



REPUBLIC OF SERBIA
CENTER FOR INVESTIGATION OF ACCIDENTS IN TRANSPORT
SECTOR FOR INVESTIGATION OF ACCIDENTS IN RAILWAY TRAFFIC
AND INTERNATIONAL COOPERATION
Nemanjina 11, 11000 Belgrade

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ANNUAL REPORT FOR 2017



Center for Investigation of Accidents in Transport (hereinafter referred to as CINS) is independent in its work and performs independent accident investigations. The aim of an investigation is to identify the causes and the possibility of improving safety on the railways and to prevent accidents by issuing safety recommendations.

In accordance with the Article 33 of the Law on Investigation of Air, Rail and Water Traffic Accidents (*“Official Gazette of the RS” No. 66/15*) and the Article 23 of the Directive 2004/49/EC of the European Parliament and of the Council of EU (Directive on Railway Safety), CINS drafted and published the Annual Report.

Annual report for 2017 consists of:

- Information on CINS
- Investigation procedure in the field of railway transport
- Investigations opened in 2017
- Investigations closed in 2017
- Issued safety recommendations
- Measures taken on the basis of the issued safety recommendations



Glossary:

RS	.....	Republic of Serbia
CINS	.....	Center for Investigation of Accidents in Transport
MGSI	.....	Ministry of Construction, Transport and Infrastructure
IŽS	.....	Serbian Railways Infrastructure
a.d.	.....	Joint Stock Company
JŽ	.....	Yugoslav Railways
ZJŽ	.....	Community of Yugoslav Railways
TK	.....	Tele-command
EMV	.....	Electric train
JP	.....	Public Enterprise
EPS	Electrical Power Industry of Serbia
TENT	Thermo Power Plant “Nikola Tesla“



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1. CINS

1.1. Legal basis

Implementing the Directive 2004/49/EC of the European Parliament and of the Council of EU of the RS is performed by bringing the Law on Investigation of Air, Rail and Water Traffic Accidents (*“Official Gazette of the RS” No. 66/15*) and Law on safety and interoperability of Railway (*“Official Gazette RS” No.104/13, 66/15 - other law and 92/15*).

CINS, comprising of the Sector for Investigation of Accidents in Railway Transport and International Relations, is a special organization which conducts investigation after serious accidents at the railway system. Apart from serious accidents, CINS can investigate other accidents and incidents, which could lead to serious accidents, including technical breakdown of the structural subsystems or of interoperability factors in accordance with the Law on Investigation of Air, Rail and Water Traffic Accidents (*“Official Gazette of the RS” No. 66/15*).

According to the Law on safety and interoperability of Railway (*“Official Gazette RS No.104/13, 66/15 - other law and 92/15*) the Infrastructure Manager and Railway Undertaker must carry out tasks on investigation into the causes and consequences of accidents and incidents in rail transport as well as the circumstances in which they incurred.

By Law on Investigation of Air, Rail and Water Traffic Accidents (*“Official Gazette of the RS” No. 66/15*), CINS, Sector for Investigation of Accidents in Railway Transport and International Cooperation conducts investigation independent of all the sides and organizations responsible for railway traffic.

Professional activities related to the investigation are independent from criminal investigations or other parallel investigations that determine liability or determine the degree of guilt.

Investigation and discovering of the causes of accidents is not aimed at establishing criminal, economic, misdemeanor, disciplinary, civil or other responsibilities.

1.2. Role and goal

CINS has been established in accordance with the Law on Investigation of Air, Rail and Water Traffic Accidents (*“Official Gazette of RS” No. 66/15*). Sector for Investigations of Accidents in Railway Traffic and International Cooperation carries out tasks within the competence of the CINS in relation to rail traffic with the aim of possible improvement of safety on the railways by issuing safety recommendations.

The Law on Investigation of Air, Rail and Water Traffic Accidents (*“Official Gazette of RS” No. 66/15*) does not apply to subway (metro), trams and other types of light rail.

The main tasks of the CINS, Sector for Investigation of Accidents in Railway Traffic and International Cooperation are:

- Investigation of serious accidents, other accidents and incidents occurring on the railways system.
- Preparation of final reports on conducted investigations that may contain safety recommendations aiming to improve safety of rail traffic.



CINS performs other tasks stipulated by Law on Investigation of Air, Rail and Water Traffic Accidents ("Official Gazette of RS" No. 66/15).

1.3. Organisation of CINS

Within the CINS there are three Sectors for investigation of accidents in air, rail and water traffic. A specific internal unit, Group for financial, legal and personal affair, has been established within CINS.

CINS's structure has been presented in Fig. 1.3.1.

