REPUBLIC OF BULGARIA

MINISTRY OF TRANSPORT, INFORMATION TECHNOLOGY AND COMMUNICATIONS

RAILWAY ACCIDENT INVESTIGATION UNIT (RAIU)

ANNUAL REPORT

2017

The current report shall be published in accordance with:

- Directive 2004/49/EC;
- Railway Transport Act, 2000, prom., in force from 26.06.2015;
- Ordinance № 59, 2006, prom., in force from 31.07.2015

The normative acts are available on:
https://www.mtitc.government.bg/bg/category/161

CONTENT

Introduction

The current annual report presents the investigated railway events in 2017, as well as the activity of the national investigation body in the Republic of Bulgaria in accordance with Art. 23, paragraph 3 of Directive 2004/49/EC regarding the safety of the railway transport in the Community.

The report presents the activity of the national investigation body, which in the Republic of Bulgaria is the "Railway Accident Investigation Unit" (RAIU) in the Ministry of Transport, Information Technology and Communications (MTITC). Its statute and functions are laid down in the Railway Transport Act (RTA), Ordinance № 59 of 05.12.2006 on the safety management in railway transport, Ordinance № N-32 of September 19, 2007 on the coordination of the actions and the exchange of information during investigation of railway accidents and incidents together with the bodies of the pre-litigation proceedings and Rules of the Railway Accident Investigation Unit.

The report contains data for the conducted investigations of railway accidents in 2017, including the reasons for their occurrence and the given recommendations for improvement of the safety of the railway transport, as well as information for the undertaken measures from the addressees for their implementation. Summarized data for the implemented railway events in 2017 and the caused damages, reported by the "Manager of the Railway Infrastructure", respectively the National Company "Railway Infrastructure" (NC RI) and the railway enterprises.

1. INVESTIGATION BODY

1.1. Legal basis

In relation to the requirements of Directive 2004/49/EC of the European Parliament and the Council of 29.04.2004 regarding the safety of the railway transport in the Community, which is transposed in the "Railway Transport Act" (RTA) and Ordinance № 59/05.12.2006 for the safety management of the railway transport. In 2006 in Republic of Bulgaria was created a national body for investigation of the railway accidents and incidents – "Railway Accident Investigation Unit" (RAIU) in the Ministry of Transport, Information Technology and Communications (MTITC).

RAIU is in the structure of Directorate "Air, Water and Railway Accident Investigation Unit" (AWRAIU) in MTITC. The Directorate is a multimodular body, containing of three independent specialized units for investigation of air events, accidents in the sea areas and accidents and incidents in the railway transport.

RAIU is a national body for investigation of railway events in the Republic of Bulgaria, which in its organization and in decision taking is independent of the manager of the railway infrastructure, railway enterprises and National Safety Authority (NSA), which, in the Republic of Bulgaria, is the Executive Agency "Railway Administration" (EARA).

1.2. Functions and goals

The main goal of RAIU in conducting an investigation is to establish the circumstances and reasons that have led to the occurrence of the railway accident and incident and to issue effective recommendations, aiming at improvement of the safety of the railway transport.

The functions and tasks of RAIU are presented in details in the national normative acts, in which Directive 2004/49/EC is transposed of the European Parliament and Council regarding the safety of the railway transport in the Community.

Main functions and responsibilities of RAIU:

- Organizing, coordinating and implementing technical investigations of serious railway accidents and incidents, occurred on the territory and in the border crossings of the Republic of Bulgaria;
- Establishing the technical reasons, circumstances and facts, related to the occurrence of serious railway accidents and incidents, including identification of proofs, implementation of analysis, including the human factor, decision making, preparation of technical expertise and documentation;
- Coordinating the activities on the implementation the technical investigations with the competent investigation bodies of the Prosecutor's Office of the Republic of Bulgaria – National Investigation Office (NIO) and Ministry of Interior (MI);
- Preparing and sending to all interested parties a project of the final report on the investigation of a serious accident;
- Preparing and sending to all interested parties and publishing a final report on the investigation together with given recommendations for safety, aiming at prevention of future accidents;
- Participating in the activity of the EU Member States Network of the Bodies for Investigation of Railway Accidents, coordinated by the European Union Railway Agency (EURA);
- Participating in work groups for harmonizing the national normative legislation with the European legislation, related to the safety and investigation of the railway accidents and incidents;
- Analyzing data on occurred accidents and incidents in the system of the railway transport;
- Keeping an archive for the investigated accidents and incidents and maintaining an information database;

1.3.Organization of the activity

The main activity of RAIU as a national investigation body is to conduct technical investigation on occurred railway events, classified in accordance with Art.19 of Directive 2004/49/EC.

In 2017 RAIU has conducted investigation on railway events, consisting of three inspectors:

- state inspector of the investigation – head of RAIU with PhD qualification, master engineer, specializing in "Exploitation and Management of the Railway Transport";

- main inspector of the investigation with master engineer qualification, specializing in "Exploitation of rolling railway stock";

- inspector of the investigation with master engineer qualification, specializing in "Electronic-computing machines and devices – Design of computing machines".

The budget funds of the Unit shall be planned and provided by MTITC.

The decision to undertake an investigation shall be taken by the head of the RAIU in accordance with the requirements of:

- Directive 2004/49/EC;
- Railway Transport Act;
- Ordinance № 59/05.12.2006 on the safety management in the railway transport.

RAIU shall inform in writing the European Union Railway Agency EURA for each undertaken investigation of a railway event through the ERAIL system. The investigations shall be closed by preparing a project of a report and a final report, which shall be made publicly available on the MTITC website.

RAIU shall inform in writing EURA for each completed investigation by providing an electronic copy of the original final report in English. After validation by EURA, the final report shall be made publicly available on the Agency's website.

International activity in 2017.

1. Participation of 2 (two) inspectors of the investigation in 33rd Plenary Meeting of the EU Member States Network of the Bodies for Investigation of Railway Accidents, conducted in the period 22nd – 23rd March 2017

2. Participation of 2 (two) inspectors of the investigation in 34th Plenary Meeting of the EU Member States Network of the Bodies for Investigation of Railway Accidents, conducted in the period 17th - 18th May 2017

3. Participation of 2 (two) inspectors of the investigation in 35th Plenary Meeting of the EU Member States Network of the Bodies for Investigation of Railway Accidents, conducted in the period 22nd – 23rd May 2017.

