



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

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**No.: 340-00-9/2019-02-21-1**

**Date: 25.09.2019.**

# **ANNUAL REPORT FOR 2018**

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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 RS” No. 66/15 and 83/18) and the Article 23 of the Directive 2004/49/EC of the European Parliament and of the Council of EU (Railway Safety Directive), Center for Investigation of Accidents in Transport drafted and published the Annual Report.

Annual report for 2018 consists of:

- Information on CINS
- Investigative procedure in the field of railway transport
- Investigations opened in 2018
- Investigations closed in 2018
- 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
d.o.o.	.....	Ltd.
US	.....	Constitutional Court
JŽ	.....	Yugoslav Railways
ZJŽ	.....	Community of Yugoslav Railways
EMV	.....	Electro motor train
DMV	.....	Diesel motor train
DMK	.....	Diesel motor wagon
JP	.....	Public Enterprise
EPS	.....	Electrical Power Industry of Serbia
TENT	.....	Thermo Power Plant “Nikola Tesla”
MSK	.....	Methanol Acetic Acid Complex



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## 1. CINS

### 1.1. Legal framework

Implementing the Directive 2004/49/EC of the European Parliament and of the Council of EU (Railway Safety Directive) of the Republic of Serbia is performed by bringing the Law on Investigation of Accidents in Air, Railway and Waterborne Traffic (“Official Gazette of RS” No. 66/15 and 83/18), Law on Interoperability of the Railway System (“Official Gazette of RS”, No.41/18) and the day of bringing into force of Law on Safety in Railway Traffic (“Official Gazette of RS”, No.41/18), that is on 08.06.2018. Law on Railway Safety and Interoperability (“Official Gazette of RS” No.104/13, 66/15 - other law, 92/15 and 113/17 - other law) ceases to apply, except for the Provision of Article 78, Paragraph 1, Item 5), Subpoint (1), which shall cease to be valid after three years from the date of entry into force of this Law, that is, on 08.06.2021.

CINS, comprising of the Sector for Investigation of Accidents in Railway Traffic and International Cooperation, 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 failure of the structural subsystems or of interoperability factors in accordance with the Law on Investigation of Accidents in of Air, Railway and Waterborne Traffic (“Official Gazette of RS” No. 66/15 and 83/18).

According to the Law on Safety in Railway Traffic (“Official Gazette of RS”, No.41/18), the infrastructure manager and railway undertaking, independently from CINS, 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.

According to the Law on Investigation of Accidents in Air, Railway and Waterborne Traffic (“Official Gazette of RS” No. 66/15 and 83/18), CINS, Sector for Investigation of Accidents in Rail Traffic and International Cooperation conducts investigation independent of all the parties and organizations competent for railway traffic. CINS conducts investigation after serious accidents on the railway system with the aim of improving railway safety and prevention of accidents.

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

Investigation and determining 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 with the Law on Investigation of Accidents in Air, Railway and Waterborne Traffic (“Official Gazette of RS” No. 66/15 and 83/18), since July 2015, as a special organization whose task is to carry out professional activities relating to investigation of accidents and serious incidents in air traffic; serious accidents, other accidents and incidents in rail traffic; very serious maritime accidents, serious maritime accidents, maritime accidents, maritime incidents, serious inland navigation incidents and inland navigation incidents in water traffic. CINS has the status of the legal entity, and the headquarters of CINS are in Belgrade.

Sector for Investigation of Accidents in Railway Traffic and International Cooperation carries out tasks, which are in jurisdiction of CINS, regarding railway traffic with the aim of possible improvement of railway safety by issuing safety recommendations.

Law on Investigation of Accidents in Air, Railway and Waterborne Traffic (“Official Gazette of RS” No. 66/15 and 83/18), does not apply to underground railways (metros), trams and other types of light railway.

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

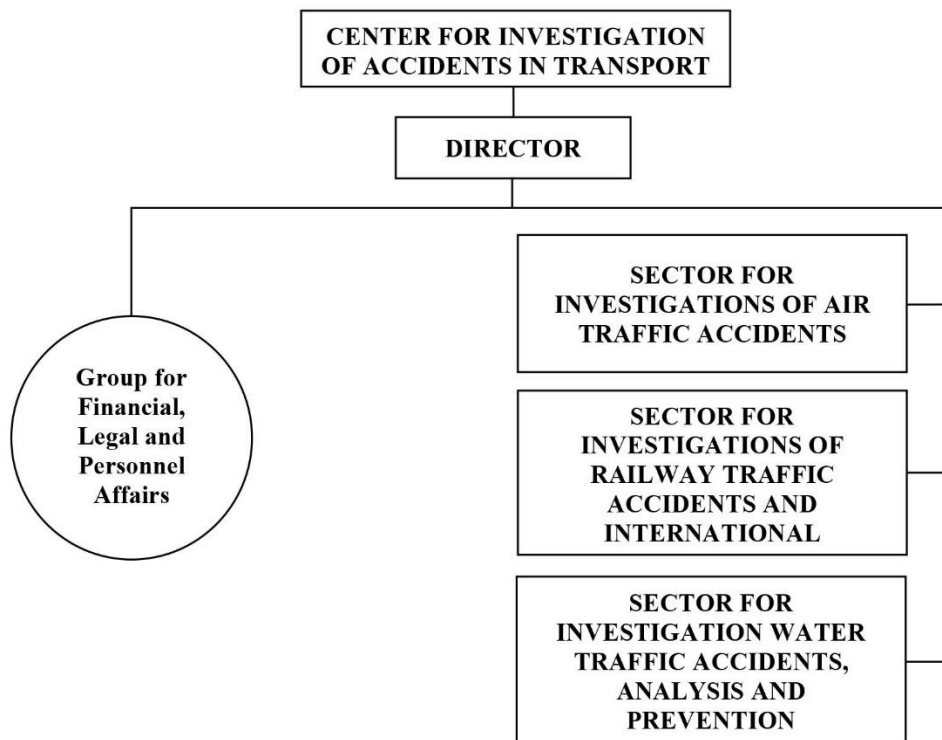
- Investigation of serious accidents, other accidents and incidents occurring on the railways system
- Preparation of final reports on conducted specific investigations that may contain safety recommendations aiming to improve safety of rail traffic.

CINS performs other tasks stipulated by the Law on Investigation of Accidents in Air, Railway and Waterborne Traffic (“Official Gazette of RS” No. 66/15 and 83/18).

## 1.3. CINS organization

Within CINS there are the following basic internal units: Sector for Investigation of Accidents in Air Traffic, Sector for Investigation of Accidents in Railway traffic and International Cooperation and Sector for Investigation of Accidents in Waterborne traffic, Analysis and Prevention of Causes of Accidents. Within CINS, a specific internal unit outside the Sectors, Group for Financial, Legal and Personal Affairs, has been established.

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 June 26, 2017 and consists of the Main Investigator for Railway Traffic and Senior Adviser for Coordination of Investigation and Railway Accidents Analysis and International Cooperation Adviser.

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 entitlements of CINS.

## 1.4. Organisations competent for the railway system

Organisations responsible for the railway system in the Republic of Serbia 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. 41/18) and the Law on Safety in the Railway Traffic (“Official Gazette of RS”, No.





41/18) and Law on Interoperability of the Railway System (“Official Gazette of RS”, No. 41/18). 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 realized 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 and 83/18).

## **2. INVESTIGATIVE PROCEDURE IN THE FIELD OF RAILWAY TRAFFIC**

### **2.1. Accidents and incidents being investigated**

According to the Law on Investigation of Accidents in Air, Railway and Waterborne Traffic (“Official Gazette of RS” No. 66/15 and 83/18), CINS conducts investigation 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 may also investigate other accidents and incidents that could lead to serious accidents, including the technical failure of structural subsystems or interoperability constituents.

CINS has discretion to decide whether to open 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 states, as well as an assessment of the benefits for gaining new knowledge from accident and incident investigation that would have an impact on the safety of the railway system.

According to the Law on Investigation of Accidents in Air, Railway and Waterborne Traffic (“Official Gazette of RS” No. 66/15 and 83/18), accidents and incidents may be:

1. Serious accident in railway traffic is a collision or derailment of the train 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, upon 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 issuing 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 in the Railway Traffic (“Official Gazette of RS”, No. 41/18) 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 of determining the causes and issuing 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, that is, the Sector for Investigation of Railway Traffic Accidents and International Cooperation carries out an investigation to determine the causes in order to issue 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 the Main Investigator for Railway 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, in accordance with the Law on Investigation of Accidents in Air, Railway and Waterborne Traffic (“Official Gazette of RS” No. 66/15 and 83/18).



Upon receiving notification of an accident or an incident on the railway system, CINS decides whether to go on the site of the accident or incident or not. At the site of the occurrence of the accident or incident, CINS 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 initiated, not later than seven days from the decision, CINS, Sector for Investigations of Railway Traffic Accidents and International Cooperation shall inform the MGSJ and The European Union Agency for Railways (ERA) on launched investigation.

Upon completion of the investigation, CINS publishes the final report and safety recommendation on its website [www.cins.gov.rs](http://www.cins.gov.rs). 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 2018

Sector for Investigations of Accidents in Railway Traffic and International Cooperation has become operational on 26.06.2017. In 2018 it has initiated 4 (four) investigations.

Basic data on investigations that Sector for Investigations of Accidents in Railway Traffic and International Cooperation has initiated in 2018 are shown in Table 3.1.

