

NIB ANNUAL REPORT 2019

Safety Investigation Authority

FINLAND



PREFACE TO THE REPORT

This is the annual report of railway sector of the Safety Investigation Authority, Finland for calendar year 2019.

National investigation ID

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

The new identifier

Accident/incident categories

- L Aviation accidents and incidents
- R Rail accidents and incidents
- M Marine accidents and incidents
- Y Other accidents and incidents
- P Exceptional events

Investigation identifier

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

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

The old identifier

Terms used in this report:

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

Investigation identifier:

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

The first part refers to the investigation category (A, B, C, D or S).

The second part is a sequence number referring to the order of the accident within its accident category in the year in question.

The third part refers to the year of the accident.

The fourth part indicates the accident category (L, R, M or Y).

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



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1 INTRODUCTION TO THE INVESTIGATION AUTHORITY

1.1 Legal Basis

The Safety Investigation Authority, Finland was founded in 1996 in connection with the Ministry of Justice. The tasks of the Safety Investigation Authority are specified in the relevant act (525/2011, updated 187/2019), which also include overall directions on the methods of investigation to be implemented. In Finland the Safety Investigation Authority is a multimodal investigation authority, which investigates aviation, maritime, rail and other accidents and incidents. The Safety Investigation Act also provides for the procedure to be followed in the event of exceptional and very serious events that, while not accident, had threatened or seriously damaged basic function in society.

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

1.2 Role and Mission

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

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

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

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



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

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

Task of Safety Investigation Authority

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

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

The Safety Investigation Authority

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

1.3 Organisational flow





2 INVESTIGATION PROCESSES

2.1 Cases to be investigated

Accidents and incidents to be investigated:

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

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

2.2 Institutions involved in investigations

The Safety Investigation Authority, Finland can investigate all rail accidents. Those investigations are independent, and reports are public. According to The Rail Transport Act (1302/2018) the Finnish Transport and Communications Agency can investigate those occurrences SIAF does not investigate. Investigation reports are not public.



Level crossing accidents

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

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

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

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

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

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

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



3 INVESTIGATIONS

3.1 Overview of investigations completed in 2019, identifying key trends

Type of acci- Number		Number	of victims	Damages in	Trends in rela-	
dents investi- gated	of acci- dents	Deaths	Seriously Injured	€(approxi- mation)	tion to previous years	
Collisions	1	0	0	> 2 000 000		
Derailments	0					
Level cross- ing accidents	1	4	3	2 000 000		
Other	0					

3.2 Investigations completed and commenced in 2019

Investigations completed in 2019

Date of occurrence	Title of the investigation (Occurrence type, location)	Legal basis	Completed (date)
7.4.2018	Derailment of tank wagons at Mäntyharju 7 April 2018	l (1)	3.1.2019
12.12.2018	Level crossing accident in Kemijärvi on 12 December 2018	l (1)	18.7.2019

Investigations commenced in 2019

Date of occurrence	Title of the investigation (Occurrence type, location)	Legal basis
9.12.2019	Collision of a freight train with a trackwork machine be- tween Puhos and Kesälahti on 9 December 2019	I (2) (a)

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

National rules imposed by implementing of the Directive on railway safety

- (1) in light of Article 20, §1
- (2) in light of Article 20, §2
 - (a) the seriousness of the accident or incident
 - (b) it forms part of a series of accidents or incidents relevant to the system as a whole
 - (c) its impact on railway safety on a Community level
 - (d) requests from infrastructure managers, the safety authority or the Member State
- (3) in light of Article 22
 - (§5) cross-border investigation or request to assistance
 - (§6) other reasons than those referred to in Article 20
- II Other national rules/regulations (covering possible areas excluded in Article 2, §2 and §3)
 - (2) (a) metros
 - (2) (b) trams and other light rail systems
 - (2) (c) networks that are functionally separate from the rest of the railway system
 - (3) (a) privately owned railway infrastructure, including sidings, used by the owner or by an operator for the purpose of their respective freight activities or for the transport of persons for noncommercial purposes, and vehicles used exclusively on such infrastructure
 - (3) (b) infrastructure and vehicles reserved for strictly local, historical or tourist use
 - (3) (c) light rail infrastructure occasionally used by heavy rail vehicles under the operational conditions of the light rail system, where it is necessary for the purposes of connectivity of those vehicles only
 - (3) (d) vehicles primarily used on light rail infrastructure but equipped with some heavy rail components necessary to enable transit to be effected on a confined and limited section of heavy rail infrastructure for connectivity purposes only
- III Other national rules/regulations not referred to the Safety Directive.



3.3 Safety Studies completed and commenced in 2019

Safety Studies completed in 2019

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

Safety Studies commenced in 2019

Date of commission	Title of the Study (Occurrence type, location)	Legal basis
1.9.2019	Theme investigation on shunting work accidents and in- cidents in railway traffic	l(2)(b)



3.4 Summaries of investigations completed in 2019



R2018-01

Derailment of tank wagons at Mäntyharju 7 April 2018

50 tank wagons temporarily stored in the Kinni railway yard at Mäntyharju began to move of their own accord at 11.40am on Saturday 7 April 2018. The wagons rolled a distance of 145 metres and collided with a buffer stop. The first two wagons were derailed by the collision. A leak was created in the first wagon, with 35,000kg of Methyl tert-butyl ether (MTBE) leaking into the surrounding environment.

The wagons were on their way from Russia, via the Vainikkala border crossing, to the Port of Mussalo from which the MTBE was to be shipped to a third country. In the late winter of 2018, congestion amongst dangerous goods traffic (RID traffic) had reached the stage where wagons had to be temporarily stored outside RID railway yards. Due to this situation, the railway operator in charge of transporting the goods, VR Transpoint, asked the infrastructure manager, the Finnish Transport Agency, for temporary storage locations close to Kouvola.

The Finnish Transport Agency indicated four locations on the Savo track, one of which was the Kinni railway yard. The locations were identified on the basis of an analysis by the Finnish Transport Agency, which examined decommissioned rolling stock storage locations. It took no account of the requirements for the temporary storage of RID wagons, or of the longitudinal gradient of the track.

The wagons were brought to Kinni from Kouvola on 21 March. Measures were taken to ensure that the wagons remained stationary in accordance with the valid guidelines, by using two stop blocks in either direction. The wagons were subjected to daily monitoring in case of leaks. The employees charged with checking for leaks had no RID training and their task did not include ensuring that the wagons remained in place.

The wagons began moving as the weather became warmer, because the number of stop blocks was insufficient given the longitudinal gradient of the track and the weight of the wagons. The significant rise in temperature reduced the rolling resistance of the wagons and meltwater from snow simultaneously weakened the holding power of the stop blocks.

The driver of a passing train noticed the accident 27 minutes after the derailment. In accordance with the guidelines, the driver contacted the traffic controller and notified him of the accident. The traffic controller passed the information onto the emergency response centre. The emergency duty officer called out the rescue services with the assignment code *minor accident involving dangerous goods*.



A unit from an agreement fire brigade arrived on the scene at 1pm. The rescue services had no advance information on the wagons stored at Kinni, or the chemicals they contained. Such information had not been passed on due to the lack of clarity of the obligation to notify. The unit that arrived at the scene observed that the situation was serious and that insufficient resources had been deployed. The leader of the unit contacted the officer in charge in Mikkeli and requested additional personnel and equipment at the scene of the accident. The leader also requested that the assignment code be elevated and that the officer in charge visit the scene. The officer in charge elevated the assignment code but decided to lead the rescue operation remotely.

At first, the rescue services at the scene of the accident focused on recovering the chemicals from the spill. When the leak was stopped at 3.30pm, they began to empty the contents of the two derailed tank wagons. The rescue services did not proceed in accordance with the guidelines on containing dangerous goods and ensuring occupational safety. The scene of the accident was not inspected extensively enough during the initial hours, leading to a delay in forming a situational awareness of the spread of the substance over the terrain. There were also occupational safety deficiencies in the rescue operation. An operational area command (OAC) was not set up at the scene of the accident, due to which the authorities and other actors participating in the rescue operation were unable to organise their efforts. Cooperation was inadequate and no use was made of rescue equipment and resources suitable for the situation.

The issue of post-accident measures to prevent environmental damage was left open after the rescue operation had ceased. Responsibility for the scene of the accident was transferred to the Finnish Transport Agency, but responsibility for environmental damage-control outside the railway area remained undefined. Upon identifying the situation, the ELY Centre led damage-control operations until 17 April, after which VR Group was responsible for them.

Samples taken from water bodies in the area confirmed that most of the chemicals had remained at the scene of the accident and its nearby area. Extensive damage-control measures were begun on this basis. Special arrangements were necessary in order to secure the water supply of nearby residents and businesses. Some of these arrangements remain in place and it is uncertain how long they will need to be continued. A clear picture has yet to be obtained of the accident's impacts on groundwater. It may take years or even decades to decontaminate the environment and for the effects of the accident to diminish. The total cost of the accident is several million euros. Most of the costs are related to environmental damage.

In order to avoid similar accidents in the future and reduce the consequences, the Safety Investigation Authority recommends that the Finnish Transport and Communications Agency ensure the implementation of the following recommendations:

- 1. Railway traffic operators, the Finnish Transport Infrastructure Agency and the competent authorities must develop means of preventing traffic congestion amongst transports with dangerous goods arriving from Russia. The acquisition and use of predictive information must be developed in particular.
- 2. Railway operators and infrastructure managers must perform a risk assessment of the temporary storage of RID wagons in locations other than designated RID railway yards, and the due care and attention required under RID legislation must be observed.



- 3. Railway operators and the Finnish Transport Infrastructure Agency must develop the identification and management of risks related to normal rail traffic in their safety management systems.
- 4. The Finnish Transport Infrastructure Agency will draw up guidelines on keeping wagons stationary in the Finnish state rail network.
- 5. The Finnish Transport Infrastructure Agency will inform stakeholders of its role and responsibilities.

The Safety Investigation Authority also recommends that the Ministry of the Interior ensure the adoption of the following recommendation:

6. The rescue services define the principles underlying remote management and the communication of the situational picture at the scene of the accident and draw up guidelines on remote management.

In addition, the Safety Investigation Authority repeats recommendation 2018-S23 made to the Ministry of the Interior in investigation report R2017-03:

7. The Ministry of the Interior shall ensure that an operational area command (OAC) is set up by the public authorities in the case of long-term or exceptional multi-authority tasks.



R2018-02

Level crossing accident in Kemijärvi on 12 December 2018

A freight train en route from Kemi to Kemijärvi and a waste collection lorry collided at the Kuusivaarantie unprotected level crossing on Wednesday, 12 December 2018 at 4.49 am. In the collision, the driver of the lorry died and one of the two engine drivers in the locomotive was injured. The waste collection lorry was destroyed by the collision. The train's locomotive and first wagon were derailed. The locomotive was heavily damaged in the collision, while the derailed wagon was slightly damaged. The train continued its travel for 312 m after the collision, damaging the track and the electric track devices. Traffic on the track section between Rovaniemi and Kemijärvi was interrupted for five days due to the accident.



Upon approaching the level crossing, the speed of the waste collection lorry was so high that after noticing the train around 50 metres before the level crossing, the driver had no possibility of avoiding collision despite braking and evasive action. A 80 km/h general speed limit was in effect on the accident road. The level crossing was missing the 50 km/h speed limit as required by the guidelines.

The engine driver noticed the lorry around 100 metres before the level crossing and engaged the emergency brake. The engine driver who was driving the train and the engine driver on a test drive accompanying him attempted to get into cover in the locomotive's equipment space, but only the driver on a test drive had time to exit the cabin. The side windows of the locomotive's cabin broke, increasing the severity of the injuries to the engine driver who was still in the cabin. Additionally, the fuses of the locomotive's batteries broke down in the collision. As a result, all power to the locomotive was cut, meaning that even the emergency lighting did not work. The data recorder also stopped working.

The rescue operations after the accident went smoothly. An exceptional amount of clearance work was required after the accident; for example, a road had to be constructed for the lifting of the locomotive. The clearance was slowed down by the confusion between the infrastructure manager and the railway undertaking concerning responsibilities, command relationships and the use of rescue equipment.

The conditions at the level crossing were inadequate with respect to sight lines and wait platforms. The inadequate wait platforms were common knowledge to those moving in the area, and a local professional driver had contacted the infrastructure manager concerning the matter prior to the accident.

A superstructure replacement project had been implemented on the track section in 2018, during which the risks of the level crossings had been surveyed. Several level crossings with deficiencies were identified on the track section, but they were not corrected in connection with the project. The risks were recorded in the minutes of the project's final meeting as residual risks and transferred to the infrastructure manager. No plan or timetable for eliminating the risks was prepared. As part of the project's permit process, the Finnish Transport Safety Agency required a survey of the risks of the level crossings, but no measures were required to eliminate the identified risks. The Agency did not have instructions for the survey, and there was no process for handling the results.

The safety plan of the waste collection process did not discuss traffic safety, and level crossings were not identified as risks. The instructions and orientation related to safety matters was deficient. The safety plan did not define a process for handling safety-related feedback.

This was a very typical level crossing accident. Several studies have found that inadequate level crossing conditions are one of the background factors of level crossing accidents. A lot of research data is available on the matter, but sufficiently extensive, concrete measures to improve the safety of level crossings have not been taken.

In order to avoid similar accidents and reduce their consequences, the Safety Investigation Authority recommends that

the Finnish Transport and Communications Agency ensure the implementation of the following recommendations:



- 1. The Finnish Transport and Infrastructure Agency and other road keepers shall review all speed limits, particularly at unprotected level crossings, and ensure that they comply with the guide-lines.
- 2. In its track projects, the Finnish Transport and Infrastructure Agency shall prepare a plan and a timetable for the correction of the risks identified at level crossings. It must not be possible to transfer the risks into the future as residual risks.
- 3. VR Group shall change the emergency lighting of the Sr3 locomotive to meet the TSI requirements.
- 4. Railway undertakings shall ensure that the cabin windows of the rolling stock are made of glass that does not cause additional injuries when breaking in an accident.

the Ministry of Transport and Communications ensure the implementation of the following recommendation:

5. The Finnish Transport and Infrastructure Agency shall initiate a new review of the regulations concerning clearance work and clarify the roles of the actors in clearance operations.

the joint municipal consortium for waste management Lapeco, in cooperation with the contractors, implement the following recommendation:

6. The safety management related to the waste collection process shall take comprehensively into account the requirements of the work processes and the identification of occupational safety and traffic safety risks. Instructions shall be drawn up for the work processes and the orientation of the employees, and they shall be documented. Processes for handling feedback shall be defined in order to improve the operations.

the European Railway Agency (ERA) ensure the implementation of the following recommendation:

7. An independent power supply shall be required for new rolling stock being type approved that guarantees the operation of the data recorder for a minimum of 30 minutes after power has been cut off.

The Safety Investigation Authority also recommends the following:

8. The Finnish Transport and Communications Agency shall define an approval process for the risk assessment of level crossings and supervise that the corrective measures are taken.