Participation of RAIU in other activities

1. After receiving monthly statistical information for the common safety indicators by the manager of the railway infrastructure and railway enterprises in relation to the requirements of Ordinance № 59/5.12.2006, RAIU shall implement an analysis and shall summarize the data for the safety management in the railway transport. In this connection, it has been made an analysis on the safety management for 2017, based on the data in the provided annual reports by the manager of the railway infrastructure and railway enterprises;

2. RAIU monitors daily the reports on the exploitation status in relation to the safety recommendations;

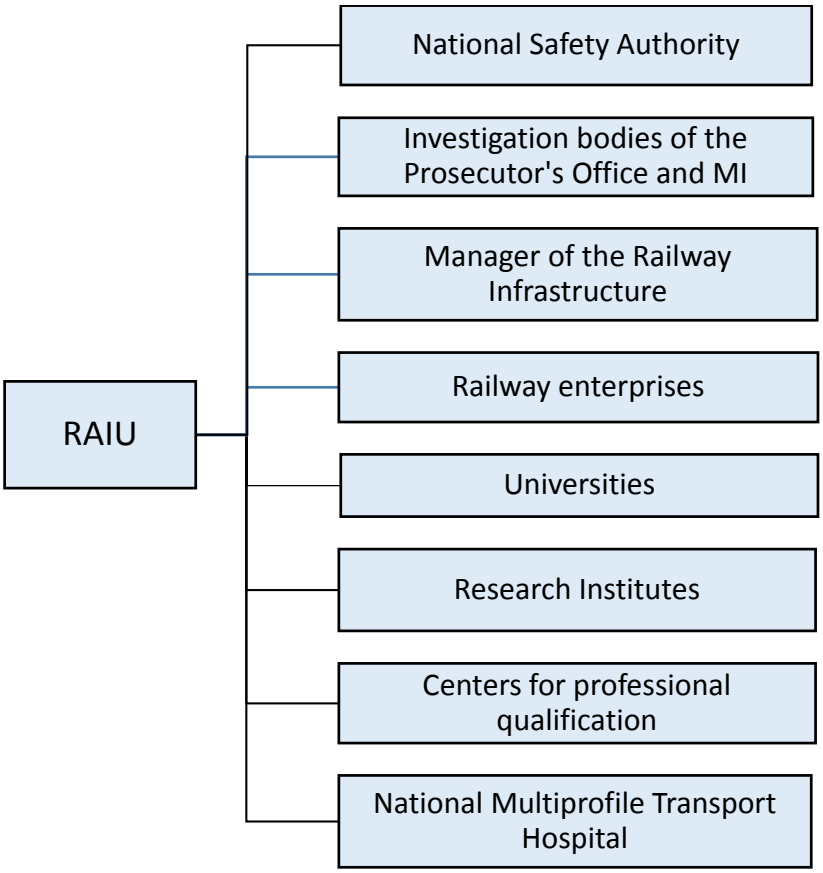
3. Preparing and publishing an annual report on the activity during the previous year, which shall be sent to the European Union Railway Agency in term.

1.4. Organizational scheme

In order to create the necessary conditions and organization for timely and effective operational activity, in the process of conducting an investigation RAIU coordinates its actions with state investigation bodies on pre-litigation proceedings, the Prosecutor's Office, NIO and MI, which carry out a parallel pre-litigation investigation. If necessary, it shall be implemented regulated exchange of information, obtained by the separate investigation bodies in accordance with Ordinance N–32/19.09.2007 for the coordination of the actions and the exchange of information during an investigation of railway accidents and incidents.

In the course of the investigation, RAIU shall create work contacts and shall coordinate its actions with the manager of the railway infrastructure, railway enterprises/carriers, National Safety Authority and consumers of railway services in relation to the investigation accident or incident, in order to provide information, related to the investigation, as well as other independent institutions and specialized administrations for expertise preparation.

Connection of RAIU with other investigation bodies and institutions



2. PROCESS OF INVESTIGATION

2.1. Events that shall be investigated

All railway events, referred in Directive 2004/49/EC, RTA and Ordinance № 59, may be investigated by RAIU as follows:

- Serious railway accidents;
- Accidents and incidents which, under different circumstances, could have the effect of the serious railway accidents;
- By its judgment, it can investigate also technical damages in the structural subsystems and elements of the operational compatibility by taking into account their significance.

In a case of an accident or incident, the authorized officials of the manager of the railway infrastructure and railway enterprises shall inform immediately the head of RAIU, according to the approved safety procedures in compliance with RTA and Ordinance № 59.

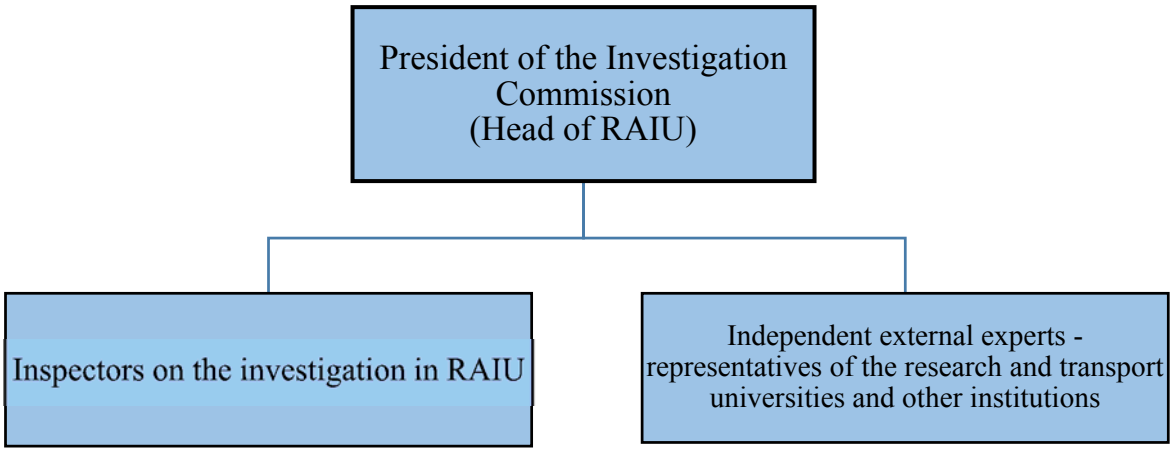
2.2. Institutions, related to the investigation.

After classification of the railway event and decision taking for the initiation of an investigation by the head of RAIU, it shall be created an Investigation Commission. The Commission, which is led by a president (the head of the unit), is composed of inspectors on the investigation from the Unit and independent external experts from the academia, and transport universities, specializing in accordance with the specifics of the investigated event. In the course of and for the aims of the investigation, the president of the Commission shall assign the implementation of the technical expertise, shall require analysis and statements from:

- Research Transport Institute;
- Technical University - Sofia;

- Transport University "Todor Kableshkov";
- Professional training centers for railway staff;
- Bulgarian Academy of Science;
- National Multiprofile Transport Hospital;
- Other institutions for any concrete case.

Structure of the Commission for investigation of railway events



2.3. Investigation process and an approach of the investigation authority

Upon each notification to the head of RAIU for a railway event, he/she shall classify it in accordance with the normative acts. After an assessment and decision by the head of the RAIU to initiate an investigation, actions shall be immediately taken for organizing and informing all interested parties in the event. The inspectors on the investigation shall move quickly to the place of the event. In a term of a week after the initiation of the investigation, RAIU shall inform in writing ERA for the undertaken investigation through the ERAIL system.