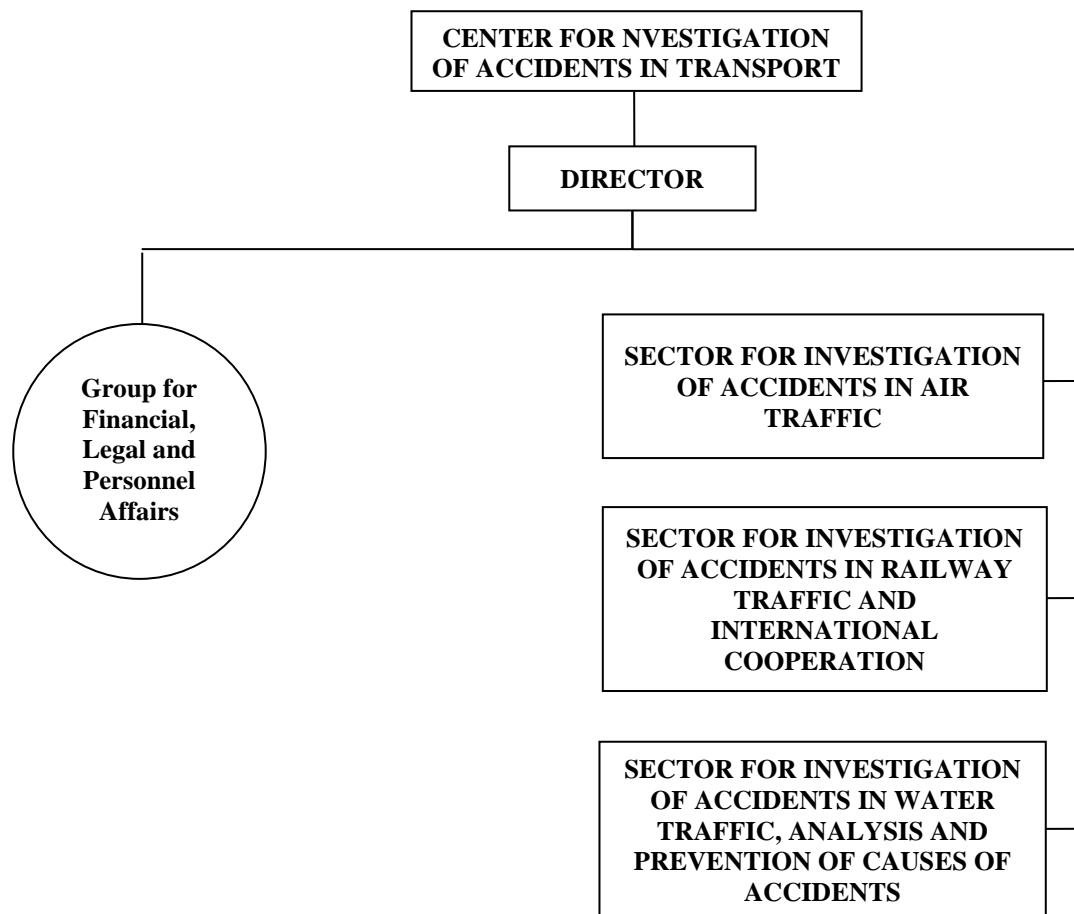


Figure 1.3.1.: Structure of CINS

Sector for Investigations of Accidents in Railway Traffic and International Cooperation within CINS has become operational since 26 June 2017 and consists of the Main Investigator for Rail Transport and Senior Adviser for coordination of investigation and railway accidents analysis.

CINS, Sector for Investigations of Accidents in Railway Traffic and International Cooperation is independent in its work and of all other bodies and organisations in charge of railway traffic (MGSI, Directorate for Railways, Infrastructure Manager and Railway



Undertakings), as well as of all legal and natural persons whose interests may be in conflict with the tasks and authorities of CINS.

1.4. Organisations responsible for the railway system

Organisations responsible for the railway system in the RS are MGSI, Directorate for Railways and CINS.

MGSI carries out state administration affairs related to the regulation and security of the transport system. MGSI is in charge of drafting laws passed by a legislative body. The legislative body in the RS is the National Assembly. MGSI sets the legal framework by developing the railway regulations and implementing of EU legislation. MGSI also carries out supervision of internal and international transport and intermodal transport, regulation and safety of the technical and technological traffic system.

Directorate for Railways (hereinafter referred to as: Directorate) carries out affairs of the state administration in the field of railways, defined by the Law on Railway ("Official Gazette of RS" No. 45/2013 and 91/2015) and the Law on Safety and Interoperability of Railway ("Official Gazette of RS", No. 104/2013, 66/2015 - other law and 92/2015). The Directorate performs tasks related to regulation of the market of railway services and tasks related to regulation of safety and interoperability of rail traffic. Directorate is competent to issue, suspend and withdraw the safety certificate for Infrastructure Managers and Railway Undertakings, to pass secondary legislation, to participate in international cooperation in the field of rail traffic which is realised by the MGSI.

CINS is a special organization which performs state administration affairs in the field of investigation of accidents and incidents according to the Law on Investigation of Air, Rail and Water Traffic Accidents ("Official Gazette of RS" No. 66/15).

2. INVESTIGATION PROCEDURE IN THE FIELD OF RAILWAY TRAFFIC

2.1. Accidents and incidents being investigated

Based on the Law on Investigation of Air, Rail and Water Traffic Accidents ("Official Gazette of RS" No. 66/15), CINS conducts investigations after serious accidents on the railway system with a view of possible improvement of railway safety and the prevention of new accidents caused by the same or similar causes. In addition to serious accidents, CINS can investigate other accidents and incidents that could lead to a serious accident, including the technical failure of structural subsystems or interoperability constituents.

