



REPUBLIC OF BULGARIA
NATIONAL AIR, MARITIME AND RAILWAY TRANSPORT ACCIDENTS
INVESTIGATION BOARD

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ANNUAL REPORT

NATIONAL RAILWAY TRANSPORT ACCIDENTS
INVESTIGATION BOARD



Sofia 2023



The present report is issued in accordance with:

- Directive (EU) 2016/798 of the EP and the Council of 11 May 2016;
- Railway Transport Act, SG issue 108, in force since 01.01.2007;
- Ordinance № 59, SG issue 102, in force since 05.12.2006.

The normative acts are available at:

<https://www.mtitc.government.bg>



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Preface

The annual report presents the activity of the National Railway Transport Accidents Investigation Body in the Republic of Bulgaria. The investigated railway events and issued safety recommendations for 2023 are described as per the requirements of article 24, paragraph 3 of Directive (EU) 2016/798/.

The annual report includes data on the railway accidents and incidents investigated in 2023, including the causes for their occurrence and the recommendations issued to improve the safety in railway transport to the National Safety Authority – Railway Administration Executive Agency (RAEA) at the Ministry of Transport and Communications (MTC).

The report includes information on the measures taken by the entities for their implementation and performance. Summary data from the railway events realized in 2023 and the damages presented by the Infrastructure manager- State Enterprise “National Railway Infrastructure Company” (SE NRIC) and the railway undertakings/carriers.

By a Decision of the Council of Ministers of the Republic of Bulgaria in 2020 was established a multimodal authority for investigating transport accidents on the safety, the “National Air, Maritime and Railway Transport Accidents Investigation Board” (NAMRTAIB/Board) within the Council of Ministers.

The Council of Ministers adopted Rules of the activity, structure and organization of the NAMRTAIB. The Board consists of three safety investigation areas in aviation, maritime and railway accidents. A Management Council consisting of three members - Heads of the respective areas, chairs the Board. The Board is a secondary spending unit within the Minister of Transport and Communications.

The investigation functions in the field of the National Railway Transport Accidents Investigation Board (NRTAIB) are stipulated in the Rules of the NAMRTAIB, Railway Transport Act (RTA), and Ordinance № 59 of 05.12.2006 on railway safety management. Since 11.04.2023, the NAMRTAIB has signed an "Agreement on cooperation in the investigation of accidents and incidents in air, water and rail transport between the Prosecutor's Office of the Republic of Bulgaria, and the Ministry of Interior.

1. INVESTIGATION BODY

1.1. Legal base

The investigation body investigates accidents and incidents in accordance with the requirements of Directive 2016/798/EP and of the Council of 11 May 2016 on railway safety, the Rules of the Board, the Railway Transport Act (RTA) and Ordinance №59/05.12.2006 for management of safety in railway transport.

Chronology and restructuring of the investigation body

In 2006, in line with the requirements of Article 21 of Directive 2004/49/EC on safety on the Community's railways, within the Ministry of Transport and Communications (MTC) was established a specialised investigation body for the investigation of railway accidents and incidents - the "Specialized Railway Transport Accidents and Incidents Investigation Unit" (SRTAIU), directly subordinated to the Minister for Transport and Communications. The resources to secure the investigation are provided from the Ministry's budget.

In 2009, the Ministry of Transport, Information Technology and Communications (MTITC) established a multimodal body Directorate Unit for Investigation of Accidents in Air, Water and Rail Transport (DUIAAWRT) under the direct authority of the Minister of Transport and Communications. The resources for securing the investigations are provided by the budget of MTITC.

In 2020, was established an independent multimodal investigation authority the "National Air, Maritime and Railway Transport Accidents Investigation Board" (NAMRTAIB) at the Council of Ministers under the direct supervision of the Prime Minister.

The National Railway Transport Accidents Investigation Body NRTAIB is part of the multimodal investigation body NAMRTAIB.

1.2. Purposes and functions

The purposes of the investigation is to improve the safety in the rail transport, to avoid accidents, and to prevent significant accidents.

The prevention of the investigation body is to establish the causes for the accidents and incidents occurrence, and to elaborate relevant safety recommendations in order to improve the safety and to prevent significant accidents without seeking personal fault and responsibility.

The functions and tasks of the NRTAIB are described in detail in the European and national normative acts.

Main functions and responsibilities of the NRTAIB:

- Organizing and leading the investigation of significant accidents, accidents and incidents that occurred on the territory and at the border crossings of the Republic of Bulgaria;
- Establishing the causes, circumstances and facts related to the occurrence of significant accidents, accidents and incidents, including identification of evidence, performance of analysis, including the human factor, decision-making, preparation of expertise and documentation of events;

-
- Coordination of the activities for conducting common investigations in which the competent bodies of the Prosecutor's Office of the Republic of Bulgaria - the investigative departments of the district prosecutor's offices, and the Investigation Bodies at the Ministry of Interior (MoI) also participate;
 - Preparation and sending to all the affected entities a draft final report with safety recommendations from the completed investigation of an accident or incident for expressing opinions and statements;
 - After analysing the views and opinions of the involved parties, a final report containing safety recommendations is drawn up and sent to all the interested parties, which is published on the website of NRTAIB;
 - Participation in the working meetings of the Network of National Investigation Bodies of the EU Member States, and conferences and trainings organized and coordinated by the European Union Railway Transport Agency;
 - Participation in working groups for harmonization of the national normative acts with the European legislation, related to the safety and investigation of railway accidents and incidents;
 - Analysis of data on occurred accidents and incidents in the railway transport system;
 - Keeping an archive of the investigated accidents and incidents and maintaining an information database within the NRTAIB.

1.3. Organization of the activity

The main activity of the NRTAIB is in its quality of national investigation body for railway accidents and incidents, is investigation of accidents and incidents classified in accordance with the requirements of art. 20 and 22 of Directive (EU) 2016/798/EP and the Council, RTA and Ordinance № 59.

The vice-chairperson of the Management Board of NAMRTAIB manages the NRTAIB, with a doctorate in railway safety, a master's degree engineer in "Operation and management of railway transport" he also chairs the accident investigation commissions;

Other investigation inspectors do not work the NRTAIB.

The investigations are performed by a commission, which includes external experts on a civil contract, with professional experience and qualifications for the relevant accident.

Investigations are provided with funds from the budget of the NAMRTAIB.

The decisions to initiate an investigation follow the requirements of the European and national normative acts, and are taken by the vice-chairperson of the Management Board of the NAMRTAIB and are in accordance with:

- Directive 2016/798/EP and the Council;
- Railway Transport Act;
- Ordinance No. 59/05.12.2006 on safety management in railway transport.

The Head of the NRTAIB shall inform in writing the Agency for Railway Transport of the European Union about any undertaken investigation of a railway event through the notification system.