The president shall lead and coordinate the activity on the technical investigation together with the pre-litigation proceedings bodies – Prosecutor's Office of RB, NIO, MI, "Civil Protection", "Emergency Medical Assistance", "Fire Safety and Protection of the Population" (FSPP) and other institutions, related to the provision of the necessary conditions for implementation of an independent technical investigation. The manager of the railway infrastructure, railway enterprise and the other legal persons, participating in the event, shall provide to the Investigation Commission all records and conversations of the staff, who participated in the management of the movement of the trains, as well as all other important information and documents, related to the signalization, railway road and the rolling railway stock. Upon a request of RAIU, the National Safety Authority shall provide any important information, that give clarity on the investigated accident or incident. The Commission shall hold meetings and interviews with the staff, that participated in the accident, as well as with witnesses on the event and shall require statements in writing from all legal and natural persons, directly and indirectly connected with the event. The Commission receives the full support and help from the competent state investigation authorities of the Prosecutor's Office of RB and MI, which conduct their own parallel investigation, according to the requirements of the Criminal Procedure Code (CPC). The technical investigation, implemented by RAIU, shall be conducted as openly as possible in order to exchange information, opinions and statements at all levels and with all parties, involved in the event. The Commission shall analyze the collected documents, materials, prepared statements and expertise before, during and after the accident, until clarifying the circumstances and reasons that had led to its occurrence.

The president of the Commission, depending on the severity of the investigated accident, shall prepare a project of the final report and send it to all participants in the accident, NSA, affected representatives of structures and organizations, as well as to the relatives of the victims in the accident. Each accident or incident within one year since the date of its occurrence shall be closed with a final report, otherwise there shall be prepared an intermediate report which describes the undertaken actions at the time. In the final report are described the chronology of the events, staff's actions, the established data for killed and injured persons and material damages, analysis of the event and circumstances, and in details, the reasons for its occurrence. If necessary, recommendations for improvement of the safety shall be prepared in order to prevent other similar events, which shall be addressed to the NSA and direct implementers – the manager of the railway infrastructure and the involved in the accident enterprises/carriers, and where appropriate – to all other interested participants in the event. The addressees of the recommendations are obligated to inform in writing the head of RAIU for the undertaken measures on the implementation of the recommendations within the specified terms.

RAIU shall inform in writing EURA about the completion of the investigation by entering the required data and information, including the given recommendations, through the interface and through the ERAIL information system and shall apply a copy of the original final report in English. The final report shall be publicly available on the RAIU website on the MTITC Internet portal.

2.4. Research of the safety of the annual reports in 2017.

RAIU received the annual reports by the manager of the railway infrastructure and railway enterprises with a total of 746 registered railway events in 2017, of which:

- 343 accidents, including 202 – train collisions, 3 – train collision with railway vehicle, 43 – derailment of a railway rolling stock, 23 – accidents on level crossing, 54 - accidents with people, 10 – fire in railway rolling stock and 8 - other;

- 53 incidents, including 28 – damage on a railway road, 23 – missed prohibition signal, 1 – broken wheel of railway rolling stock and 1 – damage in the security equipment (SE);

- 350 situations, similar to incidents.

The total number of the registered significant accidents from the National Company "Railway Infrastructure" is 47, including 1 collision of trains with obstacles in the borders of the building gauge clearance, 5 derailments, 11 accidents on level crossing and 29 accidents with people, caused by rolling stock in motion, excluding suicides and attempts at suicide.

The summarized data for railway accidents show that in 2017 a total of 16 people have died and 28 have been seriously injured as a result of the accidents with people, caused by RRS in motion.

The amount of the caused material damages on rolling stock and railway infrastructure as a result of significant railway accidents is 455 112 lv. (EUR 232 401).

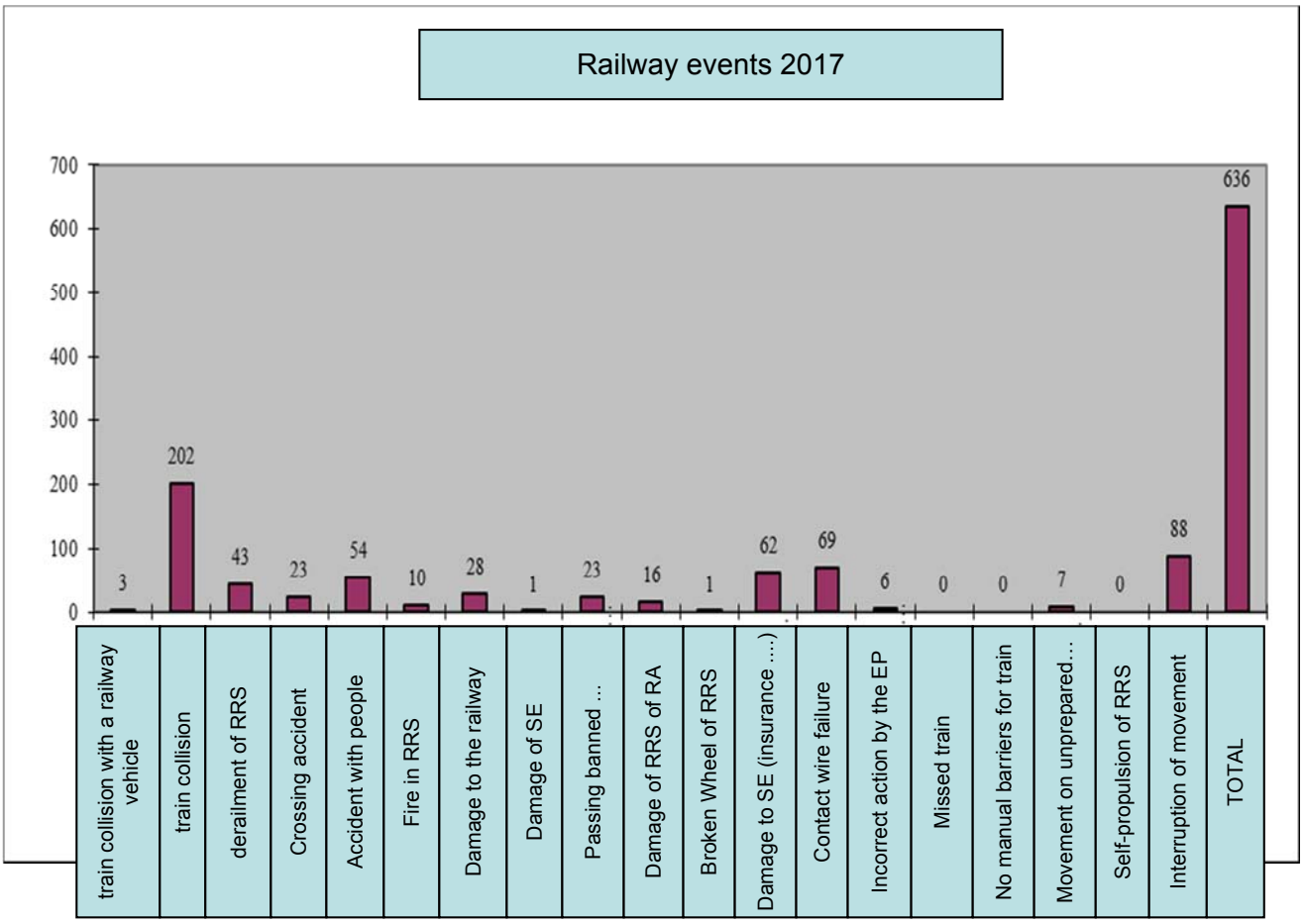
The summarized data for the railway events, occurred in 2017, are presented by type in Table 1:

Table 1: Railway events, registered by NCRI in 2017.

