurred when freight train 4719 left from Joensuu for Uimaharju on track 061 while two stop blocks had been left in place at the front wheel sets of the two rearmost wagons of the train. The front end of the train's second wagon from the rear was derailed immediately when the train started moving. The train's rearmost wagon and the rear end of the third wagon from the rear were derailed when the stop blocks became blocked in a turnout crossing. The switchman at the southern end of the railway yard heard the rumble emanating from the train and detected that the three rearmost wagons were not running on track. The switcher requested, via the railway yard radio, that the traffic controller stop the train, and the controller ordered the engine driver to stop the train.

The accident damaged track over a distance of 700 metres when the derailed wagons caused damage to the sleepers and electrical cables underground. Furthermore, four turnouts were damaged in the accident and also an electric pole of railways was damaged when a derailed wagon collided with it. The accident disturbed other railway traffic for four hours. The passenger trains were replaced with bus transport during the disturbance. The total cost of the accident was 10,000 €.

The cause of the accident was that stop blocks had been left on rail when the train started moving. The underlying cause of the accident was that the brake inspector was distracted by trying to locate his radio handset, which had fallen into a brake hose pit, and, consequently, forgot to remove the stop blocks from the right-hand rail.

The Accident Investigation Board is not issuing new safety recommendations because of this accident, since the Finnish Transport Safety Agency has set forth clear regulations for inspection of the traffic-worthiness of trains and for standard-form communications to be adhered to in all communication in railway operations.

3.5 Comment and introduction or background to the investigations

Investigations commenced in 2011 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 2007–2011)

Rail investigations in 2007–2011

Accidents investigated		**2007**	**2008**	**2009**	**2010**	**2011**	**TOT**
Serious accidents (Art 19.1)	Train collision	0	1	0	0	1	**2**
	Train collision with an obstacle	0	0	0	1	0	**1**
	Train derailment	0	0	1	0	0	**1**
	Level crossing accident	7	5	8	3	0	**23**
	Accident to person caused by RS in motion	1	0	0	0	0	**1**
	Fire in rolling stock	0	0	0	0	0	**0**
	Involving dangerous goods[6]	1	0	0	0	1	**2**
Other accidents (Art 19.2) + (Art 21.6)	Train collision	0	2	0	0	1	**3**
	Train collision with an obstacle	0	1	0	0	0	**1**
	Train derailment	5	3	2	3	1	**14**
	Level crossing accident	0	0	0	1	0	**1**
	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[6]	2	2	0	0	0	**4**
	Incidents	1	2	1	0	0	**4**
TOTAL		**14**	**14**	**12**	**8**	**3**	**51**

[6] Belongs also to an other category and is not calculated another time to the total amount.

4 RECOMMENDATIONS

4.1 Short review and presentation of recommendations

Implementation of recommendations during 2007–2011

Recommendations issued		Recommendation implementation status					
		Implemented		In progress		Not to be implemented	
Year	[No.]	[No.]	[%]	[No.]	[%]	[No.]	[%]
2007	25	11	44	5	20	9	36
2008	20	8	40	8	40	4	20
2009	17	10	59	5	29	2	12
2010	15	5	33	9	60	1	7
2011	18	5	28	13	72	0	0
TOTAL	**95**	**39**	**41**	**40**	**42**	**16**	**17**

Implementation of Recommendations, see Annex 1

A total of 299 recommendations were issued from the beginning of 1997 until the end of 2011. According to information available at 13 September 2012, 195 (65.2 %) recommendations were implemented and 57 (19.1 %) were decided not to be implemented. The fulfilment of recommendations can take time, as indicated by the fact that, of the 204 recommendations issued from 1997–2006, 156 (76.5 %) had been implemented by the end of 2011 and 41 (20.1 %) were decided not to be implemented.

4.2 Recommendations 2011

S286 Improving track availability monitoring technology

Track availability monitoring equipment, which is unreliable and often fails, is indirectly causing situations in which overall security is being compromised. The investigation commission therefore recommends the following to the Finnish Traffic Agency:

The party responsible for the upkeep of the track should systematically monitor and, when required, improve track maintenance and techniques for determining track availability so that security is not unnecessarily compromised. [B4/10R/S286]

S287 Personnel and competence management

The rail system and traffic control involve tasks for which proper handling requires plenty of system knowledge, practice, and attention. During the rush hour, and especially during equipment failure, the Helsinki signal box control tables are critical locations with regard to safety. The investigation commission therefore recommends the following to the Finnish Traffic Agency and VR Group:

Traffic control job rotation should ensure that demanding posts are familiar to traffic controllers by means of training and sufficient job rotation. With regard to training in the identification and handling of disturbances, and response procedures relating to them, special attention should be given to practices that do not compromise safety. [B4/10R/S287]

S288 Transporting wagons into the Neste Oil Oyj unloading terminal in Kilpilahti

To improve train safety and occupational health and safety, and as the distance is long and the track ends in a rail barrier, the Accident Investigation Board recommends the following:

Heavy and long rows of wagons should be transported into the Neste Oil Oyj unloading terminal in Kilpilahti by pulling them with a locomotive. [C1/10R/S288]

S289 Orientation

If the person participating in orientation training is working as a member of a train crew, it is difficult for him or her to observe what the shunting foreman is doing. Therefore, the Accident Investigation Board recommends the following:

The orientation training given to shunting foremen should be carried out so that the person participating in the training accompanies the shunting unit as an extra crew member. [C1/10R/S289]

S290 Orientation plan and orientation training card

To ensure that the orientation training for new duties is comprehensive, the Accident Investigation Board recommends the following:

An orientation plan and an orientation training card be drawn up, with the latter signed by both the orientation trainer and the trainee after the training is complete. [C1/10R/S290]

S291 Locking device adjustments and other adjustments in the point switch

A switch is the single most dangerous element in a railway system. Incorrect work methods used in the maintenance of switches may lead to systematic faults. To ensure that no misadjusted locking devices or switch contactors remain on Finnish railways, causing a significant risk of derailment, the Investigation Commission recommends that the Finnish Transport Agency and VR Track Oy carry out the following:

Adjustments of the locking devices and switch contactors located next to them should be inspected regularly and adjusted according to reference values. [B5/09R/S291]

The expertise of the persons carrying out inspections and adjustments should be ascertained. Additionally, the maintenance provider, the device supplier and the client should cooperate to update the installation and adjustment instructions for Railex and the switch contactors, as well as to ensure that they are unambiguous.

The monitoring of switch maintenance should be enhanced. The infrastructure manager should establish an independent body of experts to supervise switch maintenance with regular but random inspections, as well as to inspect the plans relating to switch maintenance and maintenance documentation.

S292 Further inspection of switch structure

The investigation revealed that under test conditions it was possible to repeatedly create a situation in switch where mechanical oscillation in the closed blade caused the point switch to become unlocked. The Investigation Commission therefore makes the following recommendation to the Finnish Transport Agency:

How the mechanical switch lock become unlocked should be investigated under normal circumstances, as well as control disturbances in the point switches. [B5/09R/S292]

Previous research into the matter should be compared with the actual situation. It would also be advisable to study the other possible causes presented by VR Track Oy in its report.

The infrastructure manager must determine whether the unlocking of switches due to mechanical oscillation is also possible in a switch that is adjusted according to reference values, as well as how small deviations from the reference values can cause switches to become unlocked. Additionally, it should also be determined whether current reference values should be changed.

A risk assessment should be carried out on the basis of this information, and the necessary steps should be taken to reduce the potential risks.

S293 Documentation of switch maintenance

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. [B5/09R/S293]

At the very least, comprehensive documentation should be available for all new equipment. The documentation should also be supervised.

