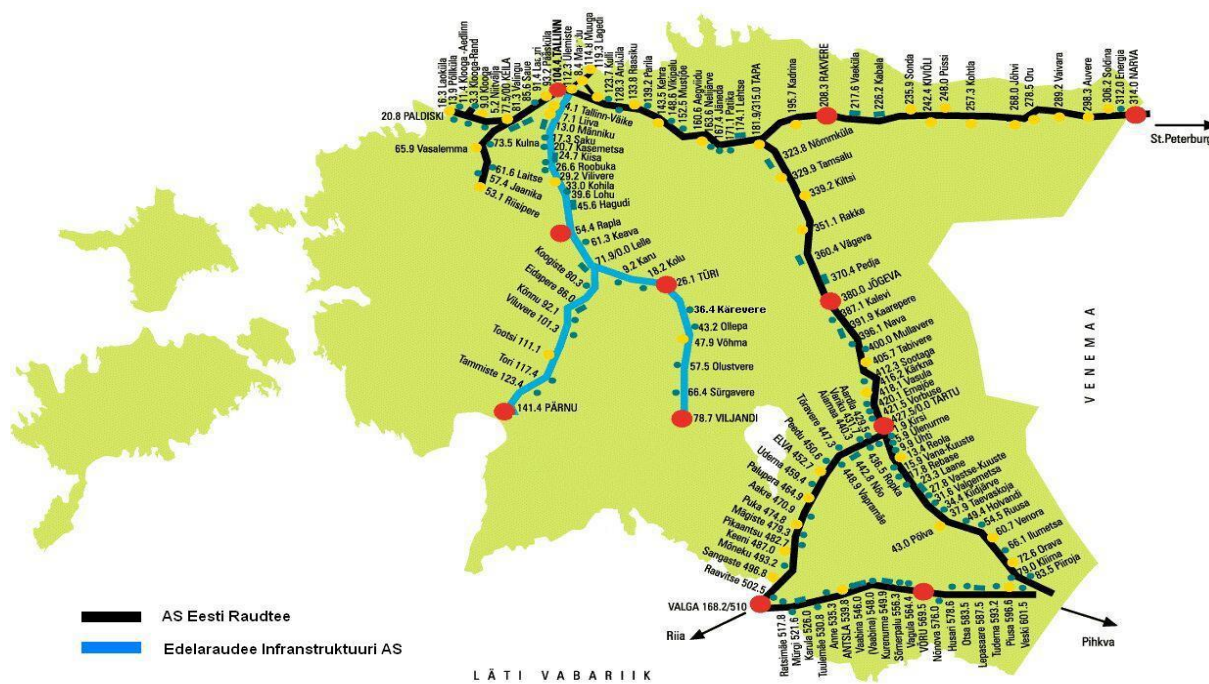




**ESTONIAN SAFETY  
INVESTIGATION  
BUREAU**

Report of the railway accidents  
investigated in 2017

Tallinn 2018



## Public railways in the Republic of Estonia



## Preface to the report

Estonia began conducting railway accident safety investigations on 31 March 2004 when a railway accident investigation unit was established at the crisis regulation department of the Ministry of Economic Affairs and Communications. The safety investigations were conducted pursuant to the Railways Act of the Republic of Estonia due to the amended requirements of the European Parliament and Council Railway Safety Directive 2004/49/EC. The multimodal transport safety investigations were separated from the crisis regulation department on 1 January 2012 when the Safety Investigation Bureau (ESIB) was formed at the same Ministry.

The existing classification of cases affecting railway safety, accident, serious accident and incident, which matches that of the Railway Safety Directive, remained in place in 2017.

Although there were no train collisions or derailments in 2017 causing death of a person, significant physical harm to at least five people, damage to railway undertakings or the environment to an extent of at least 2 million euros or which have had a clear impact on railway safety, the Safety Investigation Bureau decided to conduct a safety investigation into an accident that took place on 12 March on the Sompä level crossing.

A safety investigation is conducted pursuant to the guidelines valid in Estonia which are in accordance with the requirements set out in European Union Safety Directive. Safety investigations are independent from other investigations and proceedings of given cases. Their aim is to increase railway safety and not to appoint blame or level of responsibility.

The ESIB's investigator of railway accidents participated in the Central European and Nordic regional railway accident investigation working groups for sharing work experiences and generating new ideas. In May of 2017 a meeting of the Nordic railway accident investigators took place in Tallinn.

## Contents

Public railways in the Republic of Estonia	2
PREFACE	3
CONTENTS	4
1 INTRODUCTION TO THE INVESTIGATION BODY	5
1 Legal basis	5
2 Role and aim	8
3 Organisation	11
4 Organisational flow	12
2 INVESTIGATION PROCESSES	14
1 Cases to be investigated	14
2 Institutions involved in investigations	15
3 Investigation process and approach of the Investigation Body	16
3 SAFETY INVESTIGATIONS	20
1 Overview of completed investigations	20
2 Safety investigations completed and commenced in 2017	21
3 Summary of the safety investigations completed in 2017	22
4 Comments on investigations	23
5 Accidents and incidents investigated during the past five years (2013-2017)	25
4 RECOMMENDATIONS	27
1 Short review and presentation of recommendations	27
2 Recommendations made in 2017	28
ANNEXES	
Annex 1 Proceeding of recommendations Sompa 12.03.2017	30

# 1. Introduction to the Investigation Body

## 1.1 Legal basis

Railway accident safety investigations began on 31 March 2004 when The Railways Act came into force in Estonia as a result of the European Parliament and Council Directive 2004/49/EC on Railway Safety and which set out for an investigation unit to be created at the Ministry of Economic Affairs and Communications. Several discrepancies were eliminated with the amendment to the Railways Act which came into force on 2 March 2007.

At various times a Unit for Investigation of aviation accidents, a Unit for Investigation of railway accidents and a Unit for Investigation of maritime accidents had been formed at the crisis regulation department of the Ministry of Economic Affairs and Communications. On 1 January 2012 amendments were made to the Aviation Act, Maritime Safety Act and Railways Act and as a result, the safety investigations of these three modes of transport were combined in a new structural unit of the Ministry – Estonian Safety Investigation Bureau (ESIB).