№	TYPE OF THE EVENT	NUMBER
	ACCIDENTS	
1	Collision of a train with railway vehicle	3
2	Collision of a train	202
3	Derailment of RRS	43

№	TYPE OF THE EVENT	NUMBER
4	Accident on level crossing	23
5	Accident with people	54
6	Fire in RRS	10
7	Other	8
	Total:	**343**
	INCIDENTS	
1	Damage on railway road	28
2	Damage of SE	1
3	Missed prohibition signal	23
4	Broken wheel of RRS	1
	Total:	**53**
	SITUATIONS, SIMILAR TO INCIDENTS	
1	Damage of RRS on RI, causing delay	16
2	Damage on railway road	102
3	Damage of SE	62
4	Damage of contact network	69
5	Incorrect or incoherent actions of EP from RI	6
6	Missed train	0
7	Accepted train on a busy line	0
8	Sent train without agreement	0
9	Sent train on a busy interstation	0
10	Uninsured train with brake mass	0
11	No dropped manual barriers for trains	0
12	Movement on unprepared route	7
13	Damage in RRS on RI, leading to derailment	0
14	Selfmovement of RRS	0
15	Abandoned RRS outside the remote indicators	0
16	Interruption of movement	88
	Total :	**350**

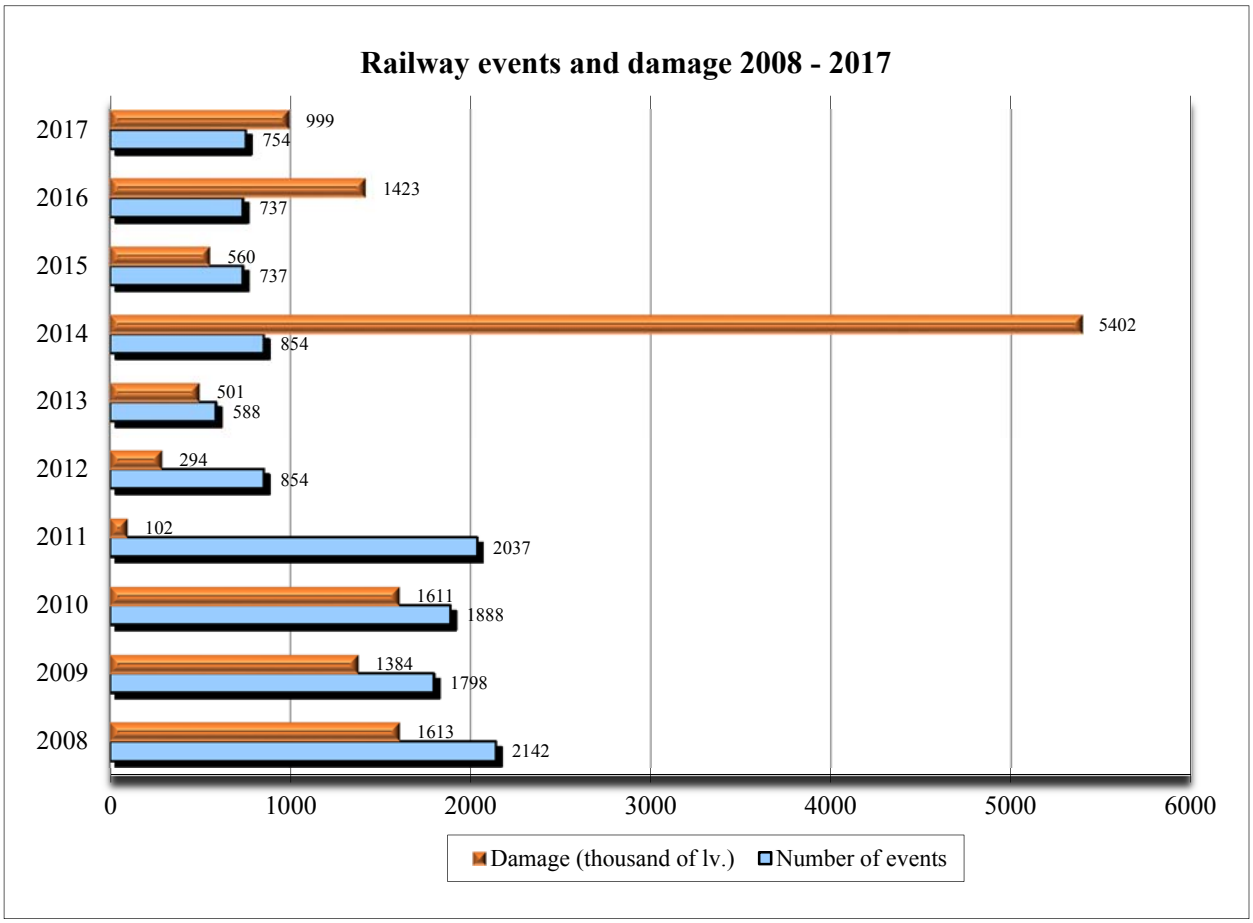
Chart of the railway events on the railway network in 2017.



Railway events with caused damage

In 2013 compared to 2012, the deviation damage / BGN is +206 902 lv. (+105 787 EUR)
In 2014 compared to 2013, the deviation damage / BGN is +5 402 000 lv. (+2 762 000 EUR)
In 2015 compared to 2014, the deviation damage / BGN is -4 842 076 lv. (-2 472 591 EUR)
In 2016 compared to 2015, the deviation damage / BGN is + 863 286 lv. (+ 440 452 EUR)
In 2017 compared to 2016, the deviation damage / BGN is -136 200 lv. (-69 597 EUR)

Chart of the railway events and caused damage on the railway network in the period 2008 - 2017



3. INVESTIGATIONS

3.1. Summary of the completed investigations

In 2017 RAIU has investigated five railway accidents, including one serious railway accident.