The investigated events are completed with a draft final report and, if necessary, safety recommendations are issued and sent to all stakeholders;

The Head of the NRTAIB shall inform the Agency for Railway Transport of the European Union in writing of any completed investigation, providing an electronic copy of the original final report in English in accordance with the requirements of Regulation (EU) 2052/2020/EC of 24 April 2020.

After validation of the report by the Agency, it becomes publicly available on the website of the NAMRTAIB.

1.4. International activity in 2023

1. Participation of the Head of the NRTAIB in the 51st plenary session of the Network Investigation Bodies of Railway Accidents from the EU Member States held on 14 and 15 February 2023 in Brussels, Belgium;

2. Participation of the Head of the NRTAIB in the 52nd plenary session of the Network Investigation Bodies of Railway Accidents from the EU Member States held on 10 and 11 May 2023 in Valenciennes, France;

3. Participation of the Head of the NRTAIB in a conference „Safety 2023“, held on 20-22 September 2023 in Tallinn, Estonia;

4. Participation of the Head of the NRTAIB in the 53rd plenary session of the Network Investigation Bodies of Railway Accidents from the EU Member States held on 10 and 11 October 2023 in Valenciennes, France.

1.5. Participation in direction NRTAIB in other events

1. As per the requirements of art. 11 (2) of Ordinance № 59/5.12.2006 monthly (until the tenth day of each month) operational information on the general safety indicators from the manager of the railway infrastructure, railway undertakings and the entities in charge of maintenance is sent to the National Safety Authority (RAEA) and to the Head of the National Railway Transport Accidents and Incidents Investigation Authority. The head of the NRTAIB and the RAEA perform analysis, summarize the received information and appoint measures for the safety improvement;

2. In accordance with the requirements of art. 12 (1) of Ordinance No. 59/5.12.2006, the Head of NRTAIB and the RAEA, every year until the end of May, receive in writing the annual reports of the manager of the railway infrastructure and railway undertakings. The head of NRTAIB performs a safety analysis for the previous year based on the provided data;

3. The head of the NRTAIB daily (7/24) receives operational information about the accidents, incidents, and irregularities that occurred on the national railway network by the railway infrastructure manager;



4. The head of NRTAIB prepared and published an annual report on the activity and investigated accidents in 2023, which was sent by September 30 to the European Union Railway Agency;

5. The head of the NAMRTAIB creates optimal conditions and organization for timely and effective work with the bodies of pre-trial proceedings in accordance with the Agreement of 11.04.2023 on interaction in the investigation of transport accidents and incidents between the Prosecutor's Office of the Republic of Bulgaria, the Ministry of Interior and NAMRTAIB;

6. In the course of the investigation, the head of NRTAIB creates working contacts with the entities involved in the accident - the railway infrastructure manager, (SE NRIC), the railway undertakings/carriers, the entities in charge of maintenance, as well as with RAEA, the users of railway services with regard to the investigated accident, Scientific Research Technical Institutes, Centres for professional qualification of the entities, and other structures and, if necessary, with the National multi-profile transport hospitals in the country indicated in (fig. 1.1).

Interaction of the NRTAIB with other authorities and institutions in the investigation process

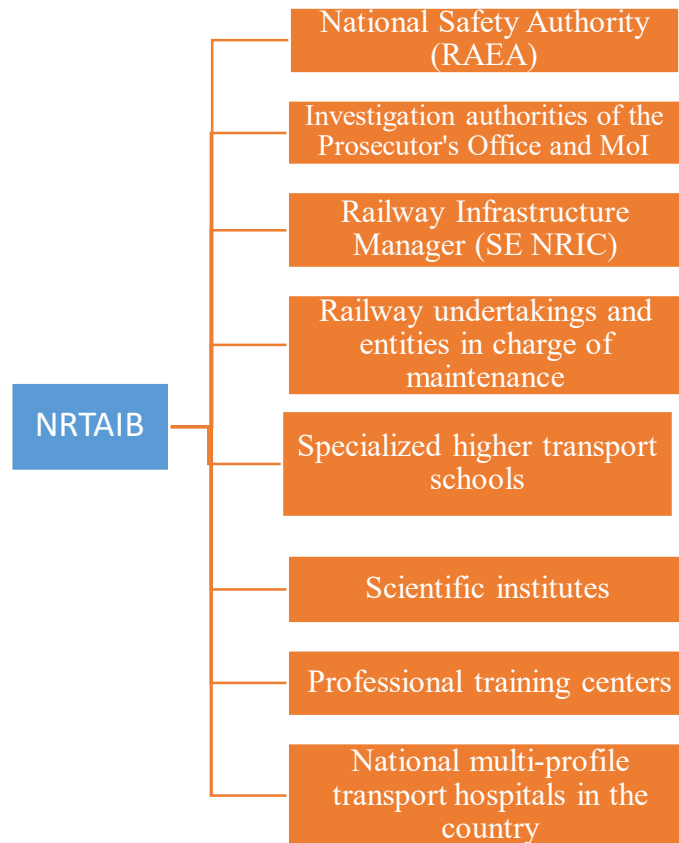


Fig. 1.1

2. PROCESS OF INVESTIGATION

2.1. Events that are subject to investigation

In accordance with the requirements of Directive (EU) 2016/798/EP and of the Council, the Railway Transport Act and Ordinance № 59, the National Railway Transport Accident Investigation Board investigates railway events:

- Significant railway accidents;
- Accidents and incidents that in different circumstances, could lead to significant accidents;
- At its discretion, investigates technical failures in the structural subsystems and interoperability constituents, taking into account their significance.

In the event of an accident or incident occurrence, the authorized officials of the railway infrastructure manager and railway undertakings shall immediately notify the Head of the NRTAIB department in accordance with their approved Safety Procedures stipulated in the Safety Management Systems as per the requirements of Directive (EU) 2016/798/EP and of the Council, the Railway Transport Act and Ordinance № 59.

2.2. Institutions related to the investigation.

In the course of the investigation, the Chairperson of the Commission assigns technical expertise, and requests analysis and opinions from the following:

- Technical University of Sofia;
- Higher School of Transport "Todor Kableshev";
- Professional Training Centres for railway staff;
- Bulgarian Academy of Sciences;
- National multidisciplinary transport hospitals in the country;
- Fire safety laboratory;
- Other institutions for each specific case, indicated in (fig. 2.1).

Structure of the Investigation Commission for railway events

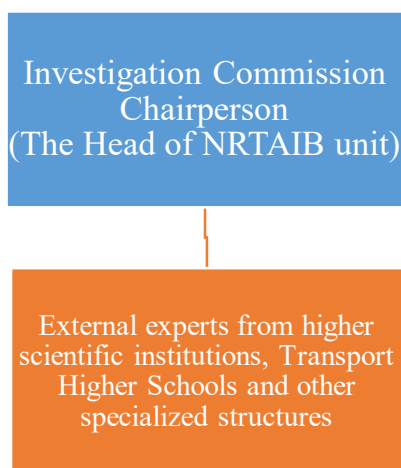


Fig. 2.1.