Activities of the Safety Investigation Bureau as a multimodal structural unit are regulated by the Aviation Act, Railways Act and Maritime Safety Act. According to Subsection 42 (1) of the Railways Act, the ESIB conducts safety investigations of accidents, serious accidents and incidents. At the same time, it establishes the independence of the ESIB in conducting safety investigations and making any decisions regarding the investigation. It specifies that in its investigative activities the ESIB is guided only by law and other legislation and any international treaties that are binding in Estonia. There is no supervisory control of the ESIB's investigative activities. Independence of the Safety Investigation Bureau is also guaranteed by Subsection 48 (2) of the Aviation Act which provides that the director of the ESIB is appointed and relieved of its duties by the Government of the Republic on the recommendation of the relevant ministry. The ESIB officials are appointed and relieved of their duties by the director of ESIB who also enters into and terminates the employment contracts with the employees of the ESIB. The Safety Investigation Bureau has an independent budget that was approved by the Parliament of the Republic of Estonia in the 2017 state budget with item code 20SE07004.

The ESIB's activities, relationships and connections with the Ministry are specified by the Safety Investigation Bureau Statutes. The Statutes require that the ESIB is accountable to the Secretary General and the Minister when using the Ministry's ancillary services. The Ministry does not have the right to give orders or tasks to the ESIB that jeopardize the independence of the safety investigation. Neither does the

Ministry have the right to demand information from the ESIB that compromises the independence of the safety investigation and may hinder any current or future safety investigations. When using the Ministry's ancillary services ESIB is guided by the statutes of the departments providing the ancillary services and the rules regulating the ancillary services. The Statutes of the Safety Investigation Bureau were approved by the Ministry of Economic Affairs and Communications Directive in 2014 and form a part of the legal framework affecting the safety investigations of railway accidents.

The Safety Investigation Bureau is a permanent structural unit of the Ministry but in order to conduct independent safety investigations it has been granted with special rights. The identifiers of the ESIB's independence described below are pursuant to Article 21 of the Directive on Railway Safety 2004/49/EC. The ESIB is functionally independent from the safety authority and the railways regulating authority. The ESIB's organisation, legal structure and decision process are independent of any railway infrastructure managers, railway undertakings, tax collection authorities, distribution authorities and notified bodies or any other party whose interests might conflict with the tasks given to the ESIB. The tasks of the investigator-in-charge are performed by the official responsible for conducting railway safety investigations.

The organisation of the investigations of railway accidents and incidents is provided by Article 4 of the Railways Act "Railway traffic and safety" that came into force on 1 July 2017. The subject of the safety investigation is specified by Section 40 "Cases affecting railway safety" which is the basis of the classification of the cases under investigation into accidents, serious accidents and incidents. The legal requirements for safety investigations are provided by Section 42 of the Railways Act "Safety investigations of accidents, serious accidents and incidents" and Section 43 "Safety Investigation Reports". The remainder of the provisions of the Railways Act serve in a clarifying and assisting role in the context of safety investigations. Legislation has provided delegation authority to two regulations related to the processes of safety investigation, these are "Safety investigation procedures" and "Procedures for providing written notification of accidents, serious accidents and incidents and format of written notifications and reports".

Railway infrastructure managers or other railway infrastructure possessors and railway undertakings as well as in the case of having been notified in the process of surveillance activities, the Technical Regulatory Authority, immediately notify the Safety Investigation Bureau of an accident, serious accident or incident via means of public communication pursuant to Subsection 42 (3<sup>1</sup>) of the Railways Act. The same Subsection also specifies presenting additional information in writing within three working days. Notification process has been specified by The Ministry of Economic Affairs and Communications "Procedures for notifying of accidents, serious accidents and incidents and the format of the written notices and reports". Pursuant to Subsection 2 (1) of the Directive a written notification is made in the format included

in the Annex of the Directive. Pursuant to Subsection 2 (2) of the Directive an immediate notification of an incident is made to the email address published by the ESIB. If the ESIB requests additional information, a written report of the incident must be presented within three working days of the request being made.

To clarify circumstances that require specialist knowledge, Subsection 42 (2) of the Railways Act provides the ESIB's right to involve experts and form committees. The experts involved in a safety investigation and the committee take part in the investigation under the supervision of the official conducting it. Authorities involved in a safety investigation are obliged to provide necessary assistance to the ESIB within their competence.

The Safety Investigation Bureau may issue a safety alert during the investigation. A safety alert is issued pursuant to Subsection 42 (11<sup>2</sup>) of the Railways Act when circumstances and facts come to light during the investigation of the occurrence that have significance to more than one railway infrastructure manager or railway undertaking or one or more European Union member state. When issuing the alert, the ESIB assesses the determined circumstances affecting safety of the relevant rolling stock, railway infrastructure installations, railway traffic regulation, maintenance arrangements, treatment processes and technical and legal guidelines. The safety alert includes only facts and descriptions but no recommendations or assessments. The safety alert is issued to those concerned and the European Union Agency for Railways.

Pursuant to Subsection 43 the ESIB must complete a written report of the safety investigation in the shortest possible time and publish it immediately but no later than 12 months after the occurrence. The safety investigation report is forwarded to all parties involved such as the railway infrastructure managers, railway undertakings, the safety investigation bodies of other European Union member states, victims and their families, owners and manufacturers of damaged property, Rescue Board, representatives of the employees and passengers and the European Union Agency for Railways. Pursuant to Subsection 43 (3) the Estonian Technical Regulatory Authority, other authorities, businesses or organisations that were subject to the ESIB's recommendations, submit a report to the ESIB on the status of the proceedings and results annually by the 1st April.

The Ministry of Economic Affairs and Communications issued the Directive No 72 "Safety Investigation Procedures" in 2012, the latest redaction of which came into force on 22.04.2016 and covers ESIB's all three areas of transport. The Directive sets out ascertainment of causes of the occurrence and making recommendations and specifies the objective of a safety investigation as prevention of similar occurrences in the future. The Directive determines areas of a safety investigation according to modes of transport, its coordinator, defines the start of a safety investigation and notification, depending on the complexity and workload of the



occurrence, formation of a safety investigation committee, its division of work, procedures for a safety investigation and the tasks of the investigator-in-charge, issuing a safety alert, the format, signing, confirmation and publication of the safety investigation report, completing the safety investigation, proceedings of the safety recommendations, if necessary, the reopening of the safety investigation and procedures for registration of the cases being investigated.

The Directive contains annexes which specify the format of safety investigation reports and the format of the report on measures taken or planned, based on the recommendations of the Railway Safety Directive 2004/49/EC annex 5 and the ERA "Guidance on Safety Recommendations in terms of Article 25 Directive 2004/49/EC".

## 1.2 Role and aim

The role of the Safety Investigation Bureau is conducting safety investigations of accidents of three modes of transport with the aim to make its contribution, via the proceedings of the results of the investigations to maritime and aviation accidents and incidents as well as railway accidents and incidents, to traffic safety in these areas. The aim of the safety investigations is to determine the circumstances and causes of the accidents and incidents investigated. In the process of the investigation they associate the causes with traffic safety and make recommendations that would help decrease or avoid such occurrences in the future. It is the task of the Safety Investigation Bureau to participate in formulation of legislation related to maritime, aviation and railway safety. If necessary, the ESIB will make recommendations for additions or amendments to this legislation. The multimodal ESIB also participates in formulation and implementation of projects, policies, strategies and development plans related to its areas of activity and participate in the preparation and implementation of international projects.

