NIB ANNUAL REPORT 2008

Accident Investigation Board

FINLAND

PREFACE TO THE REPORT

This is the annual report of railway sector of the Accident Investigation Board of Finland for calendar year 2008. This is mainly the part of the Annual Report 2008 of AIBF, which relates to railway sector. There are also some parts which have added that the report would measure up to standards of ERA.

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 BODY

1.1 Legal Basis

The Accident Investigation Board of Finland was founded in 1996 within the Ministry of Justice. The tasks of the Accident Investigation Board are specified in the relevant act and decree which also include overall directions on the characteristics of the accidents to be investigated and the methods of investigation to be implemented.

The investigation of aviation accidents is based on the relevant European Council Directive (94/56/EY) and the Convention on International Civil Aviation (Treaty Series of the Statute Book 11/49), and the investigation of rail accidents is based on the EU Railway Safety Directive (2004/49/EY). As for maritime accidents, their investigation is based on the European Council Directive 1999/35/EY and 2002/59/EY.

In Finland the investigation of rail accidents is based on the EU Railway Safety Directive. The New Rail Act came into force the 1 September 2006. The New Finnish Rail Agency started work the same day. The current accident investigation act is close to the Safety Directive. Making changes to the accident investigation act will start in 2009.

1.2 Role and Mission

The tasks of the Accident Investigation Board are specified in the relevant act and decree which also include overall directions on the characteristics of the accidents to be investigated and the methods of investigation to be implemented.

By its investigation activities, the Accident Investigation Board intends to enhance overall safety and prevent accidents. As a result of an accident investigation, an investigation report is produced that contains safety recommendations for the competent authorities and other parties concerned. In fact the safety recommendations translate the investigators' views on the means of prevention of similar or corresponding accidents in the future. The Accident Investigation Board moreover monitors the implementation of the recommendations issued. The investigation work conducted by the Board exclusively focuses on an improvement of safety with no stances taken as for questions of culpability, responsibility or liability for damages.

It is the mission of the Investigation Board to investigate all serious accidents, serious incidents and aviation, rail, and marine accidents and incidents.

Accident 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 acci-

dent, the accident investigation intends to reveal any contributory factors and background 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 an accident 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 Accident Investigation Board does not investigate an incident or accident caused intentionally or by an offence.

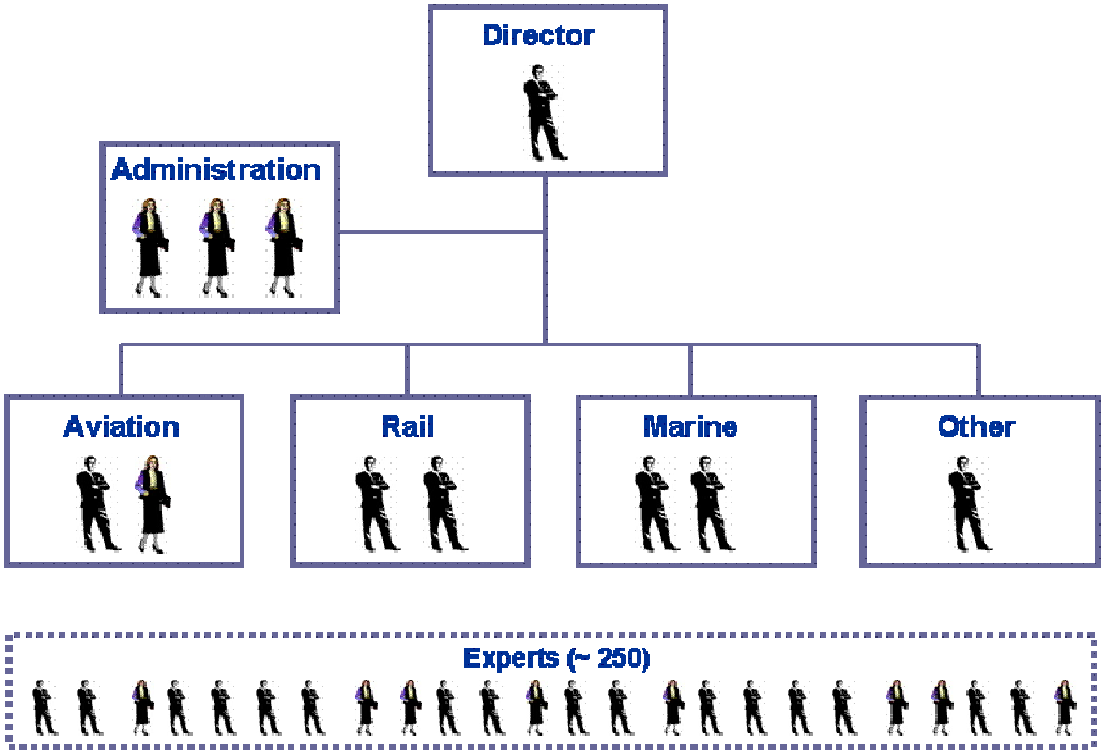
The Accident Investigation Board is also responsible for, e.g. the maintenance of a contingency to rapidly commence an investigation, the training of new accident investigators, the producing of general instructions on the carrying out of the investigation work and on the drawing up of the investigation reports, and the participation in international cooperation in the field.

Finally the Accident Investigation Board is responsible for the printing and distribution of the investigation reports and their publishing on its web pages, www.onnettomuustutkinta.fi.

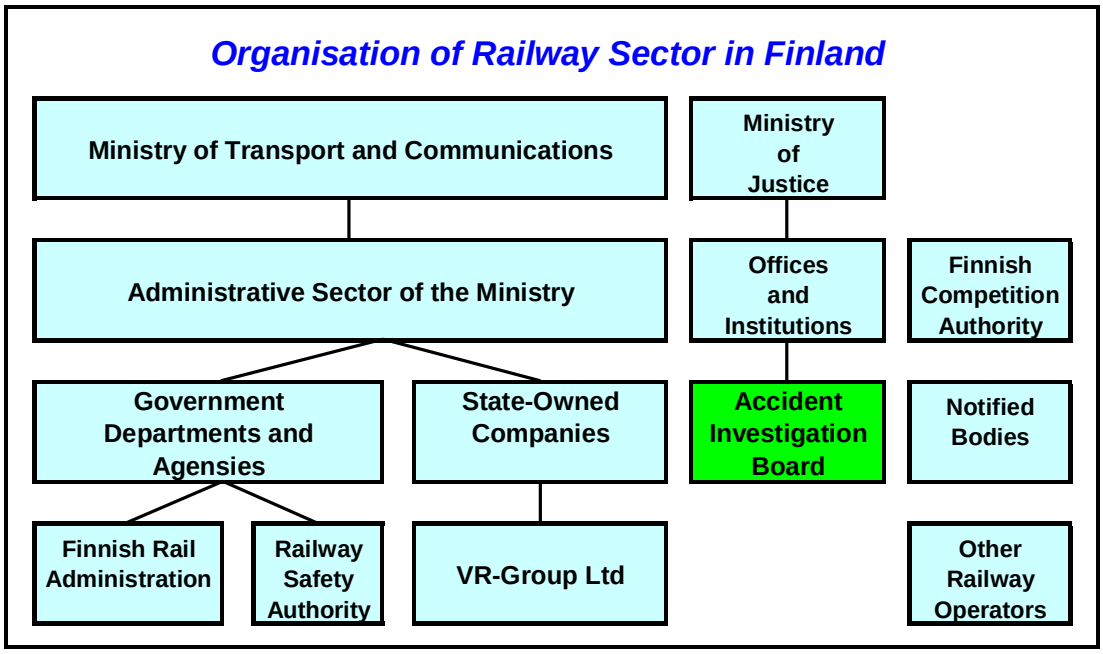
1.3 Organisation

Personnel:

Director	Tuomo Karppinen
Administrative director	Pirjo Valkama-Joutsen
Assistant	Sini Järvi
Assistant	Leena Leskelä
Aviation accidents	
Chief Air Accident Investigator	Hannu Melaranta
Air Accident Investigator	Tii-Maria Siitonen
Rail accidents	
Chief Rail Accident Investigator	Esko Värttiö
Rail Accident Investigator	Reijo Mynttinen (Leave of absence) Acting Erkki Hainari (→28.2.2010)
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

A rail accident investigation is conducted in following cases:

- Accident in train traffic
- Hazardous situation in train traffic
- Accident in shunting work in railways, if a person is deceased or seriously injured
- Accident in shunting work in railways, if it is related to transportation of dangerous goods
- Underground or tram accident, if several persons have been deceased or seriously injured or there is other special safety related reason for the investigation

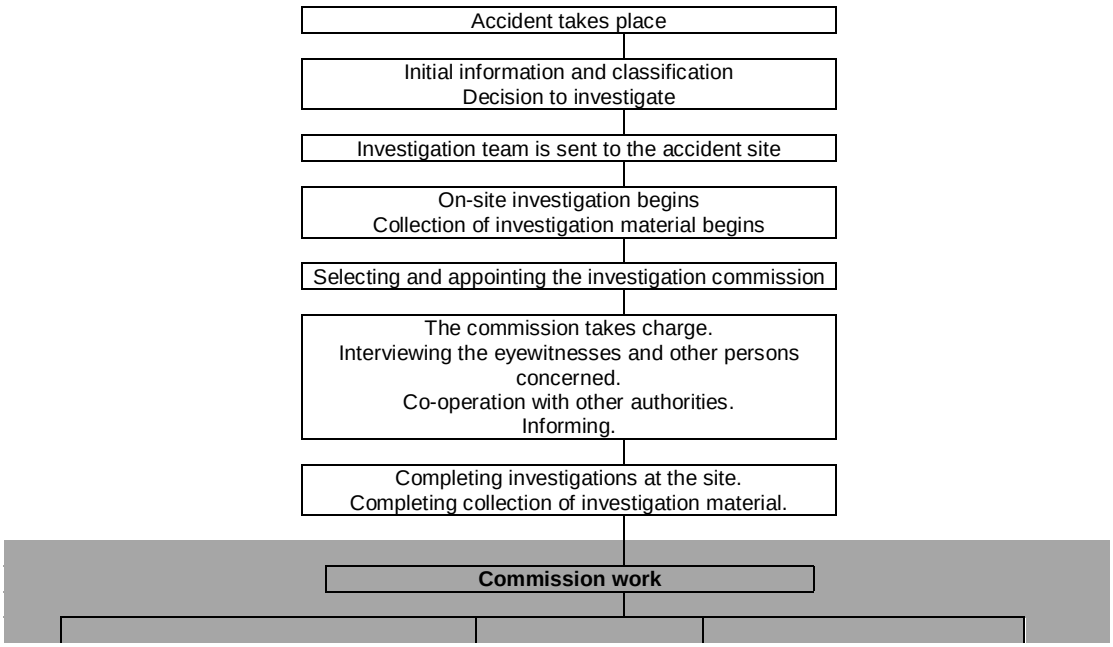
Accident Investigation Board investigates fatal level crossing accidents and level crossing accidents in which a train has derailed or a passenger or a train crew member is deceased or injured seriously.

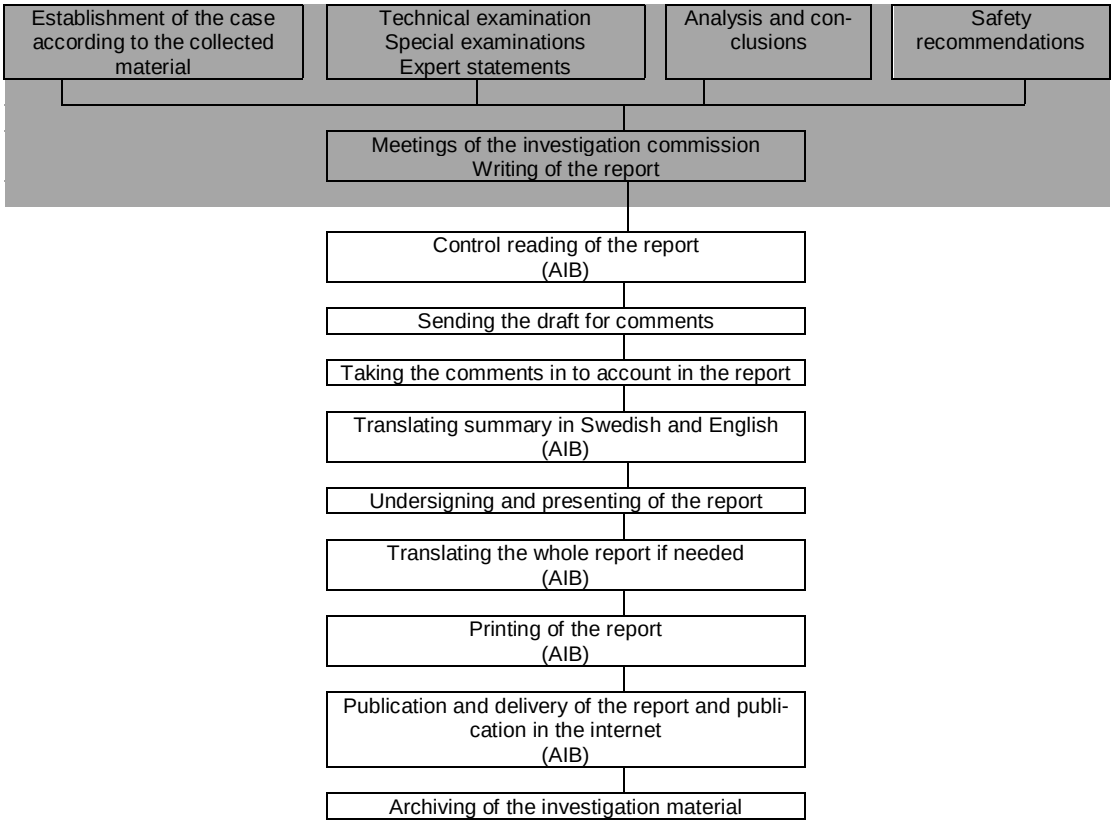
2.2 Institutions involved in investigations

The Accident Investigation Board of Finland investigates all rail accidents. Those investigations are independent and they are public. According to the Railway Act the Finnish Railway Agency can investigate those AIBF does not investigate. Those investigation reports are not public.