3.5 Comment and introduction or background to the investigations

Investigations commenced in 2019 and not followed

Date of oc- currence	Title of the investigation (Occurrence type, loca- tion)	Legal basis	Reason of non- following or suspension of investigations	Who, why, when (de- cision)

3.6 Accidents and incidents investigated during last five years (in 2015–2019)

Rail investigations in 2015–2019

Accidents investigated		2015	2016	2017	2018	2019	тот
	Train collision	0	1	0	0	0	1
ents	Train collision with an obsta- cle	0	0	0	1	0	1
. 1)	Train derailment	0	0	0	0	0	0
ac 20	Level crossing accident	0	1	1	1	0	3
erious (Art	Accident to person caused by RS in motion	0	0	0	0	0	0
Š	Fire in rolling stock	0	0	0	0	0	0
	Involving dangerous goods ¹	0	0	0	1	0	1
	Train collision	0	1	0	0	1	2
(9	Train collision with an obsta- cle	0	1	0	0	0	1
1ts 22.	Train derailment	0	1	0	0	1	2
Level crossing accident Level crossing accident Accident to person caused by RS in motion		1	0	0	0	0	1
		0	1	0	0	0	1
0.2	Fire in rolling stock	0	0	0	0	0	0
Otl (Art 2	Involving dangerous goods ¹	0	1	1	0	1	3
	Incidents in train traffic	15 ²	0	0	0	0	15
	Accidents or incidents in shunting work	0	1	2	0	7 ³	10
	TOTAL	16	7	3	2	9	37

3.7 Preliminary investigations

The Safety Investigation Authority has made, in compliance with section 8 of the Safety Investigation Act (525/2011), preliminary investigations. The SIAF has decided on the basis of a preliminary investigation, that the special characteristics of the case do not require the starting of the full investigation, but the report on the preliminary investigation is sufficient from the point of view of the safety advantage to be obtained. In the report is described briefly the events which have led to the accident and the immediate and indirect

¹ Belongs also to another category and is not calculated another time to the total amount.

² Cases belongs to the theme investigation on wrong routings in train traffic in 2015.

³ Cases belongs to the theme investigation on shunting work accidents and incidents in railway traffic.



causes, which have been found in the preliminary investigation. In the reports there are not issued recommendations, but observations and suggestions for the measures to the actors. The reports are published only in Finnish.

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

During the year 2019 SIAF published two preliminary investigation reports of rail occurrences: :

- R2019-E1 Collision of IC65 train to an object on the track on the direct line between Haarajoki and Korvensuo on 20 January 2019 (published 28.1.2019).
- R2019-E2 Derailment of a freight train in Imatra on 6 May 2019 (published 19.6.2019).

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

In 2019 occurred a total of 26 level crossing accidents, two of them were fatal. Two persons injured fatally in the accidents, four injured seriously and five injured slightly. The road accident investigation teams investigated the fatal level crossing accidents happened to a vehicle. Below short summaries of the accidents happened to vehicles.

1. Fatal level crossing accident in Juankoski on 7 February 2019

On Thursday, 7 February 2019, a level crossing accident involving a private car and a freight train occurred on the Jynkänlahti level crossing in Juankoski. Speed of the train was 68 km/h and speed of the car was about 50–60 km/h. The level crossing was passive. The accident was fatal to the car driver. The car was wrecked beyond repair. The train sustained minor damages in front of the locomotive.

The direct cause (*the key event*⁴) of the accident was that the car driver drove onto the level crossing without stopping.

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

Background risk factors4:

- the level crossing was unprotected
- mass difference between vehicles
- the level crossing is on a hill and the waiting platforms are short = > it is difficult to cross the level crossing especially on the winter conditions
- the snowfall and the trees made seeing difficult to the track
- the level crossing was familiar to the car driver, which possibly reduced the attentiveness
- trains run seldom
- the car driver didn't stop before the level crossing
- the car driver was possibly tired.

⁴ Terms used by the road accident investigation teams.



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

- level crossings should be removed or equipped with warning devices; if not, they should be equipped with STOP signs
- waiting platforms of the level crossing should be fixed
- when approaching a level crossing, the profile of the road should be changed into so that it makes easy stopping possible irrespective of the road conditions
- the mirror that has been placed in the level crossing would have improved the possibility to see the train
- the sight to the track one should open earlier
- vehicles should be equipped with system which informs of the approaching train automatically
- train should make whistle when approaching a passive level crossing
- locomotives should be equipped with efficient forward directed lights
- enlighten the road users about vigilance related to level crossings.

2. Fatal level crossing accident in Kauhajoki on 26 September 2019

On Thursday, 26 September 2019, a level crossing accident involving a tractor and a freight train (two locomotives) occurred on the Kohluntie level crossing in Kauhajoki. Speed of the train was 65 km/h and speed of the tractor was about 40 km/h before the level crossing and about 15–20 km/h at the level crossing. The level crossing was passive. The accident was fatal to the tractor driver. The tractor was damaged very badly. The train sustained minor damages in front of the first locomotive.

The direct cause (*the key event*⁶) of the accident was that the tractor driver drove onto the level crossing without stopping.

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

Background risk factors4:

- the level crossing was familiar to the tractor driver and there was a little railway traffic on track
- rise to the track
- corn load on trailer = > power to be kept on
- the handling of the vehicle takes a part of the perception
- the tractor had big rear-view mirrors and exhaust piping which restricted seeing
- the locomotive ran "the long end" in the front, and the tractor came from the left = > created visual obstruction
- the sun was shining with respect to the locomotive upper left
- the tractor driver did not use a seat belt.

⁵ Terms used by the road accident investigation teams.



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

- the level crossing should be removed or equipped with warning devices
- locomotives should be equipped with more efficient head lights => it would catch attention better
- locomotives should be equipped with camera to improve seeing to the left
- colouring of the locomotive more visible
- new placement of mirrors and exhaust piping of the tractor.



4 **RECOMMENDATIONS**

4.1 Short review and presentation of recommendations

Implementation of recommendations during 2007–2019

Recomme	ndations	Recommendation implementation status							
issued		Implemented		In progress		Not to be imple- mented			
Year	[No.]	[No.]	[%]	[No.]	[%]	[No.]	[%]		
2007	25	14	56,0	0	0,0	11	44,0		
2008	19	12	63,2	1	5,3	6	31,6		
2009	17	15	88,2	0	0,0	2	11,8		
2010	15	14	93,3	0	0,0	1	6,7		
2011	18	18	100,0	0	0,0	0	0,0		
2012	24	20	83,3	2	8,3	2	8,3		
2013	10	10	100,0	0	0,0	0	0,0		
2014	10	7	70,0	3	30,0	0	0,0		
2015	10	8	80,0	2	20,0	0	0,0		
2016	9	8	88,9	1	11,1	0	0,0		
2017	14	10	71,4	4	28,6	0	0,0		
2018	14	5	35,7	9	64,3	0	0,0		
2019	14	2	14,3	12	71,4	0	0,0		
TOTAL	199	143	71,9	34	17,1	22	11,1		

Implementation status of recommendations, see Annex 1.

A total of 403 recommendations were issued from the beginning of 1997 until the end of 2019. According to information available at 30 March 2019, 303 (75.2 %) recommendations were implemented and 65 (16.1 %) were decided not to be implemented. Since beginning of 2007 until the end of 2019 a total of 199 have been issued. 143 (71.9 %) have been implemented, 22 (11.1 %) have been decided not to be implemented and 34 (17.1 %) are under implementation.







4.2 Recommendations 2019

S1 Preventing congestion amongst RID transports

Existing information on the number of transports entering Finland was not used for the management of railway network capacity and, where necessary, the restriction of RID traffic coming from Russia. According to their own interpretations, the Finnish Transport Agency and VR had no means of restricting traffic. The Finnish Transport Safety Agency (Trafi) and the Ministry of Transport and Communications lacked information on the safety risk posed by congestion.

The Safety Investigation Authority recommends that the Finnish Transport and Communications Agency ensure the implementation of the following recommendation:

Railway traffic operators, the Finnish Transport Infrastructure Agency and the competent authorities must develop means of preventing traffic congestion amongst transports with dangerous goods arriving from Russia. The acquisition and use of predictive information must be developed in particular. [2019-S1]

For managing rail capacity, use should be made of the information held by the Finnish Transport and Communications Agency on the number of wagons in the country and rail transport operators' advance knowledge of transports.

S2 Safety checks during the temporary preservation of RID wagons

Safety levels dramatically decrease during the temporary storage of RID wagons outside RID railway yards. There is no recognition of the risks associated with the temporary storage of RID wagons outside RID railway yards.

The Safety Investigation Authority recommends that the Finnish Transport and Communications Agency ensure the implementation of the following recommendation:



Railway operators and infrastructure managers must perform a risk assessment of the temporary storage of RID wagons in locations other than designated RID railway yards, and the due care and attention required under RID legislation must be observed. [2019-S2]

S3 Development of the identification and management of risks related to rail traffic in safety management systems

The identification and management of risks related to normal rail traffic was deficient in the safety management systems of the actors. The Finnish Transport Agency's railway safety management system is focused on the management of risks in railway infrastructure management and construction projects. In VR's safety management system, the assessment of change-related risks is emphasised, while less attention is given to risks related to daily traffic.

The Safety Investigation Authority recommends that the Finnish Transport and Communications Agency ensure the implementation of the following recommendation:

Railway operators and the Finnish Transport Infrastructure Agency must develop the identification and management of risks related to normal rail traffic in their safety management systems. [2019-S3]

S4 Guidelines on ensuring that wagons remain in place

The railway operator's guidelines on the number of stop blocks failed to take account of the weight of the wagons or the longitudinal gradient of the track. The guidelines overestimated the holding power of the stop blocks. Guidelines on ensuring that wagons remain stationary should be drawn up by the infrastructure manager in order to ensure their consistency in a multi-actor environment.

The Safety Investigation Authority recommends that the Finnish Transport and Communications Agency ensure the implementation of the following recommendation:

The Finnish Transport Infrastructure Agency will draw up guidelines on keeping wagons stationary in the Finnish state rail network. [2019-S4]

The number of stop blocks must take account of the longitudinal gradient of the track, the weight of the wagons and the true holding power of the stop blocks.

S5 Clarification of the role of the infrastructure manager

Not all stakeholders are aware of the changed roles and responsibilities or operators in the railway sector. Neither practical procedures nor the parties responsible for environmental damage in the event of rail accidents have been defined with sufficient clarity.

The Safety Investigation Authority recommends that the Finnish Transport and Communications Agency ensure the implementation of the following recommendation:



The Finnish Transport Infrastructure Agency will inform stakeholders of its role and responsibilities. [2019-S5]

It would be particularly important to clarify the role of the railway accident rescue team.

S6 Guidance for and definition of remote management during rescue operations

The communication of a realistic situational awareness is very important in remote management situations. No qualitative requirements have been drawn up on the content and development of a situational awareness of an accident.

The Safety Investigation Authority recommends that the Ministry of the Interior ensure the implementation of the following recommendation:

The rescue services define the principles underlying remote management and the communication of the situational picture at the scene of the accident and draw up guidelines on remote management. [2019-S6]

It would be important to identify situations for which remote management is unsuitable.

S7 The establishment of an operational area command by the authorities should be routine

The rescue authorities and other participants did not organise their activities, so cooperation was inadequate. The issue of post-accident preventative measures was left open after the rescue operation had ended. This was partly due to lack of clarity about what transferring the scene of the accident under the responsibility of the Finnish Transport Agency involved. In extensive accidents requiring cooperation between several operators, an operational area command (OAC) would create a basis for effective cooperation

For these reasons, the Safety Investigation Authority reiterates the recommendation issued in investigation report R2017-03:

The Ministry of the Interior shall ensure that an operational area command (OAC) is set up by the public authorities in the case of long-term or exceptional multi-authority tasks. [2018-S23]

An OAC is the only effective arrangement for managing a situation involving multiple authorities/actors.

S8 Improvement of the safety management of the waste collection process

All safety risks of the waste collection process had not been identified. For example, the safety plan did not identify level crossings and other traffic safety issues as risks, there was no handling process for feedback, and orientation was deficient. The deficiencies in work instructions, orientation and supervision form the prerequisites for the establishment of high-risk working methods.



The Safety Investigation Authority recommends that the joint municipal consortium for waste management Lapeco, in cooperation with the contractors, implement the following recommendation:

The safety management related to the waste collection process shall take comprehensively into account the requirements of the work processes and the identification of occupational safety and traffic safety risks. Instructions shall be drawn up for the work processes and the orientation of the employees, and they shall be documented. Processes for handling feedback shall be defined in order to improve the operations. [2019-S40]

A more extensive nationwide survey of the safety of waste collection processes should be initiated, with the Association of Finnish Local and Regional Authorities possibly as the responsible body. A joint survey would provide different actors with tools to improve safety.

S9 Speed limits at level crossings

In violation of the guidelines, the speed limit on the road approaching the level crossing was too high. The incorrect speed limit does not indicate a change in conditions or support driver decision-making upon approaching a level crossing.

The Safety Investigation Authority recommends that the Finnish Transport and Communications Agency ensure the implementation of the following recommendation:

The Finnish Transport and Infrastructure Agency and other road keepers should review all speed limits, particularly at unprotected level crossings, and ensure that comply with the guidelines. [2019-S41]

The speed limits are specified in the guidelines of the Finnish Transport and Infrastructure Agency. The Finnish Road Association should inform private road managers and the municipalities of the Association of Finnish Local and Regional Authorities of the matter.

S10 Management of the level crossing risks identified during track projects

The conditions at the level crossing were further deteriorated during the superstucture replacement project. The risks had been identified, but they were not corrected; instead, they were postponed as residual risks. The legislation enables using the residual risk procedure to postpone the correction of level crossing risk factors identified during track projects.

The Safety Investigation Authority recommends that the Finnish Transport and Communications Agency ensure the implementation of the following recommendation:



In its track projects, the Finnish Transport and Infrastructure Agency shall prepare a plan and a timetable for the correction of the risks identified at level crossings. It must not be possible to transfer the risks into the future as residual risks. [2019-S42]

Road keepers must be involved in track projects including level crossings already during the planning stage. Cooperation allows the common risks related to level crossings to be comprehensively identified and managed.

S11 Emergency lighting of the Sr3 locomotive

In the collision, the fuses of the locomotive's batteries broke down, causing the emergency lighting to fail. The locomotive's emergency lighting did not have the independent power supply required by the TSI⁶.

The Safety Investigation Authority recommends that the Finnish Transport and Communications Agency ensure the implementation of the following recommendation:

VR Group shall change the emergency lighting of the Sr3 locomotive to meet the TSI requirements. [2019-S43]

Adding emergency lighting to other rolling stock as well will increase safety during accidents. Safety can also be improved by affixing self-illuminating caution tape into the locomotive's equipment space.

S12 Ensuring the power supply of the data recorder

In the collision, the fuses of the locomotive's batteries broke down, causing the data recorder to fail. Independent power supply is not required for data recorders in the TSI, which means that important information may be missed during accidents if power is cut out.

The Safety Investigation Authority recommends that the European Railway Agency (ERA) ensure the implementation of the following recommendation:

An independent power supply is required for new rolling stock being type approved that guarantees the operation of the recorder for a minimum of 30 minutes after power has been cut off. [2019-S44]

S13 Improvement of the safety of the cabin windows of rolling stock

The wrong kind of shattering of the side windows of the locomotive's cabin and the missing fragment retention film increased the injuries of the engine drivers.

The Safety Investigation Authority recommends that the Finnish Transport and Communications Agency ensure the implementation of the following recommendation:

⁶ TSI = Technical specification for interoperability.



Railway undertakings shall ensure that the cabin windows of the rolling stock are made of glass that does not cause additional injuries when breaking in an accident. [2019-S45]

The cabin windows must be made from laminated safety glass or fragment retention films must be applied on them.

S14 Review of the execution of railway clearance operations

Railway clearance operations are not currently efficient or economical, particularly from the perspective of the entire rail network. The problem stems from the infrastructure manager's interpretation of the regulations on clearance operations, which prevents the railway undertaking from carrying out clearance operations.

The Safety Investigation Authority recommends that the Ministry of Transport and Communications ensure the implementation of the following recommendation:

The Finnish Transport and Infrastructure Agency shall initiate a new review of the regulations concerning clearance work and clarify the roles of the actors in clearance operations. [2019-S46]

The objective must be the utilisation of the existing clearance resources in cooperation between the different parties. When the use of existing clearance resources is made more efficient, operational readiness will improve and cost savings can be made.

