

Ministry of Economic Affairs and Communications Estonian Safety Investigation Bureau

Report of the railway accidents investigated in 2011

Tallinn 2012



Public railways in the Republic of Estonia

Preface to the report

Since its formation in 2004 until the end of 2001, the Unit for Investigation of Railway Accidents has been an integral part of the Ministry of Economic Affairs and Communications Emergency Management Department. During its existence, the objective of the investigation unit was to investigate serious railway accidents pursuant to the "Railway Safety Directive"2004/49/EC. In accordance with the directive, the "Railway Act" of the Republic of Estonia stipulates the obligation to investigate all accidents in the first degree, as well as incidents which could have caused an accident in the first degree. In classification of investigated cases this report is proceeding from the categories defined in the Safety Directive which creates a common understanding of the cases investigated in the European Union.

Investigations into the safety of incidents have been conducted pursuant to the Ministry of Economic Affairs and Communications Directive "Procedures for Investigating Railway Accidents, Railway Incidents and cases of rolling stock running down persons".

This report contains a summary and generalizations from the serious railway accident investigated in 2011 which took place on 23rd December 2010. There were no accidents for which the Unit for Investigation would have had to launch an investigation. Neither did the Unit for Investigation suspend any investigations already started.

The report about the safety investigation conducted during the year contained 18 recommendations made to five addressees for improvement of railway traffic safety. As of 01 April 2012 all parties concerned had presented reports on the proceedings of the recommendations. By the time of the presentation of this report 44% of recommendations had been accepted and implemented.

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1. Introduction to the Investigation Body

1.1 Legal basis

Since the spring of 2004 safety investigations into railway accidents are conducted by a structural unit established by Ministry of Economic Affairs and Communications – Unit for Investigation. The requirements of the Railway Safety Directive 2004/49/EC were applied to the "Railways Act "and they entered into force on 2 March 2007.

According to Subsection 42 (1) of the "Railway Act" the Unit for Investigation is independent in its decisions in accordance with the requirements of Article 21 of the European Parliament and Council Directive 2004/49/EC on Railway Safety.

The framework of the investigations of railway accidents is nationally regulated by the "Railways Act" Subsection 41 "Notifying the Technical Surveillance Authority " (5), Subsection 42 "Investigations of railway accidents and railway incidents" and Subsection 43 "Investigation Reports".

Pursuant to Subsection 41 (5) of the "Railways Act"the Unit for Investigation is notified by the Technical Surveillance Authority of all railway accidents, railway incidents and rolling stock running down a person. Subsection 42 provides the procedures for launching the investigation, including the right of the minister to form an investigation committee, the objective of the investigation, the right of the Unit for Investigation to involve experts, work in cooperation with enterprises, institutions and individuals in gathering information, the obligations of institutions involved in the investigation to give assistance in ascertainment of circumstances of the incident, the right of the unit for investigation to access the scene of the incident and all relevant information. Subsection 43 provides the requirements for the content

of the investigation report and the deadlines for the proposals and recommendations made in the report, as well as the obligation of the Unit for Investigation compile a report of railway incidents investigated in the previous year.

In addition to legislation the safety investigation is regulated by the Ministry of Economic Affairs and Communications Directive No 24 "Procedures for Investigating Railway Accidents, Railway Incidents and Cases of rolling stock running down persons ". The directive provides the procedure for launching the investigation, the arrangements for conducting the investigation, the right of the investigation committee or the investigator-in-charge to put out a danger alert, investigation activities, requirements for issuing the investigation report and the conditions for storing the investigation materials and the procedure for implementation of recommendations made as a result of an investigation. The directive has two annexes, one of which provides the format for the investigation report and the other a report of the measures implemented or planned for the Unit for Investigation based on the recommendations made in the investigation report of the railway accidents.

1.2 Role and aim

Pursuant to Subsection 42 (3) of the "Railways Act", the main objective and purpose of the Unit for Investigation of Railway Accidents is to identify the causes of a railway accident or incident and cases of rolling stock running down persons, if required, in order to prevent the occurrence of such accidents, incidents or rolling stock running down a person on the railway in the future.

To achieve this objective, an investigator-in-charge or an investigation committee will conduct a safety investigation on behalf of the Unit for Investigation. The Unit for Investigation has the right to involve experts and technical expertise in the investigation and if necessary, make experiments. The results of the investigation are issued in the investigation report. All persons conducting the investigation are responsible for the conduction of full investigation and its quality.

The Unit for Investigation, member of the investigation committee or an expert are guaranteed access to the scene of the railway accident, the rolling stock involved in the accident, railway infrastructure and traffic control and signalling devices. They also have the right to question all persons who have important information from the point of view of the investigation, the right to access all relevant information and documents independently or in cooperation with the authority conducting the preliminary criminal investigation. If requested, railway undertakings and third persons are obliged to present all relevant information they hold. If requested by the Unit for Investigation or investigation committee, a person is obliged to appear and give testimony about circumstances known to them.

1.3 Organisation

In order to conduct safety investigations a structural unit has been set up at the Ministry of Economic Affairs and Communications. The Unit for Investigations of Railway Accidents forms a part of the Emergency Management Department and the relevant tasks are performed by an executive officer who reports to the Head of the Emergency Management Department. The objective of the executive officer is to examine the initial circumstances of the railway incident and evaluate them based on the Railway Act and the Directive for Investigation of Railway Accidents and to make decisions about launching and conducting an investigation. If the minister has not decided to form an investigation committee, the executive officer will perform the task of the investigator-in-charge.