Table 2: Investigated accidents and incidents in 2017

Type of the investigated accidents and incidents	Number of accidents	Number of victims		Damages	
		Deaths	Serious injuries	BGN	EURO
Derailment of RRS	5	-	-	4 081 177	2 082 233
Fire in RRS	1	-	-	6 057	3 090
TOTAL:	**6**	-	-	**4 087 234**	**2 085 323**

3.2. Investigations, initiated and completed in 2017

Table 3: Investigations, completed in 2017

Date of the event	Card of the investigation	Legal basis	Completed on:
28.08.2016.	Railway accident – derailment of seven full wagons from the composition of freight train № 50505 during transition through station Petarch	Directive 2004/49/EC, Art. 19, par. 2/a, Art. 115i, par. 2 of RTA, Art. 76 of Ordinance № 59	02.02.2017
03.09.2016 г.	Railway accident – derailment of six full wagons from the composition of freight train № 50501 between stations Voluyak - Hrabarsko	Directive 2004/49/EC, Art. 19, par. 2/a, Art. 115i, par. 2 of RTA, Art. 76 of Ordinance № 59	08.02.2017
14.09.2016 г.	Serious railway accident – derailment of twelve full tank-wagons from the composition of freight train № 90570 upon entry into the Hitrino station on arrow № 5 and ignition of one of them	Directive 2004/49/EC, Art. 19, par. 1/a, Art. 115k, par. 2 of RTA, Art. 76 of Ordinance № 59	29.09.2017
09.02.2017 г..	Railway accident – derailment of a tank-wagon of a freight train № 30582 between stations Dulgopol - Komunari № 2	Directive 2004/49/EC, Art. 19, par. 2/a, Art. 115k, par. 2 of RTA, Art. 76 of Ordinance № 59	04.08.2017
04.05.2017 г.	Railway accident – derailment of electric locomotive № 86018.9 from the composition of freight train № 30690 in front of Pirdop station on 04.05.2017. The investigation continues.	Directive 2004/49/EC, Art. 19, par. 2/b, Art. 115i, par. 2 of RTA, Art. 76 of Ordinance № 59	30.08.2017

3.2.1. Derailment of seven full wagons from the composition of freight train № 50505 during transition through station Petarch.

Short description

On 28.08.2016 freight train № 50505 of railway carrier BSR „Freight transports“ Ltd. consisting of 12 wagons full of coal, 48 axes, gross mass 924 tons, serviced by two electric locomotives № 43551.1 – train and № 45166.6 – auxiliary pushing, was moving in direction Stayantsi – Voluyak – Razmenna – Batanovtsi - Dupnitsa.

The train left from the manueuvering area Stayantsi at 12:24 a.m. and arrived at Kalotina station at 1:08 p.m., where it spent 109 min. to change the diesel locomotive with 2 electric locomotives. After a 37-minute stay at Dragoman station, the train left at 3:47 p.m., passing through the next stations.

At 4:10 p.m. the train passed at speed 70km/h on the third main line at Petarch station. After its transition through arrow № 2 there was a crashing noise and the train stopped. On site inspection, the on-duty stationary switchman established that seven wagons derailed and lied down from the composition of the train (from fourth to tenth), and the carried cargo was scattered.

Consequences

As a result of the derailment of the train there were no victims. There were material damages on the railway rolling stock, railway infrastructure and the carried cargo.

The traffic on the railway infrastructure was interrupted, the total amount of the damage was 203249 lv.

Reasons

The immediate technical reason that caused the derailment of the train was the detachment of the retainer for axle-box spring, holding the outer and inner springs for the wing of the left axle-box of the second axle shaft of the first cart of fourth wagon in direction of the train movement.

Status of the investigation

The investigation was completed with a final report and two recommendations on 02.02.2017.

3.2.2. Derailment of six full wagons from the composition of freight train № 50501 between stations Voluyak - Hrabarsko.

Short description

At the request of "BSR – Freight Transport" Ltd. on 03.09.2016 was assigned a freight train № 10690, containing of 18 full wagons (coal), 72 axes and gross mass 1348 tons, serviced by electric locomotive № 46033.7. with a route Plovdiv-shunting yard – Plovdiv – Sofia - Voluyak. The train arrived at Iskar station at 5:00 a.m. and after changing the locomotive brigades, it left for Voluyak station at 5:20 a.m. The train stayed 6 min. at Voluyak station due to change in the train number and change in the brake mass certificate, and implementation of the abbreviated sample "D" of the automatic train brake. The train left Voluyak station under № 50501 in direction Voluyak – Razmenna – Batanovtsi - Dupnitsa. During the movement of the train in the interstation Voluyak – Hrabarsko on km 14+055, wagon № 31 52 665 1221-1 ,twelfth in line in the composition, derailed, with the first axle shaft of the first cart of the wagon, on the right of the direction of movement and continued its movement, and as a result the second axle shaft on the right derailed. In this condition (with derailed first cart), the train continued moving and the locomotive brigade did not notice or feel this. When the train entered a curved line on the railway road with radius R-500 m from km 23+164 to km 24+830, after the twelfth wagon, five more wagons of the train derailed from 13th to 17th and at the same time the train breaks between fifth and sixth, and between eleventh and twelfth wagon.

Consequences

There were no dead or injured people.

The caused damage on the rolling stock and the railway infrastructure from its interruption amounted to 484153 BGN.

Reasons

The intermediate technical reason that caused the accident was: Incorrect loading and distribution of the loose cargo in twelfth wagon in the train, as a result of which the central gudgeon of the first cart worked aggressively during the movement and the entry of the cart was hampered, which had led to the lifting of the right wheel of the first axle shaft of the first cart of the head of the rail without any trace.

Status of the investigation

The investigation was completed with a final report and four recommendations on 08.02.2017.

3.2.3. Derailment of twelve tank-wagons from the composition of freight train № 90570 upon entry into the Hitrino station on third line on arrow № 5.

Short description

On 10.12.2016 freight train № 90570 left Drujba station for Ruse-north station, consisting of two electric locomotives and 26 tank-wagons, 23 of which were full and 3 were empty. The route of the train was Drujba – Karnobat – Sindel-shunting yard – Ruse-north. During its movement, the train changed twice its direction, respectively at Karnobat station and Sindel-shunting yard. After the train left Sindel-shunting yard station, it passed through the next stations without the staff on-duty noticed something unusual during its movement at stations. At 5:35 a.m. the head on-duty at Hitrino station went in front of the entry building of the station to meet the arriving freight train № 90570.

At 5:37 a.m. the train entered Hitrino station and when it crossed the level crossing, which is positioned in the orifice (the side of Pliska station), the head on-duty saw sparkles, coming out of the wheels. Shortly after, the light of the level crossing extinguished and only part of the train continued moving to the station.

Most of the train established in the arrow orifice next to post № 2. The post shunter at Post № 2 called the head on-duty to inform him/her that train № 90570 had derailed. During the conversation, the post shunter felt heavy steamy smell, which was followed by a powerful blast.

Status of the investigation

The investigation was completed with a final report and 16 (sixteen) recommendations on 29.09.2017.

Consequences

As a result of the derailment, the balloon of the tenth tank-wagon was pierced (№ 33877915652-4), from which the carried cargo (propylene) leaked and ignited. There was a big fire which covered a significant area of the village.

Seven residents were killed and other 29 were injured, including serious trauma, and 1 employee on shift as shunter at Post № 2.