2.3 Investigation process or approach of the IB

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	1	50 000	
Derailments	9	0	1	500 000	
Level crossing accidents	4	4	1	190 000	
Other	1	0	0	0	

3.2 Investigations completed and commenced in 2008

Investigations completed in 2008

Date of occurrence	**Title of the investigation** (Occurrence type, location)	**Legal basis**	**Comleted** (date)
6.5.2007	Fatal level crossing accident in Kiuruvesi	i	29.1.2008
13.8.2007	Fatal level crossing accident in Röykkä, Nurmijärvi	i	23.6.2008
6.10.2007	Fatal level crossing accident in Perälä, Kempele	i	29.12.2008
21.11.2007	Fatal level crossing accident in Lahti	i	9.9.2008
31.12.2005	Freight car derailing and member of train crew injured at Tuupovaara	iii	15.4.2008
13.7.2006	Derailment of five freight wagons between Tupovaara and Heinävaara, Finland	iii	6.3.2008
21.3.2007	Derailment of a wagon in Ylivieska	iii	3.3.2008
27.5.2007	Incident at the Tampere railway yard	iii	25.4.2008
3.7.2007	Derailment of eight freight train wagons between Saarijärvi and Äänekoski	iii	12.8.2008
15.7.2007	Derailment of a freight train locomotive in Talviainen	iii	18.11.2008
4.8.2007	Tank wagon loaded with nitric acid tipped over in Siilinjärvi	iii	28.10.2008
8.2.2008	Derailment of five shunting unit wagons in the Heikkilä railway yard in Turku	iii	18.9.2008
1.3.2008	Derailment of a wagon carrying phosphoric acid in Ykspihlaja, Kokkola	iii	24.11.2008
30.4.2008	Collision of a shunting unit and a forklift truck on the Syväsatama port track in Joensuu	iii	30.12.2008
15.5.2008	Derailment of a tank wagon during shunting work in Ykspihlaja, Kokkola	iii	18.11.2008

Basis for investigation: i = According to the Railway Safety Directive, ii = On national legal basis (covering possible areas excluded in Article 2 2§ of the Safety Directive), iii = Voluntary - other criteria (National rules/regulations not referred to the Safety Directive).

Investigations commenced in 2008

Date of occurrence	**Title of the investigation** (Occurrence type, location)	**Legal basis**
25.2.2008	Fatal level crossing accident in Laukaa	i
13.6.2008	Collision of two trams on Mäkelänkatu in Helsinki	ii
25.6.2008	Fatal level crossing accident in Viinijärvi	i
7.7.2008	Fatal level crossing accident in Kiuruvesi	i
26.8.2008	Fatal level crossing accident in Suonenjoki	i
25.9.2008	Fatal level crossing accident in Iisalmi	i
8.2.2008	Derailment of five shunting unit wagons in the Heikkilä railway in Turku	iii
1.3.2008	Derailment of a wagon carrying phosphoric acid in Ykspihlaja, Kokkola	iii
30.4.2008	Collision of a shunting unit and a forklift on the	iii

	Syväsatama Port track in Joensuu	
15.5.2008	Derailment of a tank wagon during shunting work in Ykspihlaja, Kokkola,	iii
8.6.2008	Collision of a locomotive and a track tamping machine at the Jyväskylä railyard	iii
20.10.2008	Train traffic incident in Kerava	iii

Basis for investigation: **i** = According to the Safety Directive, **ii** = On national legal basis (covering possible areas excluded in Article 2, §2 of the Safety Directive), **iii** = Voluntary – other criteria (National rules/regulations not referred to the Safety Directive).

3.3 Safety Studies commissioned and completed in 2008

Safety Studies completed in 2008

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

Basis for investigation: **i** = According to the Safety Directive, **ii** = On national legal basis (covering possible areas excluded in Article 2, §2 of the Safety Directive), **iii** = Voluntary – other criteria (National rules/regulations not referred to the Safety Directive).

Safety Studies commenced in 2008

Date of commission	**Title of the Study** (Occurrence type, location)	**Legal basis**
23.5.2008	Safety study on safety deviation relating to train number automation in the Lahti area	iii

Basis for investigation: **i** = According to the Safety Directive, **ii** = On national legal basis (covering possible areas excluded in Article 2, §2 of the Safety Directive), **iii** = Voluntary – other criteria (National rules/regulations not referred to the Safety Directive).

3.4 Summaries of investigations completed in 2008

B4/2007R

Fatal level crossing accident in Kiuruvesi, Finland, on 6 May 2007

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. The total cost of the accident amounted to €50,000.

The accident was caused by the car driver's failure to notice the train. The level crossing at which the accident occurred does not fulfil the determined level crossing regulations in regard to visibility and the crossing angle. Observation was hampered by the characteristics of the level crossing and, possibly, the driver's health. Familiarity with the level crossing probably diminished the driver's attentiveness.

The start of the rescue operation was delayed due to the fact that the emergency alarm call made by traffic control was routed to the wrong emergency response centre with regard to the place of the accident. There were problems with locating the place of the accident, resulting in two of the rescue units driving to the wrong level crossing.

In order to avoid similar accidents and alleviate their effects, the investigation commission recommends that the Pohja level crossing be eliminated, since the nearest overpass is located at a distance of only 300 metres. Moreover, the commission recommends that the Finnish Rail Administration analyse similar level crossings that do not entail a great level of risk but that can be removed at a minor cost. In addition, the commission calls for an improvement in the emergency call capacities of traffic control, and reiterates its previous recommendation regarding emergency alarm calls performed at the accident site.

B5/2007R

Fatal level crossing accident in Röykkä, Nurmijärvi, Finland on 13 August 2007

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.

The car was driving in the direction of the track along Korventie road before making a turn on the Leppälammentie road, which crosses the track. The driver stopped before the level crossing, at the STOP sign, and started crossing the track, but the engine stopped and the car became stuck in the middle of the crossing. The driver of the car and the passenger on the driver's right tried to restart the engine. The driver then saw the train approaching from the right and heard the warning whistle. The freight train had departed from Kirkniemi at 2.22 p.m. The train driver noticed that a passenger car had stopped on the track on a straight section after a bend on the approach to the Korpi crossing. The train driver gave a warning whistle 250 metres ahead of the crossing. Emergency braking began about 150 metres before the crossing. The train collided with the right side of the car, at the point where the front wheel was situated. This collision threw the car onto the track embankment about 18 metres from the point of collision. The driver and the passenger were still inside the car. The train stopped 276 metres from the point of collision.

The front of the train engine suffered some damage and the car was entirely wrecked.

The direct cause of the accident was that the passenger car died in the middle of the level crossing without restarting and the train was unable to stop in time despite applying the emergency brake.

The driver of the car possibly made a mistake that led to the engine extinction on the crossing. A technical failure in the car prevented the engine from restarting. The weakening of the passenger's judgement due to intoxication also had an impact on the driver's decision not to leave the car as the train approached. Furthermore, being alarmed by the approaching train affected the decision not to leave the car.

In order to prevent similar accidents, the investigation commission recommends that the Korpi level crossing be equipped with half-barriers.

The investigation commission's observations support earlier recommendations relating to problems rescue operations have in locating the sites of accidents:

Level crossings should be equipped with signboards displaying at least the name of the level crossing and its location in the coordinates and relevant track-km. The signboard should be clearly visible in both running directions of the road. [B1/00R/S143]

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 site, in addition to the notifying of the traffic control unit. [B1/05R/S211]

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. [B1/05R/S212].

B6/2007R

Fatal level crossing accident in Perälä, Kempele, Finland, on 6 October 2007

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 car driver's destination was a dog fair in Kempele. The driver left the highway at the Oulunsalo ramp, headed in the direction of Oulunsalo, and then turned left towards Kempele town centre. At the Shell service station the driver turned left onto Sohjanantie. According to an eyewitness, the driver drove along Sohjanantie at a low speed, but did not stop at the level crossing's STOP sign.

Pendolino S52 had departed from Oulu towards Helsinki at 11.29 a.m. As the train approached the level crossing at Perälä, the engine driver noticed a car driving along Sohjanantie on the right. After it became apparent that the car was continuing towards the crossing without stopping, the engine driver started emergency braking. The track

speed limit at the crossing was 140 km/h, which was also the speed of the train immediately before the collision.

The train collided with the left side of the car. The car was caught under the front of the train and was pushed ahead by the train until the train stopped 592 metres from the crossing. The train was not derailed.

The car was entirelly wrecked and the train's front structure incurred damage. Traffic along the section of the line came to a halt from 11.40 a.m.–5.00 p.m. Train traffic between Oulu and Liminka was handled by busses while the track was closed. The accident caused damage totalling € 132,000.