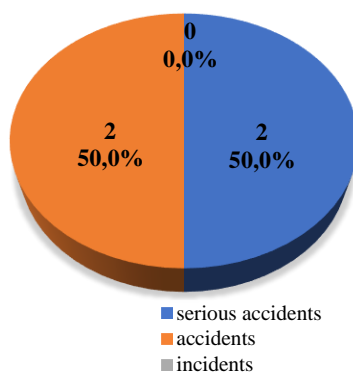
**Table 3.1:** Review of investigations initiated in 2018

TYPE OF ACCIDENT OR INCIDENT	No.	[%]
Serious accidents	2	50.0
Accidents	2	50.0
Incidents	0	0.0
<b>TOTAL:</b>	<b>4</b>	<b>100.0</b>

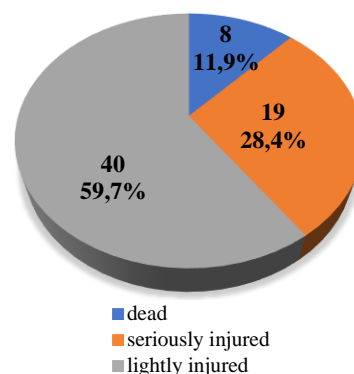
Basic data about the dead and injured persons for investigation that the Sector for investigation of accidents in railway traffic and international cooperation initiated in 2018, are summarized in Table 3.2

**Table 3.2:** Review of dead and injured persons for investigations initiated in 2018

	Passengers	Railway staff	Third parties	Total
Dead	-	-	8	<b>8</b>
Seriously injured	-	-	19	<b>19</b>
Lightly injured	23	1	16	<b>40</b>



**Figure 3.1:** Investigations initiated in 2018



**Figure 3.2:** Dead and injured in 2018

### 3.1. Fire on the train No. 2746

On 30.03.2018. at 17:50 on the regional track Crveni Krst - Zaječar - Prahovo Pristanište, between the stations Matejevac and Svrlijig, on the section of the open track located in the tunnel “Gramada“, the accident- fire on the train No. 2746 occurred. The fire occurred in the area of in the area of the municipality Svrlijig, in the area of the village Grbavče where the railway stop Hadžičevo is located. The area where the respective accident occurred is not populated.



Figure 3.1.1: The appearance of DMK 710-004 caught on fire (middle part from the outside)



Figure 3.1.2: View on passenger compartment DMK 710-004 on fire

The train No. 2746 operated, regularly, on the route Niš - Zaječar. The train's composition consisted of DMK of inventory 710-004. It came to the fire during the drive of the train through the tunnel “Gramada“. Taking into account the fact that there was no interruption of the operation of the drive group on the DMK and that the tunnel was not a suitable place for the safe evacuation of passengers and extinguishing of the resulting fire, the train driver carried on with the drive and upon exiting the tunnel stopped the train at km 32+500 at the approximate distance of 100 metres before the stop Hadžičevo, at the place suitable for safe evacuation of passengers and extinguishing of fire.

At the moment of the fire, according to the conductor's judgement, there were about 30 (thirty) passengers in the train.

The interruption of traffic on the respective section between the stations Matejevac and Svrljig lasted until 21:00, on 30.03.2018.

**Category:** Accident  
**Dead and injured:** N/A  
**Material damage:** On the railway vehicles

### 3.2. Overtaking of the loc. CEM-7 on the worker- contractor

On 13.04.2018. at 13:30 in the area of the industrial railway JP "EPS", branch TENT from Obrenovac, at the station Obrenovac at the track depot 10d, it came to serious accident overtaking of the locomotive CEM-7, owned by JP "EPS", branch TENT, on the worker of "Inter-Mehanika" d.o.o. from Skorenovac, which on this occasion, had been heavily injured and had, on the same day, succumbed to injuries at the hospital.

The serious accident occurred in the area of Belgrade, Obrenovac municipality, in the circle of TENT, at the railway station Obrenovac, at the track depot. The area in which the respective serious accident occurred is located in the industrial zone of Obrenovac municipality.



**Figure 3.2.1:** The appearance of the accident site where it came to overtaking of the loc. CEM-7 on the worker

Employees of "Inter-Mehanika" d.o.o. from Skorenovac, at the time of the serious accident, were conducting the works of installing derailment detectors on the track depots 11d and 12d of the station Obrenovac on the wagon of the series Faboo. Installation of the detectors of derailment had been carried out according to Service Agreement of T-ŽT made between JP "EPS", branch TENT from Obrenovac (service user) and "Inter-Mehanika" d.o.o. from Skorenovac (service provider).

The drive of CEM-7 locomotive was made for the purpose of shunting in the area of the depot, drawing two correct locomotives from the track depot 8d.

**Category:** Serious accident  
**Dead and injured:** 1 dead person (worker of the contractor)  
**Material damage:** N/A

### 3.3. Collision of the trains No. 2990 and 70922

On 01.08.2018. at 05:35 at the main arterial route E70/E85: Belgrade - Mladenovac - Lapovo - Niš - Preševo - state border - (Tabanovce), between the stations Klenje and Ripanj Tunel, upon driving in the direction from the Ripanj Tunel station to Klenje station on the open track at km 27+369 there came to the accident- gaining close to and collision of trains No. 2990 (EMV 413/417-033/034) and 70922 (mere locomotive 661-162). The collision occurred so that the head of the train No. 2990 (EMV 413/417-033/034), which was moving, hit the end of the train No. 70922 (the locomotive 661-162), which was standing. After the collision, the trains were moving at the length of 19 m, after which they stopped. On that occasion, the EMV 413/417-033/034 from the train No. 2990 derailed with a single bogie (the first bogie in the direction of movement). The accident occurred in the area of the village Ripanj in the city municipality Voždovac in the city of Belgrade. The area where the respective accident occurred is not populated.



**Figure 3.3.1:** The appearance of the damage on the railway vehicles after the collision of trains

The train No. 70922 operated on the route Ralja - Marshalling Yard Belgrade. The train was composed only of one locomotive 661-162. At the time of the respective accident, the train No. 70922 was standing on the open track.

The train No. 2990 operated on a regular basis, on the route Stalać - Belgrade. The train was composed of EMV 413/417-033/034. At the time of the accident, the train No. 2990 was moving from the station Ripanj Tunel to the Klenje station. At the moment of collision, according to the conductor's judgement, there were sixty to seventy passengers in the train.

The interruption of traffic at the section of the respective main arterial route lasted until 01.08.2018. at 19:49.

- Category:** Accident
- Dead and injured:** No dead, 23 lightly injured persons  
(abovementioned persons were in the train No. 2990)
- Material damage:** On the railway vehicles

### 3.4. On the level crossing, overtaking of the train No. 7821 on the bus

On 21.12.2018. at 07:30 on the main arterial route *E 70/E 85*: Belgrade - Mladenovac - Lapovo - Niš - Preševo - State border - (Tabanovce), on the level crossing secured with traffic signs on the road and the necessary zone of visibility, located in the area of the station Međurovo at km 250+065, a serious accident occurred-overtaking of the train No.7821 on the road vehicle bus. The accident occurred in the area of the populated settlement Donje Međurovo, on the track section located in the direction of geographically plain terrain.



**Figure 3.4.1:** Appearance of the vehicle after the serious accident (view in direction to the end of the vehicle)



**Figure 3.4.2:** Appearance of vehicle after the serious accident (view in direction to the head of the train)





**Figure 3.4.3:** Appearance of the head of the train



**Figure 3.4.4:** Appearance of the part of the side of the train and rear of the bus

Road vehicle bus of Mercedes Benz type O 530 of license plate NI 152-ŠJ, owned by "Niš-express" a.d. from Niš, operated on a regular bus route Novo Selo - Niš. The bus was moving through the local path from Donje Medjurovo to Niš. Upon arrival at the level crossing, the bus did not stop in front of the crossing but continued driving and entered the track profile in the area of the crossing just before the arrival of the train.

The train No. 7821, undertaking "Srbija Voz" a.d, operated, regularly, on the route Niš - Kuršumlija - Merdare stop. The train consisted of DMV 711-075/076. Upon being at the station Međurovo due to passengers' needs, the train No. 7821 was moved from the station in the direction towards the junction Belotince. Moving on the station section of the track, arriving at the level crossing at km 250+065, overtaking of the train on the road vehicle bus occurred, which has, just before arrival of the train, entered the track profile. Overtaking occurred by striking of the head of the train into the left side of the road vehicle (viewed in direction of movement of the train, that is, the road vehicle). After the strike, the train carried on with the movement in the length of 60m and derailed with two bogies. Due to the force of the strike, the road vehicle decoupled in two approximately equal parts, which were discarded along the track, one part on each side of the track.

According to the conductor's judgement, at the moment of the serious accident there were ten passengers in the train. The interruption of traffic on the section of the respective arterial route between the station Međurovo and junction Belotince lasted until 21.12.2018. at 17:30.

- Category:** Serious accident
- Dead and injured:** 7 dead, 19 seriously and 17 lightly injured persons  
(aforementioned persons were in the bus, apart from one lightly injured person- the train driver of the train No. 7821)
- Material damage:** On the infrastructure and railway vehicles

## 4. INVESTIGATION REPORTS FINALIZED IN 2018

### 4.1. Decoupling of train No. 8011

#### 4.1.1. Short description of the accident

On 03.08.2017. at 07:55 at km 3+817 of the main arterial E 66: Belgrade Center- 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, upon 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, in the area of the junction and the stop Pančevački Most, on the section located in a tunnel below the city center.

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

The place where the train No. 8011 stopped (front of the power car 412-061) after the decoupling is at km 4+080, in the tunnel 595 m from the tunnel exit (at km 4+675). According to the conductor's judgment, at the time of the accident there were 30 passengers in the train.

Based on the letter No. 3-488 dated August 04, 2017 "Information from the speed-measuring tape" of the Belgrade Train Traction Section from "Srbija Voz" a.d, it can be concluded that the decoupling of the EMV happened at a speed of 62 km/h, after which the power car 412-061 crossed 297 m until stopping (note: the assumed point of decoupling shown in figure 4.1.1. does not match the information from the speed meter tape and therefore it is not relevant). According to the position of the EMV after the incident, the rest of the train stopped 159 m behind the power car 412-061. The big difference in the stopping distances is partly the consequence of the smaller percentage of the braked weight of the power car in relation to the two trailers and power car that remained in the other part of the decoupled EMV. The other factor is the fact that from the moment of decoupling of the train until the moment when the train driver placed the brake valve into the position for fast braking, the main overhead line used the main tank to supplement air, which could have contributed to the prolongation of the stopping distance.