CINS has the discretion to decide whether to open an investigation of other accidents and incidents.

In rendering its decision, CINS shall take into account the seriousness of accidents and incidents; whether other accidents or incidents are part of a chain of accidents, or incidents of significance for the system as a whole, their impact on the safety of the railway network of the RS, as well as the railway network of the European Union, whether there is a request from the Infrastructure Manager, Railway Undertaking, the Directorate or competent authorities of other countries, as well as an assessment of the benefits for gaining new knowledge from accident and accident research that would have an impact on the safety of the rail system.



According to the Law on Investigation of Air, Rail and Water Traffic Accidents ("Official Gazette of RS" No. 66/15), accidents and incidents may be:

1. Serious accident in railway traffic is a collision, overtaking of the train or derailment which results in the death of at least one person or serious injury to five or more persons or causing great material damage to the railway vehicles, railway infrastructure, or the environment, as well as other similar accident which has an obvious impact on railway safety or the safety management.
2. Accident in railway traffic is undesirable or unintended sudden event or a specific sequence of such events, which has detrimental effects (collisions, derailments, an overtaking of the train, level crossing accidents, accidents with the participation of individuals caused by railway vehicles in motion, fires, etc.).
3. Incident in the railway traffic is an event that is associated with the railway transportation or shunting composition and adversely affects the safety of the traffic.

Great damage in rail transport is the damage that CINS, by accessing the accident site, assesses in the amount of at least two million euro.

Investigation refers to a process which includes the data collection and analysis, making conclusions, including the determination of causes and depending on the case giving safety recommendations with the aim of prevention of serious accidents in railway traffic.

Lethal injury is injury caused to a person in a serious accident in the railway traffic, resulting in the death of that person within 30 days from the injuries inflicted during serious accident in railway traffic.

Seriously injured person is any injured person who is hospitalized for more than 24 hours due to the consequences of an accident, excluding attempted suicides.

2.2. Organisations involved in investigation process

Investigations of serious accidents, other accidents and incidents on the railway system can be performed by different organizations in accordance with their legal obligations as follows:

- Infrastructure Manager and Railway Undertakings, pursuant to the Law on Safety and Interoperability of Railway ("Official Gazette of RS", No. 104/2013, 66/2015 - other law and 92/2015) and with their safety management systems (SMS) deal with determining the causes and taking measures based on the results of investigation.

- CINS investigates serious accidents, other accidents and incidents with the aim to determine the causes and give safety recommendations in order to improve safety of the railway system.

- The Public Prosecutor's Office and Police investigate an accident or incident in order to determine liability for committed infringement or criminal offense.



2.3. CINS's approach to an investigation

CINS, i.e. Sector for Investigation of Railway Traffic Accidents and International Cooperation carries out an investigation to determine the causes in order to provide safety recommendations in terms of preventive actions aiming to reduce the number of accidents and incidents and improve the safety of the railway system. Investigations carried out by the CINS do not seek to determine liability.

CINS is on standby 24 hours, 7 days a week.

For the purpose of the investigation of any accident or incident Director of CINS forms by the Decision a Working Group led by Main Investigator for Rail Traffic and for the members of the working group other employees of CINS i.e. the Sector for Investigation of Accidents in Railway Traffic and International Cooperation are appointed, which are involved in the affairs of the investigation of accidents and incidents as well as other professionals outside of CINS.

After the CINS receives notification of an accident or an incident on the railway system, it makes the decision whether to go on the site of the accident or incident or not. At the site of the accident or incident, the investigator will conduct an investigation and check the collected facts and procedures, undertaken by the Infrastructure Manager and Railway Undertaking (if in the investigation of the accident or incident one of them or both are involved).

The decision to launch an investigation can be made immediately after the receipt of notification of accident or incident occurred or after all relevant facts necessary for making the decision to launch the investigation of an accident or incident are collected.

After an investigation has been launched, not later than seven days from the decision, CINS, Sector for Investigations of Railway Traffic Accidents and International Cooperation shall inform the MGSI and The European Union Agency for Railways (ERA) on launched investigation.

Upon completion of the investigation, CINS publishes the final report and safety recommendation. The report form is in accordance with the Rulebook on the Content of the Final Report on Investigations of Accidents and Incidents in Railway Traffic ("Official Gazette of RS" No. 89/15).



3. INVESTIGATIONS OPENED IN 2017

Since the Sector for Investigations of Rail Traffic Accidents and International Cooperation has become operational on 26 June 2017, in 2017 has launched seven investigations in total.

Basic data on investigations that Sector for Investigations of Accidents in Railway Traffic and International Cooperation has launched in 2017 are shown in Table 3.1.