S15 Instructions and supervision of the assessment of level crossing risks

There was no process for the handling of the risk assessment required by the authority for the track project, and there were no instructions on the matter. The identified risks did not lead to measures being taken.

The Safety Investigation Authority recommends the following:

The Finnish Transport and Communications Agency shall define an approval process for the risk assessment of level crossings and supervise that the corrective measures are taken. [2019-S47]

RECOMMENDATIONS

Date and time (Code):			13.8.2007, 15.15 (B5/2007R)					
Location:		Nurmijärvi, Röykkä, Leppälammentie / Korpi level crossing, unpro-						
		tected						
Type of occurrence:		Leve	Level crossing accident, Freight train – car					
Train type and numb	per:	Freig	ght train 3649,	2 Dv12 diesel locomotive	s and 41 wagons			
Road vehicle:		Car I	ar Ford Sierra 2.0, 1990 model					
				In the train	In the road vehicle			
Persons on board:		Crev	V:	1	1			
		Pass	sengers:	0	1			
Fatally injured:		Crev	V:	0	0			
<u> </u>		Pass	sengers:	0	1			
Seriously injured:		Crev	V:	0	1			
Olivitation in terms of		Pass	sengers:	0	0			
Slightly injured:		Crev	V:	0	0			
		Pass	sengers:	0				
Damages of rolling s	STOCK!	Dam	ages to the eq	pupment of locomotive no	se, private car entirely			
Domogoo on trock of	nuinmant	More						
Damages on track e	quipment:	None	.					
Summerur On Mondy			t)7 at 2 15 p m		nt oppurred in Däukkä			
Summary: On Monda	ay 15 Augus	st 200	n at 3.15 p.m ollidod with a f	readt train on route from	Kirkniomi to Biihimäki			
numijarvi, in which a passenger		Lai Li	nder and serio	us injuries to the car drive	r MININGIII IO MIIIIIIAN,			
Final report issued: 23.6.2008			nger and seno		<u>л.</u>			
Becommendation Because the		aroa'a	arowing pop	ulation is continuously in	creasing the volume of			
Nr S241	affic at the	Korni	level crossing	and because fast drow	ving hushes around the			
	rossina do n	ot ena	nable the maintenance of visibility in line with Ministry of Transport					
	nd Commun	icatio	ations and Finnish Railway Administration requirements, the inves-					
tigation commis		nissior	ssion recommends the following:					
T	he Korpi lev	vel cr	ossing should	d be equipped with half-	barriers.			
Date Status			Comments	• • •				
20.1.2009 In	progress		Will be equipped with half barriers, when the financing is ok.					
19.2.2010 In	progress		In action and economic plan 2010–2013.					
18.8.2011 N	ot yet imple-	-	No funding ye	et.				
m	nented							
9.2.2012 N	ot yet imple-	-						
m	nented							
19.9.2013 In	progress		No funding.					
10.3.2014 In	progress		No funding yet.					
25.2.2015 U	nder implem	nen-						
	tion							
3.3.2016 U	nder implei	men-	No progress.					
28.3.2017	nder implei	men-	Municipality h	as presented the beginn	ing of the realization to			
			ELY Centre.	Les set l'habe ba annoused				
11.4.2018 U	nder impiei	men-	2010 and will	he corried out during our	at the beginning of year			
	nder implei	mon		ne in Hanko Uwinkää lin	niter 2019.			
20.0.2018 0			nart of electrif	ys in Lianku-Hyvinkaa III	e will be reviewed as a			
10	ntion			ICATION OF LINE FOR KORDI 12	vel crossing ontions are			
	ition		to move level	Ication of line. For Korpi le	evel crossing options are			
	ition		to move level crossing with	Ication of line. For Korpi le crossing to different loc half barriers.	evel crossing options are ation or equip the level			
30.9.2019 IN		ED	to move level crossing with Korpi level cro	Ication of line. For Korpi le crossing to different loc half barriers. ossing was equipped with	evel crossing options are ation or equip the level a half-barrier unit on 30			

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

Annex 1/2 (26)

riouu romono.	Car	Car Volkswagen Golf 1.6, 1999 model			
		_	In the train	In the road vehicle	
Persons on board	Cre	w:	2	1	
		sengers:	0	0	
Fatally injured:		w:	0	1	
		sengers:	0	0	
Seriously injured:	Cre	w:	0	0	
	Pas	senaers:	0	0	
Slightly injured:	Cre	w:	0	0	
	Pas	senaers:	0	0	
Damages of rolling	n stock: The	car was wreck	ed beyond repair. The front	of the locomotive	
	sust	ained some da	mage.		
Damages on track	equipment: Non	е.			
Other damages:	Non	e.			
Summary: On 21 O	ctober 2007 at 12.5	5.n.m. a fatal le	evel crossing accident occur	red on an unprotected	
level crossing along	Heikinnellontie roa	d in Lahti The	accident occurred when a	car on Heikinnellontie	
road drove without	stopping in front of a	a locomotive er	route from Lahti to Heinola	The driver who was	
the sole person in t	he car died instant	lv The accide	nt occurred because the dr	iver of the car did not	
see the train. The le	vel crossina in ques	stion meets rea	ulations concerning visibility	and crossing angles	
but does not meet	those concerning v	vait platforms	It is possible that the drive	er was not sufficiently	
vigilant due to famili	arity with the cross	ing and the imp	pression that train traffic was	s infrequent there.	
Final report issued	1: 9,9.2008				
Recommendation	Track renovation	investments ha	ave been scheduled for the	e Lahti-Heinola track	
Nr S243	within the next few	vears The inte	ended focus is on track tech	nology renewal but it	
111. 0240	is clear that the inv	estments will a	lso cover raising level cross	sing safety to the level	
	set in technical tra	ck requirement	ts (RATO) Considering the	danger posed by the	
	level crossings alo	ong the track a	t the moment it is recomm	ended that actions to	
	improve level cross	sing safety are i	nitiated in advance before th	ne investments proper.	
	Such actions inclu	de the following	: possible replacement of l	evel crossings with al-	
	ternative road rou	tina. siahtline	improvements, wait platfor	m improvements and	
	crossing angle adju	ustments.			
	Actions to improve level crossing safety along the Lahti–Heinola track should				
	Actions to improv	ve level crossi	ng safety along the Lahti–	Heinola track should	
	Actions to improve be carried out be	ve level crossin fore the initiat	ng safety along the Lahti– ion of scheduled renovati	Heinola track should on investments.	
Date	Actions to improve be carried out be Status	e level crossin fore the initiat Comments	ng safety along the Lahti– ion of scheduled renovati	Heinola track should on investments.	
<i>Date</i> 20.1.2009	Actions to improvi be carried out be Status In progress	ve level crossin fore the initiat Comments	ng safety along the Lahti– ion of scheduled renovati	Heinola track should on investments.	
<i>Date</i> 20.1.2009 19.2.2010	Actions to improve be carried out be Status In progress In progress	re level crossin fore the initiat Comments	ng safety along the Lahti- ion of scheduled renovati crossings there has been re	Heinola track should on investments. educed speed limit on	
<i>Date</i> 20.1.2009 19.2.2010	Actions to improve be carried out be Status In progress In progress	re level crossin fore the initiat Comments In some level roads.	ng safety along the Lahti- ion of scheduled renovati crossings there has been re	Heinola track should on investments. educed speed limit on	
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Date 20.1.2009 19.2.2010 18.8.2011 9.2.2012 19.9.2013 10.3.2014 25.2.2015 3.3.2016 28.3.2017 11.4.2018 25.3.2019 30.3.2020	Actions to improve be carried out betomore o	Possibly atter Procurement Procurement Procurement Comments In some level roads. Lahti town pro- close it to the Lahti town ha equip the work Possibly atter Possibly atter Procurement delayed. Proc gerous level co 2019. On this section traditional wai level crossing	ng safety along the Lahti- ion of scheduled renovati crossings there has been re oposes to make a level cro building program in the nex s made a level crossing pla st level crossing with barrie ntion devices will be installed the devices will be installed g warning devices that are be stalled during 2018. of warning devices for Lahti- ress is on-going at commerce prossings will be equipped we n of line, both new, low-cos rning installations are imple g removal and safety impre-	Heinola track should on investments. educed speed limit on ssing plan and to en- t few years. an and has decided to rs. d. d. d. based on new technol- -Heinola line has been ial court. 12 most dan- rith half barriers during t warning devices and emented as part of the ovement programme.	
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Date 20.1.2009 19.2.2010 18.8.2011 9.2.2012 19.9.2013 10.3.2014 25.2.2015 3.3.2016 28.3.2017 11.4.2018 25.3.2019 30.3.2020	Actions to improve be carried out be Status In progress In progress In progress In progress In progress In progress In progress Under implemen- tation Under implemen- tation Under implemen- tation Under implemen- tation Partly implement- ed	Possibly atter Possibly atter Possibly atter Level crossing ogy, will be in Procurement delayed. Proc gerous level c 2019. On this sectio traditional war level crossing The work on 23 level cross	ng safety along the Lahti- ion of scheduled renovati crossings there has been re- oposes to make a level cro- building program in the nex s made a level crossing pla st level crossing with barrie ntion devices will be installed to devices will be installed g warning devices that are b stalled during 2018. of warning devices for Lahti- ess is on-going at commerce crossings will be equipped w n of line, both new, low-cos rning installations are imple g removal and safety impr 10 level crossings is comple- ings will be improved by oth	Heinola track should on investments. educed speed limit on ssing plan and to en- t few years. an and has decided to rs. d. d. d. d. d. d. d. eased on new technol- Heinola line has been ial court. 12 most dan- rith half barriers during t warning devices and emented as part of the ovement programme. eted, and the safety of her means. 2 are com-	

	Mukkula railway, and 1 other improvement project is currently
	going on.

Date and time (Co	do): 100	1_2010 (\$1/20)11R)		
Location:	Finl	Finland			
Type of occurrenc		al crossing acci	idents		
Train type of occurrenc		er crossing acci	luents		
Deed vehicles	nber.				
Road venicle:			In the train	In the read vehicle	
D	0		in the train	In the road vehicle	
Persons on board	: Cre	W:			
	Pas	sengers:			
Fatally injured:	Cre	W:			
	Pas	sengers:			
Seriously injured:	Cre	w:			
	Pas	sengers:			
Slightly injured:	Cre	w:			
	Pas	sengers:			
Damages of rolling	g stock:				
Damages on track	equipment:				
Other damages:					
Summary: While the	he number of level of	crossing accide	nts in Finland reduced signi	ficantly between 1991	
and 1998, since the	n the number has r	emained consta	ant and, at times. has even i	ncreased slightly. The	
number of accident	s has fallen in the	last two vears	However, this has not influ	lenced the number of	
deaths. Since 1993	3. there has been a	in average of '	10 fatalities per vear in leve	el crossing accidents.	
Compared to other	European countries	Level crossing	safety in Finland is below a	average.	
Some 78 per cent c	of all fatal accidents	occurred on le	vel crossings without warni	na devices Accidents	
on level crossings of	of this type were ae	nerally caused	by the vehicle driver misiuc	laing the situation not	
by the driver taking	unnecessary risks	The road speed	limit was typically 80 km/h	and the railway speed	
limit 120 km/h Most	t level crossings wit	hout warning de	evices are located on privat	e roads and most fatal	
accidents occurred	on level crossings	on such roads	Nearly all level crossings wi	thout warning devices	
fail to meet the relat	ed railway regulatio	ns Maintainers	of private roads do not have	sufficient information	
on their level crossi	na maintenance ob	liastions	of private roads do not nave	5 Sumoloni information	
Reserved on statistical	analysis a danger	nyalions. Nie level crossi	na is one without warning de	wices with a low road	
speed limit and with	h a high amount of	averade daily ti	raffic Such level crossings	are typically located in	
residential areas	in a might amount of	average daily ti	rame. Such level clossings a	are typically located in	
Final report incura	1 : 12.2.2012				
Final report issued			volvetes the development of	haal waxdaa alaaa wad	
Recommendation	The Koulullitu son	ware, which ev	valuates the dangers of sc	nool routes, does not	
Nr. 5314	Include level cross	sings, because	the road database informa	ition used by the soft-	
	ware does not con	tain level cross	ing information.	ter all sold from a sec	
	when planning	school transp	ortation, the municipalit	les snould improve	
-	safety by avoidin	g level crossir	ngs without warning devic	ces along the routes.	
Date	Status	Comments			
19.9.2013	In progress				
10.3.2014	In progress				
25.2.2015	Under implemen-				
	tation				
3.3.2016	Under implemen-	Developed geo	graphic information system.		
	tation				
11.4.2018	Partly imple-	School transp	oort guide will be updated in	2018. Recommenda-	
	mented	tion will be ad	ded as a part of designing r	new school transports.	
25.3.2019	Under implemen-	No answer to	the inquiry.		
	tation				
30.3.2020	Under implemen-	Finnish natior	nal agency for education ha	s not answered to the	
	tation	inguiry.	0		
Recommendation	Most fatal level cro	ossing accident	s occurred at level crossing	s without warning de-	
Nr. S316	vices. Level cross	na percentivity	was also noted in VTT's re	search. To make level	
	crossings percent	ble sufficiently	early for road users and to	o ensure correct level	
	crossing use:	2.5 Californity			
	Ways of improvir	a the nercent	ivity of level crossings an	d their conditions of	
	use and technica	l nronerties et	hould be specified		
		r properties si	isaia ne spesifica.		

Annex 1/4 (26)

Date	Status	Comments
19.9.2013	In progress	Researches made and also on going.
10.3.2014	In progress	
25.2.2015	Under implemen- tation	Project for means to improve perceptivity is in progress.
3.3.2016	Under implemen- tation	Project for means to improve perceptivity is in progress.
28.3.2017	Under implemen- tation	
11.4.2018	Partly imple- mented	Finnish Transport Agency will define measures for improving visibility of level crossings. Focus is on developing and installing warning devices based on new cost-effective technology.
25.3.2019	Partly imple- mented	Finnish transport agency has studied available solutions and started procurement of warning devices. Planned delivery was during years 2020-2021, but process has been delayed and is now in commercial court.
30.3.2020	IMPLEMENTES	The Finnish Transport Infrastructure Agency constructs both new, low-cost warning devices and traditional warning installa- tions as part of the level crossing removal and safety improve- ment programme.

Date and time (Co	de): 21	.2.2011, 4.05 (E	31/2011R)	
Location:	N	Nokia, between Siuro and Suoniemi stations		
Type of occurrenc	e: Co	Collision of trains, rear end collision		
Train type and nur	mber: Fr	eight train 3811,	Sr1 electric locomotive and	21 wagons - Freight
	tra	in 3801, 2 Dv12	diesel locomotive and 24 w	ragons
Road vehicle:	-	· ·		
			In the train	In the road vehicle
Persons on board	: Ci	ew:	1 – 1	
	Pa	ssengers:	0	
Fatally injured:	C	ew:	1 – 0	
	Pa	ssengers:	0	
Seriously injured:	C	ew:	0	
	Pa	ssengers:	0	
Slightly injured:	C	ew:	0	
	Pa	ssengers:	0	
Damages of rolling	g stock: Si	1 electric locomo	otive and two timber wagons	s were badly dam-
	ag	ied.	_	-
Damages on track	equipment: So	me sleepers we	re damaged.	
Other damages:	No	one.		
Summary: A freight	t train, which had t of the other train	arrived to assist a in Nokia betwee	another freight train travellir	ng to Mäntyluoto, Pori, 05 am on 21 February
2011 The engine d	river of the assisti	na train fatally ini	ured in the accident. One w	agon and the locomo-
tive which collided t	the end of the othe	er train were bad	ly damaged and had to be s	cranned Additionally
one wagon was ba	dlv damaged, but	was still repaire	able. The tracks were unda	amaged. Traffic at the
accident site was in	terrupted for 14 h	ours.		
According to the ru	innina recorder d	ata, the driver of	f the train which collided h	ad begun emergency
braking, at a speed	d of 46 km/h. five	seconds before	the impact. The train spee	ed was 43 km/h upon
impact. The maxim	um permitted spee	ed of the train wh	hich collided was 50 km/h.	
The accident was c	aused by the erro	neous location in	formation of the train to be	assisted.
Final report issued	d: 20.2.2012			
Recommendation	The visibility of w	agons should be	improved. In the reconstruc	tion drive, it was found
Nr. S323	that a wagon wit	nout a reflector o	n the end can only be seen	from a short distance
	in darkness.			
	Reflectors shou	hould be installed on the ends of wagons.		
Date	Status	Comments		
19.9.2013	In progress	Belongs also	to the needs of shunting are	eas.
10.3.2014	In progress	VR Ltd regard	the realisation as challen	ging.
25.2.2015	Under implementation	nen- 3400 wagons are installed with reflectors; work is not yet ready.		