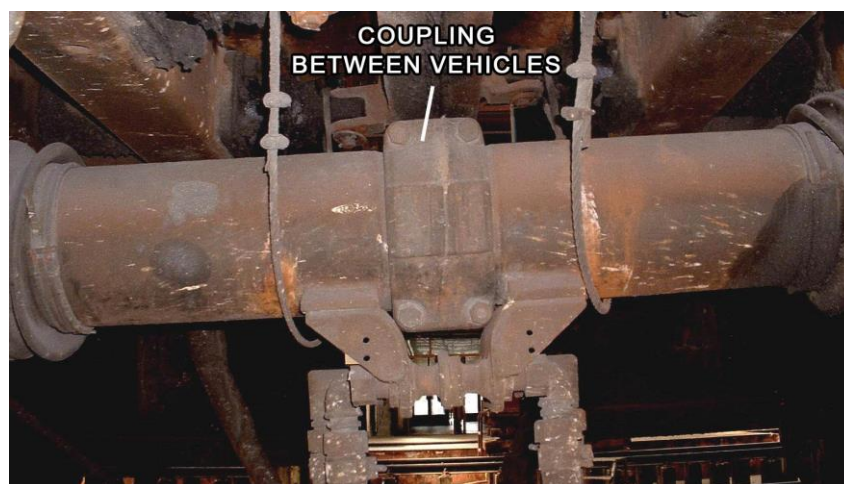


Figure 4.1.1.1: Appearance of the coupling between vehicles installed in EMV series 412/416



**Figure 4.1.1.2:** Appearance of a part of the decoupled coupling on the trailer 416-004



**Figure 4.1.1.3:** Appearance of a part of the decoupled coupling on the power car 412-061

**Category:** Incident

**Dead and injured:** N/A

Total material damage on the rail vehicles:	1 250 000.00	RSD
Total material damage on the rail infrastructure:	184 500.00	RSD
<b>Total direct material damage:</b>	<b>1 434 500.00</b>	<b>RSD</b>

The damage is stated in the official currency of the Republic of Serbia (Dinar - RSD).

According to the official middle exchange rate of the National Bank of Serbia on August 03, 2017, which is 1 EUR (Evro) = 119.8397 RSD (*Dinara*), the total material damage caused in the respective incident amounts to 11970.17 Euro (*EUR*).

#### 4.1.2. The causes of incident determined by investigation

Based on the analysis performed, it can be concluded that the immediate cause of the incident is the wear of the threaded joint between the nut of the draw bar set and the housing of the tight coupling between vehicles, due to which the threaded joint uncoupled during the ride.

In the last regular repair in 2012, the threaded joint was not properly checked and controlled. In addition, the check list for the threaded joint has no prescribed margin (limit value), which means that it is not clearly defined when the threaded joint has to be repaired or replaced.

The deadlines between regular services (carried out before the entry into force of the Law on the Railway Safety and Interoperability from 2013) were not in accordance with the applicable by-laws at that time (Rulebook 241).



The maintenance cycle, and in particular deadlines for regular repairs, were altered by internal decisions without a proper technical basis. Decisions on extending the deadlines of the regular repairs were made on the basis of reviews, not on the basis of measuring the critical dimensions of parts which are wearing and without control and the determination of the condition of parts vulnerable to damage or aging during repair. The last extension of the deadlines between regular services has not been carried out in accordance with the procedure prescribed in the valid Rulebook on the Maintenance of Railway Vehicles. This led to a situation where the period between two regular repairs was long enough for the threaded coupling assembly to be worn throughout, without measures and procedures in place guaranteeing the safe operation until the next regular repair.

#### 4.1.3. Issued safety recommendations

- SR\_01/18** “Srbija Voz“a.d. should make changes in the measurement sheet IB:594 244 so that the wording “Measurement limit“ is replaced with “Measurement limit  $d-DI$ “ and based on a corresponding analysis (calculation and similar) it should define and enter in the measurement sheet the limit value for safe operation between two regular repairs (explained in item 4.2.3).
- SR\_02/18** “Srbija Voz“a.d. should consider the possibility to make structural changes on the couplings between vehicles during regular repairs of EMV 412/416 in order to provide for a back-up alternative force transmission in case that the threaded connection is separated, or to apply other measures to reduce the risk of separation of the threaded joint (explained in item 4.2.3).
- SR\_03/18** “Srbija Voz“a.d. should, in the submitted Instructions for the Repair of Couplings between Vehicles, which was produced within the Project for the preparation of the technical and overhaul documentation for the electric multiple unit of the series 412/416 by the Institute “Kirilo Savić“ from Belgrade in 2004, align item 7 with the Working Instructions for the Control and Receiving Bodies of JŽ (“Official Gazette of ZJŽ“, No. 1/03), (explained in item 4.2.5).
- SR\_04/18** “Srbija Voz“a.d. should inform the control and receiving bodies about this case and take measures to dedicate special attention during regular repairs to the control of works performed on components that have a significant impact on safety.
- SR\_05/18** “Srbija Voz“a.d. should harmonize its Instructions for the Maintenance of Traction Vehicles no.4/2016-16-4, dated February 23, 2016, with Article 34, paragraph 2 and Article 36 of the Rulebook on Rolling Stock Maintenance no. 340-382-7/2015 dated December 04, 2015 (“Official Gazette of RS“, No. 101/15), or to thoroughly reexamine the deadlines for regular repairs by taking the original technical documentation as a basis and to change them only after performing a risk evaluation and risk assessment based on information about the determined condition (especially measurement limits) during previous regular repairs, as well as perform analyses of extraordinary repairs and unplanned works.
- SR\_06/18** “Srbija Voz“a.d. should perform a risk assessment for passenger transport in EMV of the series 412/416 where the extension of the deadlines for regular repairs was done before a previously performed risk evaluation and risk assessment based on the extension of these deadlines, as specified in paragraph 1, under 2) in Article 36 of the Rulebook on Rolling Stock Maintenance No. 340-382-7/2015 dated

December 04, 2015 (“Official Gazette of RS“, No.101/15) and in paragraph 2, item 4.13. of the Rules of Procedure of the Safety Management System of “Srbija Voz“ a.d. (due to the incident that occurred).

**SR\_07/18** The Railway Directorate should reexamine the content of the Maintenance File for EMV 412/416 and take measures from its area of competence, as the changes of the maintenance conditions specified by the manufacturer were not performed in accordance with Article 36 of the Rulebook on Rolling Stock Maintenance no 340-382-7/2015 dated December 04, 2015 (“Official Gazette of RS“, No 101/15).

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

### 4.2.1. Short description of the accident

On 21.08.2017. 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 level crossings (half-barriers and road light and sound signaling), which is located 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.



**Figure 4.2.1.1:** The appearance of the crossing (from the direction of the settlement Kutleš)



**Figure 4.2.1.2:** The appearance of the damages on the 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 track profile just before the arrival of the train.

Train No. 4905 was moving towards the main 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 junction Pečenjevce. After the transition of the train to the output of the switch region, 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 track. 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 66m, 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 there were about 40 passengers in the train.

**Category:** Serious accident

**Dead and injured:** 1 dead, 2 seriously and 2 lightly injured persons  
(aforementioned persons were located in the road vehicle)

Total material damage on the rail vehicles:	500 000.00	RSD
Total material damage on the rail infrastructure:	338 020.56	RSD
<b>Total direct material damage:</b>	<b>838 020.56</b>	<b>RSD</b>

The damage is stated in the official currency of the Republic of Serbia (Dinar - RSD).

According to the official middle exchange rate of the National Bank of Serbia on 21 August 2017, which is 1 EUR (Euro) = 119.4050 RSD (Dinara), the total material damage caused in the respective serious accident amounts to 7 018.30 Euro (EUR).

#### **4.2.2. The causes of accident determined by investigation**

The direct and immediate cause of a serious accident is that the road vehicle entered into the track just before the arrival of the train, thereby creating a dangerous situation of the occurrence of the serious accident. Hazardous situation has occurred due to the fact that the road vehicle toured half-barriers which have been suspended. The basic cause is non-compliance with the Law on Traffic Safety on the roads ("Official Gazette of RS" No 41/2009, 53/2010, 101/2011, 32/2013 - decision of US, 55/2014, 96/2015 - other law and 9/2016 - decision of US) by the driver of the road vehicle.

#### **4.2.3. Issued safety recommendations**

**SR\_08/18** Considering that the inadequate behaviour of the drivers of road vehicles became very common during the transition over tracks in the sense of non-compliance with the Law on Traffic Safety on the roads ("Official Gazette of RS" No. 41/2009, 53/2010, 101/2011, 32/2013 - decision of US, 55/2014, 96/2015 - other law and 9/2016 - decision of US), it is necessary that the Road Traffic Safety Agency

investigates in detail various forms of behaviour, the causes of this behaviour and suggests measures that would contribute to rising the level of safety.

### 4.3. Derailment of the shunting composition

#### 4.3.1. Short description of the accident

On 17.09.2017. 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 Belgrade settlement Kneževac, on the section located on the bank, 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 so 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.



Figure 4.3.1.1: Appearance of the derailed wagon



Figure 4.3.1.2: Appearance of the 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, at which on 16.09.2017 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. A locomotive 661-116 is owned by "Srbija Kargo" a.d.

The wagon type Arbel, series Faboo, consisting of two two-axle parts, forming an indivisible 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, so 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 :** N/A



Total material damage on the rail vehicles:	32 660.66	RSD
Total material damage on the rail infrastructure:	0,00	RSD
Total costs of raising the derailed rail vehicles:	364 210.40	RSD
<b>Total direct material damage:</b>	<b>396 871.06</b>	<b>RSD</b>

The damage is stated in the official currency of the Republic of Serbia (Dinar - RSD).