The statute has defined the following obligations for the Safety Investigation Bureau:

- 1) Complete all its tasks in a timely manner and to a high standard.
- 2) Ensure the confidentiality of the professional information pursuant to legislation.
- 3) Utilize any assets and resources that it has been allocated purposefully and rationally.
- 4) Ensure it does not violate the principle of independence and confidentiality of the safety investigation, forward to other structural units of the Ministry information that is necessary for them to perform their tasks.



The objective of the safety investigation has been provided by Subsection 42 (3) of the Railways Act and Section 1 of the Minister's Directive "Safety Investigation Procedures". The objective of the safety investigations of railway accidents, serious accidents and incidents is to determine the causes and make recommendations to prevent such occurrences in the future and not to appoint blame or liability.

The Statutes of the Safety Investigation Bureau specify the following rights in order to fulfil its role and aim.

- 1) Access documents and information necessary for fulfilling the tasks assigned to the Safety Investigation Bureau from ministers, secretaries general and deputy secretaries general, other departments, government authorities within the jurisdiction of the Ministry and legal persons governed by private law which are subject to the Ministry's founding, membership, stockholder or shareholder rights.
- 2) Engage employees of other departments in resolving issues within the Safety Investigation Bureau remit.
- 3) Work in cooperation with other government and local authorities and legal persons governed by private law and make recommendations to form committees and working groups within its areas of activity.
- 4) Within limits of its competence, communicate information to other authorities and persons.
- 5) Make proposals for contracts required for fulfilling its tasks.
- 6) Get further training to improve the specialist, occupational or professional level of the Safety Investigation Bureau employees.
- 7) Receive necessary office equipment, resources and literature and technical and information support.

Pursuant to the Statutes, while fulfilling its main objective, The Safety Investigation Bureau

- 1) Works in cooperation with other government departments, local government units, foundations, non-profit associations, business and consumer organisations, businesses, private persons and respective authorities of other countries and international organisations.
- 2) Represents the state in the international organisations related to its areas of activity.
- 3) Takes part in fulfilling any duties of the Republic of Estonia pursuant to the international agreements relating to the ESIB areas of activity.
- 4) Prepares the draft budget for ESIB and the report on the execution of the previous year's budget.
- 5) Develops and implements its development plan and work schedules.
- 6) Monitors, analyses and assesses the situation in its areas of activity and informs The Aviation Authority, Technical Regulatory Authority and Estonian

Maritime Administration, the Aviation and Maritime department and the Roads and Railways department of the Ministry as well as other authorities and businesses of its findings.

- 7) Performs tests and expert analysis on machinery, engines, equipment, their details and assemblies and other devices to assess their compliance with requirements to clarify the circumstances of a case under investigation.
- 8) Makes recommendations and takes decisions within its jurisdiction provided by legislation.
- 9) Ensures the confidentiality of information containing business and technical details and personal data if legislation does not provide that it should be published.
- 10) Implements measures for witness protection.
- 11) Performs the duties assigned by legislation as a chief or authorised processor of the database of cases investigated.
- 12) Preserves the items, equipment, assemblies and details in its possession that are relevant to ascertaining the causes of the occurrence.
- 13) Organises information days about safety and development activities.
- 14) Possesses, uses and disposes of public property in its possession in cases provided by and in accordance with legislation.
- 15) Advises individuals in matters relating to the Safety Investigation Bureau's areas of activity.
- 16) Performs other tasks assigned by legislation.

Subsection 42 (6) of the Railways Act provides that the official conducting the safety investigation of a railway accident, serious accident or incident has the right to

- 1) Immediate access to the rolling stock, railway infrastructure and traffic control and signalling devices involved in an accident, serious accident or incident.
- 2) Restrict unauthorised access to the scene of the accident and prohibit handling, removing or destroying items from the scene of the accident.
- 3) Ensure immediate inventory of all evidence and controlled removal of the wreck, rolling stock, infrastructure equipment or components for investigation or analysis.
- 4) Immediate access to the on-board and other recording equipment and their recordings and to subject them to their control.
- 5) Immediately receive into their disposal autopsy reports of the casualties and the results of the analysis of any samples taken from the deceased.
- 6) Question witnesses and persons who might have important information regarding the safety investigation and demand confirmation or provision of information necessary for the safety investigation.
- 7) Access to all relevant information and documents independently or in cooperation with the authority conducting the preliminary criminal investigation.

- 8) Immediate access to the testimony of persons associated with the occurrence and to the analysis results of any samples taken from these persons.

## 1.3 Organisation

From the organisational perspective, the Safety Investigation Bureau is a structural unit of the Ministry of Economic Affairs and Communications. To perform specific tasks, the ESIB has been granted a special organisational status. The ESIB's special status has been guaranteed by relevant articles of the Aviation Act, Maritime Safety Act and Railways Act. The ESIB has the right to utilise other departments' competencies and work in cooperation with them but retains complete independence in decisions relating to the requirement of cooperation and the extent of utilising of their competencies. Other structural units of the Ministry have the role of providing ancillary services to the ESIB. Cooperation with Ministry's departments is reflected in the Ministry's work schedule.

ESIB's distinctive organisational nature is reflected by the letterhead, website, logo and a budget that has been approved by the Parliament. An ESIB official has a certificate of employment. By presenting the certificate of employment the official can exercise the special rights granted to him by legislation while carrying out his official tasks. The certificate of employment includes a brief description of the right of access to the necessary facilities and the national and European Union legal bases of the right. The certificate of employment of a railway accidents investigator is valid until 1 February 2022.

The Safety Investigation Bureau's work is led by a director. There are three officials working under him, an aviation accident investigation expert, a chief specialist in marine accident investigation and a chief specialist in railway accident investigation.

Only the Safety Investigation Bureau has the right to make the decision whether to begin a safety investigation of an accident, serious accident or an incident. The safety investigation must be conducted within 12 months during which an investigation report must be completed. The report is signed by all members of the committee or in the absence thereof, the investigator-in-charge who conducted the investigation. The report is signed off by the director of the ESIB. The report is then forwarded to all parties concerned and published on the ESIB website. An interim report is published after 12 months if during this time the safety investigation has not been completed.

## 1.4 Organisational flow

Within the Ministry's structure the Safety Investigation Bureau is more separate and legally independent than other structural units - departments and offices, since this is the only way they can fulfil the tasks requiring special rights.