S294 Command relationships under exceptional circumstances

The indirect consequences of a railway accident at a critical point may have a significant impact on the use of the railway system and the users of transport services. Currently there are many operators in the railway system. The Investigation Commission therefore makes the following recommendation to the Finnish Transport Agency:

To maintain control of the overall situation, a plan of action for accidents should be drawn up by the infrastructure manager. [B5/09R/S294]

A competent team, led by the infrastructure manager, should be established in the early stages after an accident to ensure competent leadership, to support the activities of the clearance chief, and to supervise aftercare. The command group should consist of the competent representatives of various organisations as required by the situation. The threshold for establishing a command group should be sufficiently low. The composition of the command group could be varied as necessary. Its activities could be terminated as soon as the overall situation allows this. The decisions made by the command group should be documented.

S295 Traffic management under exceptional circumstances, Preparedness Plan

The Tampere traffic control was overburdened by the management of train operations and the arrangements for replacement transport. A comprehensive plan for traffic management and train services was never drawn up. There was no plan available for the use of traction services under exceptional circumstances. The organisation of equipment and personnel rotation also placed a burden on traffic control in Tampere. The Investigation Commission therefore makes the following recommendation to the Finnish Transport Agency and VR Group:

To deal effectively with exceptional situations, the forms of cooperation and the distribution of duties and responsibilities should be clearly defined both at national and local level. [B5/09R/S295]

Local traffic control is overwhelmed with the duties to be performed when following current instructions concerning major accidents. Therefore, a new set of instructions should

be drawn up with the duties distributed more rationally. Cooperation drills should also be arranged, and the roles of the traffic centre and the operators in transport management should be more clearly defined. The threshold for using additional resources should be lowered.

S296 Instructions for tightening the screw coupling

The current instructions for tightening of the screw coupling, 'to be tightened sufficiently', leave too much room for interpretation. This is why 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:

Unambiguous instructions concerning the tightening of the screw coupling in various car types should be drawn up. [B1/10R/S296]

S297 Use of the handbrake

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. [B1/10R/S297]

If there are cars in use whose handbrake breaks down if used when the air brakes are engaged, they should be modified to prevent such damage from occurring.

S298 Training of restaurant personnel for exceptional circumstances

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. [B1/10R/S298]

The training should address matters such as how to stop a train in an emergency, how to use a handbrake, and how to open the doors in various car types in an emergency. The training should target all personnel, and it should be updated whenever new stock is introduced.

S299 Preparedness plan for traffic control in exceptional circumstances

There was no preparedness plan in existence for dealing with a situation of this type, and after a brief discussion, the separated cars were steered onto a vacant track. To ensure that a preparedness plan exists, the Investigation Committee recommends to the Finnish Transport Safety Agency that it ensure that the Finnish Transport Agency take the necessary steps to implement the following recommendation:

A preparedness plan for exceptional circumstances should be drawn up for traffic control. [B1/10R/S299]

The preparedness plan should address both directions: from Ilmala to Helsinki and from Helsinki to Ilmala. The plan should also include communication with people in the cars, as well as passenger information.

Regular drills should be arranged to ensure that everything flows smoothly even in exceptional circumstances.

In its statement, the Finnish Transport Safety Agency suggests that preparedness activities should focus especially on the development of technical systems and functions that can be utilised in an emergency. The Finnish Transport Safety Agency further states that in future, traffic control should act as it did in this case – i.e., assess the situation and take the necessary action on the basis of this assessment. Those in traffic control should also master the methods available for dealing with a potentially hazardous situation.

S300 Emphasising the importance of inspections

In order to prevent the use of wrong card versions, the Accident Investigation Board has made the following recommendation:

The Finnish Transport Agency should ensure that signal box adjustment and repair work inspections, and documentation relating to them, are supervised and the importance of inspection is emphasised in signal box maintenance training. [C1/09R/S300]

It should be possible to verify that the correct software versions are also used on location, especially with regard to neighbouring signal box equipment connections. This means that maintenance personnel must be notified what software updates have been made and what operations are affected. Instructions must also be drawn up with regard to tests to ensure compatibility with neighbouring signal box equipment.

S301 Marking card versions

In order to prevent the use of wrong card versions, the Accident Investigation Board has made the following recommendation:

The Finnish Transport Agency should ensure that component versions are marked clearly and that personnel are made aware of different versions during maintenance actions. [C1/09R/S301]

S302 Replacement of the Leskinen/Leppämäki level crossing by an interchange

Considering the poor sightlines at the level crossing as well as the incline and track speed limits, the investigation commission makes the following recommendation:

The Leskinen/Leppämäki level crossing should be replaced by an interchange. [B3/10R/S302]

The Raasepori local authority plans to build an underpass between Leppämäentie and Almantie (the location of the Sundberg/Hakutie level crossing). The plan would also allow for the removal of the Torppari level crossing. Execution of this undertaking will take time, however, and therefore safety should be improved at the level crossing in the interim period. One possibility is presented by Raasepori local authority in its statement: *"A plan has also been prepared for the north of the track in connection with Leppämäentie, whereby it is proposed that a road be built east to Bäijars industrial area and onwards to highway 111."* The local authority notes also that this road could also be built more quickly than the underpass.

S303 Removal of the Tattaritie level crossing

The Tattaritie level crossing provides the only access to a nearby residential area, but it would be possible to organise a safer route by building 200 metres of road in such a way that the new road would connect with the Ulasoori-Kanaa road, which has a level crossing equipped with warning installations. Therefore, the investigation commission recommends:

The Tattaritie level crossing should be removed. [B2/10R/S303]

RECOMMENDATIONS

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.

Final report issued:	15.1.2007

Recommendation Nr. S211	**The instructions for the drawing up of an emergency notice should be developed to ensure that whenever urgent aid is needed from the rescue service, also the general emergency number is called from the incident scene, in addition to the notifying of the traffic control unit.**	
Date	***Status***	***Comments***
20.1.2009[7]	In progress	The ERC Administration supports, VR Ltd is against.
19.2.2010	In progress	The ERC Administration supports, VR Ltd will consider to change directions when the new GSM-R system is in use.
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	**IMPLEMENTED**	

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	

Date and time (Code):	S1/2005R
Location:	-
Type of occurrence:	Safety Study on Level Crossing Accidents

***Summary*:** At the request of VR-Group Ltd, in December 2005 the Accident Investigation Board of Finland commenced a safety study on road/railway level crossing accidents and appointed a commis-

[7] Date of the annual meeting concerning status of the recommendations, if not said otherwise.