To conduct an investigation of the collision between two rolling stock near Aegviidu on 23rd December 2010 the minister formed an investigation committee. This occurrence was the only one during the year following the accident where a safety investigation was conducted. The minister appointed the executive officer of the Unit for Investigation as the chairman of the committee. The chairman organised and directed the whole safety investigation which was mostly conducted during 2011. The members of the committee were involved while performing other duties as well.

The chairman of the investigation committee arrived at the scene of the accident after few hours where he received initial first-hand information about the occurrence. As part of the investigation procedure, the chairman called the committee meetings. The meetings were recorded in minutes. The division of tasks among the committee members was decided by the committee at the meetings according to necessity and the situation. Chairman of the committee relayed the information gathered to the committee members. At the meetings reviews were made of recent progress of the investigation and further tasks were planned. During the process it was agreed that the position of the committee would be formulated only in the investigation report so as not to get tangled up in the working versions which were recorded in the minutes. During the meetings the committee always updated the content of the investigation report which was being compiled at the same time with new, current information. Information collected so far was joined with the new material and these were then reconciled.

In gathering information the investigation committee worked in cooperation with the safety authority, railway undertakings and infrastructure managers, police and prosecutor's office as well as individuals and others. The facts and circumstances relating to this railway accident were referred to the relevant articles of the legislation, organisation of work in undertakings and the current operational requirements for the equipment. As a result of analysis and comparison of the information the conclusion was reached regarding this incident and based on this the recommendations of the parties involved to improve railway safety were formulated.

The draft of the investigation report was introduced to the parties involved who then had an opportunity to express their opinions about the analysis, conclusions and recommendations. The investigation of the occurrence concluded with the signing of the investigation report by all members of the investigation committee. The investigation report comes into effect from the moment of signature. The investigation report is not subject to approval by anyone. The signed investigation report was published on the Ministry's website and was forwarded to the European Railway Agency and all parties involved.

Two of the three members of the investigation committee were officials of the Emergency Management Department. Of these, only the chairman of the investigation committee did not have to fulfil other duties which were not relating to railway safety.

The Unit for Investigation of Railway Accidents is an organic part of the Emergency Management Department. For the majority of 2011 there were 4 officials in the department. At the end of the year, a fifth colleague was recruited who is an executive officer with the objective to conduct safety investigations of marine accidents. The department is run by the Head of Department who, along with an adviser reporting to him, is responsible for risk analysis, emergency and crisis management and cooperation between military and civilian structures. During the year, the position of an executive officer responsible for safety investigations of aircraft accidents was renamed as an expert. In the work of safety investigations of railway accidents, aircraft accidents and marine accidents, as well as emergency management, the officials are separate in their functions.

All necessary expenses for running the department are covered from the budget of the Ministry of Economic Affairs and Communications. The Unit for Investigations of Railway Accidents does not have a separate budget.

1.4 Organisational flow

In addition to other functions, the Ministry of Economic Affairs and Communications also performs the duties of a ministry of transport. The Emergency Management Department is one of its functional departments. By the end of 2011, three separate officials had been hired at the Emergency Management Department to conduct safety investigations of the three different areas of transport and who fulfilled the objectives of the Unit for Investigation for their particular area.

The Units for Investigation of Marine, Aircraft and Railway accidents used to be functional parts of the Emergency Management Department. The department was lead by the Head of Department. The Emergency Management Department reports directly to the Secretary General of the Ministry. Political work of the ministry is lead by the minister.

In addition to the officials dealing with the transport safety investigations at the Emergency Management Department, the ministry also includes The Road and Railways Department, the main objective of which in the railway field is participating in the development of improvement plans, ensuring their implementation and preparing draft legislation for the field.



Figure 1. Investigation units and the safety authority in the organisational structure of the Ministry at the end of 2011.

In the administrative field of the Ministry of Economic Affairs and Communications the function of the railway safety authority is performed by the Technical Surveillance Authority. The Technical Surveillance Authority is a state authority separate from the ministry with its separate budget.

2. Investigation process

2.1 Cases to be investigated

The Unit for Investigation of Railway Accidents is obliged to investigate accidents that lead to a necessity to make amendments to railway safety regulations or changes in ensuring railway safety and accidents where at least one of the following consequences has occurred:

- 1) loss of one or more lives;
- 2) physical harm to five or more people;
- 3) extensive fire;
- 4) damages to the rolling stock, railway infrastructure or environment to the extent of at least 2 000 000 euros;
- 5) interruption to railway traffic for more than 12 hours.

The Unit for Investigation is not obliged to investigate an accident with a loss of life or physical harm to a person if rolling stock runs down a person on the railway and there are no other consequences.

The Unit for Investigation also has the right to conduct investigations of railway accidents, crashes and collisions with people if the circumstances which occurred could have caused an accident with aforementioned consequences, including in a case of technical component failure in Trans-European conventional or high-speed rail system or interoperability.

Pursuant to the requirements of Article 19 of the Railway Safety Directive 2004/49/EC, investigative bodies of member states are obliged to investigate serious accidents. In addition to serious accidents, they need to investigate accidents and incidents which, in different circumstances, might have caused serious accidents, including technical component failure in Trans-European conventional or high-speed rail system or interoperability. The directive also determines the definition of a serious accident which is a derailment or collision of trains which results in the death of at least one person or extensive physical damage to five or more people or serious damage to the rolling stock, infrastructure or environment and all other similar accidents which have a obvious impact on regulating or directing railway safety; extensive damage – where the investigative body can estimate the extent of the damage at least 2 million euros.

