



REPUBLIC OF CROATIA  
**AIR, MARITIME AND RAILWAY TRAFFIC  
ACCIDENTS INVESTIGATION AGENCY**

**NIB ANNUAL REPORT 2018**

according to Article 23(3) of Directive 2004/49/EC

CLASS: 023-01/15-01/03  
REG. No: 699-06/1-19-08  
Zagreb, 16. September 2019

September 2019



## **PREFACE TO THE REPORT**

A National Investigation Body operates in the Republic of Croatia – Air, Maritime and Railway Traffic Accidents Investigation Agency, Department for Railway Traffic Accidents Investigation – conducting independent investigation of the causes and circumstances of railway accidents and incidents according to Directive 2004/49/EC, the principles and requirements of which have been implemented into the national legislation. The objective of the investigation of the causes and circumstances of railway accidents and incidents is to increase the safety of railways.

This Annual Report is an annual report issued by the National Investigation Body of the Republic of Croatia, Air Maritime and Railway Traffic Accidents Investigation Agency, Department for Railway Traffic Accidents Investigation for 2018, pursuant to Art. 23(3) of Directive 2004/49/EC. It comprises information regarding:

- the National Investigation Body,
- the system of investigation of railway accidents and incidents,
- the investigations of accidents and incidents completed in 2018,
- the safety recommendations issued.

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## 1 INTRODUCTION TO THE INVESTIGATION BODY

### 1.1 Legal Basis

The process of the implementation of Directive 2004/49/EC into the national legislation of the Republic of Croatia was completed in 2013 with two legal Acts. The first Act is legal basis for establishing Air, Maritime and Railway Traffic Accidents Investigation Agency - AIA (National gazette No 52/13 and 69/18). The second Act is legal basis for railway traffic accident investigation (National gazette No 82/13, 18/15, 110/15 and 70/17).

AIA investigates accidents and incidents. Accident and Incidents are further divided into the following categories, reflecting their nature and consequences:

- serious accidents,
- accidents,
- incidents.

The accident and incident investigation performed by AIA is independent of any other party and independent of the investigation conducted by other bodies, especially judiciary investigation and the investigation of the causes and circumstances of accidents and incidents conducted by infrastructure managers or railway undertakings.

### 1.2 Role and Aim

Air, Maritime and Railway Traffic Accidents Investigation Agency, the National Investigation Body, was established on 29<sup>st</sup> July 2013. The mission is to guarantee independent investigation of the causes and circumstances of railway accidents and incidents. The national legislation of Republic of Croatia does not authorize AIA to investigate accidents and incidents within trams, trolleybuses and cable-cars.

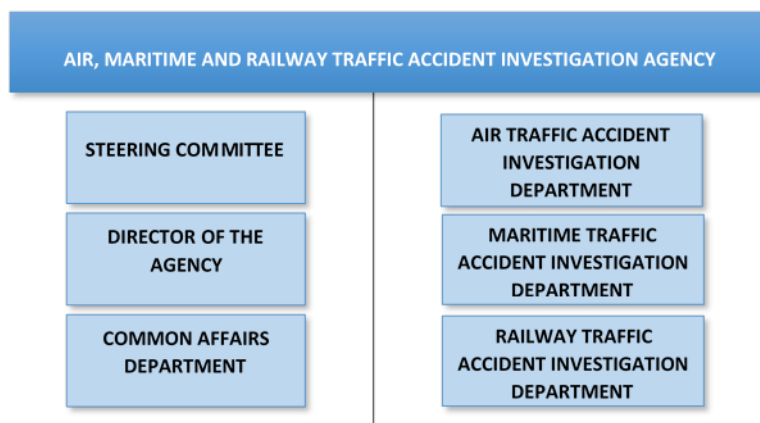
The main goal of AIA work is to prevent the occurrence of accidents and incidents. Therefore, AIA:

- investigates the causes and circumstances of rail accidents and incidents,
- issues reports and safety recommendations to railway undertakings, infrastructure managers, to the National Safety Authority or other authorities and parties.

### 1.3 Organisation

Air, Maritime and Railway Traffic Accidents Investigation Agency (AIA) – was established pursuant to the provisions of Act 52/2013. AIA is a multimodal institution; it has three independent departments for safety investigations. One of the departments is Department for Railway Traffic Accidents Investigation. The Department was established in April 2014. The Department currently has one chief investigator in charge. Other two departments are Department for Air Traffic Accidents Investigation, and Department for Maritime Traffic Accidents Investigation.

