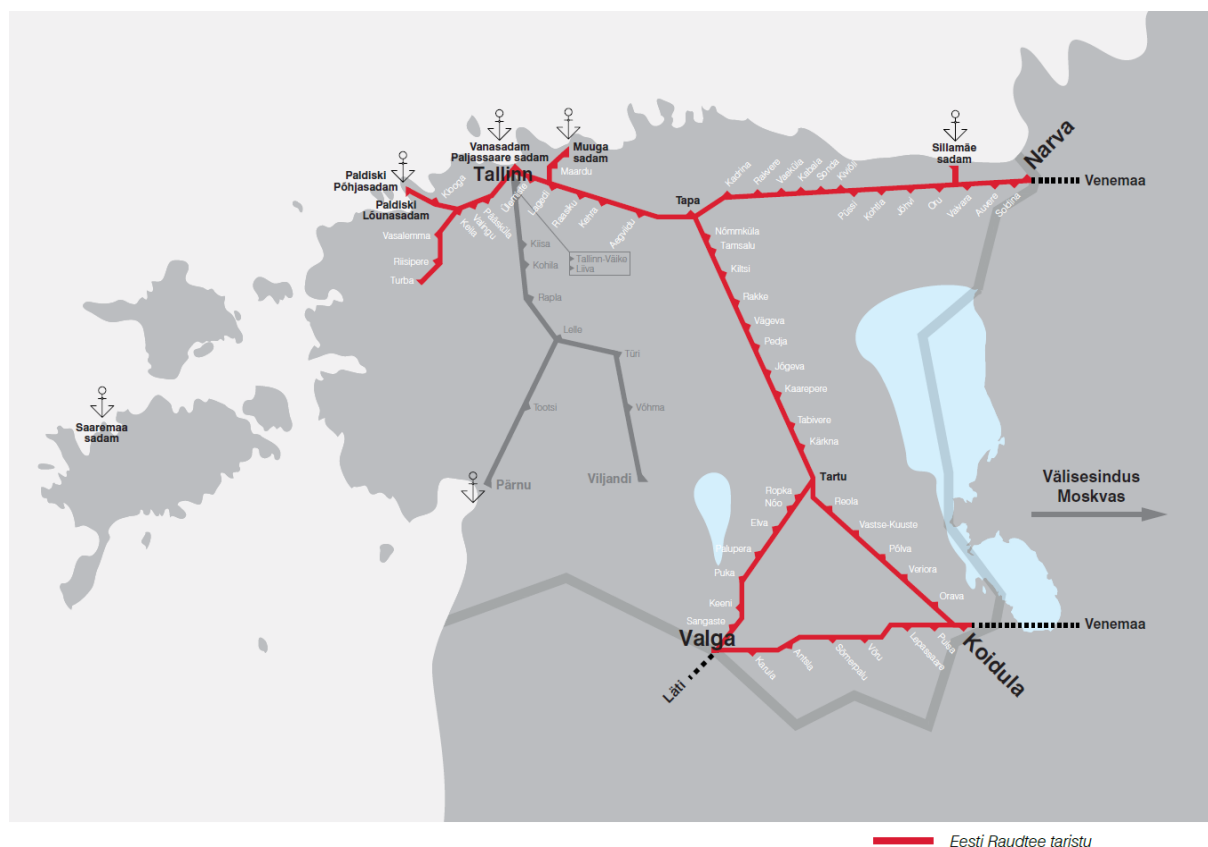




**ESTONIAN SAFETY
INVESTIGATION
BUREAU**

**Report of the railway accidents
investigated in 2019**

Tallinn 2020



Estonian Railways Ltd and Edelaraudtee Infrastrukture Ltd infrastructure

(Source: Estonian Railways Ltd)



Preface to the report

Safety investigations of railway accidents and incidents began in Estonia on 31 March 2004 when the Railway Safety Directive 2004/49/EC came into force. By the time the Directive came into force the requirements laid out in it had been applied to the Railways Act, pursuant to which the safety investigation unit of railway accidents was formed as part of the Crisis Regulation Department of the Ministry of Economic Affairs and Communications. The investigation units of the different modes of transport were separated from the Crisis Regulation Department on 1 January 2012 when a multimodal Safety Investigation Bureau (ESIB) was established. The Safety Investigation Bureau investigates maritime, aviation and railway accidents and incidents.

An accident, serious accident and incident are classified as occurrences influencing railway safety. The existing classification is pursuant to the Safety Directive. In 2019 there were no serious accidents or such incidents that required a safety investigation. Compared to the previous year, the number of incidents affecting railway safety decreased.

During the reporting year the proceedings continued for the recommendations made after the Kulna level crossing accident in the previous year. At the same time, preparations were being made for the application of the Directive 2016/798 of the European Parliament and of the Council on railway safety to the Estonian judicial area.

In December 2019, the Estonian Railways Ltd infrastructure was extended from Riisipere to Turba. Today the length of the electrified railways reaches 144 kilometres.

In Estonia safety investigations take place independently from all other investigations linked to the same occurrence and are pursuant to the national requirements and those set out by the Safety Directive.

In spring the Safety Investigation Bureau hosted a regional meeting of the Central European railway accident investigators in Tallinn. In addition, the Estonian railway accident investigator took part in a conference of the same working group in Bucharest in autumn, and in spring in the Northern countries regional working group conference in Dublin.