sion therefore. The safety study included seven recent level crossing accidents, the first one of which had been subject to investigation before the commencement of the safety study referred to. Moreover the commission investigated other level crossing accidents having occurred in 2003, 2004 and 2005, on the basis of data collected by VR-Group Ltd. The investigation also included fatal level crossing accidents in 1991–2004 as based on investigation documents produced by the Traffic Safety Commission of Insurance Companies (VALT), statistics from 1991–2004 on level crossing accidents and railway and road traffic accidents, international statistics on level crossing accidents and railway and road traffic accidents, as well as investigation reports on individual accidents in certain countries and documentation pertaining to projects on the development of level crossing safety in some countries.		
Final report issued:	20.06.2007	
Recommendation Nr. S215	As the road vehicle driver's perception error is often the cause of his failing to stop at a level crossing, the perceptibility of both the train and the level crossing should be improved. For example, in the accidents investigated by the commission, the road vehicle driver either failed to perceive the train or only perceived it too late.	
	The perceptibility of a train and a level crossing should be improved.	
Date	***Status***	***Comments***
20.1.2009	In progress	Different kind of alternatives is tested.
19.2.2010	In progress	Bumps and vibration ribs on road are on tests.
16.6.2011	In progress	Studies and tests have been made and will continue.
9.2.2012	**RECOMMENDATION DELETED**	Replaced by two new recommendations S316 and S318
Recommendation Nr. S216	A great number of level crossings feature high speed limits, even 80 km/h. This impacts the road vehicle driver's impression of a safe level crossing and hence his/her driving behaviour at the level crossing.	
	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.	
Date	***Status***	***Comments***
20.1.2009	In progress	
19.2.2010	In progress	Will be taken up when drafting new directions.
16.6.2011	Not yet implemented	
9.2.2012	**RECOMMENDATION DELETED**	Replaced by A new recommendation S315.
Recommendation Nr. S217	At a number of level crossings, the condition of the wait platform fails to meet the relevant RAMO[8] specifications. This often results in an unwillingness to stop at the level crossing.	
	Such wait platforms of level crossings that feature a poor condition should be upgraded to meet the relevant RAMO specifications.	
Date	***Status***	***Comments***
20.1.2009	In progress	
19.2.2010	In progress	No agreement on who should be responsible for.
16.6.2011	In progress	Wait platforms belong to road keepers. Most of roads are private. Road Association has started to pay attention and will need co-operation with of authorities. Road Association has organized training for the maintenance of level crossings.
9.2.2012	**RECOMMENDATION DELETED**	Out of date, because RAMO is no longer valid. Too extensive.
Recommendation Nr. S218	The regulations in Part 9, RAMO are not applied to old level crossings. Consequently it is not quite clear what regulations apply to the maintenance of level crossings.	
	Maintenance instructions should be drawn up for level crossings.	
Date	***Status***	***Comments***
20.1.2009	In progress	
19.2.2010	In progress	
16.6.2011	In progress	Maintenance orders and instructions are under preparation.
9.2.2012	In progress	

[8] RAMO = The Track Technological Rules and Regulations.

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

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

Final report issued:	23.11.2007

Recommendation Nr. S224	When driving on a familiar route, a driver performing a delivery task may pay such strong attention to matters other than driving that his/her attentiveness, and following the traffic and his or her surroundings is disrupted. At such moments, special danger zones include unguarded level crossings.	
	Itella and other businesses performing deliveries can improve safety by avoiding unguarded level crossings when planning their delivery routes.	
Date	***Status***	***Comments***
20.1.2009	In progress	
16.6.2011	In progress	Finnish Transport and Logistics will also remind Itella of this subject.
9.2.2012	**RECOMMENDATION DELETED**	Replaced by a new recommendation S319.
Recommendation Nr. S225	Level crossings and other dangerous locations should also be taken into consideration when mail is sorted route-specifically.	
	A warning sign notifying of a dangerous location on the route, placed between sorted mail stacks being delivered, might act as a prompt to the mail carrier when he/she arrives at the dangerous location on the route.	
Date	***Status***	***Comments***
20.1.2009	In progress	
16.6.2011	In progress	
9.2.2012	In progress	
Recommendation Nr. S226	As the use of navigators is becoming more common, they can be complimented with various programs which will warn of dangerous locations en route.	
	A navigator/GPS device in the vehicle, should be installed warning of dangerous locations such as level crossings.	
Date	***Status***	***Comments***
20.1.2009	In progress	
19.2.2010	In progress	Level crossing databank for navigators can be downloaded from the internet.
16.6.2011	In progress	
9.2.2012	**RECOMMENDATION DELETED**	Too extensive and untargeted.
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	

Date and time (Code):	5.3.2007, 14.39 (B2/2007R)		
Location:	Nivala, Niskakankaantie / Pahaoja level crossing, unprotected		
Type of occurrence:	Level crossing accident, Passenger train – car		
Train type and number:	Local train H494, Dm12 rail bus		
Road vehicle:	Passenger car Renault Laguna Break 1.6, 2000 model		
		In the train	***In the road vehicle***
Persons on board:	***Crew:***	2	1
	Passengers:	25	1
Fatally injured:	***Crew:***	0	1
	Passengers:	0	1
Seriously injured:	***Crew:***	0	0
	Passengers:	0	0
Slightly injured:	***Crew:***	0	0
	Passengers:	0	0
Damages of rolling stock:	Slight damages to the rail bus, the car was completely wrecked.		
Damages on track equipment:	None.		
Other damages:	None.		

***Summary*:** On Monday 5 March 2007 at 2.39 p.m., a level crossing accident took place involving a passenger car and a rail bus travelling from Ylivieska to Iisalmi. Both the driver and the passenger of the car perished, while the train personnel and passengers were unharmed. The accident wrecked the car beyond repair, while the train suffered only minor damage. The total material costs due to the accident were approximately EUR 70,000.

Final report issued: 23.11.2007

Recommendation Nr. S228	The Pahaoja unguarded level crossing is situated on a busy private road in Niskakangas which, in addition to the locals, is used by regular taxi traffic and heavy traffic due to farming and industry in the area. For train safety alone, it would be extremely important that the level crossing be equipped with a warning station with automatic gates. This measure would also increase the likelihood that a driver notices an approaching train, thanks to lowered or lowering gates.	
	The Pahaoja unguarded level crossing should be equipped with a half barrier equipment.	
Date	***Status***	***Comments***
20.1.2009	In progress	RHK is not going to install the level crossing with barriers.
16.6.2011	In progress	Nivala town is of the opinion that the level crossing should be equipped with half barriers.
9.2.2012	In progress	

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	

Recommendation Nr. S235	The Pohja level crossing is located very close to a safe overpass, and the cost of its removal would be reasonably low. The safe overpass located nearby is not utilised in the current situation. The Finnish Rail Administration should systematically locate and remove level crossings in cases where the removal and construction of a replacement route could be performed at a minor cost. Due to this, the investigation commission recommends:	
	The Finnish Rail Administration should systematically locate crossings that have a bridge nearby or whose traffic can otherwise be directed through a safer route, removing them even though their volume and risk level might be low.	
Date	***Status***	***Comments***
20.1.2009	In progress	
18.8.2011	In progress	
9.2.2012	**RECOMMENDATION DELETED**	Content of this recommendation is included in new recommendation S309.

Recommendation Nr. S236	The start of the accident rescue operation was hindered by the fact that the emergency alarm call made by a traffic controller was patched through to the North Ostrobothnia and Kainuu Emergency Response Centre, which was not the Emergency Response Centre responsible for the accident site. Since railway traffic control areas are typically part of more than one Emergency Response Centre's area, the opportunities traffic controllers have for making emergency alarm calls should be enhanced. Due to this, the investigation commission recommends:	
	Traffic controllers should have the capacity to place an emergency alarm call to the Emergency Response Centre in the ERC area in which the accident site is located.	
Date	***Status***	***Comments***
20.1.2009	In progress	On process.
19.2.2010	In progress	Remote controllers have direct numbers to different ERCs.
16.6.2011	In progress	Emergency Response Centre, VR Group Ltd and Finnish Transport Agency are drafting guidelines in co-operation.
9.2.2012	**IMPLEMENTED**	

Date and time (Code):	9.3.2007, 16.13 (B3/2007R)		
Location:	Särkisalmi, Sinkonen level crossing, unprotected		
Type of occurrence:	Level crossing accident, passenger train -- car		
Train type and number:	Regional train 746, Dm12-railcar		
Road vehicle:	Car Mercedes Benz 190D, 1985 model		
		In the train	***In the road vehicle***
Persons on board:	***Crew:***	2	1
	Passengers:	34	1
Fatally injured:	***Crew:***	0	1
	Passengers:	0	1
Seriously injured:	***Crew:***	0	0
	Passengers:	0	0
Slightly injured:	***Crew:***	0	0
	Passengers:	0	0
Damages of rolling stock:	The railcar's blockage bumper and automatic coupling 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.