Annex 1/5 (26)

Under implemen-	In realisation: in the new wagons and $\frac{1}{4}$ of the old wagons al-
tation	ready have.
Under implemen-	
tation	
Partly imple-	75% of freight wagons owned by VR Group have been fitted
mented	with end reflectors.
Partly imple-	VR is installing reflectors to freight wagons. 75% of freight wag-
mented	ons owned by VR Group have been fitted with end reflectors.
IMPLEMENTED	Reflectors have been installed on 80% of the freight wagons
	owned by VR.
	Jnder implemen- ation Jnder implemen- ation Partly imple- mented Partly imple- mented MPLEMENTED

Annex 1/6 (26)

25.3.2019	Under implemen- tation	Development of rail yard instructions has been started in Finn- ish transport agency and in railway stakeholders' common in- struction work group.
30.3.2020	Partly imple- mented	The development of instructions has already been started in the Finnish Transport Infrastructure Agency and in the joint instruc- tion committee of the railway sector. VR has developed its own station-specific instructions so that the first new-type local instructions common for the entire group were introduced on 1 January 2018. Currently, common instruc- tions are available for all stations where VR has operations. These instructions will be developed further in the period 2020– 2021.

Date and time (Code):	6.4.2013, 3.22 (R2	2013-01)		
Location:	Vammala railway yard			
Type of occurrence:	Derailment			
Train type and number:	Freight train 3703,	Sr1 electric locomotive and	43 wagons	
Road vehicle:	-			
		In the train	In the road vehicle	
Persons on board:	Crew:	1	-	
	Passengers:	0	-	
Fatally injured:	Crew:	0	-	
	Passengers:	0	-	
Seriously injured:	Crew:	0	-	
	Passengers:	0	-	
Slightly injured:	Crew:	0	-	
	Passengers:	0	-	
Damages of rolling stock:	13 wagons damaged.			
	Two tracks were da	amaged at a distance of 17	7 metres, including	
Damages on track equipment:	two turnouts. In addition, the sleepers of one track were damaged			
	at a distance of 249	9 metres.		
Other damages:	A small amount of crude tall oil leaked onto the ground.			
Disturbances of traffic:	The accident caused a traffic interruption that lasted approximately			
	11 hours. The stat	ion was returned to norma	I use one month after	
	the accident. 11 trains in passenger traffic and 11 trains in freight			
	traffic had to be cancelled.			
Summary: Freight train 3703 en	route from Lampe	re to Rauma derailed at th	e Vammala station in	
Sastamala. The train was proceeding as planned, until at the Vammala turnout V003, the rear bogie of				
vagon 15 or the front bogie of wagon 16 was directed between the switch blades and the stock rails o				
the turnout. As a consequence, the rear end of the train began to derail. Two Russian tank wagons				
tipped over and the train broke into two parts. Nine Finnish freight wagons derailed. The intermediate				

tipped over and the train broke into two parts. Nine Finnish freight wagons derailed. The intermediate wagon between the Russian tank wagons and the Finnish freight wagons derailed to the left, causing minor damage to the track to the left of the train's direction of travel. The 16 wagons at the end of the train remained on the rails. The front end of the train, the locomotive and 15 wagons continued moving for another 314 metres after the brake pipe was broken. The rear bogie of the last wagon at the front end of the train's direction to the locomotive's data recorder, the train's speed at the moment of derailment was 67 km/h.

The derailment was caused by the switch turning underneath the train. The train caused the open switch blade to move, resulting in the opening of the switch lock, which allowed the switch to turn. When an open switch blade is subjected to vibration or sufficiently powerful impacts, a switch lock that allows trailing may become unlocked. As a result, the closed switch blade opened, and the wagon wheels fell between the switch blade and the stock rail.

Final report issued	d: 20.2.2014	
Recommendation	The log data availa	able in the railway safety system had not been examined and
Nr. S338	analysed.	
	The Finnish Trans for the analysis o flaws endangering	sport Agency should establish a system and methodology f the error logs of safety systems to ensure that repeated g safety are detected.
Date	Status	Comments

25.2.2015	Under implemen- tation	Fault situations will be recorded in the POHA system.
3.3.2016	Under implemen- tation	The instruction is being prepared.
28.3.2017	Under implemen- tation	
11.4.2018	Under implemen- tation	Track and safety equipment repair, and measurement data will be integrated to a single system in RAID-E project.
25.3.2019	Partly imple- mented	The development project of the condition control of the track network and of maintenance systems (RAID-E) improves the matter but because of different generations of equipment, all the equipment cannot be connected to the system.
30.3.2020	Under implemen- tation	The Finnish Transport Infrastructure Agency will develop its RAID-e system further by including a safety device section in the system. The root cause analysis tool for safety devices will be piloted in 2020.

Date and time (Code):	7.11.2013, 17.17	(R2013-02)			
Location:	Pännäinen, Seinäjo	Pännäinen, Seinäjoki Ylivieska section of line			
Type of occurrence:	Train collision, Col	Train collision, Collision with an obstacle, a maintenance machine.			
Train type and number:	Freight train 5489,	2 Dv12 diesel locomotives	and 6 wagons.		
Road vehicle:	-		¥		
		In the train	In the road vehicle		
Persons on board:	Crew:	1 + 1	-		
	Passengers:	0	-		
Fatally injured:	Crew:	0	-		
	Passengers:	0	-		
Seriously injured:	Crew:	0	-		
	Passengers:	0	-		
Slightly injured:	Crew:	0 + 1	-		
	Passengers:	0	-		
Damages of rolling stock:	The collision cause	d a hole into the fuel tank c	of the first engine, and		
	the left steps of bo	th engines were damaged.	The excavator was		
	damaged beyond r	epair.			
Damages on track equipmen	t: None.				
Other damages:	600 liters fuel leake	ed onto the track.			
Disturbances of traffic:	Traffic at the accide	ent site was interrupted for 3	3.5 hours. Delays from		
	hour to four hours	for eight passenger trains a	and effects on several		
	other trains becaus	other trains because of waiting. One freight train was cancelled from			
	between Kokkola-Tampere.				
Summary: Freight train 5489	collided with an excav	ator carrying out trackworl	k on the track section		
between Pännäinen and Kolp	pi, on which superstru	cture and electrification w	orks were being con-		
ducted. Located near Pännäine	en Station, the trackwo	ork supervisor had requeste	ed the traffic controller		
for permission for an excavator	to carry out trackwork	. The permission was giver	tor the work to begin		
on the Pannainen-Kolppi secti	on "behind a freight tra	in". The trackwork supervis	sor informed the exca-		
vator driver of the permission.	At the time, the excav	ator was located 3.4 kilom	etres from Pannainen		
Station towards Kolppi.	which is a set of the strength of the	a driver peties of the lights o	f an annraaching		
Having driven the excavator pa	Initially onto the track, the	le driver noticed the lights o	if an approaching		
that signal DE22 had been swit	a to get on the track. Or	ily moments earlier, the eng	ine driver had realised		
of 50 km/b. However, the locar	netive's left buffer bit t	he left rear corpor of the ex	raking norm the speed		
of 50 km/n. However, the locomotive's left burler fill the left fear comer of the excavator's top carriage					
Einal raport issued: 11 11 2015					
Percommondation Currently, tradeworks begin without sufficient preparation and electronic of the					
Nr S345	nonsihilities Initial safe	atv meetings are held in an	attempt to ensure that		
the safety	aspects are nut right in	order for the contractors to	hegin work However		
much more	e time should be devot	ed to such preparation pla	nning and clarification		
of respons	ibilities. Good planning	also involves ensuring th	at communication be-		
tween the	parties is working.	ties is working.			

	The Finnish Transport Agency will ensure that contracts include a separate			
	before trackwork is begun.			
Date	Status	Comments		
25.2.2015	Under implemen- tation	In March workshop of track possession planning.		
3.3.2016	Under implemen- tation	Tested in Seinäjoki–Oulu project.		
28.3.2017	Under implemen- tation			
11.4.2018	Under implemen- tation	The will is to proceed towards this.		
25.3.2019	Partly imple- mented	Track work meetings are widely in use in the whole of Finland. The handling of track work is systemised in the regional quality and track work meetings concerning traffic. The procedures will be unified during 2019.		
30.3.2020	Under implemen- tation	For the purposes of construction processes, the Finnish Transport Infrastructure Agency will specify the minimum time to be used for work planning before the work is actually started.		
Nr. S346	ities and tasks rela sise monitoring wh commissioning ins monitoring of comp The large number These occurrences creased risk of gett haviour of both org comply with safety The Finnish Trans safety regulations	ted to the safety of railway operations. The instructions empha- ere written forms and reports are used. With the exception of pections, site monitoring is rarely carried out on the field. The bliance with trackwork safety regulations should be increased. of unauthorised trackworks was a cause for particular concern. is can be reduced only by increasing field monitoring. An in- ting caught for breaches of regulations efficiently directs the be- anisations and individuals. Along with this measure, actions that regulations should be made financially attractive. Sport Agency will increase the field monitoring of trackwork is by allocating appropriate resources for such work.		
Date	Status	Comments		
25.2.2015	Under implemen- tation	Accepted in the management team; work underway.		
3.3.2016	Under implemen- tation	Safety coordinator training underway.		
28.3.2017	Under implemen- tation	Piloted. Transport Agency tries to develop monitoring.		
11.4.2018	Under implemen- tation	Guidebook for supervisors is being prepared. Rail maintenance supervision instruction is ready. Minimum requirements for su- pervision will be defined during 2018.		
25.3.2019	Under implemen- tation	Finnish transport agency has improved instructions and pro- curement process. Supervision criteria will be defined in all fu- ture contracts.		
30.3.2020	Under implemen- tation	The Finnish Transport Infrastructure Agency will prepare sepa- rate, additional orientation material for the safety coordinators on the safety culture in railway environment and on the role, responsibilities and rights of the safety coordinators. The project manual will be adopted. Developer consultants will be familiar- ised on the use of the template documents for procurement in- structions.		

Date and time (Code):	18.3.2015, 14.58 (R2015-03)
Location:	Hyvinkää, Helsinki Riihimäki section of line (line number 112), km
	61+293
Type of occurrence:	Incident, risk of derailment
Train type and number:	Commuter train 9692, 2 x Sm4 electric train units
Road vehicle:	-

			In the train	In the road vehicle	
Persons on board	:	Crew:	2		
		Passengers:	100	-	
Fatally injured:	(Crew:	0	-	
		Passengers:	0		
Seriously injured:	(Crew:	0	-	
	1	Passengers:	0	-	
Slightly injured:		Crew:	0	-	
		Passengers:	0	-	
Damages of rolling	g stock:	None.			
Damages on track	equipment:	None.			
Other damages:		None.			
Disturbances of tr	affic:	None.			
Summary: The regional train (the kilometers before the Hyvinkää s 156 km/h. The maximum allowed s been switched on. The incident did the rear unit reported having faller overhead rack fell on the floor and		ation, at 2.58 p.m beed over the switc not cause significa off the seat due to broke.	., the train ran through a ch was 80 km/h. The engine ant personal injuries. One p o a strong lurch. Loose flue	switch at a speed of s's ATP device had not bassenger travelling in orescent tubes on the	
Pasammandation	U. [7.0.2013]				
Nr. 2015-510	not switched on, the maximum speed of the train should be mechanically res in order to reduce the consequences of a possible accident. The Safety Inve- tion Authority, Finland recommends that the Finnish Transport Safety Agency ensure the implementation of the following recommendation: If a train's ATP engine device is not switched on, the train's speed sho restricted to a maximum of 80 km/b			The Safety Investiga- t Safety Agency (Trafi)	
Date	Status	Comments			
3.3.2016	Under impleme tation	n- Will be only in	the new Sr3 locomotives.		
28.3.2017	Under impleme tation	n- VR's rolling st already has.	tock only in the new Sr3 lo	comotives. Fenniarail	
11.4.2018	Under impleme tation	n- Implemented	into some series of rolling s	tock.	
25.3.2019	Under impleme tation	n- if ATC is not c if ATC is not c In Helsinki Cit ATC is not op In VR Group's not operative other rolling s	Dr18 locomotives speed is operative. ty Transport's Sm5 trains s erative. s new Sr3 locomotives spe . VR has not decided to r tock.	s automatically limited peed is also limited if ed is limited if ATC is make modifications to	
30.3.2020	IMPLEMENTE in different way	D The speed of not in use. Th ATP is not in u limited if ATP both indicator ers that remin	Fenniarail's Dr18 locomotiv the speed of Junakalusto's S use. The speed of VR Grou is not in use. Older rolling s lamps indicating that ATP is d the engine driver to switc	ves is limited if ATP is Sm5 trains is limited if p's Sr3 locomotives is stock is equipped with is not in use and stick- h ATP on.	

Date and time (Code):	6.2.2015, 9.14 (R2015-01)			
Location:	Kokemäki, Isotalo level crossing (km 285+145), Kokemäki Pori sec-			
	tion of line (line nur	nber 344)		
Type of occurrence:	Level crossing acci	dent, passenger train-tracte	or	
Train type and number:	Passenger train 461, Sr1electric locomotive and 3 coaches			
Road vehicle:	Articulated Hauler (Dumper), Volvo A25D, 2002 model			
	In the train In the road vehicle			
Persons on board:	Crew:	2	1	
Passengers: 25		25	0	
Fatally injured: Crew: 0		0	0	
	Passengers:	0	0	
Seriously injured:	Crew:	1	1	

	Pas	sengers:	0	0		
Slightly injured:		W:	0	0		
	Pas	sengers:	0	0		
Damages of rolling	g stock: Loc	omotive front w	as damaged, the dumper w	as broken from its ar-		
	ticu	ticulation.				
Damages on track	equipment: Nor	ie.				
Other damages:	Nor	None.				
Disturbances of tra	affic: Trat	fic at the accid	ent site was interrupted for	7 hours. The train to		
	Por	i was replaced	with bus. Three passenge	r trains from between		
	Tan	npere–Pori were	e replaced with busses.			
Summary: On Fri	day, 6 February 2	2015, a passer	nger train and an articulate	ed hauler collided in		
Kokemäki. The colli	sion occurred at the	e unprotected le	vel crossing of a private roa	id and the Kokemäki-		
Pori railway. The ac	cident happened w	hile workmen w	vere preparing to move a tra	ck excavator over the		
track. The driver of	the articulated hau	ler was driving o	over the tracks to transport	materials required for		
moving the excavat	or, when the passe	enger train cam	e from his left and collided	with the trailer of the		
articulated hauler. B	Soth the hauler drive	er and engine dr	iver were seriously injured.	I he articulated hauler		
Is a 21-tonne earth	moving machine. I	ne impact split	the nauler in two, the tracto	or being thrown to the		
The colligion course	s and the trailer to tr	e right side. I n	e front end of the locomotive	e was badly damaged.		
heuler emounted to	a no damage to th		ists of repairs to the train e	ingine and articulated		
Final report issue	$\frac{100001 E U R 700,00}{100001 E U R 700,00}$	0.				
Final report issued	1. 19.6.2015		n in an an an an air the in a train			
	The railway maint	enance provide	r issued appropriate instruction	clions to the work su-		
INT. 2010-323	pervisors of the ea	the maintenance	any for now to move the exca	avalor over the tracks.		
	For this purpose,	no separate in	structions available for non-	trackwork-related use		
	of level crossings	in excentional	circumstances that nose a	risk of collision The		
	Safety Investigation	n Authority F	inland recommends that t	he Finnish Transport		
	Safety Agency sho	ould ensure the	adoption of the following re	commendation:		
	The Finnish Tran	sport Agency r	nust draft readily available	auidelines for time-		
	intensive. non-tra	ackwork-relate	d use of level crossings of	or other similar work		
	that poses a risk	of a collision.				
Date	Status	Comments				
3.3.2016	Under implemen-	Need for new	instructions will be taken in	to account when pre-		
	tation	paring the nex	t action plan.			
28.3.2017	Under implemen-	It has been de	ealt with different actors. Ac	tors must learn to es-		
	tation	timate.				
11.4.2018	Partly imple-	Guidebook for	r special road transports in	level crossings will be		
	mented	published in 2	018.			
25.3.2019	Partly imple-	Instructions for	or special road transports in	level crossings have		
	mented	been publishe	d 1.1.2019. Instructions for	another time-consum-		
		ing rail crossir	ng will be finished during 20	19.		
30.3.2020	Under implemen-	The Finnish T	ransport Infrastructure Ager	ncy will specify the $\overline{\text{cri}}$ -		
	tation	teria for the le	evel crossings where cross	ing with long vehicles		
		will be prohibi	ted. Prohibition will be impl	emented with prohibi-		
		tory traffic sig	ns and added to Digiroad or	similar service.		