The total amount of the damage and expenses for the recovery of the rolling stock, railway infrastructure and interruption of the accident was: 3 238 891,13 lv.

Reasons

The main reason for the accident is non-observation of the speed on a prepared route for entry of freight train № 90570 on 3rd diversion line at Hitrino station.

Through arrow № 1 the train passed at speed 81 km/h and through arrow № 5 at speed 78 km/h when the limit was 40 km/h for entry in a deviation of third entry-dispatch line with a stop. When the train entered the station, it did not follow the permitted indicators of the warning and entry traffic lights, limiting the speed to 40 km/h in accordance with Art. 317, p. 3 and Art. 324, par. 2 and par. 3, p. 5 of Ordinance № 58. There was not followed also the signal for speed limit of 60 km/h through the entry arrows when entering the main line because of the type of locking the arrows at Hitrino station, according to Art. 384, par. 1 and par. 2 of Ordinance № 58.

3.2.4. Derailment of a tank-wagon of freight train № 30582 between stations Dulgopol - Komunari on road № 2.

Short description

On 09.02.2017 a full tank-wagon of propane-butane from the composition of freight train № 30582, serviced by Bulgarian Railway Company SOJSC, derailed with its first cart on road № 2 in the interstation Dulgopol - Komunari. The locomotive brigade did not notice the derailment. When the train entered Komunari station and after crossing arrows № 101, 3 and 5, the tank-wagon went up again on the rail road.

Consequences

As a result of the accident there were no victims but serious material damages were caused on 4 477 m of the rail road, on arrows № 101, 3 and 5 and on the derailed wagon. The staff and passengers were not injured.

Reasons

The reason which led to the accident was an obviously moved center of the gravity of the tank-wagon in transverse direction, visible from the established two-sided gaps in the sliding of the two carts and the basket, as well as the loosening of the press assembly of a wheel-axis, which disturbed the distance between the bandages of the first leading axle shaft of the wagon and this made it difficult for the cart to enter the curved line in the rail road.

Status of the investigation

The investigation was completed with a final report and 3 recommendations on 04.08.2017.

3.2.5. Derailment of electric locomotive № 86018.9 from freight train № 30690 upon entry into Pirdop station on 04.05.2017.

Short description

On 04.05.2017 freight train № 30690, serviced by railway carrier "DB Cargo Bulgaria" Ltd., was moving on route Burgas – Karlovo – Pirdop with three locomotives, two of which in off-day (cold) condition and 23 empty wagons. In front of the entry signal at Pirdop station, the second locomotive № 86018.9 derailed with the first axle shaft. The derailment was a result of a broken axis on the first axle shaft.

Consequences

As a result of the accident no staff was injured.

The material damages on the locomotive and railway infrastructure amounted to 39 200 BGN.

Reasons

The reason which led to the accident was a break in the first axle shaft in the direction of movement of locomotive № 86018.9 in the area of the transition to the back of the head-stock, resulting in weariness of the material and presence of multiple cracks on the outer surface of the axis.

Status of the investigation

The investigation was completed with a final report and recommendations on 30.08.2017.

Pursuant to Art.23, paragraph 2 of Directive 2004/49EC of the EP and the Council, the data and the final reports from all the above investigations were entered in English in the ERAIL information system of the European Union Railway Agency.

3.3. Investigations, started in 2017 and continued in 2018.

Table 4: Investigations, started in 2017 and continued in 2018.

Date of the event	Card of the investigation	Legal basis	Stage
12.10.2017.	Occurance of a fire in electrical locomotive № 44134.2, serving fast train № 8693 in Dimitrovgrad station.	Directive 2004/49/EC, Art. 19, par. 2/a, Art. 115k, par. 1, p.2 of RTA, Art. 76 of Ordinance № 59	The investigation continues in 2018

3.3.1. Occurance of a fire in electrical locomotive № 44134.2, serving fast train № 8693 in Dimitrovgrad station on 12.10.2017.

Short description

On 12.10.2017 fast train № 8693 left Sofia station, consisting of 4 passenger wagons, serviced by electric locomotive № 44134.2. The train was moving in direction Sofia – Plovdiv – Dimitrovgrad – Burgas under the Schedule for Movement of Trains (SMT), the train left Sofia station at 1:20 p.m. without any technical defects. At 1:22 p.m. between Sofia station and Poduyane station happened the first disconnection of the locomotive. When the train left Elin Pelin station at 1:50 p.m. it happened the second disconnection. There were not established other disconnections during the movement of the train to Plovdiv station. In the area from Sofia station to Plovdiv station the locomotive was working with all traction engines turned on. The train arrived at Dimitrovgrad station at 4:47 p.m. with indication for ground union. A locomotive maneuver was taken to change the direction of the train. After movement for 1.5 minutes, during which the locomotive passed 480 m, occurred self-ignition in the engine room. The motormen stopped the locomotive, started extinguishing the fire with the available extinguishers and called 112. After the truck of the fire safety arrived at Dimitrovgrad station at 5:10 p.m., the fire was localized and at around 5:32 p.m. it was extinguished.

There were no injured passengers and staff. There were material damages on the locomotive.

Status of the investigation

The investigation continues in 2018.

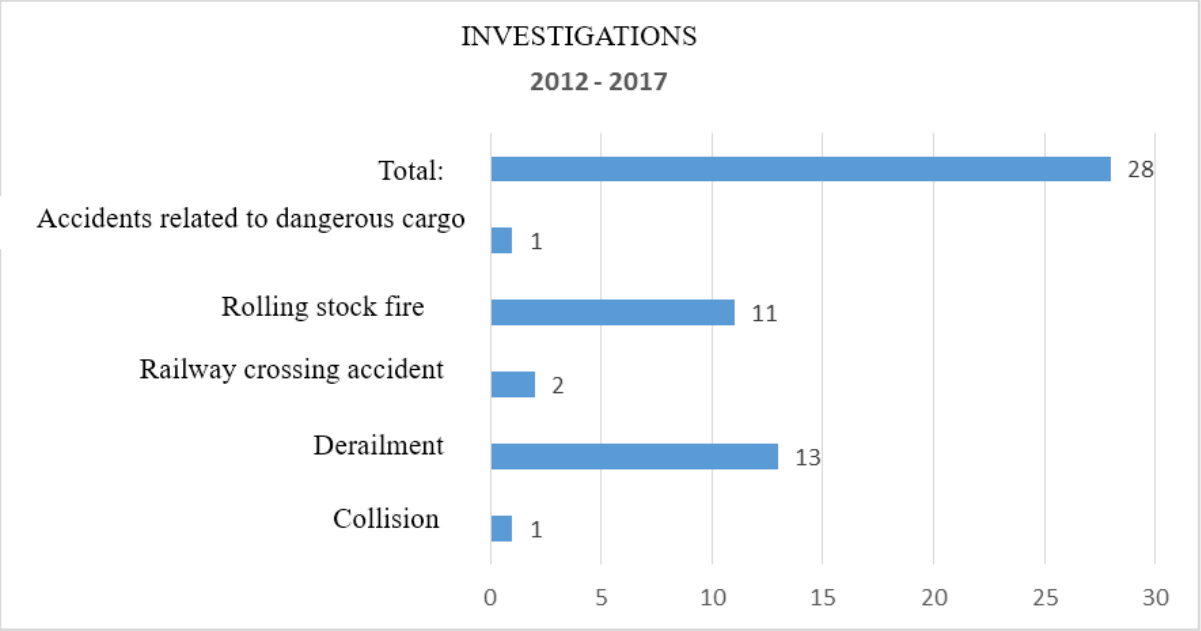
3.4. Accidents and incidents, investigated in the last five years.