Final report issued: 12.12.2007

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

Date and time (Code):	31.12.2005, 9.14 (C9/2005R)		
Location:	Tuupovaara railway yard		
Type of occurrence:	Derailment		
Train type and number:	Shuntig unit, Dv 12 diesel locomotive and 11 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:***	1	
	Passengers:	0	
Slightly injured:	***Crew:***	0	
	Passengers:	0	
Damages of rolling stock:	The derailed wagon suffered minor damages.		
Damages on track equipment:	None		
Other damages:	None.		

***Summary*:**. On Saturday 31 December 2005 at 9.14 a.m., a shunting accident occurred in the Tuu-

povaara railway yard, in which a group of empty wagons for carrying wood products, being pushed by an engine, collided with a derailer, causing the derailment of the first wagon in the direction of travel. The shunting foreman, who was standing on the wagon's left end step, was seriously injured after falling between the tracks and being hit by the left end step of the next wagon as he extricated himself from the moving wagons. The step dragged him for several metres before he was able to break free.

Final report issued:	15.4.2008

Recommendation Nr. S240		
	Greater attention should be paid to shunting work safety during the ploughing of snow in rail yards.	
Date	***Status***	***Comments***
20.1.2009	In progress	
18.8.2011	In progress	
9.2.2012	In progress	

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

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

Final report issued:	23.6.2008

Recommendation Nr. S241	Because the area's growing population is continuously increasing the volume of traffic at the Korpi level crossing, and because fast growing bushes around the crossing do not enable the maintenance of visibility in line with Ministry of Transport and Communications and Finnish Railway Administration requirements, the investigation commission recommends the following:	
	The Korpi level crossing should be equipped with half-barriers.	
Date	***Status***	***Comments***
20.1.2009	In progress	Will be equipped with half barriers, when the financing is ok.
19.2.2010	In progress	In action and economic plan 2010–2013.
18.8.2011	Not yet implemented	No funding yet.
9.2.2012	Not yet implemented	

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.

Final report issued:	9.9.2008

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	

Date and time (Code):	4.8.2007, 6.24 (C6/2007R)		
Location:	Siilinjärvi, Kemira GrowHow Oyj industrial railway yard		
Type of occurrence:	Derailment		
Train type and number:	Shunting unit, 3 Dv12 diesel locomotives + 6 tank wagons		
Road vehicle:			
		In the train	***In the road vehicle***
Persons on board:	***Crew:***	1 + 2	
	Passengers:	0	
Fatally injured:	***Crew:***	0	
	Passengers:	0	
Seriously injured:	***Crew:***	0	
	Passengers:	0	
Slightly injured:	***Crew:***	0	
	Passengers:	0	
Damages of rolling stock:	Tank isolation and bogies of the overturned wagon damaged. Minor damages to two other wagons.		
Damages on track equipment:	Derailer and 5 meter track damaged.		

Other damages:	None.

***Summary*:** At Kemira GrowHow Oyj railway yard an accident occurred on Saturday 4.8.2007 at 6.24 am, where a tank wagon loaded with nitric acid collided with a derailer, causing the wagon to derail and tip over. The following wagon also derailed. It stayed upright. The total cost of the accident was less than 50 000 euros.
The reason for the accident was that the derailer was not removed before shunting of the wagons and that the derailer that had been left on was not noticed in time. The shunting foreman gave order to shunt without securing the route first.

Final report issued:	28.10.2008

Recommendation Nr. S247	Right operation of the derailer should always be secured so that misuse could not be possible. Forgetting a derailer on should be hindered.	
	A derailer should always have interdependence to the turnout which leads to the track in question. Especially railway yards where dangerous substances are handled should always be built according to regulations.	
Date	***Status***	***Comments***
20.1.2009	In progress	No instructions exist.
18.8.2011	In progress	
9.2.2012	In progress	

Date and time (Code):	15.7.2007, 18.11 (C5/2007R)		
Location:	Talviainen station		
Type of occurrence:	Derailment		
Train type and number:	Freight train 3913, 2 Dv12 diesel locomotives and 35 wagons		
Road vehicle:			
		In the train	***In the road vehicle***
Persons on board:	***Crew:***	1	
	Passengers:	0	
Fatally injured:	***Crew:***	0	
	Passengers:	0	
Seriously injured:	***Crew:***	0	
	Passengers:	0	
Slightly injured:	***Crew:***	0	
	Passengers:	0	
Damages of rolling stock:	Some brake clutches of the locomotive had to be replaced and wheels required lathing.		
Damages on track equipment:	Track retainers broke off and the wheels of the derailed locomotive left marks on the sleepers.		
Other damages:	The axle counter sensor and cable were replaced.		

***Summary*:** On Sunday 15 July 2007 at 6.11 p.m., one of the two locomotives of a freight train was derailed after passing a curved turnout in Talviainen station. The derailed locomotive incurred some damage.
The derailment occurred because the track was bent out of shape and therefore hindered passage.

Final report issued:	18.11.2008

Recommendation Nr. S249	The rail inconsistency that was uncovered during the investigation would have been noticed earlier if track geometry measurements had been completed before the rail was taken into use, for example during final rail securing work. Final rail securing work is a good time for this, since today's securing machines enable track geometry measurements. Measurements could be a quality requirement. This would ensure that any geometries that do not meet regulations would become apparent before track commissioning.	
	Demanding surface construction projects should include rail geometry measurements before the track is taken into use. The measurements could be compared with set limit values.	
Date	***Status***	***Comments***
20.1.2009	In progress	All of the constructors do not yet have devices.
18.8.2011	In progress	Some constructors have already obtained equipment.
9.2.2012	**IMPLEMENTED**	

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.

Final report issued:	29.12.2008

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 chanc-ing the town plan.
18.8.2011	Not yet imple-mented	Will be removed in context of Seinäjoki-Oulu track project.
9.2.2012	Not yet imple-mented	

Recommendation Nr. S252	Because a car can become wedged under the front structure of the train when the structure breaks, the Accident Investigation Board recommends the following:	
	The front structure of the Sm3 electric train should be redesigned to prevent cars from being wedged under the structure.	
Date	***Status***	***Comments***
20.1.2009	In progress	
19.2.2010	In progress	
16.6.2011	Not yet imple-mented	According to VR the running features of the train would change too much.
9.2.2012	Not yet imple-mented	

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.

Final report issued:	26.1.2009

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	

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 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	

Date and time (Code):	26.8.2008, 10.43 (B5/2008R)		
Location:	Suonenjoki, Haapakoski, Konttila level crossing, unprotected		
Type of occurrence:	Level crossing accident, railway work unit – car		
Train type and number:	Railway work unit 7582, Service rail car Tka8 and 3 wagons		
Road vehicle:	Car Ford Sierra 4D 2.0, 1986 model		
		In the train	***In the road vehicle***
Persons on board:	***Crew:***	1 + 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:	Slight damages to the service railcar, the car entirely wrecked.		
Damages on track equipment:	None.		
Other damages:	None.		

***Summary*:** At 10.43 a.m. on Tuesday 26 August 2008, a railway work unit en route from Pieksämäki to Suonenjoki collided with a car at an unprotected level crossing in Suonenjoki.
The accident was fatal to the driver of the car. The car was damaged beyond repair and the railway work unit, which was a service railcar, incurred minor damage.
The direct cause of the accident was that the car driver drove onto the level crossing without stopping. In all probability, the driver completely failed to observe the railway work unit approaching from the left. The lack of a proper wait platform, a sharply rising road and limited visibility made it difficult to observe the surroundings and drive the car at the same time.