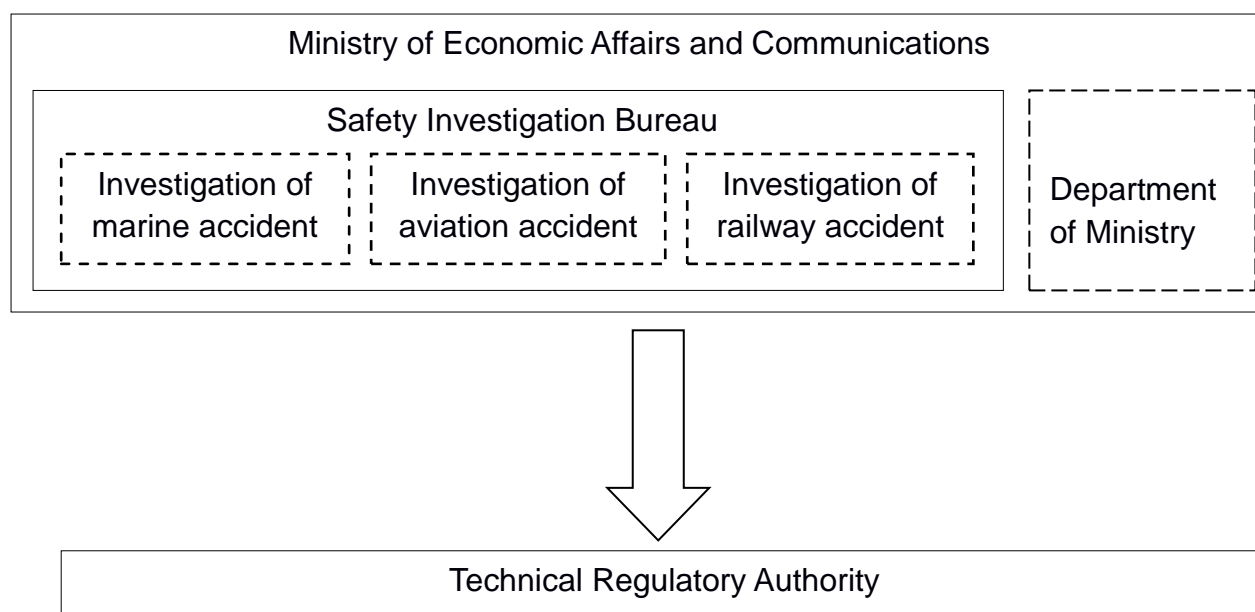


Figure 1 The Safety Investigation Bureau in the organisational structure of the Ministry

Work of the ESIB is directed and supervised by the director. The ESIB is an integrated structural entity. Only the areas of work that the officials are involved in can be differentiated. All ESIB officials are permanent staff. Every official has a specific area assigned to them and they are responsible for the accurate, lawful and timely completion of the duties of this area.

The title of each ESIB official reflects the transport sector the accidents and incidents of which they are responsible for conducting safety investigations of. An official is independent in conducting safety investigations. If necessary, they will use the officials of other areas of transport as assistants in their investigation. If one of the officials is away for a longer period, the others will cover his work to a certain extent. Once the official has returned to work, all necessary information will be forwarded to him to enable him to continue the activities. All officials take turns to be involved in the Safety Investigation Bureau's 24-hour telephone service.



Safety investigations of railway accidents in Estonia are conducted only by the Safety Investigation Bureau. In parallel with the safety investigation, other investigations or procedures of a given case may take place. An ESIB safety investigation is an independent and completely autonomous process. No other investigation or proceedings conducted by law enforcement, surveillance authorities or other authorities and institutions are related to it. Only the ESIB decides the content and results of a safety investigation.

Estonian Technical Regulatory Authority (ETRA) is an independent department of administration of the Ministry of Economic Affairs and Communications with a separate budget, structure and management. The ETRA performs the function of the railway safety authority and a regulator in Estonia

All railway infrastructure managers and rail operators and other undertakings that manage or own other railway infrastructure or rolling stock are independent manufacturing enterprises acting as legal persons. The Ministry of Economic Affairs and Communications is a shareholder for three of them. These are the railway infrastructure manager Estonian Railways Ltd, railway undertakings AS EVR Cargo and AS Eesti Liinirongid (Elron). The Estonian state does not participate in the ownership of the rest of the infrastructure and freight companies. The relationship between the Safety Investigation Bureau and railway undertakings is regulated by legal acts and directives.

## 2. Investigation processes

### 2.1 Cases to be investigated

The Railways Act specifies which cases require the Safety Investigation Bureau to conduct a safety investigation. The implementation of the Railway Safety Directive 2004/49/EC in Estonian legislation has ensured the classification of occurrences affecting railway safety in Estonia is identical to that of the Directive. The terminology used in Estonia is identical to the Safety Directive in form as well as substance.

The Safety Investigation Bureau is obligated to investigate serious accidents. If the circumstances of an accident or incident or similar circumstances might have caused a serious accident, including at least one death or significant physical harm to five or more people, also technical failure in the subsystem of the Trans-European conventional or high-speed rail system or interoperability constituent, the ESIB has a right to begin a safety investigation. In making the decision the Safety Investigation Bureau must consider the severity of the accident or incident from the pan-European perspective and other important circumstances. In its assessment of an accident or incident the ESIB considers applications submitted by a safety investigation body of another European Union member state, the Technical Regulatory Authority and infrastructure managers and railway undertakings.

The Safety Investigation Bureau has developed the appendix R3 “Characteristics of a railway accident or incident for making the decision to begin a safety investigation or formulating an opinion” to the ESIB handbook “Safety Investigation Manual”. In order to make a decision regarding launching a safety investigation the ESIB gathers additional information about the occurrence based on which it assesses the potential of risk of the occurrence, number of fatalities or injuries as a result of the railway infrastructure manager’s equipment failure, fatality of a person who was known to the railway infrastructure manager to be or work at the railway, obvious mistake or oversight of the railwayman as a probable cause of the occurrence, circumstances of similar cases, collision of rolling stock with a group of people, depending on the number of injuries and fatalities. Annex R3 of the handbook directs the ESIB to take a risk-based approach as well as relying on the legally determined cases when making the decision to begin a safety investigation.