When comparing the requirements set out in the Directive to the investigation obligation currently valid in Estonia, we can conclude that the Unit for Investigation of Railway Accidents has the obligation to investigate all accidents which have the characteristics of a serious accident.

Article 21 of the Directive as well as Estonian Railway Act authorise the Unit for Investigation of Railway Accidents to investigate other incidents as well.

2.2 Institutions involved in investigations

In the period in question the minister formed a committee to investigate the accident which had occurred. The committee had three members. All three members were officials of the ministry, 2 of which were members of the Emergency Management Department and 1 head of the Railways Division of the Road and Railways Department. An executive officer from the Emergency Management Department was assigned as the chairman of the committee who customarily fulfils all the tasks set for the Unit for Investigation of Railway Accidents and an adviser was assigned as a member of the committee whose main task is to deal with the work of emergency management.

Outside the activities of the Unit for Investigation, information held by the safety authority (Technical Surveillance Authority) was used. With cooperation, additional information was obtained from the railway infrastructure manager (AS EVR Infra) and railway undertaking (AS EVR Cargo and Elektriraudtee AS). Materials from police investigations (criminal bureau of the North Prefecture) were used in the investigation, as well as information from the Estonian Meteorological and Hydrological Institute about the weather conditions and the Northern Regional Hospital about the victim. An overview of the activities of the emergency services following the accidents was based on the information given by the alarm centre.

All the institutions involved in the investigation were approached by a member of the investigation committee who collected the information. The institutions involved did not attend the investigation committee meetings or influence the committee in analysing the information or developing conclusions and recommendations. The investigation committee maintained its independence throughout the investigation. Members of the investigation committee were not included in the criminal investigations of the police, surveillance investigation of the safety authority or the internal investigations of the railway undertakings. All these investigations were conducted separately from the safety investigation. Neither did any of these make recommendations or proposals for the direction of the safety investigation. The safety investigation lasted longer than the criminal, surveillance or internal investigations of the undertakings which allowed their investigation materials to be compared to those of the investigation committee.

Generally, the cooperation with other institutions or their involvement in gathering information about the incident during the safety investigation depends on the specific characteristics of an incident and the need for information from a specific institution in clarifying the circumstances.

2.3 Investigation process and approach of the Investigation Body

The Unit for Investigation of Railway Accidents will launch the investigation of an incident after receiving the notification. The notification will be made by the Technical Surveillance Authority. Before taking the decision to launch an investigation the Unit for Investigation will gather additional information about the case. Pursuant to the "Railway Safety Directive 2004/49/EC and the Railway Act, the Unit for Investigation must commence discussion regarding launching the investigation maximum one week after being notified of the railway accident, railway incident or running down a person. In the course of obtaining additional information the Unit for Investigation consults the Technical Surveillance Authority and railway undertakings in order to determine the severity of the occurrence. The Unit for Investigation shall notify the European Railway Agency and relevant parties within a week of the decision to launch an investigation.

The safety investigation is conducted pursuant to the Ministry of Economic Affairs and Communications Directive "Procedures for Investigating Railway Accidents, Railway Incidents and Cases of rolling stock running down persons". To identify the circumstances of the case to be investigated, the investigator-in-charge or the investigation committee works in cooperation with government authorities as well as undertakings and other legal or natural persons. The investigation committee organises its own work. It plans all necessary investigative activities and appoints the committee members responsible for carrying them out. The investigation committee determines the approximate timeframe for these activities. Upon learning of the commencement of an investigation the railway undertakings and infrastructure managers keep and if necessary, present to the committee the locomotive, the lead carriage, speed recorder tape of the locomotive, consignment note of the train, inspection certificate of the train's brakes, data regarding speed limits, log book of the locomotive, records of the exchange of information between the locomotive crew and dispatch and other necessary documents.

The infrastructure managers and the railway undertakings will keep all details of the rolling stock, rail tracks and other items which might be important in determining the causes of the incident. In the course of the investigation, all parties will be heard, they will be informed of the results and they will be given an opportunity to give their opinions and comments about the investigation.

The Minister's Directive also provides the investigative activities. During the course of the investigation a sketch map of the scene of the accident will be drafted which will be connected to the distance in kilometres. The sketch map will show all facilities, items and locations which explain the occurrence. The investigation committee will preserve the photographic material of the occurrence. Legal documents concerning the technical condition of all the equipment involved in the incident are compiled and information from the recording equipment is gathered which is also stored with the investigation materials. In the course of the investigation, the weather conditions at the scene of the occurrence are determined; clarifications and testimony of the witnesses and other persons are gathered.

The investigation committee decides whether to involve experts or persons performing expert technical assessment or whether to perform any tests. In the course of the investigation the parties in the case are determined, all circumstances related to non-compliance of safety requirements are analysed in order to identify the causes of the case and to make conclusions and formulate recommendations regarding improvement of railway safety.

3. Investigations

3.1 Overview of completed investigations

During 2011 the investigation of one incident was completed which, according to the current classification in Estonia, was an accident in the first degree and according to the European classification a serious accident. In 2010 investigations of 3 occurrences were completed, in 2009 4 occurrences and in 2008 also 1 incident.

For several years, the most significant characteristic in the decision to launch an investigation has been the occurrence of death as a result of the accident.

The classification of data in the tables included in the annual report is pursuant to the provisions of the Railway Safety Directive 2004/49/EC and other European legal provisions.