Final report issued:	26.6.2009

Recommendation Nr. S258	In their statement, the owners of the rights to the road indicated that they were not aware that they were responsible for the road's maintenance in the vicinity of the level crossing.
	The Finnish Rail Administration should inform parties in charge of road maintenance about their obligation to build and maintain road segments

	leading to level crossings as set out in the relevant regulations. The Finnish Rail Administration should also appropriately inform of any track changes to be made and any shortcomings discovered during inspection rounds.	
Date	***Status***	***Comments***
19.2.2010	In progress	
18.8.2011	Not yet implemented	Needs co-operation between Finnish Transport Agency and Road Association.
9.2.2012	**RECOMMENDATION DELETED**	Content of this recommendation is included in new recommendation S317.

Date and time (Code):	8.6.2008, 5.48 (C5/2008R)		
Location:	Jyväskylä railway yard		
Type of occurrence:	Collision of the locomotive and the tamping machine at the railway yard		
Train type and number:	3 x Dv12 locomotive – turnout tamping machine Ttk2-857		
Road vehicle:			
		In the train	***In the road vehicle***
Persons on board:	***Crew:***	1 - 4	
	Passengers:	0	
Fatally injured:	***Crew:***	0	
	Passengers:	0	
Seriously injured:	***Crew:***	0	
	Passengers:	0	
Slightly injured:	***Crew:***	0 – 1	
	Passengers:	0	
Damages of rolling stock:	The tamping machine was damaged in the chassis, body, bogies, wheelsets and automated controls. The foremost locomotive's maintenance deck and hand rails were damaged on the right side.		
Damages on track equipment:	About 20 metres of track was damaged.		
Other damages:	None.		

Summary**:** On 8 June 2008 at 5.48 a.m., a turnout tamping machine was involved in an accident at the Jyväskylä railway yard, leading to the slight injury of a track foreman in the driver's cab of the tamping machine. The accident involved the collision of a unit consisting of three Dv12 locomotives with a tamping machine involved in work. The engine driver applied the emergency brakes, but the locomotives were unable to stop in time and the front corner of the foremost locomotive collided with the left corner of the tamping machine. The force of the collision caused the right rail to collapse underneath the tamping machine. The collision damaged the tamping machine in places including the chassis, body, automated controls, bogie and wheelsets. The foremost locomotive incurred damage on the right side of the maintenance deck and hand rails. About 20 metres of track were damaged.
The direct cause of the accident was that the front of the tamping machine, which was at work on turnout V032, extended so close to turnout V024 that the locomotives were unable to safely pass the tamping machine. Since turnout V032 was reserved because it was being replaced, turnout V024 was also reserved. In order to control and reverse turnout V024, the traffic controller had to use the VHP[9] command. The traffic controller was unaware of the precise location of the tamping machine. Another factor contributing to the accident lay in the fact that the tamping machine's foreman and the traffic controller had not agreed on the precise limits of the work area.

Final report issued:	6.8.2009

Recommendation Nr. S262	Just before the unit consisting locomotives and tamping machine collided, the traffic controller prepared a route for the locomotives through a turnout adjacent to the work area reserved for the tamping machine, using the VHP command.	
	Before executing the VHP command, the traffic controller should ensure that there are no other units at or within the vinicity of the turnout for which the command is given.	
Date	***Status***	***Comments***
19.2.2010	In progress	
18.8.2011	Not yet implemented	Should be included in instructions of traffic control centres.
9.2.2012	**IMPLEMENTED**	

[9] VHP = emergence release of point locking.

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.

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***
19.2.2010	In progress	
18.8.2011	In progress	
9.2.2012	In progress	

Date and time (Code):	13.6.2008, 13.50 (B2/2008R)		
Location:	Helsinki, Mäkelänkatu 45, Mäkelänrinne stop, no. 0269		
Type of occurrence:	Collision, rear collision		
Rolling stock type and number:	Articulated tram type I, no. 70, line 1, shift 3 – articulated tram type I, no. 42, line 7B, shift 71		
Road vehicle:			
		In the tram	***In the road vehicle***
Persons on board:	***Crew:***	1 + 1	
	Passengers:	18 + 31	
Fatally injured:	***Crew:***	0	
	Passengers:	0	
Seriously injured:	***Crew:***	0 + 0	
	Passengers:	2 + 0	
Slightly injured:	***Crew:***	0 + 1	
	Passengers:	11 + 11	
Damages of rolling stock:	The front of the tram colliding with the other was somewhat damaged, and the rear of the other tram was seriously damaged.		

Damages on track equipment:	None.
Other damages:	None.

***Summary*:**. On Friday, 13 June 2008, at 1:50pm, a line-1 tram collided with the rear of a line-7B tram on the Mäkelänrinne stop, on Mäkelänkatu, in Helsinki. Two passengers were severely injured. A tram driver and 22 passengers were slightly injured. Several others received lesser injuries such as bruises and neck and shoulder pain and headaches caused by whip flash. The rails were not damaged and the trams remained on the rails. The rear of the line-7B tram was substantially damaged. For example, the chassis of the rearmost car was bent out of shape. The front of the line-1 tram was somewhat damaged, but after minor repairs it was temporarily operative.
The cause of the accident was that the driver of the tram approaching from behind was not able to stop the tram in time. The driver apparently tried to stop the tram via incorrect braking methods in the belief that the brakes were not working properly. The background factors were the driver's inexperience, the possibility that the driver anticipated that the tram ahead would leave the stop earlier, and the driver's suspicion that the brakes were not working properly and therefore the use of the incorrect braking method.

Final report issued:	4.11.2009

Recommendation Nr. S267	The floor hatch that came off at the joints caused severe injury to one passenger. The floor hatches of articulated trams are not locked. In order to ensure that the hatches do not come off in collisions and similar accidents.	
	It should be ensured that tram floor hatches remain fastened in all conditions.	
Date	***Status***	***Comments***
19.2.2010	In progress	Fastening of hatches in articulation part has been solved, designing of the fastening of other hatches is not yet ready.
16.6.2011	In progress	Is postponed to year 2012.
9.2.2012	In progress	

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.

Final report issued:	31.8.2009

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	
Recommendation Nr. S270	Several parties from the Finnish Rail Administration and VR Group participate in the traffic control system procurement and management. The organising of work packages and the assignment of project ownership and responsibilities over the life cycles of the systems are unclear. The centralisation of traffic control requires continuous introduction of new automation and information technologies. The deviations investigated have involved shortcomings in system user instructions as well as difficulties for the users to identify problematic situations on the display screens. The responsibility for ensuring that the systems function properly and that the corrective actions are monitored should be placed near the end users.	
	The experts using traffic control systems on a daily basis should participate in the specifications, inspections, and start-up activities of these systems and also take part in the system administration during the life-cycle of the system.	
Date	***Status***	***Comments***
19.2.2010	In progress	
18.8.2011	In progress	
9.2.2012	**IMPLEMENTED**	

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	
		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.	
	Signal E681 should be moved to a more visible location.	
Date	***Status***	***Comments***
18.8.2011	In progress	
9.2.2012	In progress	
Recommendation Nr. S273	Broad ATC construction areas slow down traffic and force centralised traffic control to perform prioritisation in order to minimise delays from schedule. Non-standard arrangements also increase the risk of accident.	
	Overly extensive ATC construction areas should be limited.	
Date	***Status***	***Comments***
18.8.2011	In progress	Technical possibilities exist.
9.2.2012	**IMPLEMENTED**	

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.	
	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	
Recommendation Nr. S275	The information provided by the locomotive's running control as the train approached the ATC construction area was incomplete.	
	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	

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

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

The accident was caused by the car driver noticing the train too late and not having time to stop or otherwise prevent the accident.