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1. Introduction to the Investigation Body

1.1 Legal basis

The European Parliament and Council Directive 2004/49/EC on Railway Safety came into force on 31 March 2004. On the same day, the Railways Act came into force in Estonia by which the requirements of the Directive were applied to the national judicial area. Pursuant to the Railways Act, simultaneously to the Directive, an investigation unit was created at the Crisis Regulation Department of the Ministry of Economic Affairs and Communications. Railway accident and incident safety investigations began in Estonia.

In addition to its main tasks, the Crisis Regulation Department also evolved to become a structural unit of the Ministry and for several years the department included the investigation units for aviation, railway, and maritime accidents. On 1 January 2012, the units for investigation of the three modes of transport were separated from the Crisis Regulation Department and a unified independent Estonian Safety Investigation Bureau (ESIB) was established. The Safety Investigation Bureau was established by amendments to the Aviation Act, Maritime Safety Act and Railways Act.

The Safety Investigation Bureau is multimodal. Its activities are regulated according to the mode of transport by relevant articles of the Aviation Act, Maritime Safety Act and Railways Act. For railways, Subsection 42 (1) of the Railways Act establishes that the safety investigations of accidents, serious accidents and incidents are conducted by the ESIB, a structural unit of the Ministry of Economic Affairs and Communications. Next, the same subsection establishes the ESIB's independence in conducting safety investigations and making any related decisions. It is provided that the ESIB is guided only by legal acts and other legislation and any international treaties that are binding in Estonia. There is no supervisory control of the ESIB's investigative activities. Same provisions have been established regarding the safety investigations of the other modes of transport. As a structural unit of the Ministry, the Safety Investigation Bureau has greater independence than the other structural units and this is 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 director of ESIB appoints the employees of the ESIB and relieves them of their duties as well as enters into and terminates the employment contracts with them. The budget of the

Safety Investigation Bureau is independent and was approved by the Parliament of the Republic of Estonia in the 2019 State Budget Act with item code 20SE070004.

The Safety Investigation Bureau Statutes defines the statutory rights and obligations and regulates the ESIB's relationships, and connections and tasks and obligations. The Statutes specifies the ESIB's accountability to the Secretary General and the Minister regarding organisation of work and other matters. Legislation of the Ministry of Economic Affairs and Communications, the Secretary General's Directives, internal procedure rules, operations procedures, current statutes, and other legislation are binding in the organisation of the Safety Investigation Bureau's work. The Ministry ensures the functioning of the ESIB in organisational and general matters. On the proposal of the Director of the Safety Investigation Bureau, the duties of the employees are determined in the job descriptions approved by the Secretary General of the Ministry. Each ESIB employee is responsible for the legality, accuracy, and timely completion of their duties. The Safety Investigation Bureau Statutes form a part of the legal framework affecting the work of railway safety investigations and it has been approved by a Minister of Economic Affairs and Communications Directive.

The Safety Investigation Bureau is one of the structural units of the Ministry of Economic Affairs and Communications. As it performs specific duties it has been granted with special rights and independence. The ESIB is functionally independent of the safety authority and the railway regulating authority. The ESIB is independent of all parties whose interests might conflict with the duties assigned to it, including its organisation, legal structure and decision-making process which are independent of any railway infrastructure managers, railway undertakings, the Tax Board, distribution authorities and notified bodies. While investigating, the official responsible for railway accident safety investigations performs the tasks set by the investigator-in-charge. The identifiers of the ESIB's independence are pursuant to Article 21 of the Directive on Railway Safety 2004/49/EC.

The organisation of the investigations of railway accidents and incidents is provided by Article 4 of the Railways Act "Railway traffic and safety". The objects of the safety investigation, accident, serious accident, and incident are listed in Section 40 "Cases affecting railway safety" (1) and defined in subsequent subsections 2, 3 and 4. The Railways Act has two sections dedicated specifically to safety investigations which are Section 42 "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 Railways Act Section 42 (12) "Safety investigation procedures" and Railways Act Section 42 (13) "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 have to notify the Safety Investigation Bureau of an accident, serious accident or incident via means of public communication pursuant to Subsection 42 (3¹) of the Railways Act. The same Subsection also specifies submission of a written notification with clarified and verified facts within three working days. A written notification is always made for all accidents and serious accidents. Additional information for incidents is submitted as a report within three working days if the ESIB requests it. The notification process has been specified by the Ministry of Economic Affairs and Communications Directive No 26 “Procedures for notifying of accidents, serious accidents and incidents and the format of the written notices and reports”. Subsection 2 (1) of the Directive provides the format for written notification and it is included in Annex 1 of the Directive. The format for the written report of an incident is provided in subsection 2 (2) and is included in Annex 2 of the Directive.

Subsection 42 (2) of the Railways Act provides the ESIB’s right to involve experts and form committees to clarify circumstances that require specialist knowledge. The experts involved in a safety investigation and the committee take part in the investigation under the supervision of the official conducting it. The same Subsection establishes the obligation by authorities involved in a safety investigation to provide necessary assistance to the ESIB within their competence.

The official conducting a safety investigation can make a precept to the person under obligation to fulfil the obligations related to the safety investigation. The right has been provided by Subsection 42 (11) of the Railways Act. In the event of non-compliance with the precept, under the same Subsection (11¹) the official conducting the safety investigation has the right to apply a penalty charge.

The Safety Investigation Bureau may issue a safety alert during the safety investigation. A safety alert is issued pursuant to Subsection 42 (11²) 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, handling 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.