The following table gives a summary of the occurrence which was investigated:

Summary of the completed investigation in 2011

Table 1

Type of	Number of	Number of victims		Damages in €	Trend in
accident investigated	accidents	Deaths	Serious injuries	(approximation)	relation to previous years
Collision	1	1	-	878198	increased
between					
trains					

In 2010 three accidents which took place on level crossings where investigated. Therefore, the number of accidents on level crossings has decreased as in 2011 none were investigated. Since 2004 when the Unit for Investigation of Railway Accidents was formed, the occurrence described here is the first of its kind. This accident leads to the conclusion that the number of train collisions among occurrences investigated has increased.

The damages of the accident investigated during the year are approximately twenty times higher and reach approx. 880 000 euros compared to the damages caused in the last two years where the annual damages were about 44 000 euros.

3.2 Investigations completed and commenced in 2011

The safety investigation of the accident from December 2010 was completed in 2011. This occurrence was the only one which was investigated during this year.

The investigation of the accident in question was launched pursuant to Article 19 (1) of Railway Safety Directive 2004/49/EC and according to the classification of the same Directive it is a serious accident. Taking into consideration the circumstances provided, the Committee Directive 2009/149/EC which make amendments to the Directive 2004/49/EC classifies this occurrence as a collision of trains.

According to national legislation this occurrence is an accident in the first degree and commencement of its investigation is laid down in subsection 42 (4) of the Railways Act which provides that the Unit for Investigation has the obligation to investigate all accidents in the first degree.

The investigation completed during 2011 is summarised in the following table:

Investigations completed in 2011

Table 2

Date	of	Title	of	the	investigation	Legal basis	Completed
occurrence		(Occurr	ence t	ype, loca	ation)		(date)
23.12.2010		Collisio	n of a	n electri	c rolling stock	i	14.11.2011
		and a	freigh	it train	, collision of		
		trains o	n Ae	gviidu	– Kehra open		
		track, m	ain tra	ack II, k	m 157,880.		

Basis for investigation: i = according to the Safety Directive

There were no railway accidents in 2011 where the Unit for Investigation launched an investigation and the investigation continued into the following year. There were also no investigations of accidents where the investigation was wholly conducted in the same year as the accident.

3.3 Summary of investigation completed in 2011

Aegviidu 23.12.2010

On Thursday, 23rd December 2010 at 02.41am there was a collision between an electric rolling stock with no passengers and a freight train on the rural double track near Aegviidu station on the Kehra - Aegviidu open track managed by AS EVR Infra (km157, 880).

The four-carriage electric rolling stock set with no passengers which had been stationed and being prepared for the morning trip at Aegviidu station had started moving without the permission of the train traffic regulator. When moving onto the main track, the electric rolling stock cut through the switch point which had been set in order to let through the train coming from the opposite direction from Aegviidu station. The electric rolling stock with no train number was driven by a locomotive driver who had been preparing the rolling stock for the morning trip due to severe weather conditions. The electric rolling stock was driving in the



oncoming track with increasing speed and reached the head-on collision with AS EVR Cargo freight train at a speed of 93 km/h when approx. 3 minutes from the start of trip had passed and the distance covered the starting point was 3 km and 100 m. The driver of the electric rolling stock did nothing to break the speed or stop and he died as a result of the collision. The locomotive driver of the oncoming freight train suffered minor injuries.

The locomotive crew of the freight train

followed all the rules and signals when driving the train at a speed of 54 - 62 km/h. When the traffic light signals changed, he slowed down and planned to stop the train which had a staged braking system at the next traffic lights. Immediately prior to collision the emergency brakes were engaged but it was too late as the collision took place 2 seconds later.

The regional train dispatcher was looking for reasons as to why the loss of control over the turn happened at Aegviidu station and the emergency light came on his monitor. Time was too short for implementing measures.

As a result of the accident, railway infrastructure was damaged to the extent of 100m, the switch point of Aegviidu station was cut through, the overhead network had broken and its tower damaged. The diesel locomotive of the freight train has suffered damages to the extent of major- and body repairs. Five carriages of the freight train were totally wrecked and 8 carriages sustained damages to the amount of running repairs.

The lead carriage at the head of the electric rolling stock was completely destroyed, as well as the front end of the railcar. Train traffic on the 1st and 2nd main track between the stations of Kehra and Aegviidu was stopped completely for 16 hours and 45 minutes. As the result of the

accident 29 passenger trains were left out of operation, 17 passenger trains were late together for 14 hours and 10 minutes. Twenty freight trains were held on in total for 190 hours and 53 minutes.

The investigation report made 18 recommendations for increasing railway traffic safety.

3.4 Comments on investigations

The report of the accident investigated during the year was completed within 11 months of the accident. No investigations commenced during the year that were suspended.

The accident which investigation report was completed in 2011 took place on double rail open track whilst most of the accidents in the past have taken place on level crossings. When comparing the statistics of the past five years, it is noticeable that the number of deaths in the investigated accidents has remained between 1 and 4. The number of injuries was greatest in 2007, since then there either have been none or the number has been singular while there have been no people seriously injured since the accident investigated in 2007.

Total number of deaths and the injured

Table 3

Year	Deaths	Injured in road vehicle / of them seriously	Injured in rolling stock / of them seriously
2007	4	6/2	5/1
2008	1	-	-
2009	2	-	-
2010	3	1/-	2/-
2011	1	-	1/-
Total	11	7/3	8/1

When looking at the breakdown of the deaths over the past five years, it can be noted that there have been no deaths in passenger trains among the accidents investigated. Only in the last year, 2011, the casualty has been railway personnel - a locomotive driver. As the occurrences investigated in the past years have been accidents on level crossing the casualties have been third parties in road vehicles which have collided with rolling stock.