Final report issued:	10.3.2010	
Recommendation Nr. S276	The Pikakyläntie road is mainly used as a shortcut, and there are two guarded level crossings in the vicinity of the level crossing. Traffic on Pikakyläntie could be safely directed to these roads and over the Pori–Mäntyluoto track. In addition, since equipping a level crossing with a warning installation with half-barriers is expensive, the Investigation Commission recommends:	
	The unprotected level crossing of Teurastamo on the Pikakyläntie road should be removed.	
Date	***Status***	***Comments***
18.8.2011	In progress	Private road transaction is in progress.
9.2.2012	In progress	
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	

Date and time (Code):	1.10.2009, 12.29 (C4/2009R)		
Location:	Koria station on the Lahti–Kouvola section of line		
Type of occurrence:	Incident, risk of collision of a passenger train and a freight train.		
Train type and number:	Passenger train IC6 – freight train 2823		
Road vehicle:			
		In the train	***In the road vehicle***
Persons on board:	***Crew:***	2+2	
	Passengers:	400+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.		

***Summary*:** At 12:29pm on Thursday, 1 October 2009, an incident occurred at the Koria station on the Lahti–Kouvola section of line, when a passenger train ended up on the wrong track in front of a freight train.

Several sub-projects relating to the Lahti–Luumäki–Vainikkala construction project were under-way on the Lahti–Kouvola section of line. With regard to the Koria station, work was in progress relating to the commissioning of a new signal box to be installed on the Lahti–Kouvola section of line. The Automatic Train Protection (ATP) system was not operational at the Koria station and special arrangements were applied at the station. The signal box of Koria station was manned.

Final report issued:	18.5.2010

Recommendation Nr. S280	Safety planning for the transitional stage was not entirely successful. The location of the construction area, the use of the railhead sign on the route, and the utilisation of the features of the signal box, were not appropriate in terms of the entire project. Decommissioning or exceptional usage of systems relating to Automatic Train Protection and safe traffic arrangements should be taken into account as separate risk factors in safety planning relating to the railway system.	
	A risk assessment of technical safety systems as well as the planning, implementation, provision of instructions, and monitoring of safety-enhancing measures based on this assessment should be carried out in conjunction with all construction projects involving work on safety devices.	
Date	***Status***	***Comments***
18.8.2011	In progress	Implemented in major projects.
9.2.2012	In progress	

Date and time (Code):	17.7.2009, 9.50 (B7/2009R)
Location:	Loviisa, Rauhalantie level crossing, unprotected
Type of occurrence:	Level crossing accident, freight train – car
Train type and number:	Freight train 2867, two Dv12 diesel locomotives and a wagon
Road vehicle:	Car Volkswagen Golf Variant, 2004 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 front of the locomotive sustained some damage, the car was wrecked beyond repair.		
Damages on track equipment:	None.		
Other damages:	None.		

***Summary*:** On Friday, 17 July 2009, at 9.50am, a level crossing accident took place at the unprotected Rauhalantie level crossing in Loviisa, in which the driver of a car perished after having steered in front of a freight train.

The most probable cause for the accident was the elderly driver's failure to perceive the approaching train. Other underlying causative factors in the accident may include the driver's familiarity with the level crossing and the fact that his physical capabilities were diminished through illnesses and impaired eyesight.

Final report issued:	6.9.2010

Recommendation Nr. S281	The relevant parties hold divergent views on the duty to clear the sightlines. **The Ministry of Transport and Communications should ensure that such consistent guidelines on the duty to clear the sightlines are issued as are acceptable to all parties.**	
Date	***Status***	***Comments***
16.6.2011	In progress	A working group will be needed.
9.2.2012	**RECOMMENDATION DELETED**	Content of this recommendation is included in new recommendation S317.

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 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 com-

	mission 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	

Date and time (Code):	14.7.2009, 11.17 (B6/2009R)		
Location:	Vihti, Kotkaniemi / Kotkaniemi 1 level crossing, unprotected		
Type of occurrence:	Level crossing accident, freight train – car		
Train type and number:	Freight train 3647, two Dv12 diesel locomotives		
Road vehicle:	Car Renault Megane 1.6, 2000 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:	The front of the locomotive suffered minor damage and the car was entirely wrecked.		
Damages on track equipment:	Wooden cover of the next level crossing was damaged.		
Other damages:	None.		

***Summary*:** At 11:17 a.m. on Tuesday 14 July 2009, a fatal level crossing accident occurred on the Kotkaniementie unprotected level crossing in Ojakkala in Vihti. The accident occurred when a car travelling along Kotkaniementie road drove without stopping in front of a freight train en route to Riihimäki. A nine-year-old girl in the car was fatally injured. The car was wrecked beyond repair. Damage totalling €6,000 was caused to yhe rolling stock and to the track.
The cause of the accident lay in the car driver's completely failing to observe the approaching freight train.

Final report issued:	15.10.2010

Recommendation Nr. S283	The level crossing is very busy with various kinds of traffic, especially during the summer. Each year, nearly 4,000 people visit the premises of Yara Suomi on the other side of the crossing (Kotkaniemi road maintenance committee statement 5 November 2009). There is no alternative route to these premises. In addition, the Kotkaniemi private road maintenance committee covers four properties and summer residences with a total of 22 shareholders. Considering the busy domestic and international traffic on the Kotkaniemi road, the investigation commission recommends the following:	
	The Kotkaniemi 1 level crossing should also be equipped with warning installation with half-barriers.	
Date	***Status***	***Comments***
16.6.2011	In progress	Transport Agency and Vihti municipality are drafting a joint project Nissola interchange arrangement preliminary master plan, the purpose is the removal of Kotkaniemi level crossing.
9.2.2012	In progress	

Date and time (Code):	17.9.2009, 13.13 (C3/2009R)		
Location:	Kilpua, Kilpua station		
Type of occurrence:	Derailment		
Train type and number:	Freight train 5418, 2 x Sr1-electrical locomotive + 45 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:	The bogies and breaking equipment of four derailed wagons were damaged.		
Damages on track equipment:	Track damage extended over around 200 metres.		
Other damages:	None.		

***Summary*:** On Thursday 17 September 2009 at 13:13 p.m., five Russian pellet-carrying wagons were derailed at Kilpua station on the Oulu-Ylivieska section of line. The derailment occurred at the southern end of the station, when a pellet train en route from Oulu to Kokkola departed from track three towards the main track after giving way to an oncoming train. When the train's rear section was still on track 3, the train driver felt an abrupt jerk and noticed the brake pipe loosening. The train driver immediately stopped the train and went outside to inspect the situation. Although the last three of the train's eight wagons were still on the track, five had been derailed. The train had a total of 45 wagons. Being able to disengage the train at the point where the first wagon had derailed, the driver moved the wagons at the front to Oulainen for further inspection. The total costs of the incident amounted to 112,000 euros.
The incident occurred because the heavy pellet train was directed onto a sidetrack which was in poor condition. Due to oncoming traffic, the remote controller was forced to direct the freight train onto Kilpua's track three.

Final report issued:	25.11.2010

Recommendation Nr. S284	Knowing the actual condition of station sidetracks is of major importance to traffic control, which directs trains towards sidetracks when the traffic situation so requires. In order to ensure that traffic control can choose the right track for any given train, the Accident Investigation Board recommends the following:	
	The Finnish Transport Agency should define the station sidetracks to which trains comprising heavy Russian wagons can be directed. Clear restrictions should be imposed with regard to tracks that are unsuitable for heavy Russian wagons.	
Date	***Status***	***Comments***
16.6.2011	In progress	VR: Information about tracks, which can not be used, should be available.
9.2.2012	**IMPLEMENTED**	

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.		
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	

Date and time (Code):	26.4.2010, 17.10 (B4/2010R)		
Location:	Helsinki railway yard, turnout V013		
Type of occurrence:	Derailment		
Train type and number:	Commuter train 9488, 3 x Sm4 electric train units		
Road vehicle:			
		In the train	***In the road vehicle***
Persons on board:	***Crew:***	2	0
	Passengers:	100	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:	The train's wheels, bogies, chassis protection sheets, left side, two windows, pantograph, and some roof structures were damaged.		
Damages on track equipment:	Both switch mechanisms were replaced. Sleepers and rails were damaged. A catenary, portal and support were replaced.		
Other damages:	None.		