2.3. Process of investigation and Investigation Body Approach

Following the notification on the mobile phone by the authorized persons of the railway infrastructure manager about an occurred accident or incident, the Head of the NRTAIB, analyses the submitted information and classifies the railway event, takes a decision for departure to the place of the accident, performs an inspection on the spot and takes a decision for undertaking an investigation. If authorities of the pre-trial proceedings have arrived on the spot, an organisation for independent inspection, taking photograph materials, controlled removal of separately damaged elements and details of railway infrastructure and rolling stock shall be established.

The security authorities of the Ministry of Interior preliminarily fence off and limit the access of outsiders and the media to the scene of the accident, in order to preserve the visible physical evidence. When there is an injury (staff and/or passengers) from the accident, the emergency medical teams are given the opportunity to provide first aid to the injury. In the event of a fire occurring in the rolling stock of the bodies of "Fire Safety and Civil Protection" (FSaCP), an opportunity is provided to extinguish the fire, after which the investigative structures begin inspections and investigation procedures.

After taking a decision, the Head of the NRTAIB appoints a commission to investigate the accident. The Commission shall include independent external experts with relevance given the type of the investigated event, stipulated in item 2.2. When deciding to initiate an investigation, the head of the NRTAIB shall inform all the interested parties in the event. Within a week after the initiation of the investigation, shall inform the European Union Agency for Railways in writing of the initiation of an investigation through the notification system.

The Chairperson of the Commission manages and coordinates the activities of the investigation independently of the bodies of the pre-trial proceedings - Prosecutor's Office, Investigation, and Ministry of Interior in order to respect the requirements of the Safety Directive for independent investigation. He supports the activities related to the teams of "Emergency Medical Aid" and "Fire Safety and Civil Protection" (FSaCP). The Infrastructure Manager, the Railway Undertaking and the other legal entities involved in the event shall provide the Chairperson of the Investigation Commission with all the records and conversations of the staff involved in the train traffic management, as well as any other important information and documents related to signalling and rail track.

The National Safety Authority (RAEA) shall provide any important information giving clarity on the accident or incident under investigation as well as information on the rolling stock involved in the accident, registered in the European register of the vehicles.

The Commission conducts interviews with the personnel involved in the accident, as well as with eyewitnesses and witnesses of the event and requires written testimony from all legal entities and individuals directly and indirectly related to the event.

The Commission receives the full support and assistance from the competent investigation authorities of the Prosecutor's Office and the Ministry of Interior, which conduct their own parallel investigation, in accordance with the requirements of the Code of Criminal Procedure (CPC).

The safety investigation carried out by the NRTAIB is conducted as openly as possible in order to exchange information, opinions and statements to the extent appropriate to the investigative procedures.

To the Commission are submitted the collected documents and materials provided by the Task force, which the Infrastructure manager assigns, and in which participate representatives of the parties involved in the accident.

The Commission analyses the collected documents and materials provided by the Task force, the opinions and expertise prepared before, during and after the accident in order to clarify the circumstances and the causes that led to its occurrence.

The Chairperson of the Commission, depending on the severity of the accident under investigation, prepares a draft final report, which he sends to the RAEA and the affected entities, structures and organizations, as well as to the relatives of the victims in the accident (if any).

In accordance with the requirements of the Safety Directive, any accident or incident investigated within one year from the date of its occurrence shall end with a final report, and

in the event of an extension, an interim report shall be drawn up describing the action taken to date.

The final report shall set out the chronology of the Commission Implementing Regulation (EU) 2020/572 of 24 April 2020 on the reporting structure that shall be followed for railway accident and incident investigation reports.

If necessary, recommendations are made to improve the safety, in order to prevent other events of similar nature. The safety recommendations are addressed to the RAEA and the entities involved in the event - the railway infrastructure manager, the railway undertakings, and other interested participants in the event.

The National Safety Authority RAEA and other bodies or structures to which the recommendations are addressed shall regularly report to the Investigation Body on the measures taken and planned as a result from the recommendations.

The Head of the NRTAIB shall inform the European Union Railway Agency in writing of the completion of the investigation, sending a copy of the final report translated into English with the safety recommendations given. The final report is made publicly available on the website of the NAMRTAIB.

2.4. Safety research of 2023.

The presented data are downloaded from the annual safety reports of the railway infrastructure manager and railway undertakings (carriers) with registered in them totally **920** railway events, classified under categories:

- **341** accidents, including 1 – collision of a train in a railway vehicle, 204 – collision of a train in an obstacle, 33 – derailments in RRS, 28 – accidents at level-crossings, 42 – accidents with persons, 15 – fires in RRS, 13 – others and 5 – suicides;
- **64** incidents, including 5 – damages of the rail track, 18 – deformed rail track, 1 – damage of the SE, 40 - SPAD (signal passed at danger) and 0 – RRS broken wheel;
- **515** situations, close to incidents.

The summarized 33 significant railway accidents in 2023 are in accordance with the General safety indicators (GSI).

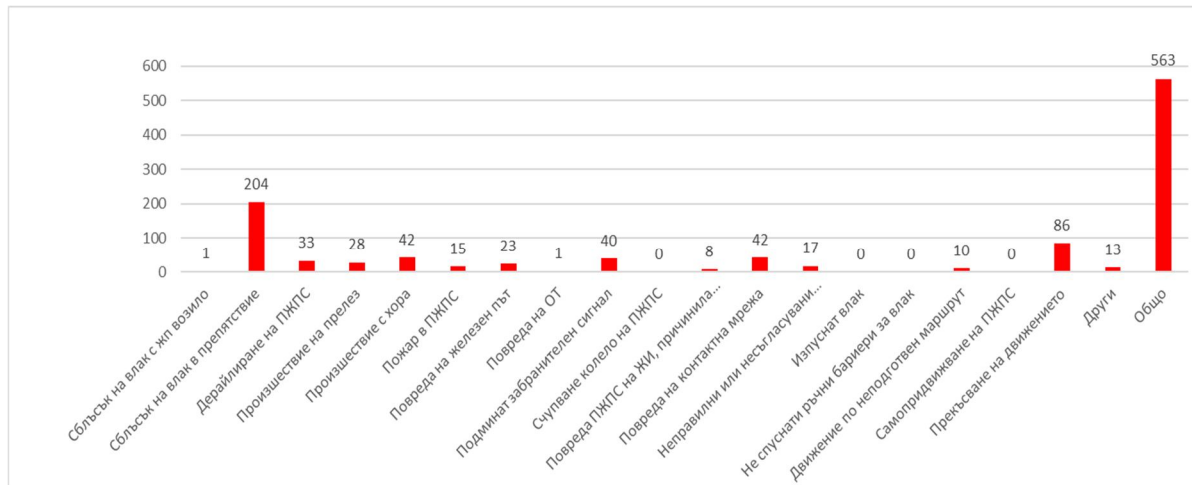
As a result of the occurred significant railway accidents, the value of the caused material damages of the railway infrastructure, and of the rolling stock amounts to BGN 2 350 210 (EUR 1 200 128).