## 2.2 Institutions involved in investigations

With regard to inclusion of other parties in the investigation the Safety Investigation Bureau is guided by the principles provided by the Railways Act and the Directive about the procedures for safety investigations. The principles are common and compulsory to all parties. The purpose of inclusion is primarily to obtain necessary information about the occurrence, so that the safety investigation can be conducted to the required standard. Infrastructure managers as well as third parties are obliged to provide the relevant information they hold when requested by the ESIB. If invited by the ESIB a person is obliged to appear and give testimony about circumstances known to them. The Railways Act establishes the right of the official conducting a safety investigation to make a precept to the person under obligation in order to fulfil the obligations related to the safety investigation. In the event of non-compliance with the precept, the right to apply the penalty charge to either a natural or a legal person is available pursuant to the procedure prescribed by legislation.

The Safety Investigation Bureau has signed a cooperation agreement with the Police and Border Guard Board, the Office of the Prosecutor General, the Rescue Board and the Emergency Centre. Compliance with the cooperation agreement ensures the coordinated activities of the various authorities when fulfilling the duties assigned to them by legislation. Both parties guarantee that a criminal investigation does not hinder the safety investigation and vice versa. The Emergency Centre sends an immediate SMS and an email notification to the relevant official ESIB address of any incident or accident they have been informed of in the railway, maritime or aviation field. If possible, the Police and Border Guard Board and the Rescue Board ensure safety at the scene and their assistance with the investigations after the rescue operations have finished. All parties allow access to evidence and factual information, unless forbidden by law. The prosecutor's office decides whether to share data collected as part of the criminal proceedings. Ensuring access and disclosure of evidence cannot hinder the safety investigation or criminal proceedings. If necessary, the parties consult each other and where possible, exchange information. Although the parties work in cooperation the safety investigation and criminal proceedings are conducted separately.

Safety Investigation is supported by current legislation. Based on this, pragmatic cooperation methods have evolved with various businesses, authorities, institutions and private individuals. For example, during the safety investigation conducted in 2017, Tartu Observatory was consulted about the location of the sun at the precise moment of the accident in order to assess its potential influence on the occurrence. The Safety Investigation Bureau has signed cooperation agreements with the Finnish



and Latvian safety investigation authorities, the northern and southern neighbours respectively.

The legislation provides an obligation to invite investigative bodies of another Member State of the European Union to participate in a safety investigation if the accident involves a railway infrastructure manager established or licenced in that member state. If necessary, the ESIB may ask the safety investigation bodies of other countries and European Railways Agency for help with specialist knowledge, technical inspection, performing analysis and giving assessments.

It is the role of the investigator-in-charge to interpret the information gathered either by involving others or by directly and systematic processing the facts, knowledge and circumstances which will be reflected in the content of the investigation report. The investigator-in-charge would contact all the parties involved, listen to their viewpoints and opinions and before the end of the investigation, present to them a summary of the results of the safety investigation. The summary is discussed with the authorities, businesses, institutions and if there is interest, individuals involved in the case. As a result of the discussion, the investigator-in-charge prepares the investigation report to be signed and subsequently published.

Since 2004 when the safety investigations of railway accidents and incidents began, neither the investigator-in-charge nor members of the investigation committee have ever been part of a police criminal investigation, an internal investigation, misdemeanour proceedings of the Technical Regulatory Authority or any other proceedings or investigation of the given case conducted by another authority. Neither has any person involved in the investigation of a given case participated in a safety investigation.

## 2.3 Investigation process and approach of the Investigation Body

The proceedings of the case begin with the receipt of the initial notification. The initial notification of railway accidents and incidents arrives from two sources: the Emergency Centre and the railway infrastructure manager. The Emergency Centre notifies the ESIB by email and helpline of all occurrences in air, water and rail that it is aware of for 24 hours a day. From the railway sector, railway infrastructure managers and possessors and railway undertakings and if they have become aware during regulatory activities, the Technical Regulatory Agency, notify the Safety Investigation Bureau by means of public communication immediately. In the railway sector, a notification is made about an accident, a serious accident or an incident. A written notification of an accident or a serious accident containing additional

information is made to the ESIB in the agreed format within three working days by the infrastructure manager that made the initial notification. In case of an incident, a written report about additional information in an agreed format is also made within three working days to the ESIB if the ESIB has requested this. All written documents received by the ESIB are systematically stored within a digital document management system as part of the ancillary services.

Based on a pragmatic agreement the railway infrastructure manager usually makes the initial notification by phone directly to the official dealing with the safety investigations of railway accidents. The notification received by the ESIB helpline is also forwarded to the official dealing with the safety investigations of railway accidents by the colleague on shift. Upon receiving the verbal notification, the case proceedings begin. The official dealing with safety investigations of railway accidents assesses the initial circumstances of the case and, if necessary, will ask for additional information. He makes an initial assessment based on the Railways Act and the safety investigation manual and makes a proposal to the Director of the ESIB either to begin a safety investigation, not to begin a safety investigation or to defer the decision until additional circumstances have been clarified. Based on the verbal information received, the ESIB decides whether there is a requirement to visit the scene. In the case of a serious accident the official notifies the Director of the Safety Investigation Bureau immediately by telephone. The Director of the Safety Investigation Bureau maintains records of notifications received and if necessary, requests additional information. The Director's position on whether to begin or not to begin a safety investigation is final and binding to the official dealing with the investigations of railway accidents.

The Safety Investigation Bureau's decision whether to begin an investigation or not is made pursuant to the Railway Safety Directive 2004/49/EC and Subsection 42 (8) of the Railways Act. The decision whether to begin an investigation of an accident, serious accident or incident is made as a maximum one week after receiving notification of the occurrence. The ESIB will notify the European Union Agency for Railways within a week of the decision to begin a safety investigation by entering the relevant information in the correct format to the database of the European Union Agency for Railways. Since the start of safety investigations in Estonia in 2004 the deadline for notifying the European Railways Agency has never been missed.

The Ministry of Economic Affairs and Communications Directive No 72 "Safety Investigation Procedures" provides a unified multi-modal approach for conducting safety investigations of maritime, aviation and railway accidents. The "Safety Investigation Manual" of work procedures approved by the ESIB Director is also in accordance with the Directive. The manual consists of a generic main part and annexes. The annexes may be common to all three areas of transport or directed to the specific activities of the safety investigation of one mode of transport. In 2017 the manual contained one generic annex and 5 annexes about the railways.

The whole safety investigation is usually conducted by the investigator-in-charge who is the official responsible for investigating railway accidents. The investigator-in-charge informs all parties involved of the launch of a safety investigation. He drafts an investigation plan the fulfilment of which he is responsible for. If necessary, he makes amendments and additions to the plan during the safety investigation. The investigator-in-charge coordinates the gathering, storage and analysis of data and evidence and the contracting of experts as well as any other necessary activities.