Summary**:** On Monday 26 April 2010 at 5:10 pm, a commuter train was derailed in Helsinki at a turnout. The train was approaching track 6 at Helsinki station when a turnout along the route turned underneath the train causing the train to be derailed. The rearmost unit of the three-unit train derailed and collided with a catenary support, with the result that the portal fell on the train's roof causing extensive power outage at Helsinki railway yard. The derailed unit was damaged and there was also damage to track equipment. There were no personal injuries.

The cause of the derailment was that the turnout turned underneath the train. This was due to emergency commands issued from the signal box control. The traffic controller issued the commands to a turnout other than the one intended. Contributing to this was the fact that insulated track section faults had been common at Helsinki railway yard. Due to these faults, traffic control was using shunting routes for which emergency commands could be issued. This had become almost daily practice. Methods with stripped security were being used so as not to disturb the flow of traffic. Partly contributing to the accident was the fact that the traffic controller had very little experience with the task.

Final report issued:	7.4.2011
Recommendation Nr. S286	Track availability monitoring equipment, which is unreliable and often fails, is indirectly causing situations in which overall security is being compromised. The investigation commission therefore recommends the following to the Finnish Traffic Agency:
	The party responsible for the upkeep of the track should systematically monitor and, when required, improve track maintenance and techniques for determining track availability so that security is not unnecessarily compromised.

Date	***Status***	***Comments***
9.2.2012	**IMPLEMENTED**	
Recommendation Nr. S287	The rail system and traffic control involve tasks for which proper handling requires plenty of system knowledge, practice, and attention. During the rush hour, and especially during equipment failure, the Helsinki signal box control tables are critical locations with regard to safety. The investigation commission therefore recommends the following to the Finnish Traffic Agency and VR Group:	
	Traffic control job rotation should ensure that demanding posts are familiar to traffic controllers by means of training and sufficient job rotation. With regard to training in the identification and handling of disturbances, and response procedures relating to them, special attention should be given to practices that do not compromise safety.	
Date	***Status***	***Comments***
9.2.2012	In progress	

Date and time (Code):	19.2.2010, 4.43 (C1/2010R)		
Location:	The tracks at the Neste Oil Oyj unloading terminal in Kilpilahti		
Type of occurrence:	Collision with a solid object (buffer stop)		
Train type and number:	Shunting unit, Dr14 diesel locomotive + 51 tank wagons		
Road vehicle:			
		In the train	***In the road vehicle***
Persons on board:	***Crew:***	1+2	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:	One tank wagon was badly damaged, whilst the wheels of another got flats.		
Damages on track equipment:	The rail barrier on the track was damaged.		
Other damages:	Some of the gas pipelines at the refinery were bent, and the pipe insulation was damaged. The pipeline supports were also damaged.		

Summary**:** On Friday, 19 February 2010, five tank wagons pushed by a shunting unit bumped against a rail-barrier stop on track 204 at the Neste Oil Oyj unloading terminal in Kilpilahti, Finland. The first barrier wagon fell down the embankment, hitting a gas pipeline at the bottom. The second protection wagon came to a stop at the edge of the embankment, and the three Russian wagons behind it, containing industrial gasoline, were derailed. Neither the gas pipeline nor the wagons suffered any leaks. The wagons containing industrial gasoline had to be emptied before clearance work could begin.

The immediate cause of the accident was the shunting foreman's failure to escort the wagons all the way. He was under the impression that there was enough room for the wagons on the track. The shunting foreman's activities were influenced by the following factors:

-While trying to disengage the brakes, the conditions for the shunting foreman were hot.
-They were then cold during the long (3 km) pushing movement.
-It was the foreman's third night shift in a row and he was very tired.
-It was the foreman's first shift as an independent shunting foreman at Kilpilahti.
-The shunting foreman had not received sufficient training to act as a shunting foreman at the unloading terminal.

Final report issued:	13.4.2011

Recommendation Nr. S288	To improve train safety and occupational health and safety, and as the distance is long and the track ends in a rail barrier, the Accident Investigation Board recommends the following:	
	Heavy and long rows of wagons should be transported into the Neste Oil Oyj unloading terminal in Kilpilahti by pulling them with a locomotive.	
Date	***Status***	***Comments***
16.6.2011	**IMPLEMENTED**	

Recommendation Nr. S289	If the person participating in orientation training is working as a member of a train crew, it is difficult for him or her to observe what the shunting foreman is doing. Therefore, the Accident Investigation Board recommends the following:	
	The orientation training given to shunting foremen should be carried out so that the person participating in the training accompanies the shunting unit as an extra crew member.	
Date	***Status***	***Comments***
9.2.2012	In progress	
Recommendation Nr. S290	To ensure that the orientation training for new duties is comprehensive, the Accident Investigation Board recommends the following:	
	An orientation plan and an orientation training card be drawn up, with the latter signed by both the orientation trainer and the trainee after the training is complete.	
Date	***Status***	***Comments***
9.2.2012	In progress	

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.		
Final report issued:	4.5.2011	
Recommendation Nr. S291	A switch is the single most dangerous element in a railway system. Incorrect work methods used in the maintenance of switches may lead to systematic faults. To ensure that no misadjusted locking devices or switch contactors remain on Finnish railways, causing a significant risk of derailment, the Investigation Commission recommends that the Finnish Transport Agency and VR Track Oy carry out the following:	
	Adjustments of the locking devices and switch contactors located next to them should be inspected regularly and adjusted according to reference values.	
Date	***Status***	***Comments***
9.2.2012	In progress	
Recommendation Nr. S292	The investigation revealed that under test conditions it was possible to repeatedly create a situation in switch where mechanical oscillation in the closed blade caused the point switch to become unlocked. The Investigation Commission therefore makes the following recommendation to the Finnish Transport Agency:	
	How the mechanical switch lock become unlocked should be investigated under normal circumstances, as well as control disturbances in the point switches.	
Date	***Status***	***Comments***
9.2.2012	In progress	
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	
Recommendation Nr. S294	The indirect consequences of a railway accident at a critical point may have a significant impact on the use of the railway system and the users of transport services. Currently there are many operators in the railway system. The Investigation Commission therefore makes the following recommendation to the Finnish Transport Agency:	
	To maintain control of the overall situation, a plan of action for accidents should be drawn up by the infrastructure manager.	
Date	***Status***	***Comments***
9.2.2012	**IMPLEMENTED**	
Recommendation Nr. S295	The Tampere traffic control was overburdened by the management of train operations and the arrangements for replacement transport. A comprehensive plan for traffic management and train services was never drawn up. There was no plan available for the use of traction services under exceptional circumstances. The organisation of equipment and personnel rotation also placed a burden on traffic control in Tampere. The Investigation Commission therefore makes the following recommendation to the Finnish Transport Agency and VR Group:	
	To deal effectively with exceptional situations, the forms of cooperation and the distribution of duties and responsibilities should be clearly defined both at national and local level.	
Date	***Status***	***Comments***
16.6.2011	**IMPLEMENTED**	

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. Having collided first with the rail barrier and then the wall of the office building, the double-decker coach was so badly damaged that it had to be scrapped. The second, third, and fourth cars in the train suffered minor damage. In the fifth car, a 1,500-volt cable and a UIC cable were broken, and a brake conduit came loose. The other cars were undamaged. The rail barrier at the end of the track was completely crushed, and the concrete buffer stop behind it suffered minor fractures in the corners. The horizontal end beam to which the contact wires are attached was torn off. The office building suffered substantial material damage. The load-bearing primary frame of the building did not suffer significant damage, but the hollow-core slabs were fractured, and they also moved slightly. A meeting room in the impact area on the second floor of the building was completely destroyed, and the street-level entrance suffered substantial damage. Additionally, the building maintenance and safety-technology-related systems in the immediate vicinity of the impact area were damaged. 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.