Railway events registered in the railway network in 2023

№	TYPE OF EVENTS	NUMBER
ACCIDENTS		
1	Train collision with railway vehicle	1
2	Train collision with obstacle	204
3	RRS Derailment	33
4	Level crossing accident	28
5	Accident with persons	42
6	Fire in RRS	15
7	Other	13
8	Suicides	5
Total:		341
INCIDENTS		
1	Rail track failure	5
2	Deformed rail track	18
3	Signalling equipment (SE) failure	1
4	SPAD (signal passed at danger)	40
5	Broken wheel of RRS	0
Total:		64
SITUATIONS, CLOSE TO INCIDENTS		
1	RRS failure on the RI, caused the delay	8
2	Rail track failure	141
3	Signalling equipment failure	88
4	Catenary failure	42
5	Incorrect or incoherent actions of EP from RI	17
8	Dispatched train without approval	1
9	Dispatched train to occupied interstation	0
10	No dropped manual barriers for train	0
11	Movement on unprepared route	10
12	Interruption of movement	86
13	Other situations close to incidents	122
Total:		515

Types of railway events in 2023



Train collision with a railway vehicle-1

Train collision with obstacle-204

Derailment of RRS-33

Level -crossing accident-28

Accident with persons-42

Fire in RRS-15

Rail track failure-23

Signalling equipment failure-1

SPAD-40

Broken wheel of RRS-0

RRS failure on RI-8

Catenary failure-42

Incorrect action by the EP-17

Missed train-0

No manual barriers for train-0

Movement on unprepared route-10

Self-propulsion of RRS-0

Interruption of movement-86

Other-13

TOTAL-563

All railway events and caused damages in the period 2013÷2023



Railway events with caused damages

In 2013 compared to 2012, the deviation damages/BGN is + 206 902 BGN (+105 787 EUR)
 In 2014 compared to 2013, the deviation damages/BGN is + 5 402 000 BGN (+2 762 000 EUR)
 In 2015 compared to 2014, the deviation damages/BGN is – 4 842 076 BGN (–2 472 591 EUR)
 In 2016 compared to 2015, the deviation damages/BGN is + 863 286 BGN (+440 452 EUR)
 In 2017 compared to 2016, the deviation damages/BGN is – 136 200 BGN (–69 597 EUR)
 In 2018 compared to 2017, the deviation damages/BGN is + 1 641 141 BGN (+839 115 EUR)
 In 2019 compared to 2018, the deviation damages/BGN is – 74 728 BGN (–35 135 EUR)
 In 2020 compared to 2019 the deviation damages/BGN is + 1 156 291 BGN (+592 970 EUR)
 In 2021 compared to 2020 the deviation damages/BGN is + 1 020 277 BGN (+517 524 EUR)
 In 2022 compared to 2021 the deviation damages/BGN is + 1 645 950 BGN (+839 770 EUR)
 In 2023 compared to 2022 the deviation damages/BGN is + 8 622 237 BGN (+4 402 920 EUR)

National network of the Republic of Bulgaria at 2023.

- Total length of the railway network – 6446 km, of which rail gauge 1 435 mm – 6 293 km, incl.:
 - length of open rail track – 3 904 km;
 - double-track railway lines – 995 km;
 - railway switches – 6 800 units;
 - level-crossings – 746;
 - railway bridges – 995, with total length 43,1 km;
 - railway tunnels – 186, with total length 47,9 km;
 - continuously welded rail track – with total length 2 601 km.
- Lines with rail gauge 760 mm – 125 km.

3. INVESTIGATIONS

3.1. Summary of the investigations completed in 2023.

In 2023, the NRTAIB investigated five railway accidents.

Table 1: Investigated accidents and incidents in 2023

Type of investigated accidents and incidents	Number of accidents	Number of victims		Damages	
		Fatalities	Seriously injured	BGN	EURO
Fire in RRS	3	-	-	36 874,70	18 830,00
Derailment of RRS	1	-	-	69 290,00	35 383,00
Train collision with railway vehicle	-	-	-	-	-
Level crossing accident	-	-	-	-	-
Accident with persons from RRS	1	2	-	653,60	334,00
TOTAL:	5	2	-	106 818,30	54 547,00

3.2. Investigations, started and completed in 2023

Table 2: Investigations, started and completed in 2023

Date of the event	Visit card of the investigation	Legal base	Completed on
06.01.2023	Railway accident – fire in locomotive №91520044169-8, serviced fast train №2610 in Mezdra South station on 06.01.2023	Directive 2016/798/EP, art. 20, par. 2/a, art. 115k, par. 1, item 2 of RTA, art. 78, par. 1 and 2 of Ordinance № 59	13.04.2023
26.02.2023	Railway accident – derailment of wagons of IDFT № 40832 in Banya station on 26.02.2023	Directive 2016/798/EP, art. 20, par. 2/a, art. 115k, par. 1, item 2 of RTA, art. 78, par. 1 and 2 of Ordinance № 59	01.08.2023
20.07.2023	Railway accident – fire in locomotive №91520044063-3, serviced passenger train № 80132 in Yambol station on 20.07.2023	Directive 2016/798/EP, art. 20, par. 2/a, art. 115k, par. 1, item 2 of RTA, art. 78, par. 1 and 2 of Ordinance № 59	15.09.2023

3.3. Description of the investigated accidents in 2023

3.3.1. Railway accident – fire in locomotive № 91520044169-8, serviced fast train № 2610 in Mezdra South station on 06.01.2023.

Brief description

On 06.01.2023 fast train № 2610 departed as per the train movement schedule from Varna station at 05:00 a.m. in a composition of 4 coaches, 170 tonnages, FT No 2610 hauled

by locomotive No. 91520044169-8, serviced with a locomotive driver, an assistant locomotive driver, and a train crew with a train manager and a conductor. The personnel servicing the train and the rolling stock is part of the railway company "BDZ-Passenger Transport" EOOD. The train run daily in the direction Varna - Gorna Oryahovitsa - Sofia.

FT No. 2610 departed from Mezdra station at 10:44 a.m. The train passed on the second main track at Mezdra South Station at 10:47 a.m. without stopping, the traffic manager on duty at Mezdra South Station noticed that smoke was coming from the draft gear of the locomotive. The locomotive driver, looking to the right at the traffic manager on duty, noticed that the engine compartment was filled with black smoke and initiated a "quick stop" of the train by activating the automatic train brake. The train came to an emergency stop at 10:50 a.m., after which the locomotive quickly caught fire.