The Safety Investigation Bureau compiles different reports in the course of its work, the requirements for these are provided by Subsection 43 of the Railways Act “Safety Investigation Reports “. Pursuant to Subsection 43 (1) the ESIB must complete a written report of a 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. Subsection 43 (3) provides the obligation of the Consumer Protection and Technical Regulatory Authority, other authorities, businesses or organisations that were subject to the ESIB's recommendations, to submit a report to the ESIB annually by the 01 April about the measures taken or planned based on the recommendations. Pursuant to Subsection 43 (4), by 30 September each year, the Safety Investigation Bureau publishes an annual report on the cases investigated in the previous year, the recommendations, and proceedings, on its website.

During the reporting year, the 22.04.2016 version of the Ministry of Economic Affairs and Communications Directive No 72 "Safety Investigation Procedures" was in force. The safety investigation procedures are common to all three ESIB's areas of transport. Pursuant to the Directive the safety investigation ascertains the causes of the occurrences. During the safety investigation recommendations are developed and presented in the report with a view of preventing similar occurrences in the future. The Directive determines areas of a safety investigation according to modes of transport and its coordinator. It stipulates the procedures for commencing a safety investigation and notification of those involved. Depending on the complexity and workload associated with the occurrence, formation of a safety investigation committee is provided. The Directive establishes the 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, 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", specify the format of safety investigation reports (annex 2) and the format of the report on measures taken or planned (annex 3).

1.2 Role and aim

The Safety Investigation Bureau fulfils its role if it contributes to increasing safety in maritime, aviation and railway traffic. The aim of safety investigations is to determine the circumstances and causes of the accidents and incidents investigated. The safety investigation assesses the impact of the causes on traffic safety. Through logical connections with circumstances affecting traffic safety, recommendations are formulated that can help decrease or avoid such occurrences in the future. The role

is realised through safety investigations reports of the three areas, which, based on the findings of the investigation, make recommendations for improving traffic safety in the respective areas of transport. It is the task of the Safety Investigation Bureau to contribute to the formulation of legislation related to maritime, aviation and railway safety. If necessary, the ESIB will make recommendations for additions or amendments to current 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 Safety Investigation Bureau Statutes have defined the following obligations:

- 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) 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 main objective of the safety investigations of accidents, serious accidents and incidents is to determine the causes and make recommendations to prevent such occurrences in the future and improve railway safety but not to appoint blame or liability.

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

- 1) Access to 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) In accordance with arrangements or agreements, 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 in agreement with the Ministry.
- 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, Consumer Protection and 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

The Safety Investigation Bureau is one of the many structural units of the Ministry of Economic Affairs and Communications in a separate location. To perform specific tasks, the ESIB has been granted a different organisational status from other structural units. The ESIB's special status among the Ministry's departments 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 maintains 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. The main ESIB activities are reflected in its work schedule which forms one part of the Ministry's work schedule.

Unlike the other structural units of the Ministry the Safety Investigation Bureau has its own logo, letterhead, website, and a budget that has been approved by the Parliament. An ESIB official has a certificate of employment. By presenting the certificate of employment an 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 also 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 relevant parties 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

Structurally the Safety Investigation Bureau forms a part of the Ministry of Economic Affairs and Communications. The Ministry consists of departments and a structural unit which is called the Safety Investigation Bureau. Departments may be divided into services. The ESIB is not divided into smaller structural units. The ESIB needs to fulfil tasks requiring special rights so therefore is different and legally more independent than other departments.

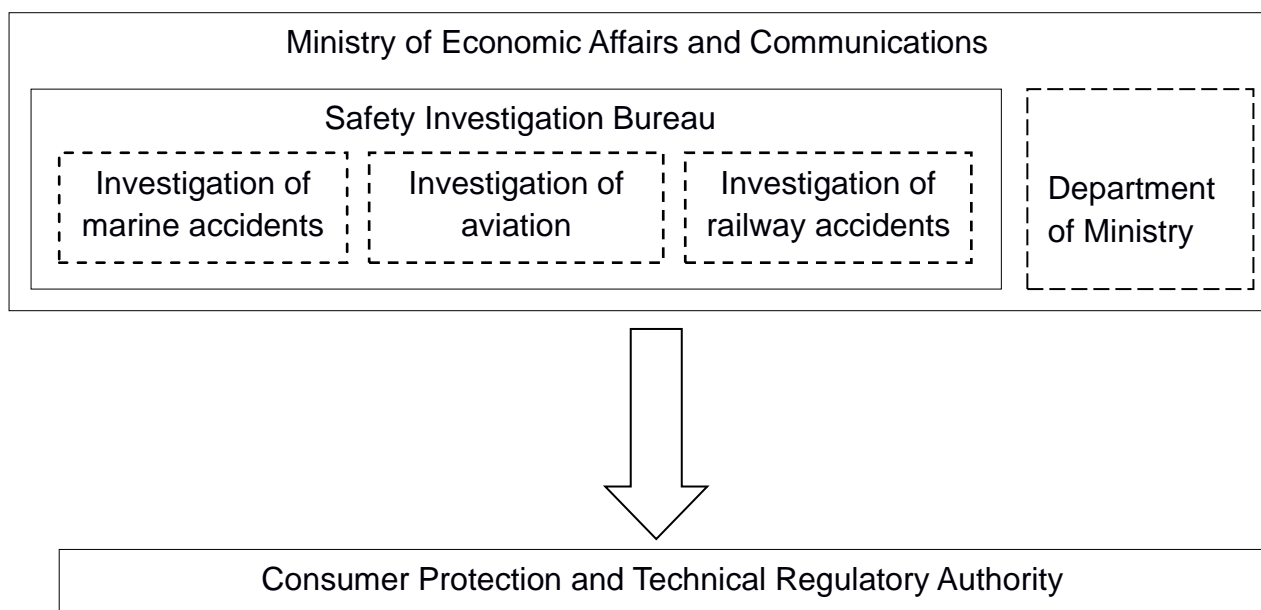


Figure 1 The Safety Investigation Bureau in the organisational structure of the Ministry