Table 3.1: Review of investigations launched in 2017

TYPE OF ACCIDENT OR INCIDENT	No.	[%]
Serious accidents	2	28.6
Accidents	4	57.1
Incidents	1	14.3
TOTAL:	7	100.0

Basic data about the dead and injured persons for investigation that the Sector for investigation of accidents in railway traffic and international cooperation launched in 2017, are summarized in Table 3.2

Table 3.2: Review of dead and injured persons for investigations launched in 2017

	Passengers	Railway staff	Third parties	Total
Dead	-	-	2	2
Seriously injured	-	-	3	3
Lightly injured	-	-	2	2

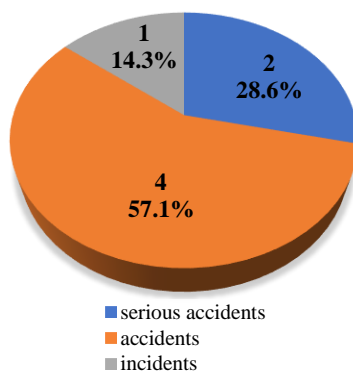


Fig. 3.1: Investigations launched in 2017

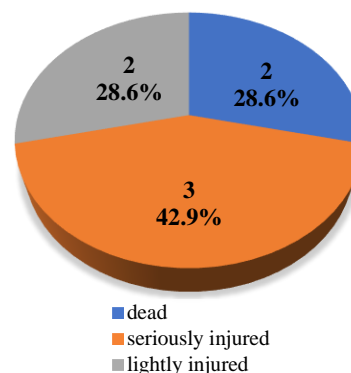


Fig. 3.2: Dead and injured in 2017

3.1. Decoupling of train No. 8011

On 03 August 2017 at 07:55 at the *km 3+817* of the main arterial route *E 66*: Belgrade Centre - Pančevo Main Station - Vršac - State border - (*Stamora Moravita*), in the area of junction and the stop Pančevački Most, on the right track of the double-track railway, when driving in the direction from the station Vukov Spomenik to the junction and the stop Pančevački Most, after passing beside the protective signal *Su 92*, the train No. 8011 decoupled (train from BG VOZ system, EMV 412/416-061/085). The accident occurred in the city of Belgrade, between the junction and the stop Pančevački Most, on the section located in a tunnel below the city center.



Fig. 3.1.1: Appearance of the part of decoupled clutch on the trailer 416-004



Fig. 3.1.2: Appearance of the part of decoupled clutch on the motor vehicle 412-061

The train No. 8011 operated regularly on the route Batajnica - Ovča. The train, as viewed in the direction of movement, consisted of: power car 412-061, trailer 416-004, trailer 416-003 and power car 412-085. Power car 412-061 (Driver's cab) was possessed by train driver. Decoupling occurred between power car 412-061 and trailer 416-004. The distance between the end of power car 412-061 and beginning of the trailer 416-004 amounted 159 m.

The location on which the train No. 8011 stopped (forehead of power car 412-061) after decoupling is located at *km 4+080*, in the tunnel at a distance of 595 m from the exit of the tunnel (at *km 4+675*). At the time of decoupling, in the train, according to the train conductor judgement, were about 30 passengers.

Category: Incident

Dead and injured: None

Material damage: On the infrastructure and railway vehicles

3.2. Derailment of train No. 62946

On 16 August 2017 at 15:30 on the main railway arterial route: Belgrade Marshalling Yard "A" - Junction "B" - Junction "K" - Resnik, between junctions "B" and "K", the train No. 62946 derailed. From the train composition, viewed from the driving locomotive 441-512, the fifth wagon series *Regs-z* No. 31 72 3924 169-6 derailed, with one bogie (two axles), front

bogie, viewed in the direction of the train's movement. The derailed wagon was loaded with two containers with crushed stone. The accident occurred in the city of Belgrade, between tunnel and viaduct in an uninhabited part of the settlement of the city Železnik. After derailment, the train passed another 1869 m after which it stopped.



Fig. 3.2.1: Appearance of part of derailed bogie



Fig. 3.2.2: First traces of derailment

The train was not decoupled. Derailed wagon was found in the track zone, on their wheels. There was no tilting or overturning of the wagon and there was no movement or dissipation of the load.

Interruption of traffic lasted until 11 October 2017 at 14:30.

Category: Accident
Dead and injured: None
Material damage: On the infrastructure and railway vehicles

3.3. On the level crossing, overtaking of the train No. 4905 on the road vehicle

On 21 August 2017 at 19:38 at the km 268+318 of the main arterial route E 70/E 85: Belgrade - Mladenovac - Lapovo - Niš - Preševo - state border - (Tabanovce), at level crossing PBE 1, secured with automatic devices on the crossings (half-barriers and road light and sound signaling), which is located in the settlement Brestovac in the area of the switch block 2 of unmanned TK station Brestovac (between entrance signal from the direction of crossing Pečenjevce and first entrance switch), there was an overtaking of the train No. 4905 on the road vehicle brand Ford type Galaxy, registration number NI 161-CL.



Fig. 3.3.1: Appearance of level crossing (from the direction of the settlement Kutleš)



Fig. 3.3.2: Appearance of the damages on loc. 441-707

Road passenger vehicle of the brand Ford type Galaxy, registration number NI 161-CL was moving the state road IIA order mark 225: Gadžin han - Brestovac - Bojnik - Lebane in the direction to centre of Brestovac and in the area of crossing has entered the profile of the track just before the arrival of the train.