Table 5: Investigated accidents and incidents in the period 2012 – 2017.

Investigated events	2012	2013	2014	2015	2016	2017	Total
Collision	-	-	-	1	-	-	**1**
Collision with an obstacle	-	-	-	-	-	-	**0**
Derailment of a train	-	1	2	1	4	**5**	**13**

Accident on level crossing	-	-	2	-	-	-	**2**
Accident with a person, caused by RRS in movement	-	-	-	-	-	-	**0**
Fire in rolling stock	1	2	2	1	4	**1**	**11**
Accident, connected with dangerous cargo	-	-	-	-	1	-	**1**
Incidents	-	-	-	-	-	-	**0**
Total:	**1**	**3**	**6**	**3**	**9**	**6**	**26**

Diagram of the investigated accidents and incidents in the period 2012 – 2017



4. SAFETY RECOMMENDATIONS

The safety recommendations given by the Railway Accident Investigation Unit (RAIU) are intended to improve safety and prevent other railway accidents. The recommendations are addressed to the National Safety Authority, the manager of the railway infrastructure, the railway enterprises and other entities having their own railway transport and/or performing acceptance and delivery activities for taking measures and actions ensuring safety.

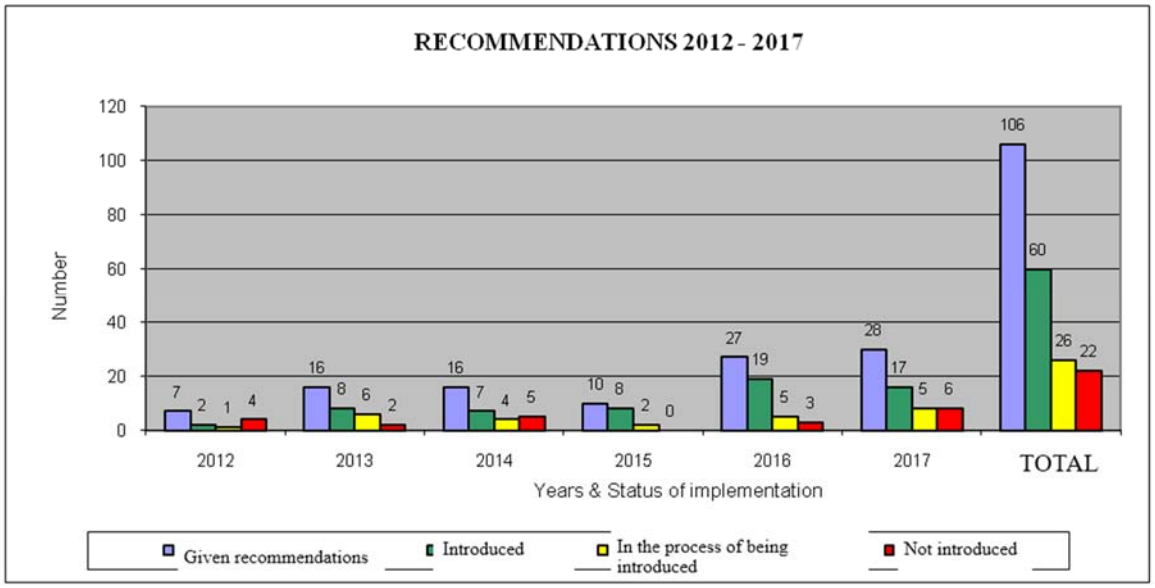
4.1. A brief review and presentation of the recommendations

Table 6: Giving and introducing recommendations within the period 2012 – 2017

Year	Given recommendations	Status of implementation of the recommendations		
		Implemented	In the process of being implemented	Accepted and not 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
Total:	**104**	**61**	**23**	**20**

A diagram of the recommendations given by the Railway Accident Investigation Unit within the period 2012 – 2017



4.2. Safety recommendations given in the year 2017

2017
Event: **Derailment of freight train № 50505 when passing through Petarch train station on 28.08.2016** Safety recommendations: (02.02.2017) 1. The railway carrier BDZ Freight Services Ltd shall increase the control over the correct loading of the carriages in the areas for loading and unloading bulk goods. 2. Improve the quality of the technical inspections conducted by the technical staff of the carrier BDZ Freight Services and Bobov Dol Power Plant EAD - the owner of the carriages utilized on the railway infrastructure. *Adopted measures* Recommendations 1 and 2 have been implemented.
Event: **Derailment of six full carriages of freight train No. 50501 between the train stations Voluyak and Hrabarsko.** *Safety recommendations:* (08.02.2017) 1. The railway carrier BDZ Freight Services Ltd and the consignors of bulk goods shall construct weight-measuring devices for the vertical loading of each wheel of the freight carriages in the areas where the loading and unloading activities are performed.

2. When technically possible, a Check Point system shall be constructed for controlling the rolling stock in motion of the railway infrastructure of the National Railway Infrastructure Company.

3. The railway carrier BDZ Freight Services Ltd shall increase the control over the proper loading of the carriages before they have been included in a train composition.

4. The railway carrier BDZ Freight Services Ltd shall increase the control over the fulfillment of the obligations of the engine brigades servicing the trains.

Adopted measures

Recommendations 3 and 4 have been implemented

Recommendations 1 and 2 are in the process of being implemented

Event: **Derailment of twelve full tank carriages of freight train № 90570 when entering Hitrino railway station at platform three of switch № 5.**

Safety recommendations: (29.09.2017)

1. The Railway Administration Executive Agency shall recommend the heads of the railway carriers and the Director-General of the National Railway Infrastructure Company to give lectures to the staff on the safety of the transport, to familiarize themselves with the content of the final report from the conducted investigation.

2. The tank carriages carrying liquefied hydrocarbon gases shall be equipped with traction and deflection devices with crash elements based on the requirements of BDS EN 15227:2008+A1:2010 and shall also possess a safety certificate.

3. The Railway Administration Executive Agency shall order the cancellation of the possibility for the owners of carriages carrying dangerous goods to take a decision themselves about the duration of the period between the repairs of the running gear, the chassis and the traction and deflection facilities, which is currently 4 or 6 years and also to stipulate the repairs to be conducted every 4 years like the requirements towards the tanks carrying dangerous goods which are included in the RID Regulations.