Since the Safety Investigation Bureau has a small number of employees it is structurally an entity. Its work is managed by the director. Only officials who are permanent staff work at the ESIB. Each official is responsible for conducting safety investigation of the specific area of transport assigned to them. They are responsible for the accurate, lawful, and timely completion of the duties of this area. The title of each ESIB official contains the name of the transport sector within which they are responsible for conducting safety investigations. An official is independent in conducting safety investigations within his area. Officials of the other areas of transport may assist their colleague in their investigation if necessary. All officials can be substituted by a colleague for a limited period during extended absences. Upon their return, the official shall receive all relevant information in order to continue and complete the work. All officials take turns to be involved in the 24-hour telephone service.

Only the Safety Investigation Bureau has been granted the right to conduct safety investigations of railway accidents in Estonia. In parallel with the safety investigation, other investigations or procedures of a given case may take place. An ESIB safety investigation is not dependent on these. It is a completely autonomous process. The safety investigation may work in cooperation with other proceedings to the extent where it does not impede its independence. 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.

The Consumer Protection and Technical Regulatory Authority (CPTRA) is an independent department of administration of the Ministry of Economic Affairs and Communications with a separate budget, structure, and management. The CPTRA 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 the infrastructure managers. These are the railway infrastructure manager Estonian Railways Ltd, railway freight transport undertaking AS Operail and the railway passenger transports undertaking 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 list of cases that require the Safety Investigation Bureau to conduct a safety investigation is specified in the Railways Act. It includes a list of occurrences affecting railway safety in Estonia which is identical to the classification used in the Railway Safety Directive 2004/49/EC. The terminology concerning railway safety used in Estonian legislation is identical in content and form to that used in the Safety Directive.

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 Consumer Protection and Technical Regulatory Authority and infrastructure managers and railway undertakings.

Organisational “Safety Investigation manual” contains the appendix R3 “Characteristics of a railway accident or incident for making the decision to begin a safety investigation or formulating an opinion”. Appendix R3 describes the process of making the decision to begin or not to begin a safety investigation and what will be addressed in the process. A brief introduction that follows in the same appendix shows that, in addition to the legal bases, the decision-making process also includes a risk-based assessment of the case. The ESIB collects additional information about the occurrence based on which it assesses the potential risk of the occurrence, the number of fatalities or injuries, fatality of a person who was known to the railway infrastructure manager to be or work at the railway as a result of the railway infrastructure manager’s equipment failure, 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.

2.2 Institutions involved in investigations

Involvement in safety investigations is based on certain principles set out in the Railways Act and specified in the Directive establishing the procedure for safety investigations. The principles are common and compulsory to all parties and prevent anyone potentially interested from intervening in the decision-making process of the safety investigation. Inclusion will achieve the required standard of safety investigation and first and foremost obtaining the necessary information about the occurrence and the circumstances surrounding it. 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. The official conducting a safety investigation has a legal right to make a precept to the person under obligation to fulfil the obligations related to the safety investigation. In the event of non-compliance with the precept, the right to impose a penalty charge to either a natural or a legal person is available pursuant to the procedure prescribed by legislation.

A cooperation agreement between the Safety Investigation Bureau and the Police and Border Guard Board, the Office of the Prosecutor General, the Rescue Board and the Emergency Centre has been in force since late spring of 2015. It ensures the coordinated activities of the various authorities when fulfilling the duties assigned to them by legislation. Both parties guarantee that a criminal investigation and the safety investigation do not interfere with each other.

The Emergency Centre sends an immediate notification to the ESIB email address of any occurrence they have been informed of which will arrive in the inbox of all the ESIB officials. If possible, the Police and Boarder Guard Board and the Rescue Board ensure safeguarding of the scene. If necessary, they will assist ESIB with the investigations once the rescue operations have finished. All parties allow access to evidence and information, unless forbidden by law. Disclosure of data collected as part of the criminal proceedings is decided by the prosecutor's office. 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 with each other, the safety investigation and criminal proceedings are conducted separately.

In the course of safety investigations, supported by legislation, pragmatic cooperation methods have evolved with various businesses, authorities, institutions and private individuals. The Safety Investigation Bureau has signed cooperation agreements with the safety investigation authorities of neighbouring European Union member states Latvia and Finland.

If an accident involves a railway infrastructure manager established or licenced in another Member State of the European Union, the legislation provides an obligation

to invite investigative bodies of that country to participate in the safety investigation. So far, there has been no requirement to use this option. Neither has it been necessary to ask for help from safety investigation bodies of other countries or European Railways Agency with specialist knowledge, technical inspection, performing analysis and giving assessments although legislation allows this.