Train No. 4905 was moving towards the arterial route *E 70/E 85*: Belgrade - Mladenovac - Niš - Preševo - state border - (Tabanovce), from the direction of station Doljevac to the direction of crossing Pečenjevce. The train operated regularly on the route Niš - Preševo. Viewed from the direction of movement, the train consisted of: locomotive 441-707 and two wagons of series Bt (wagon No. 50 72 2076 008-0 and No. 50 72 2076 010-6). After being at the station Brestovac because of the needs of the passengers, train No. 4905 was launched from 3rd main running track in the direction towards the crossing Pečenjevce. After the transition of the train to the output of the switch area, on encounter of the crossing PBE 1, there has been an overtaking of the train on the road passenger vehicle that immediately prior to the arrival of the train has entered into the profile of the railroad. Overtaking occurred so that the right part of the forehead of train locomotive struck the left port side of the road vehicle (as seen in the direction of the train or road vehicle movement).

After overtaking, the train continued moving at length of 66 m, after which it stopped, so that the forehead of locomotive was found at *km 268+384*. On that occasion, the train was pushing the road vehicle ahead at a distance of about 10 m, after which the vehicle is rejected outside track to the right, as viewed in the direction of the train movement.

At the moment of serious accident, according to the conductor's judgement, there were about 40 passengers in the train.

- Category:** Serious accident
- Dead and injured:** 1 dead person, 2 seriously and 2 lightly injured (the listed persons were in the road vehicle)
- Material damage:** On the infrastructure and railway vehicles

3.4. Derailment of the shunting composition

On 17 September 2017 at 08:45 at *km* 1+935 of the main arterial route E70/E85: (Belgrade) - Rakovica - Jajinci - Mala Krsna - Velika Plana, between junction "K1" and station Rakovica, in the area of Belgrade, in the city settlement Knezevac, on the section located on the embankment, from pushed shunting composition there has been derailment of the first wagon next to locomotive (wagon type Arbel, series Faboo No.43 72 6531 273-0) with one axle. Derailment occurred in the way that the left wheel of derailed axle, viewed in the direction of train's movement, derailed on the outside of the track, and the right wheel fell into a track. After derailment, shunting composition transferred more 5.25 m after which it stopped.



Fig. 3.4.1: Appearance of derailed wagon



Fig. 3.4.2: Appearance of derailed wagon

Shunting composition consisted of locomotive 661-116 and 10 wagons type Arbel series Faboo. Wagons from shunting composition were part of the train No. 53786, in which on 16 September 2017 at 13:05 at *km* 1+938 derailment occurred of one wagon Arbel type series Faboo (the first car to driving locomotive 461-125).

Wagons type Arbel, series Faboo that were part of shunting composition are owned by JP "EPS", a branch TENT Obrenovac, the locomotive 661-116 is owned by Railway Undertaking "Srbija Kargo" a.d.

The wagon type Arbel, series Faboo, consisting of two two-axle parts, form an permanently coupled unit. In the respective accident, on the wagon No. 43 72 6531 273-0 derailment of the second axis, as viewed from the locomotive, occurred, in a way that the left wheel of the derailed axis, viewed in the direction of movement of shunting composition, derailed at the outside of the track, and the right wheel fell into track.

Category: Accident
Dead and injured: None
Material damage: On the railway vehicles

3.5. On the level crossing, overtaking of the train No. 4905 on the road vehicle

On 09 October 2017 at 20:26 on the main arterial route E 70/E 85: Belgrade - Mladenovac - Lapovo - Niš - Preševo - state border - (Tabanovce), in the area of the settlement Gornje Polje, at level crossing ensured with the traffic signs on the road and the necessary visibility zone, which is located on the open track between the stations Grdelica and Predejane at km 304+277, there has been overtaking of the train No. 4905 on the road passenger vehicle of the brand Opel type Astra 1.4/5, registration number LE 058-LR.



Fig. 3.5.1: Appearance of level crossing (viewed from the direction of center of Grdelica)



Fig. 3.5.2: Appearance of facility - watchtower

The road vehicle of the brand Opel type Astra 1.4/5 registration number LE 058-LR was moving the uncategorized road from the direction of Grdelica to the settlement Oraovica. By coming to the level crossing at km 304+277, the vehicle did not stop in front of the level crossing, but continued to move and in the area of the level crossing has entered the profile of the track just before the train arrived.

Viewed from the direction of movement, the train consisted of: locomotive 441-746 and two wagons of series B (wagon No. 51 72 2071 003-5 and No. 50 72 2076 012-2).

After being at the station Grdelica because of the needs of the passengers, the train No. 4905 was dispatched from the station Grdelica to the station Predejane. Moving towards the open track to the station Predejane, on reaching the level crossing at km 304+277, there has been overtaking of the train to the road vehicle, which just before the train arrived, has entered the profile of the railway track. Overtaking occurred in a way that the right part of the forehead of train locomotive struck the right port side of the road vehicle (as seen in the direction of moving of the train or road vehicle).