The direct cause of the accident was that the car driver drived onto the level crossing without stopping. It is likely that the driver failed to make any observation of the train approaching from the left. This was probably because the driver had taken a wrong turn. Furthermore, the driver's attention was probably focused on driving in an unfamiliar environment, looking out for a place to turn around and pedestrians who were walking their dogs along the road. Sohjanantie was not equipped with appropriate warning signs either before or at the crossing. The vegetation between the road and the track also impaired the visibility of the track and the train running parallel to the road.

In order to prevent similar accidents, the Accident Investigation Board of Finland recommends the removal of the Perälä level crossing or its replacement with an interchange. Furthermore, as a derailment prevention measure, the Board recommends that the lower front structure of the train be re-designed in such a way that cars cannot be wedged underneath. In addition, the Board proposes the following actions before the implementation of the recommendations: Sohjanantie should be equipped with the appropriate warning signs, the level crossing should be equipped with portals, and undue vegetation between the road and the track should be regularly removed. The Board favours proposals for improved accident localisation with equipping locomotive with a GPS equipment and automatic locating of a mobile phone, as submitted in a statement by the Emergency Response Centre of North Ostrobothnia and Kainuu.

B7/2007R

Fatal level crossing accident in Lahti, Finland on 21 November 2007

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.

Rescue operations were somewhat delayed because traffic control called the wrong emergency response centre, and not the emergency response centre that was responsible for the accident site. Further delays were caused by difficulties in locating the accident site.

To prevent similar accidents in the future, the investigation commission recommends that renovation investments planned for the track be speeded up with respect to level crossing security. Several level crossings along the Lahti–Heinola track do not have sufficient visibility, and therefore the investigation commission recommends that the track speed limit be lowered at level crossings to a level that ensures the appropriate safety level.

In order to limit the negative consequences of similar accidents, the investigation commission restates earlier recommendations concerning the ability to make a telephone call directly from the accident site, and improving the compatibility of information used by emergency response centres and traffic control to locate the accident site.

C9/2005R

Freight car derailing and member of train crew injured at Tuupovaara on 31 December 2005

On Saturday 31 December 2005 at 9.14 a.m., a shunting accident occurred in the Tuupovaara 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.

The accident occurred because the derailer had not been removed and the shunting foreman did not notice this in time. The non-removal of the derailer, in turn, was possible because the key could be removed from the derailer's safety lock even though the derailer had not been removed from the rail.

To prevent the occurrence of similar accidents, the Accident Investigation Board recommends that the safety lock's operation be altered in such a way that the safety key cannot be removed before the derailer has been removed from the rail. In addition, the Board recommends that greater attention be paid to safety measures for shunting workers during the ploughing of snow in rail yards.

C3/2006R

Derailment of five freight wagons between Tupovaara and Heinävaara, Finland, on 13 July 2006

On Thursday, 13 July 2006, at 4:41 pm, a freight train en route from Tuupovaara to Joensuu was derailed about 10 km from Tuupovaara in the direction of Joensuu. The train was carrying timber. There were no casualties. A 100-metre stretch of track was damaged, and five wagons were partially damaged and later scrapped.

The accident was caused by the formation of a heat curve on the track. The rail buckled because it had a weak structure made of light rails, wooden railway sleepers and gravel ballast. The heat curve was released below the train and derailed the last five wagons of the train. Repair work at the scene also had a negative impact on track stability.

The Accident Investigation Board of Finland is not issuing any recommendations as a result of this accident because the track has little traffic and the risks of a similar incident are very low.

C2/2007R

Derailment of a wagon in Ylivieska on 21 March 2007

On Wednesday, 21 March 2007, at 10:33 am, one wagon of the freight train en route from Oulu to Ylivieska was derailed at the northern turnout of the Ylivieska station, as the train was switching from main track to side track.

The top leaf of the spring pack of the derailed wagon had broken and fallen before the derailment. In addition, a wheel bearing was broken, a wheel flat occurred, and brake triangle support screws had fallen. The wagon wheels were damaged while running on ballast, and the bogie and under frame were damaged as the bogie collided with the under frame. Also damaged were the coupling and buffer equipment of the derailed wagon and the wagons connected to it. The derailed wagon broke the electric-motor switch drive of two turnouts. Rail traffic northbound from Ylivieska was blocked for three and a half hours, and eastbound traffic for 24 hours. The total cost of the accident was 24,000 euros.

The derailment occurred because the unloaded front wheel of the front-most wheelset did not steer at the turnout, because of the missing spring pack, and therefore the bogie did not turn but tried to continue straight ahead. The spring pack had fallen because the uppermost leaf holding the pack together had broken. This was probably caused by the wheel flat and leaf fatigue. On account of its structure, a spring pack can come apart after the main leaf breaks, and the vibration caused by a wheel flat contributes to this.

The Accident Investigation Board of Finland recommends that, to prevent the occurrence of similar accidents, greater care be exercised in statutory freight train inspections, and that any flaws observed be acted upon more quickly than is currently the case. It should be ensured that the inspectors are qualified to identify damage such as that described above.

C3/2007R

Hazardous situation in train traffic in Tampere on 27 May 2007

On Sunday, 27 May 2007, at 6 pm, an incident occurred at the Tampere station, in which a shunting unit passed, without authorisation, a shunting signal that was in the stop position at the south end of the Tampere passenger railway yard. Simultaneously, a passenger train was arriving in Tampere, for which a route had been provided to the station. The train driver noticed that a shunting signal in front of the train had switched to 'stop' and was able to stop the train ahead of shunting unit wagons that were on the track.

The cause of the incident was that the shunting foreman did not notice that the shunting signal was in the stop position. Locomotives engines standing on the adjacent track and their tail lights had 'blurred' the shunting foreman's vision as the shunting unit approached the point.

The Accident Investigation Board is not issuing new safety recommendations as a result of the incident but stresses that training and guidelines should emphasise the importance of providing relevant additional information during shunting work.

C4/2007R

Derailment of eight freight train wagons between Saarijärvi and Äänekoski, Finland, on 3 July 2007

Eight wagons of a freight train carrying wood were derailed on 3 July 2007 at 4.01 p.m. Four of the wagons incurred heavy damage, and four minor damage. About 170 metres of track were damaged.

The accident was caused by the poor condition of the track and the train's excess speed, considering the condition of the track. The first of the freight wagons (the 16th wagon), carrying pinewood, was derailed. Researches show that pinewood is heavier than spruce. As the wagon approached what was possibly the weakest point of the track, the outer rail of the track, which was on a curve, was dislocated. The distance between the rails grew to such an extent that the wagon's wheels fell between the rails. Track support work had been completed at the point of the derailing. This track work, and the small repositioning and sideways movement of the rails that this involved, reduced the stability of the track.

To prevent the occurrence of similar accidents, the Accident Investigation Board recommends that segments of the track that are in poor condition be investigated, and that a speed limit of 20 km/h be set for segments that are in poor condition for trains with an axis weight of 16–20 tons, until the necessary repairs have been completed. In addition, the Accident Investigation Board repeats recommendation S181, which it issued after the occurrence of a similar accident in Huutokoski on 31 May 2002: The track should immediately be repaired and the defective old sleepers be replaced by new ones. Replacement of spike fastening by screw fastening, replacement of the rails by heavier ones, and replacement of the gravel in the railway bed by ballast should be discussed and considered.

C5/2007R

Derailment of a freight train locomotive in Talviainen, Finland, on 15 July 2007

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.

Contributing to this was the fact that rail construction in the depot had involved deficiencies in planning and implementation. At no point during the construction project had the special features of the rail's unusual geometry been taken into account. The geometry had been called into question during planning, but the matter had not been addressed when new plans were formulated. During planning, no observations had been made that there was insufficient space to even out the cant in the turnout.