The investigator-in-charge has extensive powers when conducting a safety investigation. He decides on inclusion, interpretation of the information obtained and systematic treatment of facts, knowledge, and circumstances. The results will be reflected in the content of the investigation report. During the investigation, the investigator-in-charge contacts all the parties involved, listens to their viewpoints and opinions and if necessary, asks clarifying questions. Before the end of the investigation the investigator-in-charge provides the parties concerned an extended summary of the results of the safety investigation. In accordance with established practice, the extended summary includes the following elements of the investigation report: discussion, conclusions, additional observations, actions taken and recommendations for improving railway safety. The summary will be discussed with the relevant authorities, companies, institutions and, where appropriate, individuals. As a result of the discussion, the investigator-in-charge prepares the safety investigation report for signing and subsequent publication.

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 Consumer Protection and 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 Safety Investigation Bureau receives a notification of accidents, serious accidents and incidents that have happened on Estonian railways. The proceedings of all occurrences start with receipt of the initial notification. The initial notification arrives from the Emergency Centre and is usually duplicated by the railway infrastructure manager if they have anything to add aside from the fact that it happened. The Emergency Centre notifies the ESIB 24 hours a day by email of all occurrences in air, water, and rail that it has become aware of. From the railway sector, railway infrastructure managers and possessors and railway undertakings and if they have become aware during regulatory activities, the Consumer Protection and Technical Regulatory Agency, notify the Safety Investigation Bureau by means of

public communication immediately. The publicly available means of communication is the phone that the investigator of railway accidents has access to 24 hours a day. In the case of an accident or a serious accident the infrastructure manager that made the initial notification also makes a written notification to the ESIB in the agreed format within three working days. The written notice contains specified and verified factual details of the occurrence that were not yet clear or were incorrect when the initial notification was forwarded. If the ESIB requests it, a written report with additional information about an incident will also be made within three working days in an agreed format. All written documents received by the ESIB are systematically stored within a digital document management system Delta as part of the ancillary services.

The railway infrastructure manager is immediately informed of any railway accidents and incidents by the parties concerned. He forwards the notification by phone to the official dealing with the safety investigations of railway accidents. Such pragmatic agreement with the infrastructure managers will allow the safety investigator to obtain the necessary information as soon as possible and will not unnecessarily burden the 24-hour helpline service. The notification received by the helpline must be forwarded to the safety investigator of railway accidents anyway. Information is relayed to the helpline if the caller does not know the phone number of the official conducting the safety investigation. The official dealing with safety investigations of railway accidents acknowledges the initial notification, assesses the circumstances, asks additional questions, and if necessary, requests or waits for clarification of any circumstances. Based on the Railways Act and the safety investigation manual, the official dealing with the safety investigation makes an initial assessment of the occurrence and makes a proposal to the Director of the ESIB either to begin a safety investigation or not. The official will only propose deferring the decision if gathering necessary additional information requires more time. Based on the verbal notification, the ESIB decides whether there is a requirement to visit the scene. In case of a serious accident the official notifies the Director of the Safety Investigation Bureau immediately by telephone, in other cases an email is sufficient. The Director of the Safety Investigation Bureau maintains records of notifications received. If necessary, the official conducting the safety investigation and the ESIB Director keep in regular contact to clarify the initial circumstances. The Director's position on whether to begin a safety investigation is final and binding to the official dealing with the railway accident investigations.

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 decision whether to begin an investigation is made pursuant to the Railway Safety Directive 2004/49/EC and Subsection 42 (8) of the Railways Act. The ESIB will notify the European Union Agency for Railways by entering the relevant information in the correct format to the database of the European Union Agency for Railways, at the latest one week after the decision to begin a safety investigation has

been taken. Up till now the deadline for notifying the European Railways Agency has never been missed.

The Safety Investigation Bureau applies a unified multi-modal approach to conducting safety investigations of maritime, aviation and railway accidents. This has been confirmed by The Ministry of Economic Affairs and Communications Directive No 72 "Safety Investigation Procedures" and the ESIB Director has approved the "Safety Investigation Manual" of work procedures. The manual consists of a common main part and annexes which can be common to all three areas of transport or can be area specific. In 2019 the manual contained one common annex and 5 annexes specific to railways.

The whole safety investigation is usually conducted by the official responsible for investigating railway accidents who performs the duties of investigator-in-charge. He informs all relevant parties of the launch of a safety investigation and drafts an investigation plan. He may make changes and clarifications to the draft during the safety investigation but is fully responsible for conducting of the entire safety investigation as well as its quality and compliance. The investigator-in-charge coordinates the gathering, storage and analysis of data and evidence as well as the contracting of experts and communications with relevant individuals or organisations. The investigator-in-charge organises or performs all necessary activities.

Depending on the personality traits of the investigator-in-charge and the specifics of the case, the investigator-in-charge selects the most appropriate working methods and style. When communicating with natural as well legal persons he chooses the means of communication and methods that seem the most appropriate for achieving the objective. 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 obtained information is recorded and written information is stored within the document management system Delta. 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. If requested by the investigator-in-charge, they would present this to the ESIB. The safety investigation ascertains the direct causes of the occurrence. Only the underlying causes or root causes relevant to the case at hand are determined. Determining the causes of the occurrence during the safety investigation is covered in the Annex R5 to the Safety Investigation Manual. Information about the safety investigation is generally issued by the investigator-in-charge. By prior agreement, a member of the investigation committee or the Director of the ESIB may also do this. An alert is issued on behalf of the Safety Investigation Bureau in the event of a persistently high risk.