After the overtaking, the train continued moving at length of 129 m. In the moment of stroke, the train pushed the road vehicle out of the track in right, viewed from the direction of moving of the train. The vehicle was found at the right part of the track at 13,5 m from the crossing.

In the train, based on the judgment of a conductor, at the moment of the serious accident, there were 7 passengers.

- Category:** Serious Accident
Dead and injured: 1 dead person, 1 seriously injured (the listed persons were in the road vehicle)
Material damage: On the railway vehicles

3.6. Derailment of train No. 56990

On 03 November 2017 at 15:25 at *km* 33+150 of the local track Markovac - Resavica, between the station Svilajnac and Despotovac, in the area of the municipality Despotovac, in the vicinity of the settlement Vitance, on the section near the point of crossing at level with the local road Despotovac - Vitance - Balajnac (level crossing), there has been a derailment and decoupling of the train No. 56990. From the train composition, viewed from the driving locomotive 661-158, derailed twenty first wagon of series Eas No. 80 72 5952 334-6 with both bogies (four axles). Derailed wagon was loaded with brown coal (Senja - Resavian fine coal). After the derailment, the last derailed wagon stopped at *km* 33+085. Decoupling occurred between the sixth wagon No.80 72 5952 245-4 and seventh wagon No.80 72 5958 891-9 (on the sixth wagon of series Eas No.80 72 5952 245-4 the coupling device was torn). The area where the accident occurred is not populated.



Fig. 3.6.1: Appearance of derailed wagon



Fig. 3.6.2: Appearance of the point of decoupling

Derailed wagon was found in the area of track on its wheels. There was no tilting or overturning of the wagon and there was no movement or dissipation of the load.

All wagons of the series Eas which were in the composition of the train No. were loaded with brown coal (Senja-Resavian fine coal).

- Category:** Accident
Dead and injured: None
Material damage: On the infrastructure and railway vehicles

3.7. Derailment of train No. 53527

On 23 December 2017 at 13:15 at km 122+250 of the regional route Pancevo Main Station - Zrenjanin - Kikinda - Jimbolia, when entering the station Novi Bečej, in the area of the settlement of Novi Bečej, at the train No. 53527 there has been a derailment of eight wagons of the series *Za*, loaded with acetic acid (RID 83/2789). From eight derailed wagons, the four turned upside down on its side, and with three turned over wagons leakage of acetic acid occurred.

From the composition of the train, viewed from the driving locomotive 661-243, the second wagon No. 33 72 7937 501-4 with the first wheel of the first bogie and two wheels of the second bogie derailed, a third wagon No. 33 72 7993 510-6 turned over on its side and from the same wagon the acid leaked, a fourth wagon No. 33 72 7993 519-7 turned over on its side and from the same acid leaked, the fifth wagon No. 33 72 7993 520-5 turned over onto its side, the sixth wagon No. 33 72 7993 516-3 derailed with all axles and remained to stand on its wheels on the embankment at an angle to the axis of track, seventh wagon No. 33 72 7977 585-8 derailed with all axles and remained to stand in the track on its wheels, the eighth wagon No. 33 72 7977 519-7 are turned over on its side and from the same acid leaked, and ninth wagon No. 33 72 7937 503-0 derailed with the first bogie and left to stand in the track area on its wheels.



Fig. 3.7.1: Appearance of derailed wagon



Fig. 3.7.2: Appearance of derailed wagon

The train No. 53527 operated on the route Kikinda - Banatsko Miloševo - Zrenjanin. The train composition consisted of: locomotive 661-243, 14 wagons of series *Za* loaded with acetic acid, 9 wagons of series *Za* empty and 1 wagon of series *Ea* empty.

The interruption of traffic lasted until 29 December 2017 at 14:30.

Category: Accident
Dead and injured: None
Material damage: On the infrastructure, railway vehicles and load

4. REPORTS ON INVESTIGATION COMPLETED IN 2017

4.1. Derailment of train No. 62946

4.1.1. Short description of the accident

On 16 August 2017 at 15:30 on the main arterial route: Belgrade Marshalling Yard "A" - Junction "B" - Junction "K" - Resnik, between junction "B" and junction "K", there has been a derailment of the train No. 62946. From the composition of the train, as seen from the driving locomotive 441-512, fifth wagon derailed of the series Regs-z No. 31 72 3924 169-6, with one bogie (two axles), the front bogie, as seen in the direction of movement of the train. Derailed wagon was loaded with two containers containing of the small crushed stone. After the derailment, the train has crossed another 1869 m and then it stopped.