In order to prevent similar occurrences in the future, the Accident Investigation Board recommends that planning guidelines be formulated for curved turnouts and that demanding construction projects include the measurement of rail geometries with loads before commissioning, in order to ensure that limit values are met.

C6/2007R

Tank wagon loaded with nitric acid tipped over in Siilinjärvi, Finland, on 4 August 2007

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.

To avoid similar accidents, the Accident Investigation Board of Finland recommends that the right operation of derailers should always be secured so that false operation and leaving the derailer on rail could not be possible. On railway yards, where dangerous goods are handled, should always have dependence between the derailer and the turnout that leads to the rail.

C1/2008R

Derailment of five shunting unit wagons in the Heikkilä railway yard in Turku, Finland, on 8 February 2008

On 8 February 2008 at 9.53 a.m., three Russian tank wagons and two Russian covered wagons were derailed during shunting in the Heikkilä railway yard in Turku. The track was damaged for about 70 metres.

The direct cause of the occurrence was that the track, which was in poor condition and fastened by rail spikes, gave way under the heavy tank wagons. In addition, the dry, non-greased bogie pivots of the wagons placed additional pressure on the track curve.

In order to prevent similar occurrences, the Accident Investigation Board of Finland recommends that a 20 km/h speed limit be set for wagons transporting dangerous goods on spike-fastened secondary tracks. In addition, track and railway yard condition monitoring and rail fastening work should place special emphasis on routes and tracks used for the transport of dangerous goods.

C2/2008R

Derailment of a wagon carrying phosphoric acid in Ykspihlaja, Kokkola, Finland, on 1 March 2008

On Saturday 1 March 2008 at 6.12 a.m., a shunting work incident occurred on an industrial track in Ykspihlaja, Kokkola. A group of wagons carrying phosphoric acid drove into a derailer. The bogie of the leading wagon was derailed.

The incident occurred because the shunting unit did not stop in sufficient time before the derailer. This was due to an error of judgement made by the shunting foreman and a lack of communication between the shunting foreman and engine driver. Furthermore, snow and ice had accumulated on the brakes of the wagons, thereby weakening the power of the breaks.

In order to prevent the occurrence of similar incidents, the Accident Investigation Board of Finland recommends that engine drivers be clearly informed of any blocks (e.g. derailers) along the track during shunting operations. In addition, the Board emphasises that unnecessary risks should be avoided when approaching derailers or other blocks.

C3/2008R

Collision of a shunting unit and a forklift truck on the Syväsatama port track in Joensuu, Finland, on 30 April 2008

On Wednesday 30 April 2008 at 7.04 a.m., a shunting unit collided with a heavy forklift truck on Joensuu's Syväsatama port track 183. The shunting foreman was seriously in-

jured. One of the freight wagons incurred minor damage and the forklift truck was badly damaged.

The accident occurred because the forklift driver did not observe the approaching shunting unit before turning or when turning to cross the track. The driver noticed the shunting unit only upon the collision. In order to fulfil his lookout duty, the shunting foreman was standing on the buffer step on the right side of the first wagon in the direction of travel, which contributed to the injury. He was unable to stand on the corner step because of a high loading platform on the right side of the track.

In order to prevent the occurrence of similar accidents, the Accident Investigation Board of Finland recommends that storage containers should be placed further away from the track so that they do not impede visibility. No other recommendations have been issued because actions have been taken to improve port safety with the installation of warning lights indicating that a shunting unit is moving along the tracks. In addition, the loading platform next to the track should be dismantled if it is no longer in use.

C4/2008R

Derailment of a tank wagon during shunting work in Ykspihlaja, Kokkola, Finland, on 15 May 2008

On Thursday 15 May 2008 at 5.28 p.m., one tank wagon carrying a sulphuric acid consignment was derailed in Ykspihlaja in Kokkola. After the shunting unit started pulling the wagons, the last bogie of the second last wagon carrying sulphuric acid moved onto the wrong track. Three wagons incurred damage as a result of the derailment. The track and the turnout were also damaged in the derailment area. The derailment did not cause disorder to the other train traffic.

The cause of the incident was forcing open the turnout when shunting wagons. The opened forced turnout switched to its initial position while pulling underneath the wagon and the wagon's other bogie were directed onto the other track. The wagon derailed as a result of directed to two tracks. When shunting the wagons, the lookout was not conducted in sufficient way.

The Accident Investigation Board of Finland is not issuing new recommendations as a result of the incident, but reminds operators that a lookout should be placed on the steps of the last wagon when several wagons are being shunted, if the wagon allows for this. If

it is not possible to place a lookout on the wagon, the lookout should walk alongside the wagons as they are being shunted ahead.

3.5 Comment and introduction or background to the investigations

Investigations commenced in 2008 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)**
	-			

Basis for investigation: **i** = According to the Safety Directive, **ii** = On national legal basis (covering possible areas excluded in Article 2, §2 of the Safety Directive), **iii** = Voluntary – other criteria (National rules/regulations not referred to the Safety Directive).

3.6 Accidents and incidents investigated during last five years (in 2004–2008)

Rail investigations in 2004–2008

Accidents investigated		**2004**	**2005**	**2006**	**2007**	**2008**	**TOT**
Serious accidents (Art 19, 1 + 2)	Train collision	0	0	0	0	0	**0**
	Train collision with an obstacle	0	0	0	0	1	**1**
	Train derailment	0	0	0	0	0	**0**
	Level-crossing accident	0	1	1	7	5	**14**
	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	0	0	0	0	0	**0**
Other accidents (Art 21.6)	Train collision	1	0	0	0	1	**1**
	Train collision with an obstacle	0	0	0	0	0	**0**
	Train derailment	6	7	2	3	3	**21**
	Level-crossing accident	0	0	0	0	0	**0**
	Accident to person caused by RS in motion	1	0	0	1	0	**2**
	Fire in rolling stock	0	0	0	0	0	**0**
	Involving dangerous goods	3	2	0	1	0	**6**
Incidents							
TOTAL							

4 RECOMMENDATIONS

4.1 Short review and presentation of recommendations

Implementation of recommendations during 2004 –2008

Recommendations issued		Recommendation implementation status					
		Implemented		In progress		Not to be implemented	
Year	[No.]	[No.]	[%]	[No.]	[%]	[No.]	[%]
2004	10	6	60	3	30	1	10
2005	6	6	100	0	0	0	0
2006	8	2	25	2	25	4	50
2007	25	4	16	18	72	3	12
2008	20	3	15	15	75	2	10
TOTAL	**69**	**21**	**30**	**38**	**55**	**10**	**15**

Implementation of Recommendations, see Annex 1

4.2 Recommendations 2008

S234 Removal of the Pohja level crossing

Since the Pohja level crossing is dangerous with regard to its conditions and very near a safe overpass, the investigation commission recommends:

That the Pohja level crossing be closed and a replacement overpass be created at the Hilapparannantie bridge. [B4/07R/S234][1]

It should be observed that, in its current state, this level crossing does not comply with the railroad regulations and instructions relating to the visibility and crossing angle.

S235 Level crossings that can be removed at a minor cost

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:

[1] Code in the parenthesis means: B4/07R = Investigation report number B4/2007R, S234 = Recommendation number 234.

The Finnish Rail Administration 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. [B4/07R/S235]

The Finnish Rail Administration should be the proactive party with regard to this work, since municipalities and private road administrative organs often have limited information with regard to the dangerousness of level crossings and the funding options for their removal.

S236 Traffic operators' capacity to direct emergency alarm calls to the correct Emergency Response Centre

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. [B4/07R/S236]

In practice, then, traffic controllers should be aware of the location of the ERC areas with regard to the railway network, and have the opportunity to place a call quickly to the correct ERC.