According to the official middle exchange rate of the National Bank of Serbia on 15 September 2017, which is 1 EUR (Euro) = 119.0326 RSD (Dinars), the total material damage caused in the respective accident amounts to 3334.14 Euro (EUR).

#### 4.3.2. The causes of accident determined by investigation

On the basis of the data analyzed, it can be concluded that the combination of twist of track above stipulated limit, unfavorable parameters of design of wagon type Arbel series Faboo which are essential to the safety of movement of vehicles on deformed track and suppression of composition of empty wagons with low speed generated the conditions that occur at the climbing of the wheel on the rail and derailling.

“Technical specification, big repair of cargo wagons series Faboo type Arbel” provided by the TENT does not provide sufficiently detailed check of the traction-buffing device between permanently connected parts of wagon which leads to the situation that due to jamming of drawbar, compression forces in many cases transferred over it instead of over buffers which adversely affects the security and increases the possibility of derailling of the wagon.

The driver of locomotive 661-116 was not provided with a special safety conditions that included the prohibition of pushing of shunting composition. In addition, he was given the operational task to deliver by pushing the shunting composition in the station Rakovica, which is already a serious flaw in the safety procedure.

#### 4.3.3. Issued safety recommendations

**SR\_15/18** Railway Directorate to check the licenses for the usage of wagon type Arbel, series Faboo, in sense of control of fulfillment of conditions for issuing safety certificates for transport and to bring in license special conditions for use to the public railway infrastructure these cars can be transported only as a special consignment with the prohibition of repression and, if necessary, other security restrictions, in accordance with the Article 21, Paragraph 5 of Law on Railway System Interoperability (“Official Gazette of RS“ No. 41/2018).

**SR\_16/18** When issuing license for the use of new vehicles which are made by already issued license for the type, Railway Directorate to act strictly in accordance with Article 22. of Law on Railway System Interoperability (“Official Gazette of RS“ No. 41/2018), to avoid the new vehicles getting licenses for use even when they are not in accordance with valid technical legislation (delivery and issuing of licenses for wagon series Faboo 2007/2008).





- SR\_17/18** Railway Directorate to conduct a review of the safety certificate for infrastructure management "IŽS"a.d. for not taking measures to urgently eliminate defects such as type "C" as established by measurements with track examination coach according to the Instruction 339 and to take measures within its jurisdiction in accordance with Article 15. of Law on Safety in Railway Transport ("Official Gazette of RS "No. 41/2018).
- SR\_18/18** Railway Directorate to review the Rulebook on technical conditions and maintenance of the superstructure of railway lines ("Official Gazette of RS" No.39/16, and 74/16) and to include in it the limit of the geometric parameters of railway condition, including twist, on the basis of standards SRPS EN 13848-5 and SRPS EN 13848-6 and to define, complied with these limits, the obligation of measuring the condition of track with track examination coach and action based on measurement results.
- SR\_19/18** Ministry of Construction, Transport and Infrastructure, Sector for Inspection, Group for Railway Inspection to carry out extraordinary check of railway infrastructure on the main arterial route E70/E85: (Belgrade) - Rakovica - Jajinci - Mala Krsna - Velika Plana between junctions "K1" and station Rakovica and, if necessary, take measures within their jurisdiction.
- SR\_20/18** "IŽS"a.d. to conduct examination of the reasons why the measures have not been taken for urgent elimination of defects type "C" that were determined during the measurement with track examination coach under the Instruction on unique criteria for control of the condition of railways on the network JŽ, Instruction 339 ("Official Gazette of ZJŽ" No.2/2001 and 4/2004) and to develop coordination between sectors that determined the defect and sectors that should eliminate this defect, and under review of management in order to follow and analyze these cases. According to the evaluation of safety risks which due to this occurred, to take efficient measures for elimination of the safety flaws, and in accordance with the Article 5 of Law on safety in Railway Transport ("Official Gazette of RS" No. 41/2018) and its Safety Management Manual.
- SR\_21/18** JP "EPS" branch TENT that in future purchases of new vehicles for their fleets require the vendor delivering vehicles compliant with the current technical regulations, in order to avoid the risk of obtaining the decision to deny a license for the vehicle type.
- SR\_22/18** JP "EPS" branch TENT to review and supplement the maintenance instructions for the traction-buffing devices between two parts of wagon Arbel series Faboo, by analogy with the checking of head traction-buffing devices along with regulation of control of resilient elements of drawbar and small buffers on the press and the addition of appropriate measuring and control lists, and in order to avoid that these traction-buffing devices are too pre-stressed or with a gap when they are in a state with no external load.

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

### 4.4.1. Short description of the accident

On 09.10.2017. 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 populated 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.



**Figure 4.4.1.1:** Appearance of the level crossing (view from the direction of the center of Grdelica)



**Figure 4.4.1.2:** Appearance of the facility – the guard

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 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 driving, 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, by arriving at 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 so 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. On that occasion, the train pushed the road vehicle out of the track in right, viewed from the direction of moving of the train, i.e. in the direction of the growing mileage of the track. The vehicle was found at the right part of the track at 13.5 m from the crossing.



There were, upon the conductor's judgment, seven passengers in the train.

**Category:** Serious accident  
**Dead and injured:** 1 dead, 1 seriously injured  
(aforementioned persons were in the road vehicle)

Total damage on the railway vehicles:	96 376.00	RSD
Total damage on the infrastructure:	0.00	RSD
<b>Total direct material damage:</b>	<b>96 376.00</b>	<b>RSD</b>

The damage is stated in the official currency of the Republic of Serbia (Dinar - RSD).

According to the official middle exchange rate of the National Bank of Serbia on 9 October 2017, which is 1 EUR (Evro) = 119.1859 RSD (Dinars), the total material damage caused in the respective serious accident amounts to 808.92 Euro (EUR).

#### 4.4.2. The causes of accident determined by investigation

The direct and immediate cause of a serious accident is that the road vehicle entered into the track just before the arrival of the train, thereby creating a dangerous situation of the occurrence of the serious accident. The driver of the road vehicle had the opportunity to, from the limit of dangerous area, notice the train arriving in a timely manner.

The main cause of this accident is non-compliance with the provisions of the Law on Road Traffic Safety ("Official Gazette of RS" No. 41/2009, 53/2010, 101/2011, 32/2013 - decision US, 55/2014, 96/2015 - other Law and 9/2016 - decision US) by the driver of the road vehicle. The fact that the prescribed zone of necessary visibility was not ensured, in no way diminishes the responsibility of driver of the road vehicle, because he was obliged to comply with a traffic sign II-2: "Obligation of Stopping" to stop and make sure whether the train is coming. Since the registering speeding device with which the locomotive is equipped does not record the use of locomotive siren, and that in the statements relating to the use of sirens just before the accident, there exist a certain contradiction, it cannot be reliably determined whether the train driver gave the aspect of a signal 67: "Watch out", as required by the Provisions of the Signaling Rulebook ("Official Gazette of ZJŽ", No. 4/96 and 5/96). Failure of this aspect of a signal in the manner prescribed by the provisions of the Signaling Rulebook ("Official Gazette of ZJŽ", No. 4/96 and 5/96) could contribute to the occurrence of the accident

#### 4.4.3. Issued safety recommendations

**SR\_09/18** Ministry of Construction, Transport and Infrastructure should adjust the Rulebook on the mode of crossing the railway line and the road, pedestrian or bicycle path, a place where you can carry out the intersection and measures for ensuring safe traffic ("Official Gazette of RS" No. 89/2016) with actual performances of the road vehicles (in the manner of adjustment by some countries in the region) and the actual state of the railway infrastructure.

It is necessary to determine whether the speed of the road vehicle over the crossing which is used in this calculations by this Rulebook, and which amounts to 4 km/h



is suitable for the actual performances of the rolling stock, or if this speed should be enlarged (for example, in the Republic of Slovenia the speed is 7 km/h). With the speed of 4 km/h, the large number of crossings cannot satisfy the minimal required zone of visibility that the Rulebook predicts.

Explanation for the Article 11 of the Rulebook, which is given in the Article 12, and which states:

“By securing the necessary zone of visibility from the Article 11 of this Rulebook, the participants in the road traffic are enabled with uninterrupted visibility on the railway track with both sides of the road, pedestrian or bicycle path, for noticing on time of the upcoming railway vehicles on the track so that they could stop the vehicle and stop the moving of the pedestrians or bicycles before they come to the railway, that is, in front of the traffic sign that indicates the point where the road comes over the railway track at the railway level” would make sense only in the case that in front of the crossing there is no traffic sign II-2:”Obligation of stopping”. Situation on site confirms that the traffic sign II-2:”Obligation of stopping“, exists on all the crossings with passive signalization, which we consider absolutely necessary.

In the expression:

$$t_a = \frac{m + n + d + s}{V_p} \cdot 3,6 \quad [s]$$

In front of  $s$  should stand a sign “-“, and not the sign “+“ (see Fig. 3.4.2).

- SR\_10/18** “IŽS“a.d. that given the existence of construction facilities, not even from the limit of dangerous area it is not possible to provide the necessary visibility in all directions, to consider introduction of active signaling, or to solve the problem in another way.
- SR\_11/18** “IŽS“a.d. to perform the expert- based risk assessment on the crossing. Having in mind that the accidents on the crossing (viewing them individually) are rare events, the risk evaluation cannot be done solely on the number of accidents that had happened on some crossings. The risk assessment should be done, as a measure of precaution, for all the crossing according to all the relevant parameters, whether there were accidents on them or not.
- SR\_12/18** “IŽS“a.d. that during the conduction of investigation of traffic accidents on the crossings, research committees should pay more attention to collecting relevant data, so that all the possible causes of the accident could be established, and with the goal of applying suitable measures.
- SR\_13/18** “IŽS“a.d. to do the act of “Programme for resolution of the level crossings” according to previously finished risk assessment, with the goal of taking certain actions to raise the level of safety in traffic.
- SR\_14/18** “Srbija voz“a.d. that during the conduction of investigation of traffic accidents on the crossings, research committees should pay more attention to collecting relevant data, so that all the possible causes of the accident could be established, and with the goal of applying suitable measures.