Among the injured, all three groups have been represented in the past five years, i.e. passengers, personnel and third parties. Most injured have been among third persons who have been mainly persons in road vehicles which have been in a collision on a level crossing,

slightly fewer injured among railway personnel and in only two cases the passengers have sustained injuries. In 2008 and 2009 there were no injuries in the incidents investigated.

The breakdown of the injured and deaths over the past five years is presented in the following table:

Breakdown of the injured and deaths

Table 4

Breakdown	by type of	Year, number						
persons		2007	2008	2009	2010	2011		
Deaths	Passengers	-	-	-	-	-		
	Staff	-	-	-	-	1		
	Third	4	1	2	3	-		
	parties							
	Total	4	1	2	3	1		
Injured	Passengers	1	-	-	1	-		
	Staff	4	-	-	1	1		
	Third	6	-	-	1	-		
	parties							
	Total	11	-	-	3	1		

3.5 Accidents and incidents investigated during the past five years (2007 - 2011)

In the past four out of five years the decisions to launch the investigations of incidents and accidents which were completed between 2007 and 2010 have been based on Article 21 of the Railway Safety Directive 2004/49/EC. In 2011 the investigation was conducted pursuant to Article 19 of the same directive.

Only one serous railway accident and one railway incident have been investigated in the past five years. Majority of the accidents which have been investigated have taken place on level crossings.

The classification of the investigated cases by year is reflected in the following table:

Breakdown of investigated cases by years

Table 5

Title of tl	ne case	Year, number of investigations					
		2007	2008	2009	2010	2011	Total
Art 19.1	Train collision	-	-	-	-	1	1
Art 21.6	Train collision	-	-	-	-	-	-
	Train collision	1	-	-	-	-	1
	with an obstacle						
	Train derailment	1	-	1	-	-	2
	Level crossing	12	1	2	3	-	18
	accident						
	Accident to person	-	-	-	-	-	-
	caused by RS in						
	motion						
	Fire in rolling stock	-	-	-	-	-	-
	Accident involving	-	-	-	-	-	-
	dangerous goods						
Incident		-	-	1	-	-	1
Total		14	1	4	3	1	23

4. Recommendations

4.1 Short review and presentation of recommendations

Depending on the specifics of a case, throughout the years recommendations have been made to various fields for improvement of railway safety. The following table gives an overview of recommendations by years:

Recommendations for improvement of safety

Table 6

Field of activity of	f Year, number of recommendations				
recommendation	2007	2008	2009	2010	2011
Maintenance and care of	-	1	-	-	-
railway infrastructure					
Care, maintenance and	-	-	1	-	1
managing of rolling stock					
Organisation of	2	1	5	1	4
supervision					
Road traffic management,	7	-	-	3	-
road traffic control					
devices					
Winter maintenance of	6	-	-	-	-
roads					
Dissemination of	3	-	-	1	-
information concerning					
traffic, training					
Amendments to legal acts	5	2	5	1	4
and regulating instructions					
Operation of traffic lights,	7	-	4	-	-
railway traffic control					
Organisation of operation	1	-	-	-	1
of railway communication					
devices					
Use of information	-	-	-	-	2
recording equipment					
Professional qualifications	1	-	1	-	3
of railwaymen					
Other arrangements	19	-	7	8	3
Total	51	4	23	14	18

The investigation report of the train collision investigated during 2011 made altogether 18 recommendations to 5 addressees.

At the time of this report being submitted, four out of the five recommendations made to Elektriraudtee AS four had been accepted and implemented and one had been rejected by the undertaking. Three recommendations were made to AS EVR Cargo, two of these had been accepted and implemented and one rejected. Out of the five recommendations made to AS EVR Infra two had been accepted and proceedings were continuing for the other three. The proceedings of the one recommendation made to the Railways Division of the Ministry of Economic Affairs and Communications were continuing. Proceedings of all four recommendations made to the Technical Surveillance Authority were continuing.

Implementation of recommendations

Table 7

Recomme	ndations	Recom	Recommendation implementation status						
issued		Implem	Implemented In progress		Not	to be	No infor	mation	
					impleme	ented			
Year	No	No	%	No	%	No	%	No	%
2007	51	21	41,18	28	54,90	-	-	2	03,92
2008	4	4	100	-	-	-	-	-	-
2009	23	6	26,09	17	73,91	-	-	-	-
2010	14	5	36,00	9	64,00	-	-	-	-
2011	18	8	44,44	8	44,44	2	11,12	-	-
Total	110	44	40,00	62	56,36	2	01,82	2	01,82

4.2 Recommendations 2011

All 18 recommendations made during the year have been grouped by addressees who received the recommendations.

The following recommendations were made to Elektriraudtee AS who was the owner of the electric rolling stock involved in the collision in the case which was investigated:

- 1. To establish the requirements and responsibilities for overnight heating and maintenance of the rolling stock at the turning back point in extreme wintry weather in the job description of the train driver and other legal documentation for organisation of work.
- 2. To establish procedures for handing over and receiving of the rolling stock for overnight heating and maintenance at the railway junction in extreme wintry weather with the obligation of direct communication between both parties.
- 3. To establish and organise implementation of additional measures for checking alcoholic intoxication of the workers who maintain rolling stock at turning back points.
- 4. To improve maintenance principles and the control system for checking of the technical condition of the brake shoes of electric trains.