Final report issued:	5.5.2011

Recommendation Nr. S296	The current instructions for tightening of the screw coupling, 'to be tightened sufficiently', leave too much room for interpretation. This is why 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:	
	Unambiguous instructions concerning the tightening of the screw coupling in various car types should be drawn up.	
Date	***Status***	***Comments***
9.2.2012	In progress	
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	
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***
9.2.2012	In progress	
Recommendation Nr. S299	There was no preparedness plan in existence for dealing with a situation of this type, and after a brief discussion, the separated cars were steered onto a vacant track. To ensure that a preparedness plan exists, the Investigation Committee recommends to the Finnish Transport Safety Agency that it ensure that the Finnish Transport Agency take the necessary steps to implement the following recommendation:	
	A preparedness plan for exceptional circumstances should be drawn up for traffic control.	
Date	***Status***	***Comments***
9.2.2012	**IMPLEMENTED**	

Date and time (Code):	30.12.2008 (C1/2009R)		
Location:	Korvensuo–Haarajoki, Kerava Hakosilta section of line		
Type of occurrence:	Incident, wrong signal information of the ATP		
Train type and number:			
Road vehicle:			
		In the train	***In the road vehicle***
Persons on board:	***Crew:***	0	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:	None.		
Damages on track equipment:	None.		
Other damages:	None.		

***Summary*:** According to a deviation notification a safety problem was encountered in Korvensuo on 30 December 2008. Engine drivers notified that they were receiving restrictive information. A distant signal was indicating stop even though a balise at the previous signal had given to the automatic train protection equipment (ATP) the preliminary information that driving at the fastest speed was permitted (proceed Fsl), and, as the train caught sight of the subsequent main signal, it showed the proceed aspect.

The reasons for the faulty ATP operation was that an outdated card version had been placed in the IM -module (signal box computer) controlling data transfer between Haarajoki and Korvensuo signal boxes. The wrong flash card had been installed because the software version had not been verified before installing the card. The installers said that this was because verification equipment was not operational due to the transfer of the office to another location. The card had also not been marked sufficiently clearly.

The situation was temporarily fixed once the deviation had become apparent by setting an 80 km/h speed limit in the area. The Thales "Emergency Team" met on 5 January 2009 to analyse the situation. Once the reason for the irregularity was observed, a new flash card was installed in the Haarajoki signal box module on 5 January 2009 at 23.00. The operations were tested and on 7 January 2009 the 80 km/h speed limit was lifted from the area.

Final report issued:	11.5.2011

Recommendation Nr. S300	In order to prevent the use of wrong card versions, the Accident Investigation Board has made the following recommendation:	
	The Finnish Transport Agency should ensure that signal box adjustment and repair work inspections, and documentation relating to them, are supervised and the importance of inspection is emphasised in signal box maintenance training.	
Date	***Status***	***Comments***
9.2.2012	In progress	
Recommendation Nr. S301	In order to prevent the use of wrong card versions, the Accident Investigation Board has made the following recommendation:	
	The Finnish Transport Agency should ensure that component versions are marked clearly and that personnel are made aware of different versions during maintenance actions.	
Date	***Status***	***Comments***
9.2.2012	In progress	

Date and time (Code):	14.4.2010, 16.47 (B3/2010R)			
Location:	Karjaa, Leskinen/Leppämäentie level crossing, unprotected			
Type of occurrence:	Level crossing accident, commuter train - car			
Train type and number:	Commuter train 389, Dm12-railbus			
Road vehicle:	SUV Mitsubishi PAJERO, model 1993			
			In the train	***In the road vehicle***
Persons on board:	***Crew:***		3	1
	Passengers:		~ 30–40	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 commuter train was damaged; the SUV was wrecked beyond repair.			
Damages on track equipment:	None.			
Other damages:	None.			

Summary**:** On Wednesday 14 April 2010 at 4.47pm, a fatal level crossing accident occurred on the Leskinen/Leppämäentie unprotected level crossing in Raasepori, Karjaa. The accident occurred when an SUV leaving a nearby logging site collided with a commuter train (railbus) en route from Hanko to Karjaa. The only person in the SUV was the driver, who died instantly. The damage caused by the accident to track equipment amounted to € 94,500. The SUV was wrecked beyond repair.

The accident occurred because the car driver observed the approaching train too late and was no longer able to stop before the level crossing.

The factors contributing to this were:

-The driver was probably focused on something other than making a safe crossing.

-The crossing was quite familiar to the driver, which usually reduces vigilance when approaching.

-The level crossing was not equipped with warning installations.

-Driving and a safe crossing were hindered by the road being on an incline, the lack of wait platforms, high track embankment and trees surrounding the road.

Final report issued:	25.5.2011

Recommendation Nr. S302	Considering the poor sightlines at the level crossing as well as the incline and track speed limits, the investigation commission makes the following recommendation:	
	The Leskinen/Leppämäki level crossing should be replaced by an interchange.	
Date	***Status***	***Comments***
9.2.2012	In progress	

Date and time (Code):	25.2.2010, 12.42 (B2/2010R)		
Location:	Pori Tattaritie/Tattari level crossing, unprotected		
Type of occurrence:	Level crossing accident, Car – Freight train		
Train type and number:	Freight train 3862, Dv12 diesel locomotive and 5 wagons		
Road vehicle:	Car Ford Mondeo, model 1998		
		In the train	***In the road vehicle***
Persons on board:	***Crew:***	1	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:	Minor damages to the locomotive front, the car entirely wrecked.		
Damages on track equipment:	None.		
Other damages:	None.		

Summary**:** On Thursday 25 February 2010 at 12:42, a fatal level-crossing accident occurred in Pori on the level crossing at the intersection of Tattaritie and the Mäntyluoto-Pori railway line. The driver of the train noticed that a passenger car was approaching the crossing from the right and gave a warning signal. It then became apparent to the driver of the train that the passenger car was not going to stop and the driver of the train put on the emergency brakes. The train ran into the left side of the car, the car jammed into the locomotive and the locomotive forced the car forward for 304 metres until the train came to a halt. The right buffer of the train penetrated the left side window of the car. The driver of the car died immediately from head and chest injuries. A car passenger died later in hospital from head and chest injuries.

The accident occurred because the driver of the car failed to notice the approaching train in time and was no longer able to stop or otherwise prevent the collision. Factors contributing to this were:

-The crossing was familiar to the driver of the car, which is a factor that generally reduces vigilance. The driver had also driven across the level crossing in the other direction moments before the accident.

-The level crossing was not equipped with warning installations.

-The level crossing was not equipped with proper waiting platforms and the road rises before the crossing to such an extent that drivers tend to avoid stopping before the crossing, especially in wet or slippery conditions.

-The car had tyres designated for summertime use.

-For the 30 metre stretch before the level crossing, the road had two intersections with give way signs.

Final report issued:	19.7.2011

Recommendation Nr. S303	The Tattaritie level crossing provides the only access to a nearby residential area, but it would be possible to organise a safer route by building 200 metres of road in such a way that the new road would connect with the Ulasoori-Kanaa road, which has a level crossing equipped with warning installations. Therefore, the investigation commission recommends:	
	The Tattaritie level crossing should be removed.	
Date	***Status***	***Comments***
9.2.2012	In progress	