## 4.5. Derailment of the train No. 56990

### 4.5.1. Short description of the accident

On 03.11.2017. 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, near the point of crossing of the track with the local road Despotovac-Vitance-Balajnac (level crossing), there has occurred 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 train has passed for 42 more meters, after which it stopped. Decoupling occurred between the sixth wagon No.80725952245-4 and seventh wagon No.80725958891-9 (on the sixth wagon of series Eas No.80725952245-4 the coupling device was torn). The area of the respective accident occurrence is not populated.



Figure 4.5.1.1: Appearance of the derailed wagon

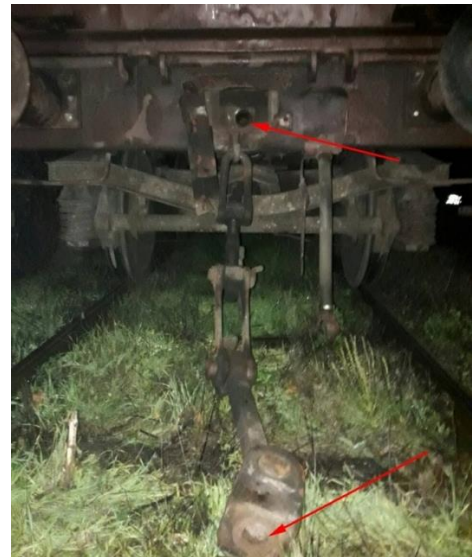


Figure 4.5.1.2: Appearance of the point of decoupling

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 Eas series that were part of the train No.56990 were loaded with brown coal (Senja-Resavian fine coal).

**Category:** Accident

**Dead and injured:** N/A

Total material damage on the rail vehicles: 70 320.00 RSD

Total material damage on the rail infrastructure: 478 296.00 RSD

Total costs of raising the derailed rail vehicles: 749 607.96 RSD

**Total direct material damage: 1 298 223.96 RSD**



The damage is stated in the official currency of the Republic of Serbia (Dinar - RSD).

According to the official middle exchange rate of the National Bank of Serbia on 03 November 2017, which is 1 EUR (Euro) = 118.8253 RSD (Dinars), the total material damage caused in the respective accident amounts 10 925.48 Euro (EUR).

#### **4.5.2. The causes of accident determined by investigation**

The immediate cause of the accident was the unsatisfactory condition of the railway on the section where the accident occurred. The direct cause is the missing and loose fastening systems and rotting and cracked series of sleepers, combined with the track twist in the zone of derailment of 23 mm, which is over the allowed maximum exploitation that is 18 mm.

The basic cause is that maintenance of the track on the observed section is below technically acceptable minimum.

Instruction on common criteria for control of the condition of railways on the network JŽ, Instruction 339 (“Official Gazette of ZJŽ” No.2/2001 and 4/2004) introduced that in the case of "unsatisfactory" status of the track (errors in the geometry of the track above the limits of exploitation “C”) "speed reduction", as an alternative measure, which in previous editions of Instruction 339 (in 1989) did not exist. A passage from the previous issue of Instruction 339 of 1989 was also 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 railways No.340-201-2/2016 (“Official Gazette of RS” No.39/16 and 74/16) as well as Instruction 339 does not define explicitly and clearly exploitation boundaries for condition of sleepers and fastening systems in which, due to security risks must take immediate corrective measures or close the railway track for transport.

#### **4.5.3. Issued safety recommendations**

**SR\_23/18** Railway Directorate that as soon as possible defines in the current Rulebook on the technical requirements and maintenance of the superstructure of railway tracks (“Official Gazette of RS” No. 39/2016 and 74/2016) limits conditions and elements of the upper substructure which requires the immediate removal of or closure of railway for traffic by eliminating unauthorized condition.

**SR\_24/18** “IŽS“a.d. to make amendments to the Instruction on common criteria for control of the condition of railway track on the network JŽ, Instruction 339 (“Official Gazette of ZJŽ” No.2/ 2001 and 4/2004), which with the decision of the "IŽS" a.d. No.4/2015-51-17 from 29 December 2015 is still applicable in "IŽS"a.d., in accordance with the provisions of Instruction 339 of 1989 which are listed in paragraph 3.3.4. For future track examination coaches' parameters in accordance with standards: EN 13848-1, EN 13848-2, EN 13848-6 are recommended.

**SR\_25/18** “IŽS“a.d. that, given the extremely poor condition of the track, makes an assessment of risk of train traffic on the local railway track Markovac - Resavica and take measures to reduce risks to an acceptable level. Based on this, to make a technical assessment of the minimum required resources (materials, machinery, labor) for track maintenance.

**SR\_26/18** Ministry of construction, traffic and infrastructure, Section for Inspection, Group for Railway Inspection, to carry out an extraordinary check of the condition of railway infrastructure on the local railway track Markovac - Resavica and to take measures within its jurisdiction.

## 4.6. Derailment of the train No. 53527

### 4.6.1. Short description of the accident

On 23.12.2017. at 13:15 at km 122+250 of the regional track Pančevo Main Station - Zrenjanin - Kikinda - Jimbolia (CFR SA), upon entering the station Novi Bečej, in the area of the populated settlement Novi Bečej, derailment of train No. 53527 occurred with total of 8 (eight) wagons of series Za loaded with acetic acid (RID 83/2789). From 8 (eight) derailed wagons, 4 (four) of them turned on its side, and at 3 (three) of them leakage of acetic acid occurred. From the train composition, viewed from the driving locomotive 661-243, derailed the second wagon of the series Za No. 33 72 7937 501-4 with the first wheel of the first bogie and 2 wheels of the second bogie, third wagon of series Za No. 33 72 7993 510-6 turned on the side and the acid leaked from it, fourth wagon of series Za No. 33 72 7993 519-7 turned on the side and the acid leaked from it, fifth wagon of series Za No. 33 72 7993 520-5 turned on the side, sixth wagon of series Za No. 33 72 7993 516-3 derailed with all the axles and remained to stand on their wheels on the bank aslope relative to the axis of the track, seventh wagon of series Za No. 33 72 7977 585-8 derailed with all the axles and remained to stand in the zone of the track on their wheels, eighth wagon of series Za No. 33 72 7977 519-7 turned on the side and from it acid leaked and ninth wagon of series Za No. 33 72 7937 503-0 derailed with first bogie and remained to stand in the zone of the track on their wheels.



**Figure 4.6.1.1:** Appearance of the derailed wagon



**Figure 4.6.1.2:** Appearance of the derailed wagon

The train No. 53527 operated on the route Kikinda - Banatsko Milosevo - Zrenjanin. The train composition consisted of driving locomotive of series 661-243, 14 (fourteen) wagons of series Za loaded with acetic acid, 9 (nine) empty wagons of series Za and one empty wagon of series Ea.

The interruption of traffic lasted until 29.12.2017. at 14:30.



**Category:** Accident  
**Dead and injured:** N/A

In this accident due to leakage from the turned over wagon-tanks, there occurred loosing of the part of the cargo (acetic acid). The leakage occurred from the three wagon-tanks and according to the following:

From the wagon No. 33 72 7993 510-6	leaked	1.76 t	In total of	853.60 EUR
From the wagon No. 33 72 7993 519-7	leaked	2.16 t	In total of	1 047.60 EUR
From the wagon No. 33 72 7977 519-7	leaked	0.67 t	In total of	324.95 EUR
<b>In total leaked</b>			<b>4.59 t</b>	<b>In total of 2 226.15 EUR</b>

According to the official middle exchange rate of the National Bank of Serbia on 22.12.2017, which is 1 EUR (Euro) = 119.0224 RSD (Dinars), the total material damage caused in the respective accident amounts to 264 962.91 RSD (Dinars).

Total damage done on the railway vehicles:	9 260 799,13	RSD
Total damage on the infrastructure:	3 659 313,40	RSD
Total cost of lifting the derailed wagon:	6 956 784,30	RSD
<b>Total direct material damage:</b>	<b>19 876 896,83</b>	<b>RSD</b>

Damage is stated in the official currency of the Republic of Serbia (Dinar - RSD).

According to the official middle exchange rate of the National Bank of Serbia on 22.12.2017, which is 1 EUR (Euro) = 119.0224 RSD (Dinars), the total material damage caused in the respective accident amounts to 167 001.31Euro (EUR).

#### **4.6.2. The causes of accident determined by investigation**

The direct cause of the accident was the unsatisfactory condition of the railway track on the section where the accident occurred. The direct cause is the missing and loose fastening and connecting accessories, rotted and cracked series of sleepers, combined with the track gauge widening (41 mm), cross level (- 27 mm) and twist (36 mm) of the track in the zone of derailment, which is over the maximum exploitation limit.

The basic cause is that maintenance of the track on the observed section is below the technically accepted minimum.

The main cause is the long-standing practice of using the railway track with trains with an overload, i.e. with loads that exceed the designed load of track in daily use, combined with the maintenance of the track below the technical minimum.





By Instruction on unique criteria for control of the condition of tracks on the network JŽ, Instruction 339 (“Official Gazette of ZJŽ” No.2/2001 and 4/2004) it was introduced that in the case of “unsatisfactory” status of 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 Instruction 339 (in 1989) did not exist. Also, the passage has been deleted from the previous issue of Instruction 339 of 1989 which stipulated that prior to reaching the limits of exploitation take measures to prevent their overdraft. Applicable Rulebook on technical conditions and maintenance of the superstructure of railways No. 340-201-2/2016 (“Official Gazette of RS” No.39/16 and 74/16) as well as Instruction 339 do not define explicitly and clearly exploitation boundaries for state of sleepers and fastening systems in which, due to security risks immediate corrective measures must be taken or closing the railway transport.