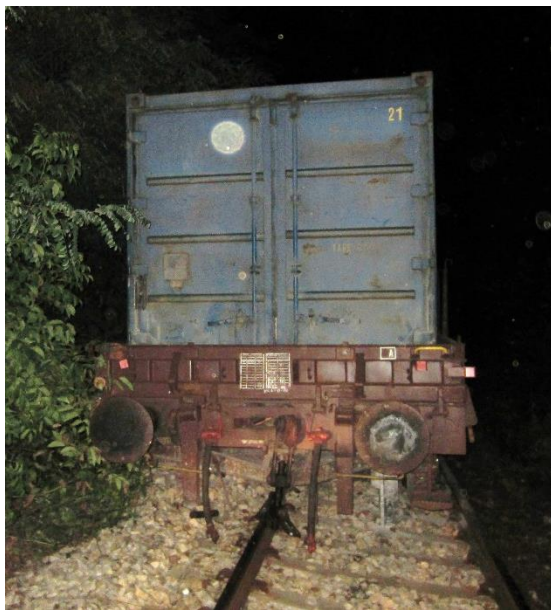


Fig. 4.1.1.1: Appearance of derailed wagon



Fig. 4.1.1.2: Appearance of part of derailed bogie

Category: Accident

Dead and injured: None

Total damage to the wagon:	1 986 775.98	RSD
Total damage to infrastructure:	3 329 859.00	RSD
Total costs of lifting up the derailed wagon:	123 283.67	RSD
Total direct material damage:	5 439 918.65	RSD

Damage is evaluated in the official currency of the RS (Dinar - RSD).

According to the official middle exchange rate of National Bank of Serbia on 16 August.2017, equal to 1 EUR (Euro) = 119.4067 RSD (Dinars), the total material damage in the respective accident amounts to 45 557.90 Euros (EUR).



4.1.2. Causes of the accident determined by the investigation

The direct cause of the accident is unsatisfactory condition of the track on the section on which the accident occurred, and the missing loose fastening accessories and cracked or rotten sleepers in a series of sleepers of at least seven, in combination with partial enlargement of track over the exploitation maximum of +35 mm, where upon under the load occurred rail spacing and fall of front left wheel on the fifth wagon from the composition of the train in track.

Additional cause that facilitated the fall in the track is the fact that on the derailed wagon the thickness of the right flange, of the leading wheel, was at an accepted minimum (22mm).

The track condition on the section where the accident occurred is a direct consequence of the track maintenance, which is below the technically accepted minimum.

The poor condition of the track is partly a consequence of the valid regulation of the Rulebook that regulates the track maintenance.

Instruction on common criteria for control of the condition of railway tracks on the network JŽ (Instruction 339) from 2001/2004 was introduced in the case of "unsatisfactory" condition of the track (errors in the geometry of the track above the limits of exploitation "C"), as an alternative measure of "speed reduction", which in previous editions of the Instruction (from 1989) did not exist. A passage from the previous issue of Instruction 339 from 1989 was deleted, which stipulated that prior to reaching the limits of exploitation to take measures to prevent their overdraft. Applicable Rulebook on technical conditions and maintenance of the superstructure of railway lines, as well as Instruction 339, do not establish an explicit and clear exploitation boundary for the state of sleepers and fastening accessories and in which, due to security risks, immediate corrective measures must be taken or to close the track for railway traffic.

4.1.3. Issued safety recommendations

SR_01/17 Directorate shall define, as soon as possible, in the existing Rulebook on technical conditions for the maintenance of the railway superstructure ("Official Gazette of RS No. 39/2016 and 74/2016), limit conditions of the track superstructure and substructure elements that require immediate corrective actions or closing of the railway line until the unauthorized condition is eliminated.

SR_02/17 Directorate shall define in the existing Rulebook on technical conditions for the maintenance of the railway track superstructure ("Official Gazette of RS, No. 39/2016 and 74/2016), criteria for the periods in which the intermediate overhauling on the railway track superstructure shall be performed.

SR_03/17 "IŽS" a.d shall amend the Instruction on the Common Criteria for the Control of the Condition of Railway Lines on the Network of Yugoslav Railways, Instruction 339 (*Official Gazette of the ZJŽ No. 2/2001 and 4/2004*), which is, by the Decision of "IŽS" a.d, No. 4/2015-51-17 from 29 December 2015 still in force in "IŽS" a.d, in accordance with provisions from the Instruction 339 from 1989, mentioned in point 3.3.5. For future track inspection coach, recommended parameters are in accordance with the Standards: SRPS EN 13848-1, SRPS EN 13848-2, SRPS EN 13848-6.



SR_04/17 “IŽS” a.d. shall prescribe in its internal documents that, if during the measurement using the track inspection coach, there is a disruption in the continuity of the measurement, the control of the superstructure parameters must necessarily be carried out at the site of the resulting disruption and in the zone for which data are missing. The control aims to eliminate the cause of the measurement disruption and to check the condition of the superstructure, by visual control and measurement of the superstructure parameters with alternative measuring devices. After removing the cause of the disruption, it is necessary to repeat the measurement with track inspection coach on that kilometre.

SR_05/17 “IŽS” a.d. shall, having in mind inadequate maintenance and condition of the tracks, sleepers and fastening accessories, assess the risk of train traffic on the main arterial route Belgrade Marshalling Yard “A” - Junction “B” - Junction “K” - Resnik, on the section between junctions “B” and “K”.

SR_06/17 “Srbija Kargo” a.d. shall perform an additional training for the traction staff for the case of ejection of the traction protection, to check train condition by visual control from the locomotive cab (possible derailment), especially if after starting and removal of the protection, there are even the slightest twitches or uneven speeds.