Date and time (Code):	12.3.2015, 13.19 (12.3.2015, 13.19 (R2015-02)			
Location:	Oulunkylä, Helsink	Oulunkylä, Helsinki–Riihimäki section of line (line number 112),			
	km 8.				
Type of occurrence:	Incident, risk of col	lision			
Train type and number:	Commuter train 96	76, 2 x Sm4 electric train ur	nits – Commuter train		
	9840, 2 x Sm4 elec	ctric train units.			
Road vehicle:	-]-			
		In the train	In the road vehicle		
Persons on board:	Crew:	2-2	-		
	Passengers:	50 - 50	-		
Fatally injured:	Crew:	0	-		
	Passengers:	0	-		
Seriously injured:	Crew:	0	-		
	Passengers:	0	-		

Slightly injured:		Crew:	0	-
		Passengers:	0	-
Damages of rolling	g stock:	None.		
Damages on track	equipment:	None.		
Other damages:		None.		
Disturbances of tr	affic:	H-train fell behind behind its schedule	its schedule for about 24 m about 15 minutes.	inutes and Z-train fell
Summary: On Thu two Sm4 commuter train stopped as a r The engine driver le block section of the 15 minutes. Other ra Final report issued Recommendation Nr. 2015-S30	rsday, 12 Mard trains ended u esult of a malfu at the train "roll" Z train following ail traffic was no 2 22.10.201 In this case the been signed re to correct the The maintain safety device	arch 2015 at 1.19 pm, an incident occurred at Pukinmäki Station afte d up within the same block section. The incident occurred after the H alfunction in safety device on the neutral section following signal E581 oll" backwards in order to exit the neutral section, causing it to enter the ring it on the same track. The H train ran late 24 minutes and the Z train not disturbed. The incident did not cause any damage. 015 the fault of the safety device had not been repaired even though it had a repaired. In order that in the future the maintenance would know how re right faults: 101 stock must ensure and instruct the repairs of		
Date	Status	Comments		
3.3.2016	Under implem tation	en- VR will settle.		
28.3.2017	Under implem tation	en- VR will settle.		
11.4.2018	Partly imple- mented	Has been app concept.	blied partly in VR Group's ir	telligent maintenance
25.3.2019	Under implem tation	en- VR has imple the maintenar nance).	mented for its part as a part ace systems of the rolling sto	rt of the developing of ock (intelligent mainte-
30.3.2020	Partly imple- mented	VR FleetCare agement. The the Sm3 and that work com	is developing a new model preparation of curriculums Sm5 trains and the aim is to apleted by the end of 2020.	for qualifications man- has been started from have the most part of

Date and time (Code):	2015 (R2015-S1)		
Location:	Finland		
Type of occurrence:	Wrong routings		
Train type and number:			
Road vehicle:	-		
		In the train	In the road vehicle
Persons on board:	Crew:		
	Passengers:		
Fatally injured:	Crew:		
	Passengers:		
Seriously injured:	Crew:		
	Passengers:		
Slightly injured:	Crew:		
	Passengers:		
Damages of rolling stock:			
Damages on track equipment:			
Other damages:			
Disturbances of traffic:			
Summary: The Safety Investigation	on Authority investig	ated factors causing wrong	routings in train traffic,
by examining a number of selected	ed cases and going	through all of the wrong ro	outes formed in 2015,
based on data made available by	the Finnish Transpo	rt Agency, Finrail and VR.	
Final report issued: 8.7.2016			
Recommendation Not all wrong	routings are reported, or their data is not collected, although this would		
Nr. 2016-S12 be possible th	rough IT means. No clear and uniform system exists for reporting on		
wrong routing	s that covers all pa	arties: the rail traffic operat	ors, the owner of the

	railway network and the safety authority. It is not possible to gain an overview of the			
	issue.			
	The Finnish Tran system for the rep	sport Safety Agency (Trafi) is obliged to create a uniform orting and classifying of deviations; one covering all actors.		
Date	Status	Comments		
28.3.2017	Under implemen- tation	Trafi is making the system and soon it is possible to test.		
11.4.2018	Under implemen- tation	Will probably be operational at the beginning of year 2019.		
25.3.2019	Partly imple- mented	Traficom is working on a common incident reporting system. VR Group's and Finnis transports agency's incidents reports will be transferred directly to the system. Smaller actors' incident re- ports to the database by e-mail or with help of the network form.		
30.3.2020	IMPLEMENTED	All incident reports from VR and the Finnish Transport Infra- structure Agency will be transferred to the Finnish Transport and Communications Agency via an electronic interface, and those of smaller operators will be submitted by e-mail or a net- work form. Joint taxonomy has been agreed on.		
Recommendation Nr. 2016-S15	 Traffic controllers feel that they have insufficient say in the creation of new traffic control systems and the development of old ones. Defects that are the responsibility of the Finnish Transport Agency (such as defects in technical equipment) are corrected quickly, but deficiencies and development needs are not necessarily reacted to at all. When procuring traffic control systems, the Finnish Transport Agency must take steps to ensure that any development needs emerging in a system can 			
	be implemented s	moothly during the system's lifespan.		
Date	Status	Comments		
28.3.2017	Under implemen- tation	I ransport Agency examines if it is working in Riihimäki–Tam- pere amendment work.		
11.4.2018	Partly imple- mented	Finish Transport Agency and Finrail have started regular meet- ings where among other topics the most critical development needs are discussed.		
25.3.2019	Partly imple- mented	Responsibility of system development is divided between Finn- ish transport agency and Traffic Management Finland Group (TMFG). Transport agency has agreed procedures for pro- cessing initiatives from traffic controllers. Initiative processing will be improved during 2019.		
30.3.2020	IMPLEMENTED	The Finnish Transport Infrastructure Agency has agreed on the procedures by which the ideas and proposals for the improve- ments concerning traffic control will be handled and taken into the decision-making process.		

Date and time (Code):	3.2.2016. 8.09 (R2	3.2.2016, 8.09 (R2016-01)		
Location:	Uimaharju, (line nu	mber 701), km 673+930)	
Type of occurrence:	Accident to person	s involving rolling stock	in motion – Track worker	
	hit by a train.			
Train type and number:	Regional train 760,	Dm12 rail bus		
Road vehicle:	-			
	In the train Other			
Persons on board:	Crew:	1		
	Passengers:	24		
Fatally injured:	Crew:	0		
	Passengers:	0		
Seriously injured:	Crew:	0	1	
	Passengers:	0		
Slightly injured:	Crew:	0		
	Passengers:	0		
Damages of rolling stock:	None.			
Damages on track equipment:	None.			
Other damages:	Portable earth radar was damaged.			

-				
Disturbances of tr	affic: Traff	fic at the accident site was interrupted for 20 minutes.		
Summary: The acc	Summary: The accident happened when one of the cable markers did not notice the approaching train			
and moved too clos	se to the rails. The	cable marker's attention was focused on the cable detector. In		
addition, the current	weather conditions	and the train being quiet made the train more difficult to notice.		
Due to the suddenn	ess of the situation,	the engine driver had no chance to avoid the collision.		
Final report issued	<i>t:</i> 4.10.2016			
Recommendation	The Finnish Trans	port Agency's cable marking request form does not directly ad-		
Nr. 2016-S27	dress the need for	protective measures during the work. The instructions on cable		
	marking do not dis	scuss work safety sufficiently. At the moment, there is a great		
	variety among cabl	le marking requests, cable marking request forms are not used,		
	and the responsibil	ities for using the forms are unclear.		
	The Finnish Trans	sport Agency shall renew the instructions on cable marking		
	and adapt the cal	ble marking request form so that the purchaser must com-		
	ment on the prote	ctive measures to be used in the work.		
Date	Status	Comments		
28.3.2017	Under implemen-	Not yet ready.		
	tation			
11.4.2018	Under implemen-	Instructions will be updated during 2018.		
	tation	· · ·		
25.3.2019	Under implemen-	Finnish transport agency is updating cable detection form's		
	tation	commercial issues. Instructions for cable detection will be up-		
	I	dated at the same time. New instructions clearly state that all		
	I	cable detection work on railways is official track work and all		
	1	trac work instructions must be followed.		
30.3.2020	Under implemen-	The cable marking request form will be revised so that it will		
	tation	address the safety method to be used.		

Data and time (Co.	do):	22 2 2016 (D2016	02)	
Date and time (Co	de):	23.3.2010 (12010-	·02)	
Location:		Finland		
Type of occurrenc	e:	Train collision		
Train type and nur	nber:	Freight train 11375	- Sr1 electric locomotive	
Road vehicle:		-		
Persons on board		Crew:	Crew:	Crew:
		Passengers:	Passengers:	Passengers:
Fatally injured:		Crew:	Crew:	Crew:
		Passengers:	Passengers:	Passengers:
Seriously injured:		Crew:	Crew:	Crew:
		Passengers:	Passengers:	Passengers:
Slightly injured:		Crew:	Crew:	Crew:
		Passengers:	Passengers:	Passengers:
Damages of rolling	g stock:	Damages to the locomotive.		
Damages on track	equipment:	Damage to approximately 250 meters of track and track equipment.		
Other damages:		None.		
Disturbances of tra	affic:	There was interrup	tion of three days in rail tra	affic in one lane of two
		lane track. Totally closed for five hours.		
Summary: A locon	notive on its wa	ay from Kokkola to	Ylivieska collided with a ste	el slit coil on the track
at the speed of 120	km/h near the	Matkaneva Station	. The locomotive jumped o	over the slit coil, which
was lying on its flat	side, and beca	me derailed. After be	eing derailed, the locomotiv	e travelled 185 metres
and came to rest tilt	ed over the rig	ht rail so that the rai	I was close to the middle of	f the locomotive.
Final report issued	d: 20.2.2017	,		
Recommendation	The breaking	of the radial straps h	olding the slit coil pack toge	ether was preceded by
Nr 2017-S3	the radial stra	ins becoming loose	and displaced during the h	andling and transport
	after they we	re bound at the fact	tory The loose radial strar	allowed the slit coil
	nack to tilt du	ring transport. In ord	for to ansure that the radial	strane are sufficiently
	tight and that t	how stav in place the	a Safaty Investigation Autor	situps are sumptionly
	SCAR specif	ine the hinding of	slit coil packs and vorifie	only recommends mail
	taking the st	resease due to hanc	Sill COIL packs and verne	to it by calculations,
	taking ine su	esses une to hand	and a the factory into a	transport
Dete	the lateral ac		con pack during railway t	transport.
Date	Status	Comments		

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11.4.2018	Partly imple- mented	Preliminary calculations have been made, calculations are be- ing checked.
25.3.2019	Partly imple- mented	Calculations for defining sufficient strapping of steel rolls are ready, but maximum acceleration forces used in calculations need to be checked.
30.3.2020	IMPLEMENTED	The study on the acceleration properties is now completed. In the study, the forces that act on the straps of silt coil packs dur- ing handling and transport were studied. Based on the study, the binding instructions were updated (designated binding in- structions for rail freight).

Date and time (Co	de) [.]	8 7 2016 (R20	16-0	3)	
Location:		Finland	/10 00	5)	
Type of occurrenc	ò.	Train collision			
Train type and number:		Shunting unit. Dr14 diesel locomotive and 20 tank wagons			
Pood vobiolo:			-		
Road venicie.		-		In the train	In the read vehicle
Porsons on board	-	Crow			
	•	Descondors:		2	-
Estally injurad		rassengers.		0	-
ratally injureu.		Crew.		0	-
<u>Carianalu iniuradu</u>		Passengers.		0	-
Seriously injured:		Crew:		0	-
Climbth in iterade		Passengers:		0	-
Siightiy injurea:		Crew:		0	-
				U	-
Damages of rolling	g Stock:	Two wagons v	vere (bamageo.	
Damages on track	equipment:	Buffer stop da	mage	90.	
Other damages:		Few.			
Disturbances of th		None.			
Summary: A radio	-controlled shu	nting unit collid	led w	ith a rail barrier and two tar	ik wagons loaded with
SPB gasoline were	derailed at the	port of Mussa	alo in	Kotka on the night of Frida	ay 8 July 2016. As the
first wagon was de	ralled, the end	of the second	i wag	on mounted the under-fran	ne of the first wagon.
Because the height	difference was	s so great, the	so great, the override protection on the central buffer coupling was		
unable to prevent th	e couplings fro	om detaching fr	om e	ach other.	
Final report issued	d: 10.3.2017				
Recommendation	A rescue plan	forms the basis	s of s	afety in ports and other area	as where several com-
Nr. 2017-S8	panies are op	erating. The pro	omoti	on of overall safety in such	an area requires con-
	sistent actions	s from all opera	ators.	The ensure consistent acti	ons, the Safety Inves-
	tigation Autho	rity recommend	ds tha	at:	<u> </u>
	Railway unde	ertakings shou	uld co	mply with local emergen	cy plans in ports and
	other areas v	where other co	ompa	nies are also operating.	
Date	Status	Commer	nts		
11.4.2018	Partly imple-	To be dis	CUSS	ed in infrastructure manage	rs co-operation group.
	mented				<u> </u>
25.3.2019	Partly imple-	Local op	erato	rs and infrastructure man	agers have reviewed
	mented	rescue p	lans.	Updating of rescue plans	for dangerous goods
		railway ya	ards	is ongoing.	
30.3.2020	IMPLEMENTI	ED The pers	sonne	I will be familiarised with th	ne relevant orientation
		material	provid	ded by the infrastructure ma	inagers/customers be-
		fore the a	areas	are accessed for work. Jo	int rescue drills will be
		organised	d.		
Recommendation	In railway yard	ds, old buffer st	tops a	are of little relevance in stop	ping wagons. In addi-
Nr. 2017-S9	tion, the trans	port of danger	ous g	oods in wagons built accor	ding to varying stand-
	ards sets a wi	de range of req	luiren	ients for buffer stops. In risl	k analyses, overshoot-
	ings have bee	n identified as a	a pote	ential cause of accidents. Be	ecause there has been
	no change in	snunting super	VISIO	n practices, structural accid	ient prevention should
	be made mor	e enective, par	TICUIA	iriy in railway yards where	dangerous goods are
	being handled	1. To improve t	ine sa	atety of railway yards in wh	nich dangerous goods
	are being tran	sported, the Sa	atety	Investigation Authority reco	mmends that:

	Infrastructure shunting work	Infrastructure managers should modernise buffer stops on tracks where shunting work is done related to the transport of dangerous goods.		
Date	Status	Comments		
11.4.2018	Partly imple- mented	Some infrastructure managers have studied the situation and made action plan for replacement. Information is missing from some infrastructure managers.		
25.3.2019	Partly imple- mented	Finnish transport agency has checked all end buffers on its net- work and made a schedule for renewal of obsolete buffers. In- formation from some of the smaller infrastructure managers is missing.		
30.3.2020	Partly imple- mented	Finnish transport agency has checked all end buffers on its net- work and made a schedule for renewal of obsolete buffers. In- formation from some of the smaller infrastructure managers is missing.		