4. The border train stations shall allow the entry into the country of carriages carrying dangerous goods along the railway infrastructure which have the necessary documents proving their technical roadworthiness provided by the respective railway carrier.

5. The Railway Administration Executive Agency shall organize permanently, and not sporadically, controlling examinations of the operation staff related to the transport safety, in connection with the requirements of article 6, paragraph 1 of Ordinance No. 56 of 2003 and it will be compulsory for these examinations to be preceded by periodic training sessions and to be related to the assessment of the theoretical background and the practical skills of the engine drivers using stimulators which enable the evaluation of their reactions in emergency and stressful situations;

6. The Railway Administration Executive Agency shall prepare the technical conditions for providing an approved recording system and shall oblige all the railway carriers and the manager of the railway infrastructure as well as the owners of a traction rolling stock (TRS) to mount this system on their traction vehicles. The system shall be made in a way that will guarantee its capacity to record the most important parameters of the operation of the respective vehicle:

- ✓ Speed;
- ✓ Distance run;
- ✓ Astronomical time;
- ✓ Duration of the run and duration of the stay;

- ✓ Activation of an automatic train brake or if this has been done by the crane operator or in another section of the train;
- ✓ Activation of an additional (direct) brake;
- ✓ Activation of another type of brake mounted on the vehicle and values of the executed braking power;
- ✓ Position of the controller (value of the traction force);
- ✓ Current in the traction engines;
- ✓ Voltage within the catenary;
- ✓ Revolutions of the diesel (or another) engine;
- ✓ Maintaining the readiness of the alert device by the engine driver;
- ✓ Condition of the alert device (on – off);
- ✓ Giving a sound signal with the whistle of the traction vehicle;
- ✓ Personalization of the operation of the respective vehicle with the help of a chip, a magnetic card or in another appropriate manner and blocking the movement in case of a lack of personalization and identification by the operation staff;
- ✓ The devices shall be constructed in a way that will enable the transport safety authorities (the National Safety Authority and the departmental authorities) and the investigation authorities to download the necessary information immediately without having to transform or process it;

7. Every time the rolling stock is set in motion along the railway infrastructure, its technical condition is checked by a carriage inspector, an official of the railway infrastructure, which shall be duly written in the train documentation;

8. The Railway Administration Executive Agency shall oblige all the carriers to supply their traction rolling stock with alert devices having a changeable activation time which shall not result in monotony of the operation staff;

9. The management of Bulmarket Rail Cargo Ltd shall organize training courses for acquiring a professional qualification in part of the profession, which will be conducted by a licensed organization in accordance with article 9, paragraph 5 of the Law on professional education and training;

10. Bulmarket Rail Cargo Ltd shall increase the control over the issue of passes to the engines and the process of giving pre-shift instructions to the staff and also provide breaks in accordance with the requirements of the legislation;

11. Bulmarket Rail Cargo Ltd shall increase the control over the inspections conducted by the control authorities regarding the technical condition of the rolling stock and the staff related to the transport safety;

12. Bulmarket Rail Cargo Ltd shall specify the requirements for employing engine drivers who have acquired the right to receive a pension based on their contributory length of service and old age depending on the labour category.

13. The National Railway Infrastructure Company shall organize and conduct training courses of the staff of all train stations so that they will be able to react adequately in case of railway accidents.

14. To change the timetable of the freight trains carrying dangerous cargo so as to allow them to pass without stopping along the main lines of the train stations, moving at a speed close to the one permitted at the respective railway sections, with a reserve in the duration of the travel.

15. The National Railway Infrastructure Company shall organize the immediate construction and integration of a system controlling the rolling stock in motion (“Check Point”) along the railway network of the Republic of Bulgaria.

16. The National Railway Infrastructure Company, along with the railway enterprises conducting transportation with their own rolling stock, shall organize the immediate construction and integration of an automated engine signal system – equipment along the railway network of the Republic of Bulgaria and board equipment of the engines and the motor carriage trains.

Adopted measures

Recommendations 1, 4, 7, 9, 10, 11, 12 and 13 have been implemented;
Recommendations 14, 15 and 16 are in the process of being implemented.
Recommendations 2, 3, 5, 6 and 8 have not been implemented.

Event: **Derailment of a tank carriage of freight train № 30582 between the stations Dalgopol and Komunari along route No. 2 on 09.02.2017**

Safety recommendations: (04.08.2017)

1. To update the knowledge and raise the awareness of the staff of Bulgarian Railway Company AD conducting technical inspections in the border areas upon the entry of the rolling stock owned by foreign railway carriers which runs along the railway infrastructure of the Republic of Bulgaria.
2. The engine drivers shall watch for peculiarities emerging during the running of the trains they are operating and in case of any faults of the rolling stock, they shall immediately take measures for halting in order to prevent any accidents.
3. Integration in the railway infrastructure of an automated system for monitoring and control of the rolling stock in motion which shall notify any faults of the running gear (wheel pairs, axle bearings, spring hanger and unevenly loaded carriages).

Adopted measures

Recommendations 1, 2, and 3 have been implemented.

Event: **Derailment of a tank carriage of freight train № 30582 between the stations Dalgopol and Komunari along route No. 2 on 09.02.2017**

Safety recommendations: (30.08.2017)

1. The technical staff of DBI Cargo Bulgaria Ltd related to the safety of the railway transport of non-traction rolling stock shall strictly and accurately observe the requirements stipulated in article 243, paragraph 4 of Ordinance No. 58/2006, article 89, paragraph 4 and article 309, paragraph 1 and paragraph 3 of the Regulations for railway traffic and maneuvering and also in the safety management system.
2. The railway carrier DBI Cargo Ltd shall organize the training of the engine staff utilizing the respective engine series at a licensed educational institution in accordance with the requirements of article 18, item 6 of the Law on professional education and training and also in accordance with article 44, paragraph 1, item 1 of Ordinance No. 56/2003 in order for them to obtain a new certificate of professional training.
3. The management of Express Service Ltd shall take measures to thoroughly conduct the ultrasound flaw inspections of the engine wheel pairs and axles and strictly apply the technology for assembling the engine wheel pairs.

Adopted measures

Recommendations 1 and 3 have been implemented.
Recommendation 2 has not been implemented.

For the purpose of observing article 94, paragraph 4 of Ordinance No. 59 dated 05.12.2006, the addressees of the recommendations are obliged to inform the head of the Railway Accident Investigation Unit about the implementation of the given recommendations once a year.

Dr. Eng. Boycho Skrobanski

Head of the Railway Accident Investigation Unit of the Ministry of Transport, Information Technology and Communications

I, the undersigned Galina Krasimirova Grozeva in my capacity of official translator, hereby certify that the above instrument, consisting of 23 pages is a true and complete translation into English of the attached official document, originally composed in Bulgarian. In testimony thereof I have hereunto set my hand and affixed the official seal of the company. Translator:Galina Krasimirova Grozeva