Consequences

As a result of the fire, heavy material damage was caused to the locomotive. The movement of trains between Mezdra South and Zverino stations was interrupted in the period 11:00 a.m. ÷ 12:30 p.m. on 06.01.2023.

Causes

The accident occurred as a result of violation of a conditioning and contributing factor:

Contributing to the occurrence of the accident, established by a finding report dated 25.01.2023 for measuring the capacitors of the engine-pumps of the locomotive No. 91520044169-8 was that the capacitors BOAON 3-06/88 had a reduced capacity and did not meet the nominal values. That resulted in a lack of starting torque on the first circuit pump motor, possibly disrupting the traction transformer oil cooling as a result. The operating temperature of the oil rose unacceptably and led to its ignition.

A contributing factor to the accident was that the traction transformer oil pressure control was inoperative because the baroscopes were malfunctioning, thus no indication of the operation of the reduced flow first circuit pump motor was actuated. For that reason, the drivers did not take the necessary timely action.

Therefore, as the immediate cause of the accident, it can be considered that the integrity of the flexible rubber joint of the first cooling circuit was broken, which led to the leakage of transformer oil. The high-temperature leaked oil exceeded the flash point, causing it to catch fire. That gave the opportunity for the fire to grow quickly and cause great material damage. Due to heavy smoke in the engine compartment, extinguishing with manual fire extinguishers was not possible by the locomotive crew.

Status of the investigation

The investigation was closed with a final report and eight safety recommendations on 13.04.2023.

3.3.2. Railway accident – derailment of wagons of IDFT № 40832 in Banya station on 26.02.2023.

Brief description

On 25.02.2023, IDFT No. 40832 departed from Kapikule station at 19:25 p.m. in a composition of 17 wagons loaded with full GTK, 100 axles, 1061 tons with locomotive No91521688025-1, served by a locomotive driver and an assistant locomotive driver. At Kapikule station, the train was handed over by the Turkish railway carrier to the Bulgarian railway company "DB Cargo Bulgaria" EOOD. At the Kapikule station, before the departure of IDFT No 40832, the company's carriage inspector carried out a technical inspection. The train arrived at Svilengrad station at 19:45 p.m. and after border and customs checks, it departed at 21:08 p.m. At Plovdiv marshalling yard arrived at 11:14 p.m., where the locomotive crew changed. At 11:30 p.m., the train departed from Plovdiv marshalling yard and passed without stopping the stations to Banya station.

For accepting IDFT No. 40832 at Banya station at 00:30 a.m. on 26.02.2023, the traffic manager on duty ordered a route for the train to cross the second main track without stopping at the station. When the train entered Banya station, the traffic manager on duty noticed sparks coming from the wheels of the last wagons and the train stopped. The locomotive crew felt the train pull and noticed that the pressure in the main air duct dropped to 0.0 bar and the train stopped on the second track at 00:41 a.m. The locomotive driver and duty conductor inspected the train and found that there have derailed the last two wagons of the train, 16th no 37804953012-4 series Sggmrs has derailed with both wheelsets of the third bogie and 17th wagon no. 43714378583-4 series Saagrss has derailed with all four wheelsets of the wagon.

Consequences

Wagon No. 43714378583-4 was repaired - the replacement of a leaf spring set. On 25.02.2023, the wagon was included in the composition of IDFT No. 40832. After the replacement of the spring, inadmissible differences in the weight distribution on the left/right wheel of the first and second wheelset appeared, since the spring has different geometric parameters and characteristics from the original one. The technical staff did not detect the difference. During the static measurement after the derailment, an inadmissible "oblique-symmetric load" was found (between the first two wheelsets of the wagon). The large weight difference between the wheels in the left curve of the rail track caused the right wheel of the second wheelset to rise on the head of the right rail and for 14 m it derailed to the right.



Causes

The immediate cause of the accident was the installation of an inappropriate leaf spring on the derailed wagon No. 43714378583-4, which led to the appearance of inadmissible differences in the load on the first two wheelsets (left/right wheels) of the wagon. An aggravating circumstance is that this wagon was loaded with GTK of greater weight.

Status of the investigation

The investigation was closed with a final report and three safety recommendations on 01.08.2023.

3.3.3. Railway accident – fire in locomotive № 91520044063-3, serviced passenger train № 80132 in Yambol station on 20.07.2023.

Brief description

On 20.07.2023 at 13:30 p.m. train No. 80132, consisting of 2 coaches, 8 axles, 94 tons, served by locomotive No. 91520044063-3 with a locomotive driver and assistant locomotive driver, train manager and conductor, left Burgas station at 13:30 p.m. The staff serving the train, the locomotive and the coaches are part of the railway company "BDZ-Passenger Transport" EOOD.

During the movement of PT No. 80132 in the Zavoy - Yambol interstation, the train master, who was traveling in the first compartment of the first coach, smelled smoke and notified the locomotive driver by mobile phone. The locomotive driver disconnected the locomotive from the GWP and removes the pantograph, he continued the movement of the train by inertia to the Yambol station. The train master promptly gave a fire signal to the single emergency call number 112. At 15:45 p.m., train No. 80132 settled down on the third acceptance-departure track at Yambol station. The switchman on duty at Post No. 2 noticed that thick black smoke was coming out of the locomotive to the left in the direction of movement and informed the traffic manager on-duty.

Consequences

Because of the fire, material damage was caused to the burnt locomotive No. 91520044063-3, which served train No. 80132. No personnel or passengers were injured. The movement of trains between Bezmer - Yambol - Zavoy stations was not interrupted.



Causes

The accident was caused by damage to the compressor and an increase in temperature during operation in the area of the power unit of the compressor.

Status of the investigation

The investigation was closed with a final report and six safety recommendations on 15.09.2023.

3.4. Investigations started in 2023 and completed in 2024

Table 3: Investigations, started in 2023 and completed in 2024

Date of the event	Visit card of the investigation	Legal base	Completed on
07.11.2023	Railway accident – run over of two employees by locomotive № 98522051522-7, between Section point № 4 and Iliyantsi station on 07.11.2023.	Directive 2016/798/EP, art. 20, par. 1/a, art. 115k, par. 1, item 1 of RTA, art. 78, par. 1 and 2 of Ordinance № 59	25.06.2024.
01.12.2023	Railway accident – fire in locomotive № 91520044202-7, serviced international fast train №	Directive 2016/798/EP, art. 20, par. 2/a, art. 115k, par. 1, item 2 of	06.02.2024.