Covers on some of the wagon tanks were probably not sufficiently tightened or seals or sealing surfaces were not in good condition, which could contribute to leakage of hazardous cargo from wagon-tanks and potential threats to the environment.

“MSK” a.d. Kikinda in its guidelines does not prescribe the procedure for closing the opening for filling on the tanks, but the procedure is only the part of the program for the training of workers.

#### 4.6.3. Issued safety recommendations

**SR\_27/18** Railway Directorate that in short deadline defines in the applicable Rulebook on technical conditions and maintenance of the superstructure of the railway tracks (“Official Gazette of RS” No.39/16 and 74/16) the boundary conditions of elements of superstructure of the track, which require urgent elimination or closing the track for traffic until removal of unsatisfactory state.

**SR\_28/18** “IŽS” a.d. to conduct amendments to the Instruction on unique criteria for control of the condition of railway tracks on the network JŽ, Instruction 339 (“Official Gazette of RS”, No.2/2001 and 4/2004), which is by the decision of the “IŽS” a.d. No. 4/2015-51-17 from 29.12.2015 is still applicable in “IŽS” a.d., pursuant to the provisions of Instruction 339 of 1989 which are listed in clause 3.3.5. For future track inspection coaches, the parameters are recommended in accordance with standards: SRPS EN 13848-1, SRPS EN 13848-2, SRPS EN 13848-6.

**SR\_29/18** “IŽS” a.d. that, due to inadequate maintenance and condition of the track, sleepers and fastening systems, conducts an assessment of risk of train traffic on the regional railway line Pančevo Main Station - Zrenjanin - Kikinda - (Jimbolia) and take measures to reduce risk to an acceptable level. Based on this, to conduct a technical assessment of the minimum required resources (material, machinery, work force) for track maintenance.

**SR\_30/18** “IŽS” a.d. to review the procedures and criteria for the approval of the traffic of trains with an overload and that this process is confined to the extreme and rare individual occasions, and not as a daily practice.

**SR\_31/18** Ministry of Construction, Transport and Infrastructure, Sector for Inspection, Group for Railway Inspection to carry out extraordinary check of railway infrastructure on the regional line Pančevo Main Station - Zrenjanin - Kikinda - (Jimbolia) and take measures within their jurisdiction.



**SR\_32/18** “MSK” a.d. Kikinda to additionally pay attention to the procedure of closing the openings for filling the wagon-tanks for acetic acid and to conduct additional training of the staff.

**SR\_33/18** “MSK” a.d. Kikinda to define the procedure for closing the opening for filling the wagon-tanks by bringing the instruction and therein to prescribe the moment of tightening of bolts on the covers of openings for filling.



## 5. SAFETY RECOMMENDATIONS AND MEASURES TAKEN

Aiming to achieve the possible improvement of railway safety and to prevent occurrence of new accidents, CINS, Sector for Investigation of Accidents in Railway Traffic and International Cooperation, has issued 33 (thirty-three) safety recommendations. In 2017, 7 (seven) safety recommendations have been issued. From the total number of 40 (forty) safety recommendations that CINS has issued in 2017 and 2018, to the Directorate for Railways 34 (thirty-four) safety recommendation have been issued (85.00%), to other bodies and organizations 6 (six) have been issued (15.00%).

**Table 5.1:** Issued safety recommendations

Year	Directorate for Railways		Other bodies and organizations		Total	
	[бpoj]	[%]	[бpoj]	[%]	[бpoj]	[%]
2017.	6	85.71	1	14.29	<b>7</b>	<b>100.00</b>
2018.	28	84.85	5	15.15	<b>33</b>	<b>100.0</b>
<b>Total</b>	<b>34</b>	<b>85.00</b>	<b>6</b>	<b>15.00</b>	<b>40</b>	<b>100.00</b>

**Table 5.2:** Safety recommendations - status

Year	Accepted		Executed		Not accepted or reply has not been submitted		Total	
	[No.]	[%]	[No.]	[%]	[No.]	[%]	[No.]	[%]
2017.	3	42.86	1	14.28	3	42.86	<b>7</b>	<b>100.00</b>
2018.	19	57.58	6	18.18	8	24.24	<b>33</b>	<b>100.00</b>
<b>Total</b>	<b>22</b>	<b>55.00</b>	<b>7</b>	<b>17.50</b>	<b>11</b>	<b>27.50</b>	<b>40</b>	<b>100.00</b>

Due to a series of accidents derailments of trains in 2017 and the importance of the issue, CINS has, with the aim of possible improvement in order to increase railway safety and the prevention of new accidents issued to the Directorate for Railways identical safety recommendations SR\_01/17 SR\_23/18 and SR\_27/18. Similar to those safety recommendations is the safety recommendation SR\_18/18. All the above-mentioned safety recommendations Directorate for Railways has not accepted.



## 5.1. Status of safety recommendations from 2017

### 5.1.1. Investigation Report (ŽS-02/17) 33 No.: 340-8059/2017-16 of

**05.01.2018. (accident, derailment of train No. 62946 of 16.08.2017. at 15:30 on the main arterial route: Belgrade Marshalling Yard “A“ - Junction “B“ - Junction “K“ - Resnik, between Junctions “B“ and “K“)**

**SR\_01/17** Directorate for Railways 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.

**Recommendation status:** Directorate for Railways submitted the report - a letter I-01 No. 340-439-2 / 2019 of 12.04.2019., safety recommendation SR\_01/17 has not been accepted.

**SR\_02/17** Directorate for Railways 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.

**Recommendation status:** Directorate for Railways submitted the report - a letter I-01 No. 340-439-2/2019 of 12.04.2019., safety recommendation SR\_02/17 has not been accepted.

**SR\_03/17** “IŽS”a.d shall amend the Guidelines on the Unique Criteria for the Control of the Condition of Railway Lines on the Network of Yugoslav Railways, Guidelines 339 (“Official Gazette of 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 into force in “IŽS”a.d, in accordance with provisions from the Guidelines 339 from 1989, mentioned in point 3.3.5. For future measuring wagons, recommended parameters are in accordance with the Standards: SRPS EN 13848-1, SRPS EN 13848-2, SRPS EN 13848-6.

**Recommendation status:** Directorate for Railways submitted the report - a letter I-01 No. 340-1162/2019 of 21.08.2019., safety recommendation SR\_03/17 is accepted and is in the process of realization.

**SR\_04/17** “IŽS”a.d. shall prescribe in its internal documents that, if during the measurement using the measuring wagon, there is a disorder in the continuity of the measurement, the control of the superstructure parameters must necessarily be carried out at the site of the resulting disturbance and in the zone for which data are missing. The control aims to eliminate the cause of the measurement disorder and to check the condition of the superstructure, visual control and measurement of the superstructure parameters with alternative measuring devices. After removing the cause of the disorder, it is necessary to repeat the measurement with measuring wagon on that kilometre.

**Recommendation status:** Directorate for Railways submitted the report - a letter I-01 No. 340-1162/2019 of 21.08.2019., safety recommendation SR\_04/17 is accepted and is in the process of realization.



**SR\_05/17** “IŽS” a.d. shall, having in mind inadequate maintenance and condition of the tracks, sleepers and fastening devices, to assess the risk of train traffic on the main arterial route Belgrade marshalling yard “A” – Junction “B” – Junction “K” – Resnik, between junctions “B” and “K”.

**Recommendation status:** Directorate for Railways submitted the report - a letter I-01 No. 340-1162/2019 of 21.08.2019., safety recommendation SR\_05/17 is accepted and in the process of realization.

**SR\_06/17** “Srbija Kargo” a.d. shall perform an exceptional training for the locomotive drivers and staff for the case of ejection of the traction protection, to check train condition by visual control from the locomotive (possible derailment), especially if after starting and removal of the protection, there are even the slightest twitches or uneven speeds.

**Recommendation status:** Directorate for Railways submitted the report - a letter I-01 No. 340-1162/2019 of 21.08.2019., safety recommendation SR\_06/17 is executed.

**SR\_07/17** MGSI, Sector for inspection control, Railway inspection group, shall perform an exceptional 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.

**Recommendation status:** MGSI, Sector for inspection control, Railway inspection group, has not submitted the reply.

## 5.2. Status of the safety recommendations from 2018

**5.2.1. Investigation Report (ŽS-01/17) 33 No.: 340-07684/2017-006 of 01.03.2018. (incident, decoupling of the train No. 8011 of 03.08.2017. at 07:55 on the main arterial route E 66: Belgrade Center – Pančevo Main station - Vršac – state border - (Stamora Moravita) in the area of the junction and stop Pančevački most)**

**SR\_01/18** “Srbija Voz” a.d. should make changes in the measurement sheet IB:594 244 so that the wording “Measurement limit” is replaced with “Measurement limit  $d-DI$ ” and based on a corresponding analysis (calculation and similar) it should define and enter in the measurement sheet the limit value for safe operation between two regular repairs (explained in item 4.2.3).

**Recommendation status:** Directorate for Railways submitted the report - a letter I-01 No. 340-1164/2019 of 21.08.2019., safety recommendation SR\_01/18 is executed.

**SR\_02/18** “Srbija Voz” a.d. should consider the possibility to make structural changes on the couplings between vehicles during regular repairs of EMV 412/416 in order to provide for a back-up alternative force transmission in case that the threaded connection is separated, or to apply other measures to reduce the risk of separation of the threaded joint (explained in item 4.2.3).

**Recommendation status:** Directorate for Railways submitted the report - a letter I-01 No. 340-1164/2019 of 21.08.2019., safety recommendation SR\_02/18 is accepted and in the process of realization.



**SR\_03/18** “Srbija Voz“a.d. should, in the submitted Instructions for the Repair of Couplings between Vehicles, which was produced within the Project for the preparation of the technical and overhaul documentation for the electric multiple unit of the series 412/416 by the Institute “Kirilo Savić“ from Belgrade in 2004, align item 7 with the Working Instructions for the Control and Receiving Bodies of JŽ (“Official Gazette of ZJŽ“, No 1/03), (explained in item 4.2.5).