Date and time (Co	de):	27.7.2016 (R2016	-04)		
Location:		Finland			
Type of occurrenc	e:	Train collision			
Train type and nur	Train type and number:		Metro trains		
Road vehicle:		-			
			In the train	In the road vehicle	
Persons on board	-	Crew:	1	-	
	-	Passengers:	0	-	
Fatally injured:		Crew:	0	-	
		Passengers:	0	-	
Seriously iniured:		Crew:	0	-	
		Passengers:	0	-	
Slightly injured:		Crew:	0	-	
		Passengers:	0	-	
Damages of rolling	a stock:	je obriger of			
Damages on track	equipment:				
Other damages:					
Disturbances of tr	affic:				
Summary: Two me	etro trains collid	ded at Itäkeskus me	tro station in. The sides of th	ne departing test drive	
train and the teach	ing train stand	ing at the turnout ar	rea of the station collided a	nd the test drive train	
was derailed.	5	5			
Final report issued	d: 8.5.2017				
Recommendation	The accident	investigation reveal	ed that the safety device d	esign included a fault	
Nr. 2017-S22	that has been	carried across two	generations of devices.	5	
	Helsinki City	Transport and the	safety device supplier sh	ould investigate and	
	analyse the	requirements relati	ing to the operational safe	ety of the metro rail-	
	way system	thoroughly in orde	r to avoid potential faults	being carried across	
	to the next s	ystem in the cours	e of the current safety dev	vice revision.	
Date	Status	Comments			
11.4.2018	Partly imple-	Helsinki City 1	Fransport (HKL) has started	to use notified bodies	
	mented	to improve sa	afety devices design and ir	nstallation. Safety de-	
		vices will be u	inified.		
25.3.2019	Partly imple-	Definitions have been analysed and clarified during recent			
	mented	safety devices	s update project. Work cont	inues due to deficien-	
		cies found in o	old documentation.		
30.3.2020	Partly imple-	Requirements	s have been investigated, a	nalysed and specified	
	mented	further. Howe	ver, there is still work to be	done due to the short-	
		comings in the	e old documentation.	<u> </u>	
Recommendation	Controlling nig	ght-time traffic is cha	allenging. Unscheduled nigh	it-time test and teach-	
Nr. 2017-524	ing traffic had	not been planned	sufficiently well or coordina	ated. It was difficult to	
	form a compre	enensive picture of th	ne traffic situation. Night-tim	e traffic requires traffic	
	controllers to	make quick decision	is dased on events.		
	Heisinki City	ransport should	i schedule night-time me	tro trains and other	
Dette	units and dra	aw up a driving pro	gramme for them.		
Date	Status	Comments			

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11.4.2018	Partly imple- mented	There is still room for development in maintenance planning and track reservations.
25.3.2019	Partly imple- mented	Helsinki City Transport is improving synchronising of track work and night time traffic on metro lines. Also of the teaching driv- ings are drawn up more detailed plans. There is however still room for improvement in these processes.

Date and time (Co	de):	13.8.2916 (R2016-	-06)	
Location:		Finland		
Type of occurrence:		Train collision		
Train type and nur	nber:	Freight train 5316, 2 x Sr1 electric locomotives and 24 wagons		
Road vehicle:		-		
			In the train	In the road vehicle
Persons on board	:	Crew:	1	-
		Passengers:	0	-
Fatally injured:		Crew:	0	-
		Passengers:	0	-
Seriously injured:		Crew:	0	-
		Passengers:	0	-
Slightly injured:		Crew:	1	-
		Passengers:	0	-
Damages of rolling	g stock:	Locomotive and thr	ee wagons damaged badly	. Seven wagons
		damaged less seve	erely.	-
Damages on track	equipment:	Track damaged ab electric railway dan	out 100 meters and the port naged.	tal suspension of
Other damages:		None.		
Disturbances of tra	affic:	Railway yard traffic	disrupted due to a power of	utage.
Summary: An emp	oty timber train	on its way from Kemi to Kontiomäki was about to arrive at the Oulu		
freight yard, where i	t was intended	to stop for two hours and change drivers. The freight train arrived on		
track 118 and collid	ed with the em	pty wagons standing	g on the tracks at a speed c	of 33 km/h.
Final report issued	d: 23.5.2017	,		
Recommendation	A safety risk is	s involved in the wo	rk done by switchmen to pr	otect routes in railway
Nr. 2017-S28	yards without	modern technical sy	stems to protect the passag	e of trains. Route pro-
	tection by the	switchman is not v	erified in any way, which a	lso constitutes a risk.
	The faulty pro	cedure used by the	switchman made it possib	le to protect the route
	of a train on a	n occupied track. Tr	raffic implemented as shunt	ing operations should
	be more contr	olled, in which case	e the engine driver would al	so have an obligation
	to keep a look	out. If, say, for finar	ncial reasons it is not possib	ole to equip all railway
	yards with tecl	nnical monitoring by	centralised traffic control, th	e Safety Investigation
	Authority reco	mmends that		
	The Finnish	Transport Agency	should restrict trains run	nning on tracks that
-	are not unde	r technical centrali	sed traffic control.	
Date	Status	Comments		
11.4.2018	Under implem	en- A test is in pro	cess where a part of trains	route is run according
	tation	to shunting op	eration rules. A report will t	be made from this test
		and decisions	will be based on it.	
25.3.2019	Partly imple-	Due to recom	mendation, procedures ha	ve been changed for
20.2.2020	Dertheirer	example at O	ulu raliway yaro, partiy With	unierent procedures.
30.3.2020	Partiy Imple-	A plan and pro	byrainme to equip the railwa	iy yards with appropri-
	mented	ate safety dev	ices has been on establishe	the execution of
		with madequ	ale salely devices, Will	adv socured for some
		of those sites	anway yaru. Funung is alfe	auy secured for some
		or these sites.		

Date and time (Code):	28.6.2017 (R2017-01)
Location:	Ylivieska, Seinäjoki Ylivieska section of line, (line number 412), km 629+164.
Type of occurrence:	Incident – A track tamping machine began moving by itself – Haz- ard of collision.

Train type and nui	mber: A track tamping machine.				
Road vehicle:	-				
			In the train	In the road vehicle	
Persons on board	: Cre	w:	0	-	
	Pas	sengers:	0	-	
Fatally injured:	Cre	w:	0	-	
	Pas	senaers:	0	-	
Seriously injured:	Cre	w [.]	0	_	
		sonaors.	0		
Slightly injured:			0		
Silgility injuleu.	Bac	w.	0		
Demosion of rolling	Pas rieto els	sengers:	0		
Damages of rolling	g stock: Nor	e.			
Damages on track	equipment: Poir	Point machine was damaged.			
Other damages:	Nor	е.			
Disturbances of tr	affic: The	traffic was at a	a standstill for two hours.		
Summary: A self-p	owered track maint	enance machir	he used for track tamping be	egan moving of its own	
accord from the we	stern double-track v	vork site locate	d to the south of Ylivieska.	The machine trailed a	
turnout leading from	n the work site to a	track section u	sed by traffic and rolled no	orth on a track used by	
traffic for a distance	of one kilometre, c	oming to a halt	on track 1 of the Ylivieska	station. Only moments	
before, the track se	ction had been used	d by a freight tra	ain heading south. Passeng	ger trains were on their	
way to the Ylivieska	station from both s	outh and north			
Final report issue	d: 14.2.2018				
Recommendation	The Finnish Trans	port Agency d	id not require the contract	ors participating in the	
Nr 2018-S1	track project to have	e their own sat	ety management systems.	instead it required the	
	application of the	Finnish Trans	port Agency's safety man	agement system The	
	adoption of the sv	stem on a work	site with several contracto	agement system. The	
	was deficient as y	as the monitor	ing of the adoption process		
	Already at the	competitive to	ndering phase for the	project the Finnish	
	Already at the competitive tendering phase for the project, the Finnish			project, the Finnish	
	Transport Agona	Transport Agency should require each main contractor participating in track			
	Transport Agenc	y should requi	Ire each main contractor	participating in track	
	Transport Agenc projects to have	y should requi its own safet	y management system t	hat takes the special	
	Transport Agenc projects to have characteristics o	y should requints own safet f the compani	y management system the sand work sites into c	hat takes the special consideration and in-	
	Transport Agenc projects to have characteristics o clude monitoring	y should requing the second seco	y management system the same of the system the system the same work sites into a systems a systems a system same	hat takes the special consideration and in- s part of its auditing	
	Transport Agenc projects to have characteristics o clude monitoring process.	y should requits own safet f the compani of the realisa	y management system the system the system the system the system and work sites into a systems a systems a systems a system s	hat takes the special consideration and in- s part of its auditing	
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	Agency (Trafi) traff the machine before and measurements of the machine type for over 20 years. condition of the inc the missing of the m conducted these in pany also participa The Finnish Trans required during a	ic worthiness and safety inspection that had been conducted on e it was taken into use. At the request of Trafi, extensive tests a were performed on the machine, analysing the characteristics e, despite the fact that the machine type has been used in Finland The purpose of these tests remains unclear, as the visibly poor lividual machine was not detected. One factor could have been nachine's maintenance documentation. The role of the party that spections was unclear in the investigated incident, as the com- ted in the refurbishment of the machine. port Safety Agency should specify in more detail the checks traffic worthiness inspection as well as the qualification and
	independence crit	eria for the party conducting the inspection.
Date	Status	Comments
25.3.2019	Under implemen- tation	Finnish Transport Safety Agency will describe rolling stock track worthiness requirements more precisely in its internal work in- structions.
30.3.2020	Under implemen- tation	Finnish Transport Safety Agency will describe rolling stock track worthiness requirements more precisely in it's internal work in- structions.

Date and time (Co	de):	e): 21.9.2017 (R2017-02)		
Location:		Kouvola marshalling yard, track number 843, (line number 412), km		
		193+568.		
Type of occurrenc	e:	Collision - A shunti	ing locomotive with 6 wage	ons collided into 48
		wagons loaded with	n timber.	
Train type and nur	mber:	Shunting unit 6403	, a Dr14 diesel-hydraulic lo	comotive and 6 wag-
		ons.		
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:	1	-
		Passengers:	0	-
Damages of rolling	g stock:	1 hopper wagon was seriously damaged, 2 container wagons were		
		slightly damaged. A	A 20-foot tank container that	at was loaded on con-
		tainer wagon was s	eriously damaged.	
Damages on track	equipment:	None.		
Other damages:		11 000 litres of hyd	drogen peroxide-water mix	ture leaked to ground,
		10 000 litres were	salvaged but had to be s	ent to chemical waste
		plant for disposal.		
Disturbances of tra	affic:	The traffic on track east of Kouvola was stopped for 15 minutes. Kou-		
		vola rail yard was partly out of use for 24 hours.		
Summary: A shun	ting unit consis	ting of diesel locom	notives, four empty hopper	wagons and two con-
tainer wagons load	ed with tank co	ontainers containing	y hydrogen peroxide, on a	container car collided
with timber wagons	standing in the	eastern up yard at	Kouvola.	
Final report issued	d: 1.6.2018			
Recommendation	Work guidance	e forms a major part	of the training of shunting	foremen. Trainee com-
Nr. 2018-S14	petencies are	not sufficiently ens	sured, because the monito	ring of work guidance
	does not give	a true picture of the	e competencies of trainees	. Nor does this ensure
	that all issues	have been learned.		
	When approv	ing safety manage	ement systems and pers	ons who are respon-
	sible for the	verification of pe	ersonnel skills, the Finn	ish Transport Safety
	Agency make	es sure that their	skills verification method	are sufficient, and
	skills verifica	tion is reported ac	cordingly.	
Date	Status	Comments		