	464 between the stations Zmeyovo – Tulovo on 01.12.2023	RTA, art. 78, par. 1 and 2 of Ordinance № 59	
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3.4.1. Significant railway accident – run over of two employees by locomotive № 98522051522-7, between Section point № 4 and Iliyantsi station on 07.11.2023

Brief description

On 07.11.2023 at 09:23 a.m. IT No. 10890 consisting of 6 coaches, 24 axles, 454 tons, served by locomotive No. 98522051522-7, departed from the sixth track at Iliyantsi station for SP 4 and the industrial branch of "Toplivo" AD.

At 09:27 a.m., IT No. 10890 arrived at RP 4 and continued its movement without stopping to the industrial branch of "Toplivo" JSC.

At around 09:45 a.m. a work group of three workers part of the infrastructure manager arrived by road transport in the area of SP 4. The group carried a chainsaw and two canisters of fuel and oil, necessary to complete the task. Without notifying the traffic manager on duty, they left for the SP 4 - Iliyantsi interstation to start work, after the "Beginning of the 25 km/h restriction" signal placed at km 0+170. From km 0+180, two of the workers started mowing grass on the railway track, and the third worker was walking about 30 meters ahead of them. A safety and health conditions at work briefing was held for the performance of the activity.

Around 10:00 a.m., after the shunting was completed, locomotive No. 98522051522-7 departed from the "Toplivo" JSC industrial branch in the direction of SP 4 for Iliyantsi station. The locomotive driver on the radio station in the locomotive reported to the traffic manager on duty of SP 4 that the shunting work was over and only the locomotive was traveling to SP 4.

At 10:10 a.m. IT No. 10891 (insulated locomotive No. 98522051522-7) passed without stopping on the third track of SP 4. The movement of the locomotive to the Iliyantsi station along the interstation was in a left curve with a radius of 250 meters.

At about 10:12 a.m. at km 0+320, the locomotive hit and killed one after another two employees working on the track with a motor scythe.

The third worker was at km 0+350 at that time, an eyewitness to the accident.

Consequences

Consequences of the event was the running over of two workers during work on the railway. The third worker, who saw the two being run over, walked towards the locomotive and the locomotive driver stopped the locomotive. The locomotive driver then came to know that he had run over two persons and both of them took follow-up action by notifying the concerned departments and officials.



Causes

The accident occurred because of non-compliance with the requirements of the normative acts, which ensure safety at work in the workplace. There were no signalmen guarding the work group, and no warning signs have been placed surrounding the workplace. The locomotive was operated with only a locomotive driver without an assistant locomotive driver. After the locomotive left the station, it entered a left curve on the rail track with a radius $R=250$ meters. The locomotive driver was operating the locomotive from the right console, which limited his forward visibility, and he did not see the two workers working in the interstation.

Status of the investigation

The investigation was closed with a final report and six safety recommendations on 25.06.2024.

3.4.2. Railway accident – fire in locomotive № 91520044202-7, serviced international fast train № 464 between the stations Zmeyovo – Tulovo on 01.12.2023

Brief description:

On 01.12.2023 at 07:32 a.m., international fast train No. 464 arrived at Zmeyovo station consisting of 2 coaches, 8 axles, 88 tons with locomotive No. 91520044202-7. The train run with a delay of 5 minutes and after a delay of 1 minute, it departed at 07:33 a.m. A sample II-A order was handed over for the movement of the train under special conditions, with the exit signal closed due to the repair of the railway switches at the Zmeyovo station. The movement of trains between Zmeyovo station and Tulovo station was provided by telephone. Rolling stock and staff of the BDZ-Passenger Transport EOOD railway company served the train. The train run daily on the TOS from Dimitrovgrad station to Gorna Oryahovitsa station.

During the movement of the train between the stations Zmeyovo and Tulovo, before the neutral insert, the MAD of the locomotive turned itself off. The driver stopped the train at

07:46 a.m. at km 226+900 and attempted to turn on the MAD, but without success. Through the window of the engine compartment, he saw that there was thick smoke inside. Sprayed a fire extinguisher, but failed to put out the fire. Activated the fire system from the first cabin, but it did not activate, then proceeded to the second command cabin, but it was inaccessible due to the thick smoke coming from the engine compartment.

At 08:25 a.m., the locomotive driver informed the traffic manager on duty at the Tulovo station that the locomotive had caught fire and asked help to remove the train. The head of the Tulovo station called the national emergency number 112 and informed about the fire.



Consequences:

No passengers or staff were injured; material damage was done to the locomotive. There is no material damage to the railway infrastructure.

From 07:46 a.m. to 14:41 p.m., the movement of trains between Zmeyovo and Tulovo was interrupted.

Because of the fire, heavy material damage was caused to the locomotive.

Causes:

The most likely cause of the fire during movement in locomotive No. 91520044202-7, which served IFT No. 464, was the temperature overheating of the power unit 221, feeding the motor-compressor 235. The auxiliary rectifier 221, feeding the compressor motor, was not cooled at that time as the fans were switched off when the train was moving on inertia.

Status of the investigation

The investigation was closed with a final report and five safety recommendations on 06.02.2024.