The investigator-in-charge is free in choosing their work methods and style dependent on the specifics of the case being investigated. The investigator-in-charge chooses different but, at the given time, the most appropriate means and methods of communication to communicate with natural and legal persons. The investigator-in-charge is the active party working with victims, state and local government authorities, businesses and organisations to ascertain the causes and other circumstances of the occurrence. The more important verbally forwarded information is recorded, written information is stored within the document management system. Upon receiving notification of the investigation, the railway undertakings retain all evidence and details of items, technical assemblies, documents, recordings of the data recording equipment and other information which might be important in determining the causes of the occurrence and present this at the request of the investigator-in-charge. The safety investigation determines which direct causes, underlying causes or root causes are relevant to the case at hand. Determining the causes of the occurrence during the safety investigation is defined in the Annex to the Safety Investigation Manual. Information about the safety investigation is generally issued by the investigator-in-charge or, by prior agreement, a member of the investigation committee or the Director of the ESIB. If there is persistent high risk, a safety alert is made on behalf of the Safety Investigation Bureau.

An annex of the Safety Investigation Manual common to all three modes of transport is dedicated to hearing out, questioning and taking statements from all individuals and parties concerned. The safety investigation is conducted as publicly as possible. Disclosure must not start hindering identification of causes or development of recommendations necessary for increasing safety. The investigator-in-charge turns to all parties involved to give them an opportunity to present their opinions, attitude, position and understanding of the proceedings of the safety investigation and its results. The parties involved may address the investigator-in-charge via the communication methods they have been advised of or by direct contact with the investigator-in-charge. Information that has restricted access pursuant to cases specified by The Public Information Act is not disclosed during or after the safety investigation. Specific dates have been designated by law to restrictions to disclosure.

Operation of the infrastructure manager's safety management system before and after the accident or incident under investigation is important in ensuring railway



traffic safety. The annex of the Safety Investigation Manual specifies which aspects of the company's safety management system should be paid attention to during the safety investigation. In cases that are not related to the management of infrastructure managers, an assessment is given to the operation of the infrastructure manager's safety management system as part of the ascertainment of the causes of the occurrence and elimination of consequences.

The investigator-in-charge is responsible for the investigation report to be completed in a timely manner and in the prescribed format. The recommendations presented in the report are subject to proceedings by the addressees. The results of the proceedings are to be presented in an annual report. The ESIB monitors the proceedings for which the lead investigator contacts the addressee of the recommendation. Monitoring of the proceedings by the investigator-in-charge is set out in the annex of the Safety Investigation Manual.

### 3. Safety Investigations

#### 3.1 Overview of completed investigations

During the reporting year the Safety Investigation Bureau received 24 initial accident notifications which is 4 more than in the previous year but 2 fewer initial notifications than in the year before that. The ESIB collected additional information from the infrastructure managers about all occurrences. The ESIB analysed the collected information and retained it in the document management system. Based on the additional information it has been determined that of the 24 reported cases 5 involved pedestrians whose actions seemed to be intentional and not unexpected to them. In all 5 cases the pedestrians died. None of the accidents that took place during the year was serious. However, the ESIB decided to investigate the circumstances of the occurrence that took place on 12 March 2017 on the Sompä level crossing. A safety investigation was launched, and it was also completed during the year.

During the year the Safety Investigation Bureau received 3 initial notifications of incidents, the number of notifications was 13 in the year before. The Safety Investigation Bureau did not launch a safety investigation of any incident. The incidents did not result in hazardous situations.

#### Summary of the safety investigations completed in 2017

Table 1

Type of case investigated	Number of cases	Casualties		Estimated losses (EUR)	Trend compared to last year
		Deaths	Seriously injured		
accident	1	2	-	87300	Increased
incident	-	-	-	-	-

Since no accident investigations were conducted in 2016, the number of cases to be investigated in 2017 should be considered as increased by comparison with the previous year. Since 2004 when the safety investigations began, there have been two serious accidents. The collision of trains on 23.12.2010 that resulted in a fatality and the derailment of a train as a result of an accident on level crossing on 16.04.2014 which also resulted in a fatality. With a relatively small number of cases it

is not possible to give credible assessments about trends based on changes that have taken place over a course of a few years.

### 3.2 Safety investigations completed and commenced in 2017

There were no safety investigations of an accident, serious accident or incident that had commenced in the previous years but still not completed by the reporting year. The case of a collision between an automobile and passenger train on a busy Somp level crossing that resulted in two fatalities is classed as an accident pursuant to Article 3 of the Railway Safety Directive 2004/49/EC and Subsection 40 (2) of the Railways Act. Based on Article 21 of the Safety Directive and Subsection 42 (5) of the Railways Act the Safety Investigation Bureau conducted a safety investigation.

#### Safety investigations completed in 2017

Table 2

Date of occurrence	Title of the investigation (Occurrence type, location)	Legal basis	Completed (date)
12.03.2017	Collision between a car and a passenger train, railway level crossing accident between Kohtla and Jõhvi stations on the Somp level crossing, km 265.047.	i	24.10.2017

Basis for investigation: i = pursuant to the safety directive

The following table shows that no safety investigations were launched in 2017 that could not be completed in the same year.

#### Safety investigations commenced in 2017

Table 3

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

Basis for investigation: i = pursuant to the safety directive



### 3.3 Summary of the safety investigations completed in 2017

#### **Sompa 12.03.2017**

On Sunday, 12 March 2017 at 17:29 a collision between a Toyota passenger car and an AS Eesti Liinirongid (Elron) passenger train No 0222 took place between Kohtla and Jõhvi stations, on the automatically configured (activated) Estonian Railways Ltd infrastructure Sompa level crossing. The driver and the passenger in the passenger seat died at the scene.