A joint Annex (AMR1) of the Safety Investigation Manual includes instructions for hearing, questioning, and taking statements from all individuals and parties concerned, specifies the objectives, planning, conducting, and documenting the



activities. 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. All parties concerned whom the investigator-in-charge addresses or who turn to the investigator-in-charge themselves have an opportunity to present their opinions, attitude, position and understanding of the proceedings of the safety investigation and its results. 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.

In most cases connections with human behaviour play an important part in the circumstances of railway accidents and sometimes incidents. Analysis of human factors during the safety investigation is supported by the guidelines set out in Annex R6 of the Safety Investigation Manual.

The effect and impact of the infrastructure manager's safety management system in the context of the case under investigation is important for ensuring railway safety. The safety investigation assesses the aspects of the safety management system that are connected to the case under investigation. Guidelines on what to concentrate on are provided in Annex R4 of the Safety Investigation Manual. 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 status and results of the proceedings are to be presented to the ESIB by the addressees in the annual report. The ESIB monitors the proceedings that take place prior to the report being presented. The investigator-in-charge contacts the addressee of the recommendation for this purpose. Monitoring of the proceedings by the investigator-in-charge is set out in Annex R5 of the Safety Investigation Manual.

3. Safety Investigations

3.1 Overview of completed investigations

During the reporting year the Safety Investigation Bureau received 19 verbal accident notifications of railway accidents and 5 notifications of incidents. 11 accidents were rolling stock colliding with pedestrians of which 6 had the characteristics related to a possible suicide. Suicide as a deliberate act by one of the parties is not classed as an accident. The ESIB does not make decisions or give assessments to suicides. At level crossings there were 6 accidents caused by a collision with a road vehicle, 1 shunting derailment and 1 ignition in a locomotive, which was immediately extinguished by hand. The year before the reporting year saw 33 notifications of accidents made to the ESIB whilst in the previous year the number of initial notifications of accidents was 24.

No serious accidents took place during the year. None of the 19 accidents that happened in 2019 had characteristics that would have required a safety investigation. They all involved relatively minor damage.

None of the 5 incidents of 2019 resulted in a hazardous situation. In 2018 the ESIB received notifications of 9 incidents and the year before that of 3.

Summary of the safety investigations completed in 2019

Table 1

Type of case investigated	Number of cases	Casualties		Estimated losses (EUR)	Trend compared to last year
		Deaths	Seriously injured		
Accident	-	-	-	-	decreased
Incident	-	-	-	-	-



3.2 Safety investigations completed and commenced in 2019

All safety investigations conducted in previous years concluded with a timely presentation of the report. There were no safety investigations that needed to be completed in 2019. Previous year's safety investigation of the accident on Kulna level crossing was completed in the same year.

Safety investigations completed in 2019

Table 2

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

Basis for investigation: i = pursuant to the safety directive

The following table shows that no safety investigations were launched in 2019 that could not be completed in the same year.

Safety investigations commenced in 2019

Table 3

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

Basis for investigation: i = pursuant to the safety directive

3.3 Comments of investigations

Although there was no reason or requirement for safety investigations in the year under review, proceedings continued for the recommendations of the previous year's safety investigation.

Total number of deaths and injuries

Table 4

Year	Deaths	Injured in road vehicle / of them seriously	Injured in rolling stock / of them seriously
2015	-	-	-
2016	-	-	-
2017	2	-	-
2018	-	1/1	8/-
2019	-	-	-
Total	2	1/1	8/-

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				
		2015	2016	2017	2018	2019
Deaths	Passengers	-	-	-	-	-
	Staff	-	-	-	-	-
	Third parties	-	-	2	-	-
	Total	-	-	2	-	-
Injured	Passengers	-	-	-	6	-
	Staff	-	-	-	2	-
	Third parties	-	-	-	1	-
	Total	-	-	-	9	-

3.4 Accidents and incidents investigated during the past five years (2015 – 2019)

During the past five years there have been investigations of two accidents that took place on a level crossing. The 2017 accident resulted in the deaths of 2 people. There were no deaths in the 2018 accident but a collision with a truck resulted in a derailment of the train and several people sustained injuries. At the beginning of the

safety investigation damages were estimated to be less than 2 million euros but during the investigation the amount was clarified and found to exceed this threshold.

Although safety investigations are conducted in the event of accidents with larger material losses and fatalities, the ESIB collects data about every occurrence and assesses their impact on the safety situation in general. Cooperation of infrastructure managers and other structures on safety issues has steadily intensified. Given the small size of the country, the number of accidents has not been on an annual downward trend as a statistical indicator. The decline can be noted when looking at a much longer timeline than covered in the annual report. The number of accidents investigated over the past five years reflects the situation in railway traffic and railway safety in general. However, bigger setbacks in some years have not been ruled out.

Breakdown of investigated cases by years

Table 6

Title of the case		Year, number of investigations					
		2015	2016	2017	2018	2019	Total
Art 19.1,2	Train collision	-		-	-	-	
	Train collision with an obstacle	-	-	-	-	-	-
	Train derailment	-	-	-	-	-	-
	Level crossing accident	-	-	-	-	-	
	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			-	-	-	-	-
Total			-	-	1	1	2

4 Recommendations

4.1 Short review and presentation of recommendations

The recommendations contained in the safety investigation reports are fulfilled by railway undertakings, the safety authority or any other authority or institution responsible for the given issue relating to railway safety. They all report annually on the follow-up to the recommendations addressed to them. The Consumer Protection and Technical Surveillance Authority monitors and directs the proceedings of recommendations addressed to railway undertakings, and they also submit a report on the proceeding of recommendations.