5. To use the materials from this accident as part of in-service training for drivers of electric trains in order to improve recognition of serious emergency situations and develop fast and rational behavioural habits in order to minimize possible damages caused by serious accidents.

The following recommendations were made to AS EVR Cargo who owned the freight train which was in the collision with the electric rolling stock:

- 1. To use the materials from this accident as part of in-service training for drivers of electric trains in order to improve recognition of serious emergency situations and develop fast and rational behavioural habits in order to minimize possible damages caused by serious accidents.
- 2. To review the position of VEPS on-board recording equipment and the interval of recording of collected information in the C36-7 series locomotives, in order to secure recording of information in the above equipment in case of collision with another rolling stock.
- 3. To review possibilities of the existing equipment Metrotec, working on the principle of GPS and the C36-7 series on-board equipment TTX-REC-M6V2 for recording data concerning traffic and traffic safety, so that if necessary, the information recorded can be used in investigations of railway accidents.

The following recommendations were made to AS EVR Infra who manages the infrastructure where the collision took place:

- 1. To organise direction of electric rolling stock for the overnight stay in the Aegviidu station to the track where access to the main track does not depend on organisation of rail traffic through the station. For this purpose it is recommended to install a catch bar or a catch switch to the hold tracks of the Aegviidu station before departure signal or to implement some other measures.
- 2. To draw up a checklist of readings for the monitors of the regional train dispatchers indicating all kinds of emergencies, equipment breakdowns and hazard situations, together with the list of different reasons that might cause them. To ensure availability of the checklist in the dispatchers' place of work and ensure that train dispatchers are familiar with its contents.
- 3. To use materials of the accident as part of in-service training for train dispatchers in order to improve recognition of indicators of a serious accident and develop rational behavioural habits.
- 4. To implement measures for improving the control system of station track encoding.
- 5. To review different possibilities of avoiding the rolling stock which has been started intentionally and without permission staying on the track and to establish implementation of the most suitable of these possibilities.

The following recommendation was made to the roads and railway division of the Ministry of Economic Affairs and Communications which is involved in the development of railway policies:

1. To implement measures for improving rail safety policy in order to modernise and specify the possibilities for implementation of the ETCS traffic control system and

GSM-R radio communication on the national level and to define in detail the staged time limits for implementing them on national public railroads.

The following recommendations were made to The Technical Surveillance Authority which performs the tasks of the safety authority:

- 1. To plan improvement of the "Rules of technical use of railway "with provisions under which a motorized transportation rolling stock without an engine driver is allowed to stay on a turning back point only where access to the main track is impossible without the permission of the dispatcher or assistant station master.
- 2. To form a position for granting construction permissions for reconstruction of station tracks of public railway which guarantees the motorized transportation rolling stock with no engine driver staying only on such station tracks from where access to the main track without permission of the train traffic regulator is impossible.
- 3. To plan revision of clause 152 of the "Rules of technical use of railway" with the purpose of specifying the organisation of monitoring motorized transportation rolling stock which is in running order on railway infrastructure.
- 4. To plan updating the "Rules of technical use of railway" with stricter requirements on the security systems of the on-board equipment of motorized transportation rolling stock.

Annex

Annex 1

Proceeding of recommendations – Aegviidu, 23.12.2010

Date and time	23.12.2010, at 02:41			
Location	AS EVR Infra infrastructure Kehra - Aegviidu open track, II main track, rura area, km 157,880.			
Type of occurrence	Collision of trains			
Train type and number	Electric rolling stock ER2 No 2203/2204, without train number. Freight train No 2020			
Road vehicle		-		
		In the train	In the road vehicle	
Number of persons (on board the train and vehicle)	Crew	1+2	-	
	Passengers	-	-	
Fatally injured	Crew	1	-	
	Passengers	-	-	
Seriously injured	Crew	-	-	
	Passengers	-	-	
Slightly injured	Crew	1	-	
	Passengers	-	-	
Damages of rolling stock	Lead carriag stock was co railcar parti sustained defo Diesel locom	e of the ele ompletely de ally destroy ormations.	ectric rolling stroyed, one ed, another freight train	

			C36-7i No 1504 damages to the extent of major- and body repairs, 5 carriages completely destroyed; 8 carriages to the amount of running repairs.
Damages of track equipment			One point, 100m of rail track, overhead contact wire and its mast destroyed.
Other damages			-
Summary: Head-o no passengers. The controller to exit the	on collision of a f electric rolling hold track.	reight train stock did r	and a four-carriage electric rolling stock with not have permission from the railway traffic
Final report issued	1 1	14.11.2011	
Recommendation No. 01	The current jo general obliga according to o carried out an people and pre To establish t heating and m point in extren driver and othe	tion of an electric train driver specifies a oose the heating regime for the carriages operature and a responsibility for the work equences and for the lives and health of of environment. ements and responsibilities for overnight e of the rolling stock at the turning back weather in the job description of the train cumentation for organisation of work.	
Date	Status		Explanation
25.10.2011	Accepted and implemented		Implementation of a new document for organisation of work, its introduction to employees.
Recommendation No 02	Direct contact between two locomotive drivers when handing over the rolling stock increases the responsibility for both parties and correctness in carrying out the job, maintaining the rolling stock in working order.		
	To establish procedures for handing over and receiving of the rolling stock for overnight heating and maintenance at the turning back point in extreme wintry weather and procedures for direc communication between both parties.		
Date	Status		Explanation
25.10.2011	Accepted implemented	and	Implementation of a new document for organisation of work, its introduction to employees.