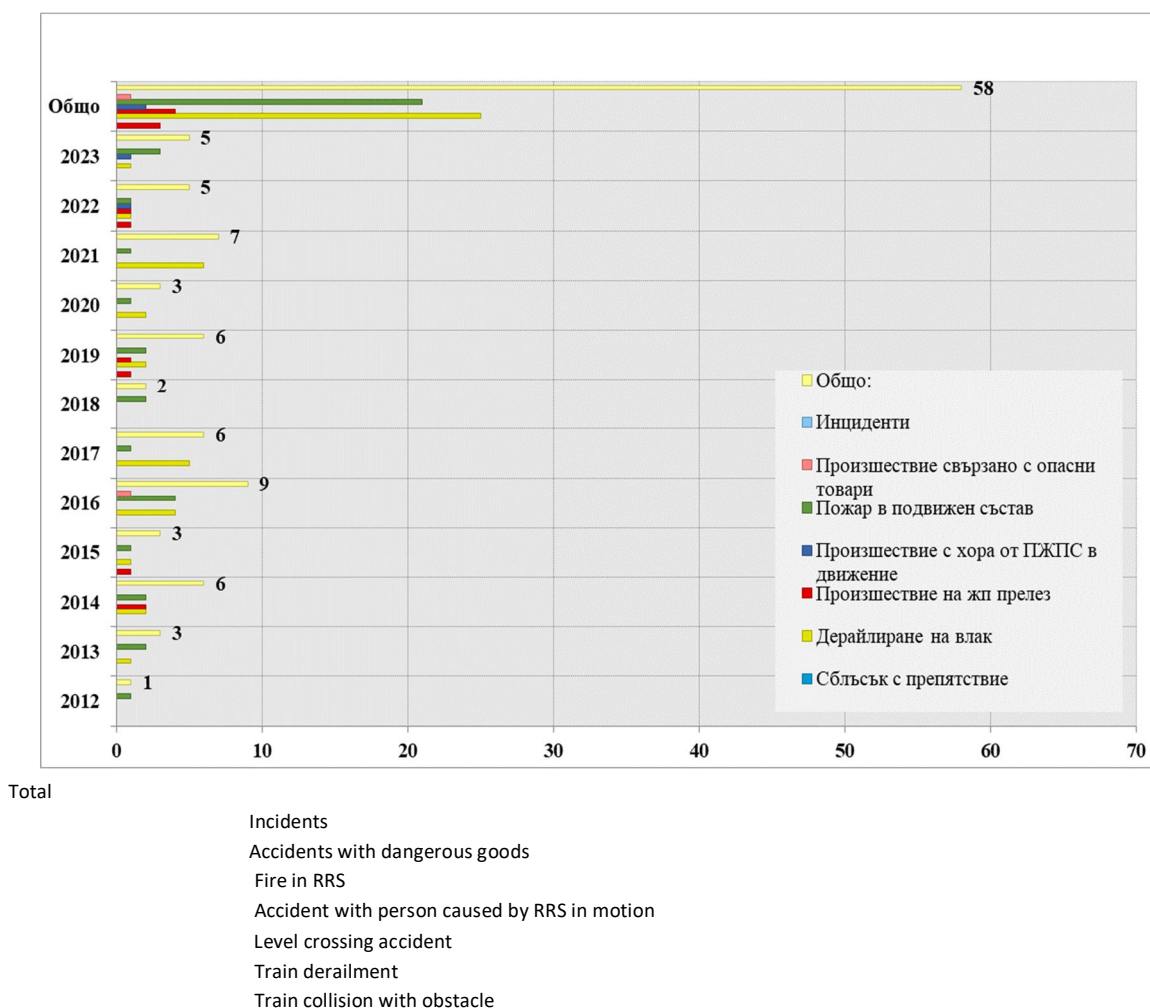


3.5. Investigated accidents and incidents 2023

Table 4: Investigated accidents and incidents in the period 2012÷2023

Investigated events	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Total
Train collision in railway vehicle	-	-	-	1	-	-	-	1	-	-	1	-	3
Collision with obstacle	-	-	-	-	-	-	-	-	-	-	-	-	0
Train derailment	-	1	2	1	4	5	-	2	2	6	1	1	25
Accident at level-crossing	-	-	2	-	-	-	-	1	-	-	1	-	4
Accident with persons of RRS in motion	-	-	-	-	-	-	-	-	-	-	1	1	2
Fire in rolling stock	1	2	2	1	4	1	2	2	1	1	1	3	21
Accident with dangerous goods	-	-	-	-	1	-	-	-	-	-	-	-	1
Incidents	-	-	-	-	-	-	-	-	-	-	-	-	0
Total:	1	3	6	3	9	6	2	6	3	7	5	5	56

Chart of investigated accidents and incidents in the period 2012÷2023



4. SAFETY RECOMMENDATIONS

4.1. Brief summary of the safety recommendations that the NRTAIB issued

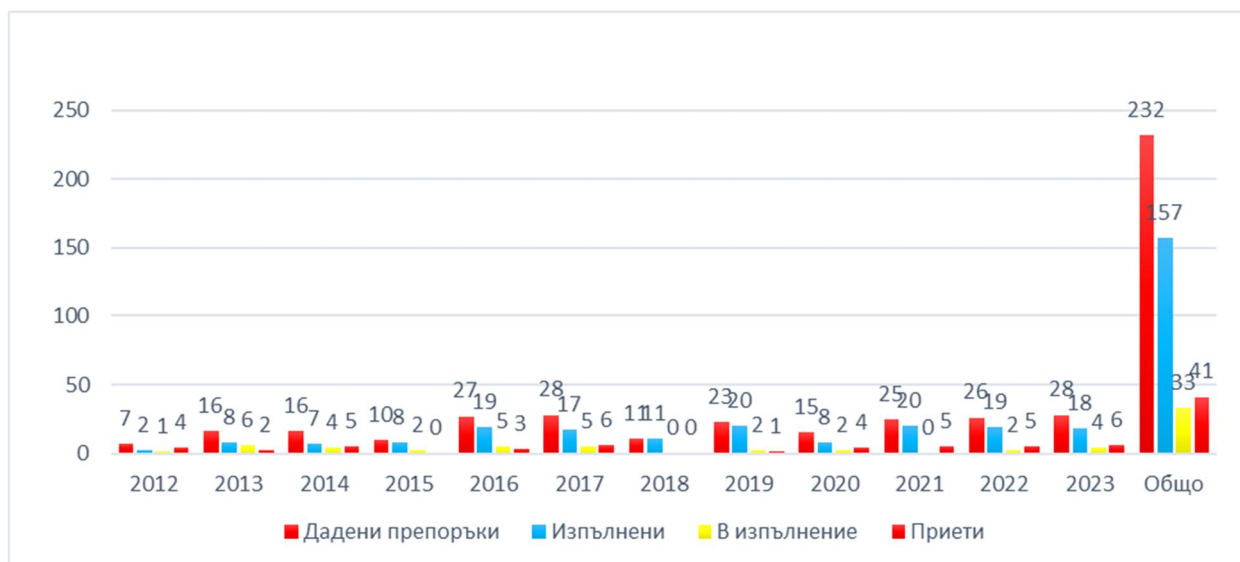
The safety recommendations given by the National Railway Transport Accident Investigation Board (NRTAIB) are aimed at improving safety and preventing other accidents of similar nature. The recommendations are addressed to the National Safety Authority (RAEA), the Railway Infrastructure Manager (NRIC), railway undertakings and other persons related to the maintenance of rolling stock to take measures and actions to improve the safety in railway transport and to avoid other accidents.

Table 5: Issued and implemented recommendations in the period 2012÷2023

Year	Given recommendations	Status of implementation of the recommendations		
		Implemented	In process of implementation	Accepted and implemented
2012	7	2	1	4
2013	16	8	6	2
2014	16	7	4	5

2015	10	8	2	0
2016	27	19	5	3
2017	28	17	5	6
2018	11	11	0	0
2019	23	20	2	1
2020	15	8	2	4
2021	25	20	0	5
2022	26	19	2	5
2023	28	18	4	6
Total	232	157	33	41

Issued and implemented recommendations in the period 2012 ÷ 2023



Given recommendations Implemented In process of implementation Accepted Total

4.2. Safety recommendations, issued in 2023

4.2.1. Railway accident – fire occurred in locomotive № 91520044169-8, serviced fast train № 2610 in Mezdra South station on 06.01.2023

Safety recommendations: (13.04.2023)