All addressees and executors of recommendations receive recommendations together with the safety investigation report directly from the Safety Investigation Bureau. The Consumer Protection and Technical Surveillance Authority receives the report even if they are not themselves involved in any of the proceedings of recommendations in any way.

Recommendations for improvement of safety

Table 7

Field of activity of recommendation	Year, number of recommendations				
	2015	2016	2017	2018	2019
Maintenance and care of railway infrastructure	-	-	-	-	-
Care, maintenance and managing of rolling stock	-	-	-	-	-
Organisation of supervision	-	-	1	-	-
Road traffic management, road traffic control devices	-	-	-	2	-
Winter maintenance of roads	-	-	-	-	-
Dissemination of information concerning traffic,	-	-	1	-	-

training					
Amendments to legal acts and regulating instructions	-	-	-	1	-
Operation of traffic lights, railway traffic control	-	-	-	1	-
Organisation of operation of railway communication devices	-	-	-	-	-
Use of information recording equipment	-	-	-	-	-
Professional qualifications of railwaymen	-	-	-	-	-
Other arrangements	-	-	-	1	-
Total	-	-	2	5	-

The following table shows the status of implementation of recommendations of the past five years based on data as of 1 April 2020.

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	%
2015	-	-	-	-	-	-	-	-	-
2016	-	-	-	-	-	-	-	-	-
2017	2	2	100	-	-	-	-	-	-
2018	5	2	40	3	60	-	-	-	-
2019	-	3	60	-	-	-	-	-	-
Total	7	7	100	-	-	-	-	-	-

The table above shows that in 2018 the ESIB made 5 recommendations of which 2 were fulfilled in the same year. Proceedings for 3 recommendations of the previous year were conducted in 2019. 2019 saw the conclusion of all proceedings of the recommendations made in 2018 by accepting and fulfilling, i.e. implementing them.

Proceedings of a recommendation made in one year continue in the following years until the addressee has completed the proceedings or suspended them due to change in circumstances. During the whole period the addressee submits an annual report to the Safety Investigation Bureau in specified format.

To get an overview of the status of the proceedings of recommendations the ESIB contacts the addressees verbally between the submission of the recommendation and the report being presented to the ESIB.

4.2 Proceedings of recommendations continued in 2019

Two of the recommendations developed as a result of the Kulna level crossing accident were accepted and fulfilled in 2018. Proceedings of three recommendations continued. The following are the recommendations on which the addressees submitted a report on the continuation of the proceedings.

The Estonian Road Administration as the possessor of the road continued the proceeding of the following recommendation:

1. Install a mandatory traffic speed warning sign on the Kulna level crossing on the approach from the forest.

The Consumer Protection and Technical Surveillance Authority as the safety authority continued proceedings of the following recommendations:


1. Plan a set of proposals to the Ministry of Economic Affairs and Communications in order to elevate the status of the level crossing inspection committee by increasing its duties and authority.
2. Direct Estonian Railways Ltd to prioritize installation of automatic traffic light signalling device on the Kulna level crossing.



Annexes



Annex 1

Proceeding of recommendations – Kulna, 20.02.2018

Date and time	20.02.2018, at 08.29am		
Location	Estonian Railways Ltd infrastructure, open track between Vasalemma and Keila, rural area, km 73,208.		
Type of occurrence	Accident: level crossing accident		
Train type and number	Passenger train No 522		
Road vehicle	Scania truck with a Kraker semi-trailer		
		On the train	In the road vehicle
Number of persons (on board the train and vehicle)	Crew	3	1
	Passengers	37	-
Fatally injured	Crew	-	-
	Passengers	-	-
Seriously injured	Crew	-	1
	Passengers	-	-
Slightly injured	Crew	2	-
	Passengers	6	-
Damages to rolling stock	Various types of deformations on the bodywork of three carriages, damage to undercarriages, automatic clutch and driving motor.		
Damages to track equipment	Damage to the tracks including the cover plate rendered unusable.		
Other damages	Scania truck's engine, cab and gearbox destroyed and the Kraker semi-trailer deformed, causing both to be unrecoverable.		
Summary: As the road conditions improved, the Scania truck drove at increasing			

speed towards a visible station without noticing the slowing Stadler Flirt EMU 1309 passenger train and collided with it.		
Final report issued	11.10.2018	
Recommendation No 01	One of the prescribed warning signs on the approach to the level crossing is missing.	
	Install a warning sign 112 "Level crossing without a barrier" to the same post as the additional warning sign "Level crossing ahead" 125.	
Date	Status	Explanation
12.12.2018	Accepted and fulfilled.	Planning of implementation of measure.
July 2019		<p>Install road signs 351 "Maximum speed" on both directions before the level crossing with the maximum allowed speed of 50 km/h.</p> <p>Road sign 351 with the maximum allowed speed of 70 km/h installed (the yellow line on the photo) and 50 km/h (the red line on the photo), approx. 280 m and 140 m before the railway respectively.</p> 
12.12.2018	Accepted and fulfilled.	<p>In addition to the recommendations No 1 and 2, the Estonian Road Administration decided to</p> <p>Recondition the carriageway road markings at the approach to the level crossing and install rumble strips on the road surface to alert drivers.</p> <p>Reduce the intersection of the carriageway near the level crossing (within the 50m zone) to avoid</p>