25.3.2019	Under implemen-	According to Finnish Transport Safety Agency, they use EU-
	tation	level criteria when auditing safety management systems. Pro-
		cedures have not been changed due to recommendation. In-
		competencies of trainees
Recommendation	Training at the edu	cational institute does not include the possibility to practice the
Nr. 2018-S15	use of radio-contro	lled equipment. Guided training on a simulator would improve
	the preparedness of	of trainees for work.
	Training institution	ons in the railway sector include simulator training in the
Dete	training program	ne for shunting foremen.
25.3.2010		KPAO is researching on acquiring a simulator for radio-con-
23.3.2019	tation	trolled locomotive operator training. Decision will be made dur-
		ing 2019.
30.3.2020	Under implemen-	Training centre KRAO decided that the recommendation will be
	tation	taken into account in connection with the update of the simula-
		tor environment supplied by Corys. The board of KRAO dis-
		cussed the matter and made a decision on the procurement.
		sible. The estimated delivery time from signing the agreement
		is about one year.
Recommendation	Track changes are	a daily activity in railway yards. If they are not done correctly and
Nr. 2018-S16	information is not p	assed onto the relevant parties, there is a high risk of accidents.
	The Finnish Trans	sport Agency draw up written instructions for track changes
	In railway yards a	ind ensure that the operators in the yards act according to
Date	Status	Comments
25.3.2019	Partly imple-	Finrail will test during 2019 a new IT tool to indicate track occu-
	mented	pancy situation on railway yards. It should solve the issue.
30.3.2020	IMPLEMENTED	The level of instructions is already sufficient. In addition to the
		instructions, the Finnish Transport Infrastructure Agency is de-
		veloping, in cooperation with Finrail, a railway yard tool that will
		tracks for all parties involved
Recommendation	The radio control s	system of the locomotives responds slowly to the driver's com-
Nr. 2018-S17	mands. There is no	b separate <i>emergency stop</i> button on the radio control unit. The
	delay in the radio	control system slows the start of emergency braking in critical
	situations.	
	The Finnish Tran	sport Safety Agency (Irafi) require that the radio control
	button.	unting work have a separate, non-delayed emergency stop
Date	Status	Comments
25.3.2019	Under implemen-	According to Trafi adding an emergency-stop button to existing
	tation	rolling stock would be time consuming and expensive. Because
		of these reasons Trafi cannot require this kind of feature.
		SIAF has information, that there are radio-control systems in
		use in Finland that fulfil the recommendation. So, the solutions
		use in Finland that fulfil the recommendation. So, the solutions should be still clarified.
Recommendation	Near misses and m	use in Finland that fulfil the recommendation. So, the solutions should be still clarified. inor collisions, which are not revealed, occur in the case of radio-
Recommendation Nr. 2018-S18	Near misses and m controlled locomoti	use in Finland that fulfil the recommendation. So, the solutions should be still clarified. inor collisions, which are not revealed, occur in the case of radio- ves. Users do not dare to report such incidents, due to fear of
Recommendation Nr. 2018-S18	Near misses and m controlled locomoti sanctions. There is	use in Finland that fulfil the recommendation. So, the solutions should be still clarified. inor collisions, which are not revealed, occur in the case of radio- ves. Users do not dare to report such incidents, due to fear of s no way of learning from <i>near misses</i> and collisions involving
Recommendation Nr. 2018-S18	Near misses and m controlled locomoti sanctions. There is radio-controlled loc	use in Finland that fulfil the recommendation. So, the solutions should be still clarified. inor collisions, which are not revealed, occur in the case of radioves. Users do not dare to report such incidents, due to fear of s no way of learning from <i>near misses</i> and collisions involving omotives, which hampers the development of the safety of radio-
Recommendation Nr. 2018-S18	Near misses and m controlled locomoti sanctions. There is radio-controlled loc controlled work. In	use in Finland that fulfil the recommendation. So, the solutions should be still clarified. inor collisions, which are not revealed, occur in the case of radio- ves. Users do not dare to report such incidents, due to fear of s no way of learning from <i>near misses</i> and collisions involving omotives, which hampers the development of the safety of radio- the railway sector, safety management systems remain at the
Recommendation Nr. 2018-S18	Near misses and m controlled locomoti sanctions. There is radio-controlled loc controlled work. In level of target settir authorities and the	use in Finland that fulfil the recommendation. So, the solutions should be still clarified. inor collisions, which are not revealed, occur in the case of radio- ves. Users do not dare to report such incidents, due to fear of a no way of learning from <i>near misses</i> and collisions involving omotives, which hampers the development of the safety of radio- the railway sector, safety management systems remain at the ng, since their implementation is virtually unsupervised by public re is little self-supervision.
Recommendation Nr. 2018-S18	Near misses and m controlled locomoti sanctions. There is radio-controlled loc controlled work. In level of target settir authorities and the The Finnish Trans	use in Finland that fulfil the recommendation. So, the solutions should be still clarified. inor collisions, which are not revealed, occur in the case of radio- ves. Users do not dare to report such incidents, due to fear of s no way of learning from <i>near misses</i> and collisions involving omotives, which hampers the development of the safety of radio- the railway sector, safety management systems remain at the ng, since their implementation is virtually unsupervised by public re is little self-supervision. sport Safety Agency begin monitoring the practical imple-
Recommendation Nr. 2018-S18	Near misses and m controlled locomoti sanctions. There is radio-controlled loc controlled work. In level of target settir authorities and ther The Finnish Trans mentation of safe	use in Finland that fulfil the recommendation. So, the solutions should be still clarified. inor collisions, which are not revealed, occur in the case of radio- ves. Users do not dare to report such incidents, due to fear of sono way of learning from <i>near misses</i> and collisions involving omotives, which hampers the development of the safety of radio- the railway sector, safety management systems remain at the ng, since their implementation is virtually unsupervised by public re is little self-supervision. sport Safety Agency begin monitoring the practical imple- ty management systems.
Recommendation Nr. 2018-S18 Date	Near misses and m controlled locomoti sanctions. There is radio-controlled loc controlled work. In level of target settir authorities and ther The Finnish Trans mentation of safet Status	use in Finland that fulfil the recommendation. So, the solutions should be still clarified. inor collisions, which are not revealed, occur in the case of radio- ves. Users do not dare to report such incidents, due to fear of s no way of learning from <i>near misses</i> and collisions involving omotives, which hampers the development of the safety of radio- the railway sector, safety management systems remain at the ng, since their implementation is virtually unsupervised by public re is little self-supervision. sport Safety Agency begin monitoring the practical imple- ty management systems. <i>Comments</i>
Date 25.3.2019	Near misses and m controlled locomoti sanctions. There is radio-controlled loc controlled work. In level of target settir authorities and ther The Finnish Trans mentation of safe Status Under implemen-	use in Finland that fulfil the recommendation. So, the solutions should be still clarified. inor collisions, which are not revealed, occur in the case of radio- ves. Users do not dare to report such incidents, due to fear of s no way of learning from <i>near misses</i> and collisions involving omotives, which hampers the development of the safety of radio- the railway sector, safety management systems remain at the ng, since their implementation is virtually unsupervised by public re is little self-supervision. sport Safety Agency begin monitoring the practical imple- ty management systems. Comments Finnish Transport and Communications Agency Traficom mon-
Recommendation Nr. 2018-S18 Date 25.3.2019	Near misses and m controlled locomoti sanctions. There is radio-controlled loc controlled work. In level of target settir authorities and ther The Finnish Trans mentation of safet Status Under implemen- tation	use in Finland that fulfil the recommendation. So, the solutions should be still clarified. inor collisions, which are not revealed, occur in the case of radio- ves. Users do not dare to report such incidents, due to fear of s no way of learning from <i>near misses</i> and collisions involving omotives, which hampers the development of the safety of radio- the railway sector, safety management systems remain at the ng, since their implementation is virtually unsupervised by public re is little self-supervision. sport Safety Agency begin monitoring the practical imple- ty management systems. <i>Comments</i> Finnish Transport and Communications Agency Traficom mon- itors the contents of safety management systems. SIAF's im- presention is that there is needed more meniation of safety area.
Recommendation Nr. 2018-S18 Date 25.3.2019	Near misses and m controlled locomoti sanctions. There is radio-controlled loc controlled work. In level of target settir authorities and ther The Finnish Trans mentation of safet Status Under implemen- tation	use in Finland that fulfil the recommendation. So, the solutions should be still clarified. inor collisions, which are not revealed, occur in the case of radio- ves. Users do not dare to report such incidents, due to fear of s no way of learning from <i>near misses</i> and collisions involving omotives, which hampers the development of the safety of radio- the railway sector, safety management systems remain at the ng, since their implementation is virtually unsupervised by public re is little self-supervision. sport Safety Agency begin monitoring the practical imple- ty management systems. Comments Finnish Transport and Communications Agency Traficom mon- itors the contents of safety management systems. SIAF's im- pression is that there is needed more monitoring of practical re- alization.

Annex 1/20 (26)

30.3.2020	IMPLEMENTED	This is one of the key tasks of the Finnish Transport and Com- munications Agency, in which audits include regular monitoring	
		of the operations in the field.	
Recommendation	Emergency service routes are marked in the rescue plans for railway yards for the		
Nr. 2018-S19	transport of dangerous goods), along which routes into the area are planned in case		
	accidents occur. Ho	owever, these routes are largely unknown to the Emergency Re-	
	sponse Centre Adn	ninistration, and this could hamper and delay access to the acci-	
	dent site.		
	The Emergency R	Response Centre add numbered emergency service routes	
	for railway yards	to its system, and emergency duty officers be instructed to	
	locate the accider	nt site primarily through such routes.	
Date	Status	Comments	
25.3.2019	Under implemen-	According to Emergency response centres, emergency service	
	tation	routes cannot be added to its new ERICA system. Ministry of	
		Interior has proposed that emergency service routes could be	
		manuled like normal streets, so they would be visible in all road	
		maps. Finnish transport agency has checked all fail yard emer-	
		gency service routes as a part of safety study for dangerous	
Recommendation	Several railway yar	ds have not been equipped with clearly visible track numbers at	
Nr	the ends of tracks	Identifying the destination track can be difficult and it may come	
C10/2003R/S194	as a surprise that the	he track is occupied.	
	For these reasons.	the Safety Investigation Authority will open Recommendation	
	C10/2003R, intend	ed for the Finnish Transport Agency in the investigation report,	
	with the status "No	t to be implemented":	
	Railway yard trac	ks should be equipped with number plates.	
Date	Status	Comments	
25.3.2019	Partly imple-	Finnish transport agency is studying best possibilities to display	
	mented	track information to railway operators in all operating conditions.	
		Priority is in rail yards for dangerous goods.	
30.3.2020	Partly imple-	Tracks in railway yards will be equipped with number plates by	
	mented	2024.	

Date and time (Code):		26.10.2017 (R2017-03)		
Location:		Raasepori, Skogby level crossing, line number 142, Karjaa–Hanko		
		section of line (km	183+714)	
Type of occurrence:		Level crossing acci	dent	
Train type and num	ber:	Passenger train 382, Dm12 rail bus		
Road vehicle:		Military off-the-road truck Sisu A2045		
			In the train	In the road vehicle
Persons on board:		Crew:	1	1
		Passengers:	15	7
Fatally injured:		Crew:	0	0
		Passengers:	1	3
Seriously injured:		Crew:	0	1
		Passengers:	0	2
Slightly injured:		Crew:	0	0
		Passengers:	0	2
Damages of rolling stock:		Front end damage to Dm12 rail bus. Military off-the-road truck was		
		wrecked totally.		
Damages on track equipment:		None.		
Other damages:		None.		
Disturbances of traffic:		Track between Tammisaari and Hanko out of service 6.5 hours.		
Summary: A rail bus travelling from Karjaa to Hanko collided with a Defence Forces high mobility terrain				
vehicle in Skogby, Raasepori, at an unprotected level crossing. A pioneer unit from the Uusimaa Brigade				
was engaged in an attack exercise, moving vehicles from Skogby to Syndalen in Hanko.				
Final report issued:	Final report issued: 7.6.2018			
Recommendation T	he Defence I	orces have develop	ed their risk assessment wi	th regard to exercises,
<i>Nr. 2018-S20</i> b	but this work is still in progress. The current risk assessment form does not encour-		form does not encour-	
a	ge naming id	entified risks, but the	ese are evaluated by predet	ermined risk type (e.g.

	land or sea traffic accidents). If the risks involved in exercises are not identified and named, it is difficult to control and warn troops on exercise.		
	The Defence Fore identify the actual	ces develop the risk assessment of exercises in order to risks and name those which are identified.	
Date	Status	Comments	
25.3.2019	Partly imple-	Risk management is and has been under development in Finn-	
	mented	ish defence forces. Aim is to make risk management a fixed part	
		of all activities. Development program has been planned to be	
		completed by the end of year 2020.	
30.3.2020	Partly imple-	Part of the development work is already completed and part of	
	mented	it is still ongoing. The occupational and in-service safety system	
		was audited in 2018, and one of the system's focus points is the	
		consistent and systematic implementation of risk management.	
		Risk management training has been developed in staff in-ser-	
		vice training, and it has been implemented since 2019. Training	
		2020 Programme is currently going on. Risk management re-	
		porting has been developed, and the procurement of a coner-	
		ent/joint risk management information system has been com-	
	Deneine of lovel on	pieted; implementation/training will take place in 2020.	
Nr 2018-S21	crossings	ussings have not always locused on the most dangerous level	
NI. 2010-521	The Finnish Trans	sport Agency and the Finnish Transport Safety Agency en-	
	sure that resource	es are allocated to improving the safety of, or removing, the	
	most dangerous l	evel crossings.	
Date	Status	Comments	
25.3.2019	Partly imple-	Finnish transport agency is implementing the so called 65-pro-	
	mented	gram, in which safety of several level crossings will be im-	
		proved. In addition to this, the agency has introduced a new ac-	
		tion package to improve level crossing safety. Actions will be realised 2018–2022.	
30.3.2020	Partly imple-	The Finnish Transport Infrastructure Agency is implementing a	
	mented	level crossing safety improvement programme that improves	
		the safety of almost 300 level crossings. In addition, the use of	
		more attordable level crossing systems is developed and ex-	
		tended lunther.	
	torrain vohicles are	Igo space sealing modules of the Defence Force's high mobility	
NI. 2010-322	is not affectively m	onitored. There are guidelines on the use of seatbelts and the	
	monitoring of such	USE.	
	The Finnish Defe	nce Forces develop seatbelts in cargo space seating mod-	
	ules so that they a	are easier to use and enhance their monitoring of the use of	
	seatbelts.	_	
Date	Status	Comments	
25.3.2019	Partly imple-	Finnish defence forces is studying and planning possible tech-	
	mented	nical changes to seatbelts. Decisions on changes will be made	
		after studies are finalised.	
		I raining and monitoring of seat belt usage has been improved.	
30.3.2020	Partly imple-	Part of the development work is already completed and part of	
	mented	it is suil ongoing: The instructions on the use of cargo area seats	
		as well as related training and monitoring has been specified	
		numer. The usability of seatbens has been improved with tech-	
		2019 The Finnish Defence Forces will make the necessary de	
		cisions based on the results and analyzes of these tests before	
		the end of 2020	
	1		

Date and time (Code):	7.4.2018, 14.40 (R2018-01)
Location:	Kinni rail yard, line number 231, Kouvola–Pieksämäki section of
	line, km 248+396, track number 332, turnout V308
Type of occurrence:	Collision – Tank wagons moved accidentally downhill and collided
	with rail buffer.

Annex 1/22 (26)