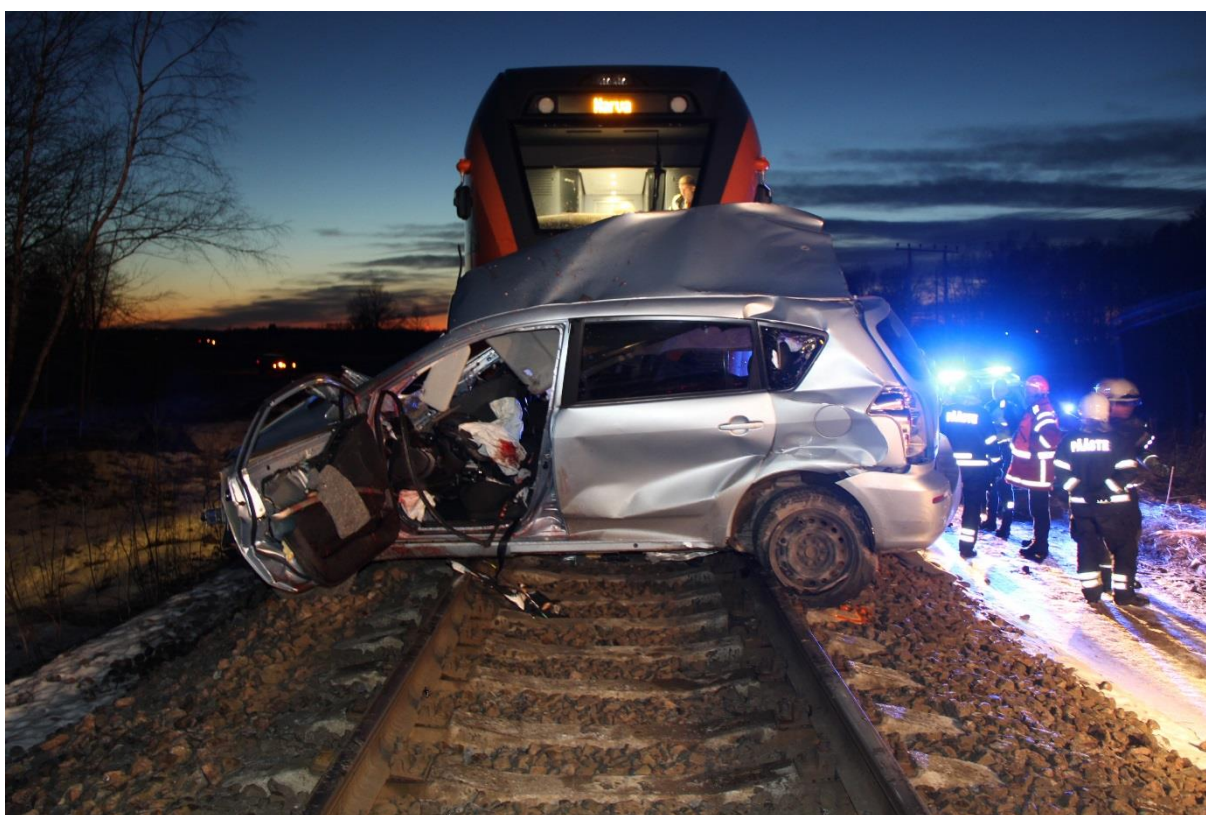


Photo 1. The train and the car after the accident.

The Elron three-carriage diesel train Stadler Flirt DMU2313 served the Tallinn – Narva route. The train is equipped with B-class ALSN-type control-command and signalling subsystem VEPS. By breaking on the single rail track and pushing the car in front of it the train remained on the track when it stopped. The train approached the level crossing at a speed of 100km/h. The driver of the rolling stock observed all traffic regulations.

The occurrence took place before sunset. The sun did not interfere with the car driver's field of vision in order to observe the traffic lights as it shone at a 78° angle in respect to the car's trajectory. Both young men in the car were under the influence of narcotic drugs which is why the driver did not evaluate the traffic situation adequately.



He did not take into account the blinking prohibiting traffic lights at the level crossing or adequately assess the reason why cars had stopped before the level crossing. The Toyota drove past the stopped cars at a slow speed until it ended up in front of the train on the level crossing; the train hit the left side of the car while engaging emergency brakes and pushed it in front of it on the tracks for a further quarter of a kilometre.

On the train there were the driver of the rolling stock, two customer attendants and 56 passengers. None of them received injuries.

Train traffic was stopped for 4 hours and 11 minutes after which a speed restriction of 25 km/h was established. The passengers were transported to the destination by coaches.

The safety investigation report made 2 recommendations for increasing railway traffic safety which were forwarded to the Technical Regulatory Authority.

### 3.4 Comments of investigations

The accident that was investigated in the reporting year took place towards the end of winter and the safety investigation report was signed in autumn. The safety investigation of the Sompa accident lasted for 7 months and 12 days. Thus the investigation was completed within the prescribed 12 months.

We must take into account that in Estonia there is one official in the ESIB fulfilling the role of an investigator-in-charge undertaking the railway accident investigations as well as fulfilling all other tasks as per the job description and schedule of work. He receives notifications of accidents and incidents, gathers relevant additional information and assesses the possible requirement for a safety investigation, participates in regional as well as pan-European events for safety investigation organisations, gathers material, processes it and based on this, compiles a report, prepares procedural materials, works in cooperation with national institutions, etc. Therefore the investigator-in-charge is not exempt from other duties for the duration of the safety investigation but he needs to find the optimal relationship between these and plan his work so that everything necessary would be completed in a timely manner.

## Total number of deaths and injuries

Table 4

Year	Deaths	Injured in road vehicle / of them seriously	Injured in rolling stock / of them seriously
2013	1	-	-
2014	2	-	12/-
2015	-	-	-
2016	-	-	-
2017	2	-	-
<b>Total</b>	5	-	12/-

The occurrence under investigation took place on a single-track main railway line. The safety investigation did not reveal any circumstances where the railway infrastructure manager's or the railway undertaking's actions had indicated a heightened risk on the level crossing. The emotional response of the relatives of the deceased was fair in relation to the consequences of the occurrence.

The number of deaths in accidents with fatalities has remained around one or two over the years. The number of those seriously injured has also been limited to very few. There might have been more minor injuries related to accidents with passenger trains.

The following table shows the number of injuries and deaths over the past five years:

## Breakdown of the injured and deaths

Table 5

Breakdown by type of persons		Year, number				
		2013	2014	2015	2016	2017
Deaths	Passengers	-	1	-	-	-
	Staff	-	-	-	-	-
	Third parties	1	1	-	-	2
	<b>Total</b>	1	2	-	-	2
Injured	Passengers	-	12	-	-	-
	Staff	-	-	-	-	-
	Third parties	-	-	-	-	-
	<b>Total</b>	-	12	-	-	-

### 3.5 Accidents and incidents investigated during the past five years (2013 – 2017)

During the past five years there has been an investigation of the only serious accident that took place on a level crossing. The occurrence resulted in a derailment of the train and deaths of two people. In addition, the ESIB conducted a safety investigation of two accidents the characteristics of which did not have the conditions that would have required a safety investigation to be launched. The decision to investigate was taken as a result of consideration of circumstances.