**Recommendation status:** Directorate for Railways submitted the report - a letter I-01 No. 340-1164/2019 of 21.08.2019., safety recommendation SR\_03/18 is accepted and in the process of realization.

**SR\_04/18** “Srbija Voz“a.d. should inform the control and receiving bodies about this case and take measures to dedicate special attention during regular repairs to the control of works performed on components that have a significant impact on safety.

**Recommendation status:** Directorate for Railways submitted the report - a letter I-01 No. 340-1164/2019 of 21.08.2019., safety recommendation SR\_04/18 is executed.

**SR\_05/18** “Srbija Voz“a.d. should harmonize its Instructions for the Maintenance of Traction Vehicles no.4/2016-16-4, dated February 23, 2016, with Article 34, paragraph 2 and Article 36 of the Rulebook on Rolling Stock Maintenance no. 340-382-7/2015 dated December 04, 2015 (“Official Gazette of RS“, No. 101/15), or to thoroughly reexamine the deadlines for regular repairs by taking the original technical documentation as a basis and to change them only after performing a risk evaluation and risk assessment based on information about the determined condition (especially measurement limits) during previous regular repairs, as well as perform analyses of extraordinary repairs and unplanned works.

**Recommendation status:** Directorate for Railways submitted the report - a letter I-01 No. 340-1164/2019 of 21.08.2019., safety recommendation SR\_05/18 is accepted and in the process of realization.

**SR\_06/18** “Srbija Voz“a.d. should perform a risk assessment for passenger transport in EMV of the series 412/416 where the extension of the deadlines for regular repairs was done before a previously performed risk evaluation and risk assessment based on the extension of these deadlines, as specified in paragraph 1, under 2) in Article 36 of the Rulebook on Rolling Stock Maintenance No. 340-382-7/2015 dated December 04, 2015 (“Official Gazette of RS“, No.101/15) and in paragraph 2, item 4.13. of the Rules of Procedure of the Safety Management System of “Srbija Voz“a.d. (due to the incident that occurred).

**Recommendation status:** Directorate for Railways submitted the report - a letter I-01 No. 340-1164/2019 of 21.08.2019., safety recommendation SR\_06/18 is accepted and in the process of realization.

**SR\_07/18** The Railway Directorate should reexamine the content of the Maintenance File for EMV 412/416 and take measures from its area of competence, as the changes of the maintenance conditions specified by the manufacturer were not performed in accordance with Article 36 of the Rulebook on Rolling Stock Maintenance no 340-382-7/2015 dated December 04, 2015 (“Official Gazette of RS“, No 101/15).



**Recommendation status:** Directorate for Railways submitted the report - a letter I-01 No. 340-1052/2019 of 29.07.2019., safety recommendation SR\_07/18 is accepted and in the process of realization.

**5.2.2. Investigation Report (ŽS-03/17) 33 No.: 340-00-8226/2017-21 of 16.05.2018. (serious accident, overtaking of the train No. 4905 on the road passenger vehicle of 21.08.2017. at 19:38 on the main arterial route E 70/E 85: Belgrade - Mladenovac - Lapovo - Niš - Preševo - state border - (Tabanovce), on the level crossing PBE 1, secured with automatic devices on the crossings (half-barriers and road light and sound signaling) which is located in the area of the switch block 2 of unmanned TK station Brestovac)**

**SR\_08/18** Considering that the inadequate behaviour of the drivers of road vehicles became very common during the transition over tracks in the sense of non-compliance with the Law on Traffic Safety on the roads (“Official Gazette of RS“ No. 41/2009, 53/2010, 101/2011, 32/2013 - decision of US, 55/2014, 96/2015 - other law and 9/2016 - decision of US), it is necessary that the Road Traffic Safety Agency investigates in detail various forms of behaviour, the causes of this behaviour and suggests measures that would contribute to rising the level of safety.

**Recommendation status:** Road Traffic Safety Agency has submitted the Report- Letter No. 221-340-03-1/2019-01 of 24.06.2019., safety recommendation SR\_08/18 is executed.

**5.2.3. Investigation Report (ŽS-05/17) 33 No.: 340-00-10144/2017-20 of 18.05.2018. (serious accident, overtaking of the train No. 4905 on the road passenger vehicle of 09.10.2017. at 20:26 on the main arterial route E 70/E 85: Belgrade - Mladenovac - Lapovo - Niš - Preševo - state border - (Tabanovce), on the 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)**

**SR\_09/18** Ministry of Construction, Transport and Infrastructure should adjust the Rulebook on the mode of crossing the railway line and the road, pedestrian or bicycle path, a place where you can carry out the intersection and measures for ensuring safe traffic (“Official Gazette of RS” No. 89/2016) with actual performances of the road vehicles (in the manner of adjustment by some countries in the region) and the actual state of the railway infrastructure.

It is necessary to determine whether the speed of the road vehicle over the crossing which is used in this calculations by this Rulebook, and which amounts to 4 km/h is suitable for the actual performances of the rolling stock, or if this speed should be enlarged (for example, in the Republic of Slovenia the speed is 7 km/h). With the speed of 4 km/h, the large number of crossings cannot satisfy the minimal required zone of visibility that the Rulebook predicts.

Explanation for the Article 11 of the Rulebook, which is given in the Article 12, and which states:

“By securing the necessary zone of visibility from the Article 11 of this Rulebook,



the participants in the road traffic are enabled with uninterrupted visibility on the railway track with both sides of the road, pedestrian or bicycle path, for noticing on time of the upcoming railway vehicles on the track so that they could stop the vehicle and stop the moving of the pedestrians or bicycles before they come to the railway, that is, in front of the traffic sign that indicates the point where the road comes over the railway track at the railway level” would make sense only in the case that in front of the crossing there is no traffic sign II-2:”The obligation of stopping”. Situation on site confirms that the traffic sign II-2: ”Obligation of stopping“, exists on all the crossings with passive signalization, which we consider absolutely necessary.

In the expression:

$$t_a = \frac{m + n + d + s}{V_p} \cdot 3,6 \quad [s]$$

In front of  $s$  should stand a sign “-“, and not the sign “+“ (see Fig. 3.4.2).

**Recommendation status:** MGSI has submitted the Report-Letter No. 340-01-0059/2019-04 of 03.07.2019., safety recommendation SR\_09/18 is partly accepted (the part relating to the speed of crossing of the road vehicle over the crossing is accepted).

**SR\_10/18** “IŽS“a.d. that given the existence of construction facilities, not even from the limit of dangerous area it is not possible to provide the necessary visibility in all directions, to consider introduction of active signaling, or to solve the problem in another way.

**Recommendation status:** Directorate for Railways has submitted the Report-Letter I-01 No. 340-1052/2019 of 29.07.2019., safety recommendation SR\_10/18 is accepted and in the process of realization.

**SR\_11/18** “IŽS“a.d. to perform the expert- based risk assessment on the crossing. Having in mind that the accidents on the crossing (viewing them individually) are rare events, the risk evaluation cannot be done solely on the number of accidents that had happened on some crossings. The risk assessment should be done, as a measure of precaution, for all the crossing according to all the relevant parameters, whether there were accidents on them or not.

**Recommendation status:** Directorate for Railways has submitted the Report-Letter I-01 No. 340-1052/2019 of 29.07.2019., safety recommendation SR\_11/18 is accepted and in the process of realization.

**SR\_12/18** “IŽS“a.d. that during the conduction of investigation of traffic accidents on the crossings, research committees should pay more attention to collecting relevant data, so that all the possible causes of the accident could be established, and with the goal of applying suitable measures.

**Recommendation status:** Directorate for Railways has submitted the Report-Letter I-01 No. 340-1052/2019 of 29.07.2019., safety recommendation SR\_12/18 is accepted and in the process of realization.





**SR\_13/18** "IŽS" a.d. to do the act of "Programme for resolution of the level crossings" according to previously finished risk assessment, with the goal of taking certain actions to raise the level of safety in traffic.

**Recommendation status:** Directorate for Railways has submitted the Report-Letter I-01 No. 340-1052/2019 of 29.07.2019., safety recommendation SR\_13/18 is accepted.

**SR\_14/18** "Srbija voz" a.d. that during the conduction of investigation of traffic accidents on the crossings, research committees should pay more attention to collecting relevant data, so that all the possible causes of the accident could be established, and with the goal of applying suitable measures.

**Recommendation status:** Directorate for Railways has submitted the Report-Letter I-01 No. 340-1163/2019 of 21.08.2019., safety recommendation SR\_14/18 is accepted and in the process of realization.

**5.2.4. Investigation Report (ŽS-04/17) 33 No.: 340-00-9180/2017-18 of 22.06.2018.  
(accident, derailment of the pushed shunting composition of 17.09.2017. at 08:45  
on the main arterial route E70/E85: (Belgrade) - Rakovica - Jajinci - Mala Krsna  
- Velika Plana, between the junction "K1" and station Rakovica)**

**SR\_15/18** Railway Directorate to check the licenses for the usage of wagon type Arbel, series Faboo, in sense of control of fulfillment of conditions for issuing safety certificates for transport and to bring in license special conditions for use to the public railway infrastructure these cars can be transported only as a special consignment with the prohibition of repression and, if necessary, other security restrictions, in accordance with the Article 21, Paragraph 5 of Law on Railway System Interoperability ("Official Gazette of RS" No. 41/2018).

**Recommendation status:** Directorate for Railways has submitted the Report-Letter I-01 No. 340-897-2/2019 of 10.07.2019., safety recommendation SR\_15/18 is not accepted

**SR\_16/18** When issuing license for the use of new vehicles which are made by already issued license for the type, Railway Directorate to act strictly in accordance with Article 22. of Law on Railway System Interoperability ("Official Gazette of RS" No. 41/2018), to avoid the new vehicles getting licenses for use even when they are not in accordance with valid technical legislation (delivery and issuing of licenses for wagon series Faboo 2007/2008).