Train type and number:		50 Vgobo tank wagons (no train number, wagons were brought to rail yard on 21.3. with train T58221).		
Road vehicle:		-		
			In the train	In the road vehicle
Persons on board:		Crew:	0	
		Passengers:	0	
Fatally injured:		Crew:	0	
		Passengers:	0	
Seriously injured:		Crew:	0	
	-	Passengers:	0	
Slightly injured:		Crew:	0	
	-	Passengers:	0	
Damages of rolling	g stock:	1 tank wagon was damaged.	seriously damaged, 1 tank	wagon was slightly
Damages on track	equipment:	Rail buffer was des	stroved totally.	
Other damages:		35 000 kgs of MTB	E leaked to ground and ne	arby waters.
Disturbances of tr	affic:	The traffic betwee	n Hillosensalmi and Mänty	/hariu was suspended
		between 7. 13.4.2	018.	
Summary: 50 tank	wagons tempo	prarily stored in rails	vay yard began to move of	their own accord. The
wagons rolled a dis	tance of 145 m	etres and collided	with a buffer stop. The first	t two wagons were de-
railed by the collision	on. A leak was	created in the first	wagon, with 35,000kg of	Methyl tert-butyl ether
(MTBE) leaking into	the surroundir	ig environment.		
Final report issued	d: 1.3.2019			
Recommendation	Existing inform	nation on the numb	er of transports entering Fi	nland was not used for
Nr. 2019-S1	the managem	ent of railway netwo	ork capacity and, where ne	cessary, the restriction
	of RID traffic c	oming from Russia.	According to their own inte	rpretations, the Finnish
	Transport Age	ncy and VR had no	means of restricting traffic.	The Finnish Transport
	Safety Agency	/ (Trafi) and the M	inistry of Transport and C	ommunications lacked
	information on	the safety risk pos	ed by congestion.	
	Railway traffi	c operators, the Fi	nnish Transport Infrastru	cture Agency and the
	competent authorities must develop means of preventing traffic congestior			
	competent at	itnorities must de	velop means of preventi	ng traffic congestion
	amongst tran	sports with dange	rous goods arriving from	Russia. The acquisi-
	amongst tran	sports with dange	rous goods arriving from mation must be develope	ng traffic congestion Russia. The acquisi- d in particular.
Date	amongst tran tion and use	sports with dange of predictive infor Comments	rous goods arriving from mation must be develope	ng traffic congestion Russia. The acquisi- d in particular.
<i>Date</i> 30.3.2020	amongst tran tion and use Status Partly imple-	sports with dange of predictive infor Comments The Finnish T	rous goods arriving from mation must be develope	ng traffic congestion Russia. The acquisi- ed in particular.
Date 30.3.2020	amongst tran tion and use Status Partly imple- mented	sports with dange of predictive infor Comments The Finnish T operative coo	rous goods arriving from mation must be develope ransport Infrastructure Age peration with respect to bo	ng traffic congestion Russia. The acquisi- ed in particular. ency has strengthened order traffic through the
<u>Date</u> 30.3.2020	amongst tran tion and use Status Partly imple- mented	sports with dange of predictive infor Comments The Finnish T operative coo TMFG service	rous goods arriving from mation must be develope ransport Infrastructure Age peration with respect to bo agreement and in coopera	ng traffic congestion Russia. The acquisi- ed in particular. ency has strengthened order traffic through the ation with RZD. VR has
<u>Date</u> 30.3.2020	amongst tran tion and use Status Partly imple- mented	sports with dange of predictive infor Comments The Finnish T operative coo TMFG service agreed with it	ransport Infrastructure Age peration with respect to bo agreement and in coopera s customers on a principle	ng traffic congestion Russia. The acquisi- ed in particular. ency has strengthened order traffic through the ation with RZD. VR has e on the basis of which
Date 30.3.2020	amongst tran tion and use Status Partly imple- mented	sports with dange of predictive infor Comments The Finnish T operative coo TMFG service agreed with it the customers	ransport Infrastructure Age peration with respect to bo agreement and in coopera s customers on a principle s can leave orders from RZ	ency has strengthened arder traffic through the ation with RZD. VR has on the basis of which 2D unconfirmed for the
<i>Date</i> 30.3.2020	amongst tran tion and use Status Partly imple- mented	sports with dange of predictive infor Comments The Finnish T operative coo TMFG service agreed with it the customers subsequent m	Transport Infrastructure Age peration with respect to bo a greement and in coopera s customers on a principle s can leave orders from RZ nonth if the traffic and pace	ng traffic congestion Russia. The acquisi- ed in particular. ency has strengthened order traffic through the ation with RZD. VR has on the basis of which ZD unconfirmed for the of traffic's handling are
Date 30.3.2020	amongst tran tion and use Status Partly imple- mented	The Finnish T operative coo TMFG service agreed with it the customers subsequent m not as planne	Transport Infrastructure Age peration with respect to bo agreement and in coopera s customers on a principle can leave orders from R2 nonth if the traffic and pace ed. VR has agreed with R2	ng traffic congestion Russia. The acquisi- ed in particular. ency has strengthened order traffic through the ation with RZD. VR has on the basis of which ZD unconfirmed for the of traffic's handling are ZD on the sidelining of
Date 30.3.2020	amongst tran tion and use Status Partly imple- mented	sports with dange of predictive information <u>Comments</u> The Finnish T operative coo TMFG service agreed with it the customers subsequent m not as planne trains in Russi	Transport Infrastructure Age peration with respect to be agreement and in coopera s customers on a principle can leave orders from RZ nonth if the traffic and pace ed. VR has agreed with RZ ia if congestion occurs amo	ng traffic congestion Russia. The acquisi- ency has strengthened order traffic through the ation with RZD. VR has on the basis of which ZD unconfirmed for the of traffic's handling are ZD on the sidelining of ngst traffic on the Finn-
Date 30.3.2020	amongst tran tion and use Status Partly imple- mented	The Finnish T operative coo TMFG service agreed with it the customers subsequent m not as planne trains in Russi ish side of the	Transport Infrastructure Age peration with respect to be agreement and in coopera s customers on a principle s can leave orders from RZ nonth if the traffic and pace ed. VR has agreed with RZ ia if congestion occurs amo border. Traficom's information	ng traffic congestion Russia. The acquisi- ad in particular. ency has strengthened order traffic through the ation with RZD. VR has on the basis of which ZD unconfirmed for the of traffic's handling are ZD on the sidelining of ngst traffic on the Finn- ation system related to
Date 30.3.2020	amongst tran tion and use Status Partly imple- mented	sports with dange of predictive infor Comments The Finnish T operative coo TMFG service agreed with it the customers subsequent m not as planne trains in Russi ish side of the the transit tra	Transport Infrastructure Age peration with respect to bo a greement and in coopera s customers on a principle s can leave orders from RZ booth if the traffic and pace ed. VR has agreed with RZ ia if congestion occurs amo border. Traficom's information ffic stock is undergoing a	a Russia. The acquisi- d in particular. ency has strengthened order traffic through the ation with RZD. VR has on the basis of which ZD unconfirmed for the of traffic's handling are ZD on the sidelining of ngst traffic on the Finn- ation system related to renewal process, and
<u>Date</u> 30.3.2020	amongst tran tion and use Status Partly imple- mented	sports with dange of predictive infor Comments The Finnish T operative coo TMFG service agreed with it the customers subsequent m not as planne trains in Russ ish side of the the transit tra efforts have b	Transport Infrastructure Age peration with respect to bo agreement and in coopera s customers on a principle s can leave orders from RZ onth if the traffic and pace ed. VR has agreed with RZ ia if congestion occurs amo border. Traficom's informa- fic stock is undergoing a een made to include a tool	ng traffic congestion Russia. The acquisi- d in particular. ency has strengthened order traffic through the ation with RZD. VR has on the basis of which 2D unconfirmed for the of traffic's handling are 2D on the sidelining of ngst traffic on the Finn- ation system related to renewal process, and that would enable bet-
<u>Date</u> 30.3.2020	amongst tran tion and use Status Partly imple- mented	sports with dange of predictive information The Finnish T operative coo TMFG service agreed with it the customers subsequent m not as planne trains in Russi ish side of the the transit tra efforts have b ter utilisation	Transport Infrastructure Age peration with respect to be agreement and in coopera s customers on a principle s can leave orders from RZ nonth if the traffic and pace ed. VR has agreed with RZ ia if congestion occurs amo border. Traficom's informa- ffic stock is undergoing a een made to include a tool of existing rolling stock info	ng traffic congestion Russia. The acquisi- ency has strengthened order traffic through the ation with RZD. VR has on the basis of which ZD unconfirmed for the of traffic's handling are ZD on the sidelining of ngst traffic on the Finn- ation system related to renewal process, and that would enable bet- ormation.
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		The Finnish Transport Infrastructure Agency has carried out a temporary storage risk assessment, and none of the assessed stations was suitable for temporary storage of RID wagons. The Finnish Transport Infrastructure Agency has also carried out research on locations for storing wagons other than RID wagons. This research is not yet completed. As far as the Finnish Transport and Communications Agency is
		concerned, the work on this matter continues as follow-up work. This follow-up work also focuses on the safety procedures used in the designated RID railway yards and aims to reduce any
		hazards identified.
Recommendation Nr. 2019-S3	in the safety mana railway safety man way infrastructure r ment system, the a	gement systems of the actors. The Finnish Transport Agency's agement system is focused on the management of risks in rail- management and construction projects. In VR's safety manage- assessment of change-related risks is emphasised, while less or risks related to daily traffic.
	Railway operators	and the Finnish Transport Infrastructure Agency must de-
	velop the identific	ation and management of risks related to normal rail traffic
	in their safety mai	nagement systems.
Date	Status	Comments
30.3.2020	mented	ne Finnish Transport infrastructure Agency has set out the risk management for normal operation as part of risk management procedures and has also set out a risk management programme in accordance with this. The Finnish Transport Infrastructure Agency will adjust its risk assessment guidelines so that all risks aspects that jeopardise the attainment of the objectives will be
		taken into account. According to VR Group, the identification and management of risks are part of everyday activities. A re- quirement to identify, assess and manage the risks of key pro- cesses of railway operations has been added to VR Group's railway safety management system. The 2020 action plan of the Finnish Transport and Communications Agency includes the task to evaluate whether the operator has the ability to identify the risks and perform effective risk management work concern- ing its own operations. The risk management procedures of rail- way operations are among the key supervision themes, and as- sessing the risk management procedures is a priority when the
Recommendation	The railway operat	or's guidelines on the number of stop blocks failed to take ac-
Nr. 2019-S4	count of the weight of the wagons or the longitudinal gradient of the track. The guidelines overestimated the holding power of the stop blocks. Guidelines on ensuring that wagons remain stationary should be drawn up by the infrastructure manager in order to ensure their consistency in a multi-actor environment. The Finnish Transport Infrastructure Agency will draw up guidelines on keeping wagons stationary in the Finnish state rail network.	
	Status	Comments
30.3.2020	Under Implemen- tation	tions for ensuring that rolling stock is kept stationary when it is left standing. Updated instructions will be published during 2019. Track gradient information is added to track plans for tracks that are used for storing and/or loading/unloding of wag- ons.
Recommendation Nr. 2019-S5	Not all stakeholders are aware of the changed roles and responsibilities or operators in the railway sector. Neither practical procedures nor the parties responsible for environmental damage in the event of rail accidents have been defined with suffi- cient clarity. The Finnish Transport Infrastructure Agency will inform stakeholders of its	
Date	Status	Comments
	Suus	

Annex 1/24 (26)

11.4.2019 Recommendation Nr. 2019-S6	IMPLEMENTED The communication management situa content and develo	Finnish transport agency, VR-Group, Ministry of interioir, Minis- try of the environment, Ministry of economic affairs and employ- ment, Finnish Environment Institute and Centres for Economic Development, Transport and the Environment have issued in- structions for communication and responsibilities in crisis situa- tions. Instructions also include contact information. In of a realistic situational awareness is very important in remote tions. No qualitative requirements have been drawn up on the pment of a situational awareness of an accident.	
	The rescue servic	es define the principles underlying remote management and	
	draw up guideline	s on remote management.	
Date	Status	Comments	
30.3.2020	Under implemen-		
	tation		
Recommendation Nr. 2018-S23	The rescue authorities and other participants did not organise their activities, so cooperation was inadequate. The issue of post-accident preventative measures was left open after the rescue operation had ended. This was partly due to lack of clarity about what transferring the scene of the accident under the responsibility of the Finnish Transport Agency involved. In extensive accidents requiring cooperation between several operators, an operational area command (OAC) would create a basis for effective cooperation.		
	The Ministry of the Interior shall ensure that an operational area command		
	(OAC) is set up by the public authorities in the case of long-term or excep- tional multi-authority tasks.		
Date	Status	Comments	
14.6.2019	IMPLEMENTED	Ministry of Interior has issued rule 1363/2018 on 1.1.2019. It	
		contains orders to make plans for organising rescue services. A part of these are command structures for demanding situa- tions, for example setting up operational area command (OAC).	

Date and time (Code):	12.12.2018, 4.50 (R2018-02)	
Location:	Kemijärvi, Palojärvi level crossing, line number 542, Rovaniemi-		
	Kemijärvi section o	f line (km 1038+856)	
Type of occurrence:	Level crossing acci	dent	
Train type and number:	Freight train T5155	, Sr3 locomotive and 22 un	loaded timber wag-
	ons		
Road vehicle:	Truck Volvo FM		
		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:	1	0
	Passengers:	0	0
Damages of rolling stock:	Front end, side and undercarriage of Sr3 locomotive were dam-		
	aged. One bogie of	first wagon was damaged.	Truck was totally
	wrecked.		
Damages on track equipment:	300 meters of track was damaged.		
Other damages:	-		
Disturbances of traffic:	Section of line between Rovaniemi and Kemijärvi was out of service for 6 days.		
Summary: A freight train en rout	e from Kemi to Kemijärvi and a waste collection lorry collided at the		
Kuusivaarantie unprotected level	crossing on Wednesday, 12 December 2018 at 4.49 am. In the colli-		
sion, the driver of the lorry died a	nd one of the two e	ngine drivers in the locom	otive was injured. The
train's locomotive and first wagon	were derailed.	5	,
Final report issued: 18.7.2019			

	All safety risks of the waste collection process had not been identified. For example,				
Nr. 2019-S40	the safety plan did r	not identify level crossings and other traffic safety issues as risks,			
	there was no handl	ing process for feedback, and orientation was deficient. The de-			
	ticiencies in work in	structions, orientation and supervision form the prerequisites for			
	The safety manage	nement related to the waste collection process shall take			
	comprehensively into account the requirements of the work processes and				
	the identification	of occupational safety and traffic safety risks. Instructions			
	shall be drawn up	for the work processes and the orientation of the employ-			
	ees, and they sha	I be documented. Processes for handling feedback shall be			
	defined in order to	o improve the operations.			
Date	Status	Comments			
30.3.2020	Under implemen-	The Association of Finnish Local and Regional Authorities has			
	lation	Association representing Finnish regional and municipal waste			
		management companies) and has had initial discussions on the			
		subject.			
		Lapeco is currently having a competitive bidding for new con-			
		tracts. The new invitations to tender impose obligations on the			
		contractor to establish a safety plan. Electronic feedback pro-			
		Crientation will be carried out and documented once the new			
		contracts are started			
Recommendation	In violation of the g	uidelines, the speed limit on the road approaching the level cross-			
Nr. 2019-S41	ing was too high. T	he incorrect speed limit does not indicate a change in conditions			
	or support driver de	ecision-making upon approaching a level crossing.			
	The Finnish Tran	sport and Infrastructure Agency and other road keepers			
	should review all s	speed limits, particularly at unprotected level crossings, and			
Data	ensure that comp	ly with the guidelines.			
30 3 2020		The Finnish Transport Infrastructure Agency and road keepers			
00.0.2020		have checked the speed limits.			
Recommendation	The conditions at the	he level crossing were further deteriorated during the superstuc-			
Nr. 2019-S42	ture replacement pi	roject. The risks had been identified, but they were not corrected;			
	instead, they were postponed as residual risks. The legislation enables using the				
	moteud, mey were	postponed as residual risks. The legislation enables using the			
	residual risk proced	lure to postpone the correction of level crossing risk factors iden-			
	residual risk procec tified during track p	lure to postpone the correction of level crossing risk factors iden- rojects.			
	residual risk procec tified during track p In its track projec prepare a plan and	lure to postpone the correction of level crossing risk factors iden- rojects. cts, the Finnish Transport and Infrastructure Agency shall d a timetable for the correction of the risks identified at level			
	residual risk proced tified during track p In its track projed prepare a plan and crossings. It mus	lure to postponed as residual fisks. The legislation enables using the lure to postpone the correction of level crossing risk factors iden- rojects. ts, the Finnish Transport and Infrastructure Agency shall d a timetable for the correction of the risks identified at level t not be possible to transfer the risks into the future as re-			
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	An independent power supply is required for new rolling stock being type ap- proved that guarantees the operation of the recorder for a minimum of 30 minutes after power has been cut off.		
Date	Status	Comments	
30.3.2020	Under implemen- tation	ERA will include the recommendation in the EC standardisation request to the CCMC (CEN-CENELEC Management Center). The standardisation request will be sent to the CCMC by June 2020.	
Recommendation	The wrong kind of shattering of the side windows of the locomotive's cabin and the		
Nr. 2019-S45	missing fragment re	etention film increased the injuries of the engine drivers.	
	Railway undertaki	ngs shall ensure that the cabin windows of the rolling stock	
	are made of glass	that does not cause additional injuries when breaking in an	
	accident.		
Date	Status	Comments	
30.3.2020	Issued		
Recommendation	Railway clearance	operations are not currently efficient or economical, particularly	
Nr. 2019-S46	from the perspective	ve of the entire rail network. The problem stems from the infra-	
	structure manager's	s interpretation of the regulations on clearance operations, which	
	prevents the railwa	y undertaking from carrying out clearance operations.	
	The Finnish Trans	sport and infrastructure Agency shall initiate a new review	
	of the regulations	concerning clearance work and clarify the roles of the ac-	
Data	Status	Comments	
30.3.2020	Partly imple-	According to the Ministry of Transport and Communications, our	
50.5.2020	mented	legislation in chanter 22 of the Rail Transport Act (1302/2018)	
	montou	fully complies with EU legislation, and especially under section	
		173 of the said law, the Finnish Transport Infrastructure Agency	
		operating as the infrastructure manager has the right to access	
		all necessary resources also from other operators after a dis-	
		ruption in order to normalise the situation.	
Recommendation	There was no proc	ess for the handling of the risk assessment required by the au-	
Nr. 2019-S47	thority for the track	project, and there were no instructions on the matter. The iden-	
	tified risks did not le	ead to measures being taken.	
	The Finnish Trans	port and Communications Agency shall define an approval	
	process for the ris	k assessment of level crossings and supervise that the cor-	
	rective measures	are taken.	
Date	Status	Comments	
30.3.2020	Under implemen-	According to the Finnish Transport and Communications	
	tation	Agency, the infrastructure managers will assess the risks in ac-	
		cordance with their own process. All level crossing risks will be	
		assessed in connection with other risks.	