Recommendation	Until now the checking for alcoholic intoxication has taken place					
No 03	mainly in Tallinn and the employees were not convinced that they					
	could be checked at turn	ing back points.				
	To establish and organise implementation of additional measures					
	for checking alcoholic is	ntoxication of support staff who maintain				
_	rolling stock at turning b	ack points.				
Date	Status	Explanation				
25.10.2011	Accepted and	Implementation of a new document for				
	implemented	organisation of work,				
		its introduction to employees,				
		performing checks at turning back				
At least twice a		points				
year						
Recommendation	Choice of brake shoes a	nd their application did not ensure the exit				
No 04	of the electric rolling stock from the hold track in this case.					
	To improve principles of use and the control system for checkin					
	of the technical condition of the brake shoes of electric trains.					
Date	Status	Explanation				
2012	Rejected	The brake shoes in use comply with the				
		normative document valid in the				
		Russian Federation TY 32-01124323-				
		72-94. Principles of use of brake shoes				
		must comply with the requirements set				
		by their producer. The undertaking does				
		not have autionty to change this.				
Recommendation	The electric train driver might not be able to adequately assess the					
No 05	circumstances which lead to the collision of trains.					
	To use the materials from this accident as part of in-service					
	training for drivers of electric trains in order to impr					
	recognition of serious en	mergency situations and develop fast and				
	caused by serious accide	nts.				
Date	Status	Explanation				
05-06.01.2012	Accepted and	Carrying out technical training,				
1						
02-03 02 2012	implemented	discussions				
02-03.02.2012	implemented	discussions				

Recommendation	The locomotive driver might not be able to adequately assess the	
No 06	circumstances which lead to the collision of trains.	
	To use the materials from this accident as part of in-service training for locomotive drivers in order to improve recognition of serious emergency situations and develop fast and rational behavioural habits in order to minimize possible damages caused by serious accidents	
Date	Status	Explanation
2011-2012	Accepted and implemented	During regular technical training and training days the circumstances of the accident have been examined again and explanations have been given as well as instructions for action in special circumstances. Long term, a plan for using a relevant simulation is under consideration.
Recommendation No 07	VEPS on-board recording equipment was damaged during the train collision which is why the information immediately before the accident was not recorded.	
	To review the position of VEPS on-board recording equipment and the interval of recording of collected information in the C36-7 series locomotives in order to secure recording of information in case of collision with another rolling stock.	
Date	Status	Explanation
2012 II and III quarter	Accepted and implemented	As part of the modernisation of VEPS equipment, the recording of collected information is guaranteed.
Recommendation No 08	Officially the undertaking is using the potential of the equipment only partially. In gaining information about safety, the information which has been retained unofficially might be important in assessing the case. To review possibilities of the existing equipment Metrotec, working on the principle of GPS and the C36-7 series on-board equipment TTX-REC M6V2 for recording data concerning	
	traffic and traffic safety, so that if necessary, the information recorded can be used in investigations of railway accidents.	
Date	Status	Explanation

2012	Rejected	The plant producing the locomotives,
		GE, does not offer a technical solution.
Recommendation	In the case which was	investigated there was a possibility to
No 09	access the main track from hold track without permission from the	
	traffic regulator and desp	pite prohibiting traffic signals.
	To organise direction o	f electric rolling stock for the overnight
	stay in the Aegviidu stat	tion to the track where access to the main
	track does not depend of station. For this purpose	on organisation of fail traffic through the
	or a catch switch to the	hold tracks of the Aegviidu station before
	departure signal or to im	plement some other measures.
_		
Date	Status	Explanation
12.2011	Proceedings continue	As AS EVR Infra does not have tracks
		which correspond to the
		recommendation made by the
		investigation report, AS EVR Infra has
		made a request to AS Elektriraudtee to
		make the necessary preparations in order
		to not leave empty rolling stock
		overnight at Aegviidu station.
		AS EVR Infra approached the Technical
01.2012		Surveillance Authority for an
		explanation of circumstances where a
		passenger train is allowed to stop over in
		relevant stations. According to their
		from the safety authority to keep empty
		rolling stock in a station overnight as
		current regulation allows this anyway.
01-04.2012		Additional requirements/ conditions
		have been set for leaving rolling stock
		without a crew to stop over. The board
		of AS EVR Infra has approved the
		relevant amendments to the code of
		conduct and, pursuant to the Railway
		Act, submitted them to the Technical
		Surveillance Authority for approval
		(amendments come into force for the
		users of the infrastructure once they

2012 II half-year		have been approved and published).
		Necessary amendments to the "Rules of technical use of railway" are being considered by the Ministry of Economic Affairs and Communications working group for the draft of the "Rules of technical use of railway".
Recommendation	It took longer for the tra	in dispatcher to realise that this was not a
No 10	case of random equipment failure but a situation caused by rolling stock ignoring traffic rules than it took the rolling stock to drive from hold track into a collision.	
	To draw up a checklist regional train dispatche equipment failures and l different reasons, which of the checklist in the d that train dispatchers are	t of readings for the monitors of the ers indicating all kinds of emergencies, hazard situations, together with the list of might cause them. To ensure availability lispatchers' place of work and make sure familiar with its contents.
Date	Status	Explanation
2012	Accepted and implemented	Amendments were made to all current guidelines on how to act in the case of all faults and emergency situations.
Recommendation No 11	Train dispatchers in Estonia do not have the experience to quickly recognise such occurrences.	
	To use materials of the accident as part of in-service training for train dispatchers in order to improve recognition of indicators of a serious accident and develop rational behavioural habits.	
Date	Status	Explanation
2011 - 2012	Accepted and implemented	Additional instruction has been carried out after each significant railway accident. Explanations and instructions for how to act in emergency situations have been given in regular technical training and at training days. Specialists from other fields have been included in order to increase the quality of instruction.
Recommendation	The railway infrastructure manager did not have up-to-date information about the electric rolling stock being uncoded on the	