SR_07/17 MGSI, Sector for Inspection, Group for inspection affairs of the Railway, shall perform an additional check of the condition of railway infrastructure on the main arterial route Belgrade Marshalling Yard “A” - Junction “B” - Junction “K” - Resnik, and, if necessary, take measures within its jurisdiction.

5. SAFETY RECOMMENDATIONS AND MEASURES TAKEN

5.1. Safety recommendations

With the aim of possible improvement of safety on the railway and prevention of the new accidents, Sector for Investigation of Accidents in Rail Traffic and International Cooperation has issued the following safety recommendations in 2017:

SR_01/17 Directorate shall define, as soon as possible, in the existing Rulebook on technical conditions for the maintenance of the railway superstructure (“Official Gazette of RS No. 39/2016 and 74/2016), limit conditions of the track superstructure and substructure elements that require immediate corrective actions or closing of the railway line until the unauthorized condition is eliminated.

SR_02/17 Directorate shall define in the existing Rulebook on technical conditions for the maintenance of the railway track superstructure (“Official Gazette of RS, No. 39/2016 and 74/2016), criteria for the periods in which the intermediate overhauling on the railway track superstructure shall be performed.



- SR_03/17** “IŽS” a.d shall amend the Instruction on the Common Criteria for the Control of the Condition of Railway Lines on the Network of Yugoslav Railways, Instruction 339 (*Official Gazette of the ZJŽ No. 2/2001 and 4/2004*), which is, by the Decision of “IŽS” a.d, No. 4/2015-51-17 from 29 December 2015 still in force in “IŽS” a.d, in accordance with provisions from the Instruction 339 from 1989, mentioned in point 3.3.5. For future track inspection coach, recommended parameters are in accordance with the Standards: SRPS EN 13848-1, SRPS EN 13848-2, SRPS EN 13848-6.
- SR_04/17** “IŽS” a.d. shall prescribe in its internal documents that, if during the measurement using the track inspection coach, there is a disruption in the continuity of the measurement, the control of the superstructure parameters must necessarily be carried out at the site of the resulting disruption and in the zone for which data are missing. The control aims to eliminate the cause of the measurement disruption and to check the condition of the superstructure, by visual control and measurement of the superstructure parameters with alternative measuring devices. After removing the cause of the disruption, it is necessary to repeat the measurement with track inspection coach on that kilometre.
- SR_05/17** “IŽS” a.d. shall, having in mind inadequate maintenance and condition of the tracks, sleepers and fastening accessories, assess the risk of train traffic on the main arterial route Belgrade Marshalling Yard “A” - Junction “B” - Junction “K” - Resnik, on the section between junctions “B” and “K”.
- SR_06/17** “Srbija Kargo” a.d. shall perform an additional training for the traction staff for the case of ejection of the traction protection, to check train condition by visual control from the locomotive cab (possible derailment), especially if after starting and removal of the protection, there are even the slightest twitches or uneven speeds.
- SR_07/17** MGSI, Sector for Inspection, Group for inspection affairs of the Railway, shall perform an additional check of the condition of railway infrastructure on the main arterial route Belgrade Marshalling Yard “A” - Junction “B” - Junction “K” - Resnik, and, if necessary, take measures within its jurisdiction.



5.2. Measures taken

Because of the need of the creation of the annual report, CINS with the Letter 33 No. 340-00-8059/2017-21 from 22 June 2018., which was sent to the Directorate urged to submit the report on the basis of the issued safety recommendations for 2017 (SR_01/17, SR_02/17, SR_03/17, SR_04/17, SR_05/17 and SR_06/17) and by the Letter 33 No. 340-00-8059/2017-22 from 22 June 2018, which was sent to MGSI, Sector for Inspection, Group for Inspection Affairs of the Railway urged the delivery of Report, based on the issued safety recommendation (SR_07/17). CINS to the conclusion of this Annual Report has not received a report on the measures taken on the basis of safety recommendations issued by the Directorate and issued safety recommendations by the MGSI, Sector for inspection, the Group for Inspection affairs of the Railway. CINS was forwarded a Letter I-01-02 No. 340-843-2/2018 dated 10 July 2018 by the Directorate, with which it was informed that Report on mentioned measures will be delivered within the time specified in Article 35, Paragraph 5 of the Law on Investigation of Air, Railway and Water Traffic Accidents ("Official Gazette RS", No.66/15), although Article 35 Paragraph 5 of the Law on Investigation of Air, Railway and Water Traffic Accidents ("Official Gazette RS" No. 66/15) stipulates that the Directorate, other agencies and organizations are required to submit at least once a year which does not mean that it is only once a year, but the word at least implies multiple times depending on the needs, and does not stipulate when.

With Letter No. 1/2018-1475 of 28 May 2018 "IŽS" a.d. informed CINS that the safety recommendations SR_03/17, SR_04/17 and SR_05/17 were accepted and taking action has begun on the basis of issued safety recommendations. Accordingly, CINS opened safety recommendations SR_03/17, SR_04/17 and SR_05/17. Upon the implementation of all necessary measures taken by the "IŽS" a.d., based on issued safety recommendation SR_03/17, SR_04/17 and SR_05/17, CINS will close the listed safety recommendations.