S238 Observance of freight train inspection instructions

Because inspections had not reacted to the wheel flat or the broken leaf, the Accident Investigation Board of Finland recommends:

Greater care should be exercised during statutory freight train inspections, and any flaws observed should be acted upon more quickly than is currently the case. [C2/07R/S238]

In order to ensure successful inspection, it should be ensured that the inspectors are qualified to identify damage such as that described above.

S239 Derailer safety lock

Because derailers are widely used in rail yards, it should also be ensured that they can be operated as safely as possible.

It should not be possible to remove the key from a derailer's safety lock without also removing the derailer from the rail. [C9/05R/S239]

S240 Snow ploughing

Greater attention should be paid to shunting work safety during the ploughing of snow in rail yards. [C9/05R/S240]

S241 Equipping the level crossing with half-barriers

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. [B5/07R/S241]

A VTT Technical Research Centre of Finland study completed in 2000 also recommends equipping the level crossing with a half-gate.

The Finnish Railway Administration should actively monitor changes in the frequency of traffic at similar level crossings. Such traffic can increase quickly due to zoning changes and construction activity, and therefore level-crossing safety arrangements should be reviewed at the appropriate intervals.

S242 Speed limit in rail curves in poor condition

Considering the condition of the track, the 40 km/h speed limit is too high, especially at curves, for wagons fully loaded with wood, and therefore the Accident Investigation Board recommends the following:

Track curves that are in poor condition should be identified and these curves should have a speed limit of 20 km/h for trains with an axis weight of 16–20 tons, until the necessary repairs have been completed. [C4/07R/S242]

In addition, the Accident Investigation Board repeats recommendation *S181*, which it issued after the occurrence of a similar accident in Huutokoski on 31 May 2002: *"The track should immediately be repaired and the defective old sleepers be replaced by new ones. Replacement of spike fastening by screw fastening, replacement of the rails by heavier ones, and replacement of the gravel in the railway bed by ballast should be discussed and considered. [C5/02R/S181]."*

S243 Improving safety along the track before scheduled renovation investments

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. [B7/07R/S243]

The implementation of the recommendation requires cooperation among all parties concerned. These include the Finnish Railway Administration, the cities of Lahti and Heinola, the Nastola municipality, local road maintenance councils and the Finnish Road Administration Häme Region.

S244 Review of track speed limits

The speed limit along the Lahti–Heinola track is currently 60 km/h for the most part. However, sightline on many level crossings is limited to such an extent that an accident is possible even if nobody makes a mistake or there is no technical fault in the vehicles. The track profile does not allow for a reduction in speed limits to the appropriate levels, but it is nevertheless possible to reduce speeds to some degree.

The speed limit along the Lahti–Heinola track should be reduced in the proximity of level crossings with poor sightline to the extent that this is reasonably possible. [B7/07R/S244]

Currently, only sole locomotives and trains with empty wagons drive at the maximum permitted speed. The speed limit for heavier trains has been set at 50 km/h due to axle weights. It would therefore be reasonable to reduce the speed limit to 50 km/h.

S245 Speed limit for wagons carrying dangerous goods on nail-fastened secondary tracks

A 20 km/h speed limit should be set for cars carrying dangerous goods on spike-fastened secondary tracks. [C1/08R/S245]

S246 Condition monitoring of tracks used for the transport of dangerous goods

Track and railway yard condition monitoring and rail fastening work should place special emphasis on routes and tracks used for the transport of dangerous goods. [C1/08R/S246]

S247 Function of the derailer

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. [C6/07R/S2471]

This can be carried through by, for example, installing a turnout which works as a security turnout before the derailer. Between the turnout and the derailer should be such interdependence that it could not be possible to turn the turnout before the derailer has been taken off the track first.

S248 Design guidelines for curved turnouts

There are no design guidelines for curved turnouts. Few curved turnouts exist in Finland, but they are very demanding to plan and construct. The preparation of design guidelines for curved turnouts would increase information on, and awareness of, problem areas, and as a result better account could be taken of factors such as cant planning.

Design guidelines should be prepared for curved turnouts. [C5/07R/S248]

S249 Rail geometry measurements during track construction

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. [C5/07R/S249]

S250 Providing relevant information during shunting operations

The engine driver should be informed about any derailers or other blocks on the track during shunting work. [C2/08R/S250]

S251 Removal of the level crossing or its replacement by an interchange

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. [B6/07R/S251]

The Kempele municipal plan contains a proposal for the building of a road connection, and early implementation of this project would provide for an alternative route to the area.

S252 Re-design of the lower structure of Pendolino train's nose

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. [B6/07R/S252]

S253 Transfer of storage containers

The port track bends strongly to the left after passing the port gate towards the port area. Halfway into the curve, there are storage containers next to the track on the inside curve. They impede visibility when approaching the port.

The storage containers next to the track should be placed further away from the track so that they do not impair visibility. [C3/08R/S253]

S254 Location of local turnout control buttons

Turnouts for which local control is possible can be operated more safely if the local turnout control buttons are located close to the turnouts. Therefore, the Accident Investigation Board of Finland recommends the following:

Local turnout control buttons should be located as close to turnouts as possible. [C7/07R/S254]

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 rollingstock:	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 occured 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[2]	Not yet Implemented	The ERC Administration supports, VR Ltd is oppose.

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	Not yet Implemented	Under process.

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 commission therefor. 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 investiagted 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–

[2] Date of the annual meeting concerning status of the recommendations.

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. S213	The investigation commission found out that in most accidents the vehicle ran onto the crossing without stopping. However in Finland the sightline requirements on unprotected level crossings ensure a safe sightline area only at a distance of eight metres from the railway line. Stopping a vehicle over this distance is not possible unless the driver has prepared for it. In order to improve safety, the investigation commission recommends that:	
	Stopping at unguarded level crossings with the sightline along the railway only attained at a distance of 8 metres from the railway, be adopted as the regular model of behaviour.	
Date	***Status***	***Comments***
20.1.2009	**NOT TO BE IMPLEMENTED**	It has not been required in the latest directive, which came into affect.
Recommendation Nr. S214	Level crossings of very different types belong to the same category according to the sightline requirements presently valid in Finland. Requirements do not take account of the good visibility that exists at many level crossings.	
	The sightline requirements for level crossings should be modified so as to also consider the crossing of a level crossing without stopping in case a sufficient sightline along the railway is attained substantially before 8 metres from the railway.	
Date	***Status***	***Comments***
20.1.2009	**NOT TO BE IMPLEMENTED**	It has not been required in the latest directive, which came into affect.
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	Not yet Implemented	Different kind of alternatives are tested.
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	Not yet Implemented	
Recommendation Nr. S217	At a number of level crossings, the condition of the wait platform fails to meet the relevant RAMO[3] 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	Not yet Implemented	

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

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	Not yet Implemented	
Recommendation Nr. S219	At the moment it is not possible to restrict traffic on level crossings or prohibit the use of level crossing, e.g. for heavy-duty road vehicles, even in case of an extremely dangerous level crossing. For example, on the rail network there are level crossings with sightlines that are insufficient for a safe crossing of the level crossing by a combined transport vehicle. Nevertheless the use of the crossing cannot be prohibited.	
	The railway keeper and the safety authority should be allowed to restict road vehicle traffic on level crossings.	
Date	***Status***	***Comments***
20.1.2009	Not yet Implemented	The Rail Act makes it possible.
Recommendation Nr. S220	In many countries, the warning whistle given by a train is a key safety element. In some countries this is even mandatory and in some countries, it is customary to whistle at all level crossings. On the other hand, whistling generates noise nuisance. Furthermore no Finnish research data exists as for the audibility and conspicuousness of whistles.	
	A study should be conducted on the use of whistles at level crossings.	
Date	***Status***	***Comments***
20.1.2009	Not yet Implemented	No plan to go over. No evidences of the need.
Recommendation Nr. S221	If the advance route plan has been drawn up poorly or on an erroneous basis, leads this to unnecessary and dangerous crossings, especially for heavy vehicles.	
	In their route plans, transport operators should consider possible crossings of railways. Railway crossings should be minimized and more safe crossings prioritized.	
Date	***Status***	***Comments***
20.1.2009	Not yet Implemented	
Recommendation Nr. S222	As the amount of building land continuously diminishes especially in big population centres, new areas are planned with only poor transport connections. A road may cross a railway in a place where the crossing was originally designed and built for only one house or one farming road. The planning of transport connections should be carefully carried out so as to ensure safe access to the area.	
	In land use planning, special attention should be paid to safe railway crossing, and the building of new level crossings should be avoided.	
Date	***Status***	***Comments***
20.1.2009	Not yet Implemented	