#### Breakdown of investigated cases by years

Table 6

Title of the case		Year, number of investigations					
		2013	2014	2015	2016	2017	Total
Art 19.1,2	Train collision	-	-	-	-	-	-
	Train collision with an obstacle	-	-	-	-	-	-
	Train derailment	-	-	-	-	-	-
	Level crossing accident	-	1	-	-	-	1
	Accident to person caused by RS in motion	-	-	-	-	-	-
	Fire in rolling stock	-	-	-	-	-	-
	Accident involving dangerous goods	-	-	-	-	-	-
Art 21.6	Train collision	-	-	-	-	-	-
	Train collision with an obstacle	-	-	-	-	-	-
	Train derailment	-	-	-	-	-	-
	Level crossing accident	1	-	-	-	1	2
	Accident to person caused by RS in motion	-	-	-	-	-	-
	Fire in rolling stock	-	-	-	-	-	-
	Accident involving dangerous goods	-	-	-	-	-	-
Incident		-	-	-	-	-	-
<b>Total</b>		<b>1</b>	<b>1</b>	<b>-</b>	<b>-</b>	<b>1</b>	<b>3</b>



In addition to the safety investigations the ESIB conducted a safety survey of the incidents that took place at the end of 2015 / beginning of 2016. The survey assessed the circumstances related to the 7 track breakages that occurred as result of a sudden drop in air temperature and the ESIB formulated an opinion as a result of this.

## 4. Recommendations

### 4.1 Short review and presentation of recommendations

#### Recommendations for improvement of safety

Table 7

Field of activity of recommendation	Year, number of recommendations				
	2013	2014	2015	2016	2017
Maintenance and care of railway infrastructure	-	-	-	-	-
Care, maintenance and managing of rolling stock	-	-	-	-	-
Organisation of supervision	-	-	-	-	1
Road traffic management, road traffic control devices	1	1	-	-	-
Winter maintenance of roads	-	-	-	-	-
Dissemination of information concerning traffic, training	-	1	-	-	1
Amendments to legal acts and regulating instructions	-	4	-	-	-
Operation of traffic lights, railway traffic control	1	2	-	-	-
Organisation of operation of railway communication devices	-	-	-	-	-
Use of information recording equipment	-	-	-	-	-
Professional qualifications of railwaymen	-	-	-	-	-
Other arrangements	-	-	-	-	-
<b>Total</b>	<b>2</b>	<b>4</b>	<b>-</b>	<b>-</b>	<b>2</b>

## Implementation of recommendations

Table 8

Recommendations issued		Recommendation implementation status							
		Implemented		In progress		Not to be implemented		Implementation suspended	
Year	No	No	%	No	%	No	%	No	%
2013	2	2	100	-	-	-	-	-	-
2014	4	4	100	-	-	-	-	-	-
2015	-	-	-	-	-	-	-	-	-
2016	-	-	-	-	-	-	-	-	-
2017	2	2	100	-	-	-	-	-	-
Total	6	6	100	-	-	-	-	-	-

Proceedings of recommendations are conducted by the addressees until the proceedings have been completed or suspended due to change in circumstances. When the proceedings continue, the addressee of the recommendation presents an annual report in specified format to the Safety Investigation Bureau.

An interim review about the proceedings of the recommendations given in the safety investigation of the Sompa accident, signed on 24 October 2017, was carried out at the ESIB and the Technical Regulatory Authority meeting on 12 December 2017.

### 4.2 Recommendations 2017

During 2017 the ESIB worked out recommendations during the safety investigation of the Sompa level crossing accident. Approach to the level crossing was marked to the road vehicle by clearly visible traffic control devices. The crossing traffic lights were working. All other road users were waiting for the train to pass, only the car involved in the accident did not react accordingly and drove at relatively slow speed into a collision with a train. The circumstances of the case indicated the need to broaden the perception of road users of railway safety and the importance of having an adequate position of one's own mental state and attitudes that are dangerous to themselves as well as others before entering traffic. From other observations, a recommendation arose for a brake test.

The following recommendations were made to the Technical Regulatory Authority as the safety authority:

- Find opportunities within the traffic safety programme to organise a social campaign that focuses on the importance and role of a road user in ensuring safety at a railway level crossing.



- Apply for additional instruction for the driver of the rolling stock involved in the accident of the implementation of the AS Eesti Liinirongid “FLIRT type multiple unit train brake use manual Ver.02”.



## Annexes

### Annex 1

#### Proceeding of recommendations – Sompa, 12.03.2017

Date and time	12.03.2017 at 17.29pm		
Location	Estonian Railways Ltd infrastructure, open track between Kohtla and Jõhvi, rural area, km 265.047		
Type of occurrence	Accident: level crossing accident		
Train type and number	Passenger train No 0222		
Road vehicle	Passenger car Toyota		
		On the train	In the road vehicle
Number of persons (on board the train and vehicle)	Crew	3	1
	Passengers	56	1
Fatally injured	Crew	-	1
	Passengers	-	1
Seriously injured	Crew	-	-
	Passengers	-	-
Slightly injured	Crew	-	-
	Passengers	-	-
Damages to rolling stock	Damage to the automatic clutch, wings of the front buffer, snowplough and paintwork of the front of the train		
Damages to track equipment	-		
Other damages	The Toyota was deformed and had become a wreck.		
Summary: Ignoring the prohibiting red lights on the level crossing, the passenger car Toyota drove in front of the diesel train Flirt DMU 2313.			



Final report issued	24.10.2017	
Recommendation No 01	The road user's attitude to traffic culture did not allow him to give way to an approaching train on a level crossing while the lights were flashing red.	
	Find opportunities within the traffic safety programme to organise a social campaign that focuses on the importance and role of a road user in ensuring safety at a railway level crossing.	
Date	Status	Explanation
19.10.2017	Accepted and fulfilled.	Instruction book for teachers about railway safety for all school levels.
13.11.2017		A press release on the TRA website about the railway safety report.
28.11.2017		A press release summarising the 2nd half year on the TRA website.
06.12.2017		TRA announcement of the OLE (Operation Lifesaver Estonia) Christmas campaign.
31.12.2017		Forward a TRA insert about railway safety to the Estonian Road Administration campaign.
07.03.2018		Draft legislation about traffic management on level crossings in cooperation with the Estonian Road Administration.
14.03.2018		Railway safety as part of the safety training event at Paikuse.
21.03.2018		Railway safety as part of the safety training event at Tartu.
27.03.2018		A railway safety booklet for children aged 5 to 7, made publicly available in partnership with partners.
Recommendation No 02	There is no certainty that the driver of the rolling stock had performed short brake test after changing cabs and prior to the manouvre.	
	Apply for additional instruction for the driver of the rolling stock involved in the accident of the implementation of the AS Eesti Liinirongid "FLIRT type multiple unit train brake use manual Ver.02".	



Date	Status	Explanation
21.11.2017 and 24.11.2017	Accepted and fulfilled	It was confirmed during the surveillance proceedings that the manual is repeatedly introduced as part of technical training. After the accident, training of the manual was carried out for all train drivers. The training was also attended by the train driver who was involved in the accident and he has confirmed his attendance with a signature.