No 12	overnight hold track.	
	To implement measures in order to improve station track	
	encoding control systems.	
Date	Status	Explanation
2012 II quarter	Proceedings continue	There is no technical solution at this time but a regulative measure will be implemented. Amendments are being made to EVR Infra Code of Conduct according to which a driver of rolling stock, upon discovering that there is no encoded open track or no codes in a station, must inform the train dispatcher of this. The train dispatcher will register the information and will forward it to the communications dispatcher. The latter will check the fault and organises the repair.
Recommendation No 13	Rolling stock driving onto the main track without permission in any station creates favourable conditions for a collision of trains.	
	To review different po which has been started staying on the track and suitable of these possibil	ssibilities of avoiding the rolling stock d intentionally and without permission l to establish implementation of the most ities.
Date	Status	Explanation
01-04.2012	Proceedings continue	Additional requirements / conditions have been compiled for leaving rolling stock without a crew to stop over. The board of AS EVR Infra has approved the relevant amendments to the code of conduct and, pursuant to the Railway Act, submitted them to the Technical Surveillance Authority for approval (amendments come into force for the users of the infrastructure once they have been approved and published).
Recommendation	A modernized traffic control system helps to make railway safety	
No 14	more effective.	

	To implement measures for improving railway safety policies in order to specify the possibilities for implementation of the ETCS traffic control system and GSM-R radio communication on the national level and to define in detail the staged time limits for	
Date	Status	Explanation
2012	Proceedings continue	Estonia does not have the capabilities to fund ETCS traffic regulation system on the current railway infrastructure. AS EVR Infra has proposed to implement the GSMR digital data transmission and communication system with a cost of approx. 35 million euros as part of the I stage of ERTMS, providing the majority of the funding comes from EU structural funds. A respective project is being considered as a possible project for the funding period 2014-2020. ERTMS implementation is possible in entirety on the Rail Baltica line which is planned in EU width (1435 mm).
Recommendation No 15	There is no national regulation which prevents rolling stock without a driver at a turning back point from staying on a track where there is no possibility to access the main track without permission.	
	To plan updating the "Rules of technical use of railway" with provisions which allows motorised rolling stock without a driver to stay on the turning back point only on such station tracks where there is no possibility to access the main track without the permission of the dispatcher or the station operator.	
Date	Status	Explanation
August 2011 – April 2012	Proceedings continue	During the process of updating the "Rules of technical use of railway" The Technical Surveillance Authority has proposed to equip the hold tracks with release switches or -blades. As part of the draft proceedings of the "Rules of technical use of railway", discussion is continuing about various alternatives which is why it cannot be ruled out that more requirements are added which will

		provide proportional obligations of the railway undertaking (e.g. improving the functionality of the rolling stock's equipment, implementing a requirement for a direct personal authorisation, requirement to impose this before starting the train, etc). The need for the latter has been created mainly due to the fact that it is virtually impossible to
		standing which is why it is difficult to plan relevant investments.
Recommendation	When reconstructing station tracks, there has been no requirement	
No 16	to avoid the rolling stock moving on to the main track without	
	permission while it has been standing without a driver.	
	To develop a position when granting building permits for reconstruction of station tracks of public railways which ensures that rolling stock without a driver only stands on such station tracks where it is not possible to move to the main track without a permission from the person directing the train traffic.	
Date	Status	Explanation
August 2011 – April 2012	Proceedings continue	Processes for amendments to the "Rules of technical use of railway" are taking place as described in the previous recommendation. Additional risks when using station tracks as hold tracks are assessed on a case to case basis.
Recommendation	Currently the train disp	patcher does not have the obligation to
No 17	monitor motorised rol	ling stock if it is standing on the
	infrastructure and maintenance for keeping it in working order and preparation for allowing it to enter traffic is taking place.	
	To plan a review of clause 152 of the "Rules of technical use of railway" with the purpose of specifying the monitoring of a motorised rolling stock that is in working order on railway infrastructure.	
Date	Status	Explanation
August 2011 – April 2012	Proceedings continue	As one of the recommendations, clause 138 of the "Rules of technical use of railway" has been amended to specify that only authorised personnel have

		access to the on-board equipment.
		Among other things this will ensure that
		by default the rolling stock is being
		monitored by the transport undertaking
		until such time when a relevant person
		has been given permission to start the
		train. Practical details (remote
		authorisation, using a unique code or
		granting permission to a person
		immediately prior to starting the train)
		are in the process of revision and will be
		finalised during the draft proceedings.
		As a further recommendation, more
		specific requirements for the
		information recorded by the safety
		equipment and its safekeeping have
		been proposed for the amendments of
		the "Rules of technical use of railway".
D		
Recommendation	On-board of motorised	rolling stock must be protected in very
No 18	different situations.	
	To plan amendments to	the "Rules of technical use of railway"
	with stricter requireme	ents for security systems for on-board
	equipment of motorised	rolling stock.
Date	Status	Explanation
August 2011 –	Proceedings continue	In addition to the circumstances
April 2012		described in the previous point, more
		specific requirements for the
		information recorded by the safety
		equipment of the motorised rolling stock
		and its safekeeping have been proposed
		in order to improve the general security
		systems.