- With recommendation 1, it is suggested that SE NRIC and "BDZ-Passenger Transport" EOOD familiarize the interested personnel with the contents of this report;
- With recommendation 2, it is suggested that BDZ PP EOOD restores the performance of monthly talks and trainings of the operating and repair personnel in the locomotive depots;
- With recommendation 3, BDZ PP EOOD is proposed to replace all elastic joints in the transformer oil cooling circuits of locomotives series 44 and 45 with metal elastic joints;
- With recommendation 4, BDZ PP EOOD is proposed to TP to carry out checks on the serviceability of the baroscopes to control the operation of the engine-pumps, as well as the condition of their starting capacitors;

- With recommendation 5, BDZ PP EOOD is proposed to design, develop and install a new PGI on the locomotive series 44 and 45;
- With recommendation 6, BDZ PP EOOD is proposed to create an organization to amend and supplement the departmental regulation PLS 100/2018 for the recovery of overhaul repairs and bring the inter-repair runs of locomotive series 43, 44 and 45;
- With recommendation 7, BDZ PP EOOD is proposed to take actions to limit the access of the locomotive crew to the devices and electrical hard connections for control in device cabinets M1 and M2 in the first and second cabins of locomotives series 44 and 45;
- With recommendation 8, BDZ PP EOOD is proposed to install video recorders on the two front walls of the locomotives with visibility to the railway infrastructure and in the two command cabins of the locomotives.

Undertaken measures

The eight given recommendations have been implemented.

4.2.2. Railway accident – derailment of wagons of IDFT M/TB № 40832 in Banya station on 26.02.2023

Safety recommendations: (01.08.2023)

- With recommendation 1, it is suggested that SE NRIC and "DB Cargo Bulgaria" EOOD familiarize the interested personnel with the content of this report.
- With recommendation 2, it is suggested that "DB Cargo Bulgaria" EOOD, when accepting rolling stock at the border stations, which will be served by the railway company, to increase the quality and control when performing the technical inspections.
- With recommendation 3, it is proposed that the SE NRIC build a control point (Check Point) between the Kapikule and Svilengrad border stations with the following functionalities:
 - o Measurement of the vertical load on the left/right wheel of the wheelsets in motion of the road transport vehicle;
 - o Deviations from the shape of the wheels (trenched and layered tires) of the road transport vehicle;
 - o Dimensional frame.

Undertaken measures

Two recommendations have been implemented.

One recommendation has been accepted for implementation.

4.2.3. Railway accident – fire in locomotive № 91520044063-3, serviced passenger train № 80132 in Yambol station on 20.07.2023

Safety recommendations: (15.09.2023)

- With recommendation 1, it is suggested that SE NRIC and "BDZ-Passenger Transport" EOOD familiarize the interested personnel with the contents of this report;
- With recommendation 2, BDZ PP EOOD is proposed to carry out an analysis of the damage that occurred that led to accidents and the subsequent repairs as necessary;
- With recommendation 3, BDZ PP EOOD is proposed to carry out a comprehensive change of the regulations for the repair and maintenance of the electric locomotives series 43, 44 and 45, which have not been overhauled (PDR-LS 0103/1978 and PZR - PLS 127/2005);

• With recommendation 4, BDZ PP EOOD is proposed to conduct periodic trainings to increase the professional qualification of the engineering and technical personnel engaged in the repair and maintenance of locomotives;

• With recommendation 5, it is suggested that BDZ PP EOOD assigns to the locomotive depots every locomotive entered for TP, the engine compartment to be cleaned regularly with a vacuum cleaner, and the large aggregates to be dismantled and thoroughly cleaned at each MPR;

• With recommendation 6, it is suggested that BDZ PP EOOD equip the locomotive depots with infrared cameras to detect the places with increased temperature after prolonged operation of the locomotive.

Undertaken measures

The six given recommendations have been implemented.

4.3. Safety recommendations, issued in 2024.

4.3.1. Significant accident – run over of two employees by locomotive №98522051522-7, between Section point № 4 and Iliyantsi station on 07.11.2023

Safety recommendations: (25.06.2024)

• With recommendation 1, it is suggested that SE NRIC and CTVB JSC inform the interested staff with the contents of this report;

• With recommendation 2, it is suggested to the SE NRIC that the authorities for safety and health at work undertake systematic inspections regarding the quality of the types of briefings conducted (including daily ones) by the direct supervisors and the entries in the briefing books;

• With recommendation 3, it is suggested to the SE NRIC that the occupational safety and health authorities organize and conduct trainings for the direct supervisors conducting the types of personnel briefings in the railway sections, paying attention to the risk assessment and accompanying hazards in the types of works on the rail track;

• With recommendation 4, it is suggested that SE NRIC systematically conduct trainings for personnel working with mechanized equipment and machines, for which legal capacity is required;

• With recommendation 5, CTVB JSC is proposed to supplement the texts regarding safety and control over the implementation of the provisions in the "Instructions for the work of locomotive drivers and assistant drivers when performing train and shunting activities" and in "Management of "Movement" of "Cargo Trans Vagon Bulgaria" JSC, part of the Safety Management System;

• With recommendation 6, CTVB JSC is proposed to correct and supplement the texts in the book for daily instruction regarding the safety of the movement of shunting trains in the interstation SP 4 - Iliyantsi

Undertaken measures:

One recommendation has been implemented.

Five recommendations have been accepted and not implemented.



4.3.2. Railway accident – fire in locomotive № 91520044202-7, serviced international fast train № 464 between the stations Zmeyovo – Tulovo on 01.12.2023

Safety recommendations: (06.02.2024)

- With recommendation 1, it is proposed that SE NRIC and "BDZ-Passenger Transport" EOOD familiarize the interested personnel with the contents of this report;
- With recommendation 2, BDZ PP EOOD is proposed to undertake the replacement of capacitors with electrolyte of the R-C groups with dry type capacitors of locomotive series 44 and 45;
- With recommendation 3, BDZ PP EOOD is proposed to install technical means (thermostats) for temperature control of rectifier groups 020 and 022 of locomotive series 44 and 45;
- With recommendation 4, it is proposed that BDZ PP EOOD restore the power supply to the electronic unit for controlling the auxiliary machines Y2 from the own transformer 222, in accordance with the design schemes of the manufacturing plant for series 44 and 45;
- With recommendation 5, BDZ PP EOOD is proposed to organize and carry out renovation (overhaul) of the locomotives of series 44 and 45, which are due for overhaul.

Undertaken measures:

One recommendation has been implemented.

One recommendation has been accepted and not implemented.

Three recommendations have been accepted in implementation.

Pursuant to the requirements Directive (EU) 2016/798 and Ordinance № 59, the addressees of recommendations regularly report to the Head of the National Railway Transport Accidents Investigation Board on the measures taken or planned for implementation as a result from the issued recommendations.

Dr Eng. Boycho Skrobanski

Deputy President of the NAMRTAIB AB

Head of NRTAIB Unit