**Recommendation status:** Directorate for Railways has submitted the Report-Letter I-01 No. 340-897-2/2019 of 10.07.2019., safety recommendation SR\_16/18 is accepted.

**SR\_17/18** Railway Directorate to conduct a review of the safety certificate for infrastructure management "IŽS" a.d. for not taking measures to urgently eliminate defects such as type "C" as established by measurements with track examination coach according to the Instruction 339 and to take measures within its jurisdiction in accordance with Article 15. of Law on Safety in Railway Transport ("Official Gazette of RS" No. 41/2018).



**Recommendation status:** Directorate for Railways has submitted the Report-Letter I-01 No. 340-897-2/2019 of 10.07.2019., safety recommendation SR\_17/18 is accepted and in the process of realization.

**SR\_18/18** Railway Directorate to review the Rulebook on technical conditions and maintenance of the superstructure of railway lines (“Official Gazette of RS” No.39/16, and 74/16) and to include in it the limit of the geometric parameters of railway condition, including twist, on the basis of standards SRPS EN 13848-5 and SRPS EN 13848-6 and to define, complied with these limits, the obligation of measuring the condition of track with track examination coach and action based on measurement results.

**Recommendation status:** Directorate for Railways has submitted the Report-Letter I-01 No. 340-897-2/2019 of 10.07.2019., safety recommendation SR\_18/18 is not accepted.

**SR\_19/18** Ministry of Construction, Transport and Infrastructure, Sector for Inspection, Group for Railway Inspection to carry out extraordinary check of railway infrastructure on the main arterial route E70/E85: (Belgrade) - Rakovica - Jajinci - Mala Krsna - Velika Plana between junctions "K1" and station Rakovica and, if necessary, take measures within their jurisdiction.

**Recommendation status:** MGSI, Sector for Inspection, Group for Railway Inspection, has not submitted the reply.

**SR\_20/18** “IŽS“ a.d. to conduct examination of the reasons why the measures have not been taken for urgent elimination of defects type "C" that were determined during the measurement with track examination coach under the Instruction on unique criteria for control of the condition of railways on the network JŽ, Instruction 339 (“Official Gazette of ZJŽ” No.2/2001 and 4/2004) and to develop coordination between sectors that determined the defect and sectors that should eliminate this defect, and under review of management in order to follow and analyze these cases. According to the evaluation of safety risks which due to this occurred, to take efficient measures for elimination of the safety flaws, and in accordance with the Article 5 of Law on safety in Railway Transport (“Official Gazette of RS“ No. 41/2018) and its Safety Management Manual.

**Recommendation status:** Directorate for Railways has submitted the Report-Letter I-01 No. 340-1165/2019 of 21.08.2019., safety recommendation SR\_20/18 is accepted and in the process of realization.

**SR\_21/18** JP “EPS“ branch TENT that in future purchases of new vehicles for their fleets require the vendor delivering vehicles compliant with the current technical regulations, in order to avoid the risk of obtaining the decision to deny a license for the vehicle type.

**Recommendation status:** Directorate for Railways has submitted the Report-Letter I-01 No. 340-1165/2019 of 21.08.2019., safety recommendation SR\_21/18 is accepted.



**SR\_22/18** JP “EPS“ branch TENT to review and supplement the maintenance instructions for the traction-buffing devices between two parts of wagon Arbel series Faboo, by analogy with the checking of head traction-buffing devices along with regulation of control of resilient elements of drawbar and small buffers on the press and the addition of appropriate measuring and control lists, and in order to avoid that these traction-buffing devices are too pre-stressed or with a gap when they are in a state with no external load.

**Recommendation status:** Directorate for Railways has submitted the Report-Letter I-01 No. 340-1165/2019 of 21.08.2019., safety recommendation SR\_22/18 is executed.

**5.2.5. Investigation Report (ŽS-06/17) 33 No.: 340-00-10982/2017-16 of 14.08.2018.  
(accident, derailment of the train No. 56990 of 03.11.2017. at 15:25 on the local track Markovac - Resavica, between the station Svilajnac and Despotovac)**

**SR\_23/18** Railway Directorate that as soon as possible defines in the current Rulebook on the technical requirements and maintenance of the superstructure of railway tracks (“Official Gazette of RS” No. 39/2016 and 74/2016) limits conditions and elements of the upper substructure which requires the immediate removal of or closure of railway for traffic by eliminating unauthorized condition.

**Recommendation status:** Directorate for Railways has submitted the Report-Letter I-01 No. 340-1052/2019 of 29.07.2019., safety recommendation SR\_23/18 is not accepted.

**SR\_24/18** “IŽS“a.d. to make amendments to the Instruction on common criteria for control of the condition of railway track on the network JŽ, Instruction 339 (“Official Gazette of ZJŽ” No.2/ 2001 and 4/2004), which with the decision of the "IŽS"a.d. No.4/2015-51-17 from 29 December 2015 is still applicable in "IŽS"a.d., in accordance with the provisions of Instruction 339 of 1989 which are listed in paragraph 3.3.4. For future track examination coaches' parameters in accordance with standards: EN 13848-1, EN 13848-2, EN 13848-6 are recommended.

**Recommendation status:** Directorate for Railways has submitted the Report-Letter I-01 No. 340-1166/2019 of 21.08.2019., safety recommendation SR\_24/18 is accepted and in the process of realization.

**SR\_25/18** „IŽS“a.d. that, given the extremely poor condition of the track, makes an assessment of risk of train traffic on the local railway track Markovac - Resavica and take measures to reduce risks to an acceptable level. Based on this, to make a technical assessment of the minimum required resources (materials, machinery, labor) for track maintenance.

**Recommendation status:** Directorate for Railways has submitted the Report-Letter I-01 No. 340-1166/2019 of 21.08.2019., safety recommendation SR\_25/18 is accepted and in the process of realization.

**SR\_26/18** Ministry of construction, traffic and infrastructure, Section for Insepection, Group for Railway Inspection, to carry out an extraordinary check of the condition of railway infrastructure on the local railway track Markovac - Resavica and to take



measures within its jurisdiction.

**Recommendation status:** MGSI, Sector for Inspection, Group for Railway Inspection, has not submitted the reply.

**5.2.6. Investigation Report (ŽS-07/17) 33 No.: 340-00-13136/2017-19 of 26.11.2018.  
(accident, derailment of the train No. 53527 of 23.12.2017. at 13:15 the regional  
line Pančevo Main Station - Zrenjanin - Kikinda - state border - (Jimbolia),  
in the area of the station Novi Bečej)**

**SR\_27/18** Railway Directorate that in short deadline defines in the applicable Rulebook on technical conditions and maintenance of the superstructure of the railway tracks (“Official Gazette of RS” No.39/16 and 74/16) the boundary conditions of elements of superstructure of the track, which require urgent elimination or closing the track for traffic until removal of unsatisfactory state.

**Recommendation status:** Directorate for Railways has submitted the Report-Letter I-01 No. 340-1052/2019 of 29.07.2019., safety recommendation SR\_27/18 is not accepted.

**SR\_28/18** “IŽS” a.d. to conduct amendments to the Instruction on unique criteria for control of the condition of railway tracks on the network JŽ, Instruction 339 (“Official Gazette of RS”, No.2/2001 and 4/2004), which is by the decision of the “IŽS” a.d. No. 4/2015-51-17 from 29.12.2015 is still applicable in “IŽS” a.d., pursuant to the provisions of Instruction 339 of 1989 which are listed in clause 3.3.5. For future track inspection coaches, the parameters are recommended in accordance with standards: SRPS EN 13848-1, SRPS EN 13848-2, SRPS EN 13848-6.

**Recommendation status:** Directorate for Railways has submitted the Report-Letter I-01 No. 340-1167/2019 of 21.08.2019., safety recommendation SR\_28/18 is accepted and in the process of realization.

**SR\_29/18** “IŽS” a.d. that, due to inadequate maintenance and condition of the track, sleepers and fastening systems, conducts an assessment of risk of train traffic on the regional railway line Pančevo Main Station - Zrenjanin - Kikinda - (Jimbolia) and take measures to reduce risk to an acceptable level. Based on this, to conduct a technical assessment of the minimum required resources (material, machinery, work force) for track maintenance.

**Recommendation status:** Directorate for Railways has submitted the Report-Letter I-01 No. 340-1167/2019 of 21.08.2019., safety recommendation SR\_29/18 is accepted and in the process of realization.

**SR\_30/18** “IŽS” a.d. to review the procedures and criteria for the approval of the traffic of trains with an overload and that this process is confined to the extreme and rare individual occasions, and not as a daily practice.

**Recommendation status:** Directorate for Railways has submitted the Report-Letter I-01 No. 340-1167/2019 of 21.08.2019., safety recommendation SR\_30/18 is accepted and in the process of realization.



**SR\_31/18** Ministry of Construction, Transport and Infrastructure, Sector for Inspection, Group for Railway Inspection to carry out extraordinary check of railway infrastructure on the regional line Pančevo Main Station - Zrenjanin - Kikinda - (Jimbolia) and take measures within their jurisdiction.

**Recommendation status:** MGSI, Sector for Inspection, Group for Railway Inspection, has not submitted the reply.

**SR\_32/18** “MSK” a.d. Kikinda to additionally pay attention to the procedure of closing the openings for filling the wagon-tanks for acetic acid and to conduct additional training of the staff.

**Recommendation status:** Directorate for Railways has submitted the Report-Letter I-01 No. 340-1167/2019 of 21.08.2019., safety recommendation SR\_32/18 is executed.

**SR\_33/18** “MSK” a.d. Kikinda to define the procedure for closing the opening for filling the wagon-tanks by bringing the instruction and therein to prescribe the moment of tightening of bolts on the covers of openings for filling.

**Recommendation status:** Directorate for Railways has submitted the Report-Letter I-01 No. 340-1167/2019 of 21.08.2019., safety recommendation SR\_33/18 is executed.