<p>July 2019</p>		<p>parking vehicles that may obstruct visibility of the level crossing and install the information board further away.</p> <p>The road has been marked with sidelines in both directions 140 m before the railway and transverse relief markings have been used to alert the road users – between road signs 124 and 125 as well as 127 and 128 four sets of rumble strips have been installed on the road surface.</p> 
<p>October 2019</p> <p>Photos of the traffic management on the road section approaching the railway level crossing 08.04.2020</p>		<p>In connection with the installation of automatic traffic lights and a barrier at the level crossing, the traffic management was adjusted.</p> <p>Replacement of warning signs 112 “Level crossing without a barrier” with warning signs 111 “Level crossing with barriers” (installation approx. 210 m before the railway). In both directions signs 123 and 126 have been placed underneath road signs 111. The signs 124, 127 and 125 are located between the sign 111 and the railway, and 128, 2/3 and 1/3 of the distance between the railway and warning sign 111 respectively.</p> 

<p>Assessment of the impact of the measures</p>		<div data-bbox="710 185 1240 492">  <p>035km/h N59.2847 E24.3548 762 SWN PRESTIGIO 2020/04/08 13:10:09</p> </div> <div data-bbox="710 521 1240 806">  <p>031km/h N59.2853 E24.3535 762 SWN PRESTIGIO 2020/04/08 13:10:19</p> </div> <p>In June 2018 the speed of motor vehicles approaching the level crossing was measured as 57 km/h which does not necessarily allow the vehicle to be safely stopped before the level crossing.</p> <p>Speed measurements planned for 2019 were not carried out due to the level crossing being fitted with the automated signalling system and barriers.</p>
<p>Recommendation No 02</p>	<p>The work of level crossing inspection committee has often become a formality where there is no analysis of the characteristics of any given level crossing and the focus is on just confirming its accordance with existing standards.</p> <p>Plan a set of proposals to the Ministry of Economic Affairs and Communications in order to elevate the status of the level crossing inspection committee by extending its duties and authority.</p>	
<p>Date</p>	<p>Status</p>	<p>Explanation</p>
<p>17.05.2019</p>	<p>Accepted and fulfilled.</p>	<p>To discuss the changes, The Ministry of Economic Affairs and Communications held a round table meeting involving the railway possessors, the Safety Investigation Bureau (ESIB), the safety authority, the Ministry and local authorities. A representative of the safety authority made a presentation about the level crossing inspection committee and there was a discussion about increasing the authority of the inspection committee. The discussion</p>

	<p>revealed that the level crossing inspection committee currently has sufficient powers as far as railway possessors are concerned. The powers of the inspection committee and proposals for railway possessors are directly related to this recommendation. We can also take into consideration the fact that public infrastructure managers are moving towards the provision of traffic lights and barriers at level crossings, which should also increase the safety of level crossings for motor vehicles.</p> <p>At present, according to the Regulation No. 39 of the Minister of Transport and Communications of 9 July 1999 "Rules for Technical Use of Railway" Annex 4 (wording of Regulation No. 12 of the Minister of Economic Affairs and Infrastructure 05.02.2019) there is a requirement for point 4.4: the inspection committee assesses whether the level crossing complies with the requirements and is safe to use.</p> <p>The inspection committee makes proposals and observations on the level crossing and the equipment used, and on the technical condition and requirements of the roads leading to the level crossing. If the proposals of the inspection committee are not followed, the owner or the possessor of the level crossing has to prove with other technical documentation and / or calculation that the level crossing meets the requirements and is safe to use.</p> <p>The safety authority is preparing an amendment to Annex 4 to the Ministry's Rules for Technical Use of Railway to increase the responsibility and authorisation of the inspection committee in order to render the work of the committee more efficient and enable the decisions to be implemented faster. Any ruling of the level crossing inspection committee must be subject to immediate fulfilment and legally binding to the railway undertaking</p>
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		and the road possessor. As a result of the changes there is less bureaucracy and the implementation of changes on the level crossing is faster.
Recommendation No 3	Kulna level crossing has not been fitted with standardised automatic light signalling device	
	Direct Estonian Railways Ltd to prioritize installation of automatic traffic light signalling device on the Kulna level crossing.	
Date	Status	Explanation
<p>23.09.2019 Application for construction permit No 1911271/08396</p> <p>27.09.2019 issue of construction permit No 1912271/26661</p> <p>27.09.2019 Notice No 1911581/08479 of commencement of construction</p> <p>16.03.2020 submission of application permit No 2011371/03169</p> <p>24.03.2020 CPTRA issued permit No 2012371/05515.</p> <p>The building can be used going forward.</p>	Accepted and fulfilled.	<p>The building registration code of the railway facility Kulna level crossing automatic signalling system is 221284919, the year of initial commissioning of the ASS is 2020.</p> <p>The main purpose of use of the facility is "21216 Railway safety, signalling, security, communication, lighting or energy construction or technical construction" and the location address is Harju county, Lääne-Harju municipality, Ohtu village, Vasalemma Keila 67.9-75.8 km.</p> <p>The photo shows Kulna level crossing after the installation of the automatic signalling system and barriers.</p>