Date and time (Code):	21.6.2005, 16.04 (C2/2005R)		
Location:	Helsinki railway station		
Type of occurrence:	Collision with an obstacle		
Train type and number:	Passenger train 171		
Road vehicle:			
		In the train	***In the road vehicle***
Persons on board:	***Crew:***	1+1	

	Passengers:	0	
Fatally injured:	***Crew:***	0	
	Passengers:	0	
Seriously injured:	***Crew:***	0	
	Passengers:	0	
Slightly injured:	***Crew:***	0	
	Passengers:	0	
Damages of rollingstock:	The end- and substructures of the collided coach.		
Damages on track equipment:	Trackbuffer		
Other damages:	None		
***Summary*:** In Helsinki on 20 April 2005 at 16.04, while being shunted to its departure track, passenger train 171 collided with a rail barrier, broke it and, having mounted it, continued for a further six metres towards the end platform.			
Final report issued:	26.9.2007		
Recommendation Nr. S223	In order to identify the cause of the audibility disturbances, and to determine whether the technical requirements for escort radios are sufficient and whether some new technical solutions are required to guarantee audibility, the Accident Investigation Board recommends the following:		
	The operation of escort radios at Helsinki Central Railway Station must be inspected in order to identify any black spots in radio audibility and any external interference.		
Date	***Status***	***Comments***	
20.1.2009	Not yet Implemented	Use of GSMR-radio will cancel the audibility disturbances. 2010 in use.	

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 rollingstock:	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	Not yet Implemented		

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	Not yet Implemented	
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	Not yet Implemented	
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	Not yet Implemented	SKAL supports because of safety reasons.

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 rollingstock:	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	Not yet Implemented	RHK is not going to install the level crossing with barriers.
Recommendation Nr. S229	The visibility and waiting zones of level crossing areas should be such that road users have the possibility to see the level crossing area as early as possible. If they hinder visibility, the track or road owner should have the right to cut down trees and other vegetation in the vicinity of the crossing. The slopes of waiting zones should be such that they will not tempt the driver to pass over the track without stopping, in any weather conditions.	
	Level crossing environment should be made safe for road traffic.	
Date	***Status***	***Comments***
20.1.2009	**NOT TO BE IMPLEMENTED**	The level crossing meet the guidelines of the level crossing guidelines in Finland.
Recommendation Nr. S230	The lower part of the fender, attached with screws, was torn loose in the collision. Had it been caught underneath the wheels it might have derailed the train.	
	The structure of the obstruction cleaning device of Dm12 rail bus should be such that it is either formed of one piece or possible additional parts are attached sufficiently well.	
Date	***Status***	***Comments***
20.1.2009	Not yet Implemented	The construction has been designed.

Date and time (Code):	2.2.2007, 9.01 (C1/2007R)		
Location:	Pelto switch area at the Joensuu railway yard		
Type of occurrence:	Accident during shunting work		
Train type and number:	Shunting unit, Dr14 diesel locomotive and 7 wagons		
Road vehicle:			
		In the train	***In the road vehicle***
Persons on board:	***Crew:***	1+3	
	Passengers:	0	
Fatally injured:	***Crew:***	1	
	Passengers:	0	
Seriously injured:	***Crew:***	0	
	Passengers:	0	
Slightly injured:	***Crew:***	0	
	Passengers:	0	
Damages of rollingstock:	None		
Damages on track equipment:	None		
Other damages:	The shunting unit foreman's radio telephone got unuseable broken.		

Summary**:** An accident claiming the life of a shunting unit foreman occurred at the Joensuu railway yard onriday 2 February 2007 at 9.01 a.m. The foreman, employed by VR Cargo Joensuu, perished instantly after being run over by one of the wheels of a freight car.

Final report issued:	7.12.2007

Recommendation Nr. S231		
	The instructions for rail yard work should be supplemented to forbid going between moving cars in all situations.	
Date	***Status***	***Comments***
20.1.2009	**IMPLEMENTED**	In updated working guidelines of marshalling yards.
Recommendation Nr. S232	The task of the Emergency centre is to receive emergency calls and transmit them to the units required for the rescue work. The Emergency centre evaluates the level of urgency and the units required for the situation. In order that a sufficient number of the appropriate units arrive at the scene of an accident, the Accident Investigation Board recommends that	
	The Emergency centre should use an emergency response that corresponds to the type of accident.	
Date	***Status***	***Comments***

20.1.2009	**IMPLEMENTED**	
Recommendation Nr. S233	In the instructions for safe rail yard work, it is stated that the footwear used must be suitable for shunting work and special attention must be paid to the footwear being supportive of the ankles and that the material used in the soles must be of the kind that reduces the risk of slipping. According to test results, the footwear model used at the time of the accident was of average level regarding grip. The grip category of the footwear in the conditions at the time of the accident was "uncertain" and "slippery" in terms of the heel's side slip.	
	The grip of footwear used in rail yard work should be better than average under all weather and working conditions.	
Date	***Status***	***Comments***
20.1.2009	Not yet Implemented	Tests have been done and tests are going on.

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 rollingstock:	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. The total cost of the accident amounted to €50,000.

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	Not yet Implemented	
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	Not yet Implemented	
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	Not yet Implemented	On process.

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 Marcedes 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 rollingstock:	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	Not yet Implemented	The speed limit area of the track has been lenghtenet.

Date and time (Code):	21.3.2007, 10.33 (C2/2007R)		
Location:	Ylivieska railway station		
Type of occurrence:	Derailment		
Train type and number:	Freight train 5406, electric locomotive Sr1 + 23 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 rollingstock:	The coupling equipment of two wagons and the bogie of the derailed wagon were damaged.		
Damages on track equipment:	The electric-motor switch drives of two turnouts were damaged.		
Other damages:	None.		
***Summary*:** On Wednesday, 21 March 2007, at 10:33 am, one wagon of the freight train en route from Oulu to Ylivieska was derailed at the northern turnout of the Ylivieska station, as the train was switching from main track to side track.			
Final report issued:	3.3.2008		

Recommendation Nr. S238	Because inspections had not reacted to the wheel flat or the broken leaf, the Accident Investigation Board of Finland recommends:	
	Greater care should be exercised during statutory freight train inspections, and any flaws observed should be acted upon more quickly than is currently the case.	
Date	***Status***	***Comments***
20.1.2009	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 rollingstock:	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 Tuupovaara 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. S239	Because the derailers are widely used in railway yards, it should also be ensured that they can be operated as safely as possible.	
	It should not be possible to remove the key from a derailer's safety lock without also removing the derailer from the rail.	
Date	***Status***	***Comments***
20.1.2009	Not yet Implemented	No instructions exist.
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	Not yet Implemented	

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 rollingstock:	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	Not yet Implemented	Will be equipped with half barriers, when the financing is ok.		

Date and time (Code):	3.7.2007, 16.01 (C4/2007R)		
Location:	Äänekoski–Saarijärvi section of line, at km 438+925		
Type of occurrence:	Derailment		
Train type and number:	Freight train 3364, 2 Dv 12 diesel locomotives + 28 timber wagons		
Road vehicle:			
		In the train	***In the road vehicle***

Persons on board:	***Crew:***	2	
	Passengers:	0	
Fatally injured:	***Crew:***	0	
	Passengers:	0	
Seriously injured:	***Crew:***	0	
	Passengers:	0	
Slightly injured:	***Crew:***	0	
	Passengers:	0	
Damages of rollingstock:	4 timber wagons heavily damaged + 4 wagons got minor damages.		
Damages on track equipment:	170 m of railway line damaged.		
Other damages:	None.		

***Summary*:**. Eight wagons of a freight train carrying wood were derailed on 3 July 2007 at 4.01 p.m. Four of the wagons incurred heavy damage, and four minor damage. About 170 metres of track were damaged. The accident was caused by the poor condition of the track and the train's excess speed, considering the condition of the track.

Final report issued:	18.8.2008

Recommendation Nr. S242	Considering the condition of the track, the 40 km/h speed limit is too high, especially at curves, for wagons fully loaded with wood, and therefore the Accident Investigation Board recommends the following:	
	Track curves that are in poor condition should be identified and these curves should have a speed limit of 20 km/h for trains with an axis weight of 16–20 tons, until the necessary repairs have been completed.	
Date	***Status***	***Comments***
20.1.2009	**IMPLEMENTED**	The curves have been repaired.

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 rollingstock:	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:	

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	Not yet Implemented	
Recommendation Nr. S244	The speed limit along the Lahti–Heinola track is currently 60 km/h for the most part. However, sightline on many level crossings is limited to such an extent that an accident is possible even if nobody makes a mistake or there is no technical fault in the vehicles. The track profile does not allow for a reduction in speed limits to the appropriate levels, but it is nevertheless possible to reduce speeds to some degree.	
	The speed limit along the Lahti–Heinola track should be reduced in the proximity of level crossings with poor sightline to the extent that this is reasonably possible.	
Date	***Status***	***Comments***
20.1.2009	Not yet Implemented	

Date and time (Code):	8.2.2008, 9.53 (C1/2008R)			
Location:	Turku, Heikkilä railway yard			
Type of occurrence:	Derailment			
Train type and number:	Shunting unit, Dv12 locomotive and 13 wagons			
Road vehicle:				
			In the train	***In the road vehicle***
Persons on board:	***Crew:***		3	
	Passengers:		0	
Fatally injured:	***Crew:***		0	
	Passengers:		0	
Seriously injured:	***Crew:***		0	
	Passengers:		0	
Slightly injured:	***Crew:***		0	
	Passengers:		0	
Damages of rollingstock:	The wheel set of the first derailed tank wagon was replaced.			
Damages on track equipment:	70 metres of rail were damaged.			
Other damages:	None.			

Summary:. On 8 February 2008 at 9.53 a.m., three Russian tank wagons and two Russian covered wagons were derailed during shunting in the Heikkilä railway yard in Turku. The track was damaged for about 70 metres.
The direct cause of the occurrence was that the track, which was in poor condition and fastened by rail spikes, gave way under the heavy tank wagons. In addition, the dry, non-greased bogie pivots of the wagons placed additional pressure on the track curve.

Final report issued:	18.8.2008

Recommendation Nr. S245		
	A 20 km/h speed limit should be set for cars carrying dangerous goods on spike-fastened secondary tracks.	
Date	***Status***	***Comments***
20.1.2009	**IMPLEMENTED**	Russian wagons have speed limit of 20 km/h. Turku railway yard will be renewed.
Recommendation Nr. S246		
	Track and railway yard condition monitoring and rail fastening work should place special emphasis on routes and tracks used for the transport of dangerous goods.	

Date	***Status***	***Comments***
20.1.2009	**IMPLEMENTED**	The principle is in use.

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 rollingstock:	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	Not yet Implemented	No instructions exist.

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 rollingstock:	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. S248	There are no design guidelines for curved turnouts. Few curved turnouts exist in Finland, but they are very demanding to plan and construct. The preparation of design guidelines for curved turnouts would increase information on, and awareness of, problem areas, and as a result better account could be taken of factors such as cant planning.	
	Design guidelines should be prepared for curved turnouts.	
Date	***Status***	***Comments***
20.1.2009	**NOT TO BE IMPLEMENTED**	New curved turouts will not be installed.

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	Not yet Implemented	All of the constructors do not yet have devices.

Date and time (Code):	1.3.2008, 6.12 (C2/2008R)		
Location:	Kokkola, Ykspihlaja, industrial track		
Type of occurrence:	Derailment		
Train type and number:	Shunting unit, Dv12 diesel locomotive and 19 phosphoric acid tank wagons		
Road vehicle:			
		In the train	***In the road vehicle***
Persons on board:	***Crew:***	3	
	Passengers:	0	
Fatally injured:	***Crew:***	0	
	Passengers:	0	
Seriously injured:	***Crew:***	0	
	Passengers:	0	
Slightly injured:	***Crew:***	0	
	Passengers:	0	
Damages of rollingstock:	No damages. Wheel sets of the derailed bogie were changed.		
Damages on track equipment:	Derailer was damaged.		
Other damages:	None.		
***Summary*:**. On Saturday 1 March 2008 at 6.12 a.m., a shunting work incident occurred on an industrial track in Ykspihlaja, Kokkola. A group of wagons carrying phosphoric acid drove into a derailer. The bogie of the leading wagon was derailed. The incident occurred because the shunting unit did not stop in sufficient time before the derailer. This was due to an error of judgement made by the shunting foreman and a lack of communication between the shunting foreman and engine driver.			
Final report issued:	24.11.2009		

Recommendation Nr. S250	
	The engine driver should be informed about any derailers or other blocks on the track during shunting work.

Date	***Status***	***Comments***
20.1.2009	**NOT TO BE IMPLEMENTED**	There are good orders for shunting work.

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 rollingstock:	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 drived 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	Not yet Implemented	The municipality will remove the level crossing during chanc-ing the town plan.

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	Not yet Implemented	

Date and time (Code):	30.4.2008, 7.04 (C3/2008R)		
Location:	*Joensuu, Syväsatama Port*		
Type of occurrence:	*Collision with an obstacle*		
Train type and number:	*Shunting unit, Dr14 locomotive and 12 wagons*		
Road vehicle:	*Forklift truck*		
		In the train	***In the road vehicle***
Persons on board:	***Crew:***	3	1
	Passengers:	0	0
Fatally injured:	***Crew:***	0	0
	Passengers:	0	0
Seriously injured:	***Crew:***	1	0

	Passengers:	0	0
Slightly injured:	***Crew:***	0	0
	Passengers:	0	0
Damages of rollingstock:	One wagon incurred minor damage, the forklift truck was badly damaged.		
Damages on track equipment:	None.		
Other damages:	None.		

***Summary*:**. On Wednesday 30 April 2008 at 7.04 a.m., a shunting unit collided with a heavy forklift truck on Joensuu's Syväsatama port track 183. The shunting foreman was seriously injured. One of the freight wagons incurred minor damage and the forklift truck was badly damaged.
The accident occurred because the forklift driver did not observe the approaching shunting unit before turning or when turning to cross the track.

Final report issued:	30.12.2008

Recommendation Nr. S253	The port track bends strongly to the left after passing the port gate towards the port area. Halfway into the curve, there are storage containers next to the track on the inside curve. They impede visibility when approaching the port.	
	The storage containers next to the track should be placed further away from the track so that they do not impair visibility.	
Date	***Status***	***Comments***
20.1.2009	Not yet Implemented	