Department for Railway Traffic Accidents Investigation investigates the causes of railway accidents and incidents independently of any other party and performing preventative inspections of railway safety. As an investigation body it is independent of any infrastructure manager, railway undertaking and regulatory body. The competences of Department include railways (main lines, regional lines, sidings).



## 1.4 Organisational flow

The structure of railway sector in Republic of Croatia and relationships among the parties involved are defined in Act 82/2013. The legislation applies to the railway transport systems (main lines, regional lines, sidings).

The bodies in the railway sector include Ministry for Transportation, Railway Safety Agency and AIA. Ministry for Transportation is in charge of the national railway legislation, including implementation of the EU railway legislation. Railway Safety Agency is the National Safety Authority carrying out certification and regulation of railway and railway transport operation, according to the national legislation. AIA is the National Investigation Body independent of any party in the railway sector.

All these authorities are involved in the system of maintaining and improving safety of railways and railway transport:

- **Ministry for Transportation** sets the framework by developing railway legislation.
- **AIA (NIB)** investigates railway accidents and incidents and issues safety recommendations.
- **Railway Safety Agency (NSA)** sets and adjusts safety rules for infrastructure managers and railway undertakings.

## 2 INVESTIGATION PROCESSES

### 2.1 Cases to be investigated

The national legislation of Republic of Croatia orders the National Investigation Body, in accordance with European principles, to investigate the causes and circumstances of serious accidents on main and regional lines, border railways and sidings.

When making decision whether to investigate or not, AIA takes into account the above mentioned legal requirements, as well as possibility to learn safety relevant lessons from the accident or incident.

### 2.2 Institutions involved in investigations

Following the occurrence of railway accident or incident, various parties may launch several independent investigations, depending on the occurrence's nature and consequences:

- **Infrastructure manager or railway undertaking** identifies the causes and circumstances of accident or incident, focusing on the drafting of preventative measures and the proposal of responsibility for the occurrence.
- **AIA** investigates the causes and circumstances of accident or incident with a focus on the determination of the causes and issue of preventative safety recommendation.
- **State Attorney and Police** investigate accident or incident with the aim of defining responsibility for the committing of offenses or criminal acts.

### 2.3 Investigation process or approach of the NIB

The objective of the investigation of the causes of railway accidents and incidents is to gain knowledge for the prevention of accidents and incidents, minimize the consequences and increase the safety of railways.

Investigation performed by the National Investigation Body of Republic of Croatia, Department for Railway Traffic Accident Investigation, focuses on the following aspects of each occurrence:

- independent investigation of the causes and circumstances of accident or incident (serious accidents and selected accidents and incidents only).

When notified about an accident or incident by an infrastructure manager or railway undertaking, the Chief Investigator will decide whether it will immediately go to the accident-site or not. At the Accident-site The Department will launch an independent investigation or just make onsite overview and make decision about launching an investigation later.

If The Department launches an investigation, it will notify The European Union Agency for Railways within seven days, all parties involved in an event and the NSA. The investigation of accident or incident may be launched immediately after the occurrence and/or later, in reaction to specific circumstances.

The Department will publish the conclusions of its investigation in Investigation Report, the structure of which is based on the requirements of Directive 2004/49/EC. If an accident or incident occurred without any violation of legislation or internal regulations of infrastructure manager and/or railway undertaking, The Department issues safety recommendation with the aim of preventing reoccurrence of the accident or incident. Safety recommendation is issued also if there are other findings relevant for the safety.

## 3 INVESTIGATIONS

### 3.1 Overview of investigations completed in 2018, identifying key trends

Trends of completed investigations in 2018.

Type of accidents investigated	Number of accidents	Number of victims		Damages in € (approx.)	Trends in relation to previous year
		Deaths	Ser. injury		
Collisions	0	0	0	<150.000	-100%
Derailments	4	0	0	<150.000	+33%
LC-accident	0	0	0	<150.000	-200%
Fire in RS	0	0	0	<150.000	0%
Acc. to person	0	0	0	<150.000	-200%
Other	4	0	0	0	+33%

### 3.2 Investigations completed and commenced in 2018

#### Investigations completed in 2018

Date of occurrence	Title of the investigation (Occurrence type, location)	Legal basis	Completed (date)
19 February 2017	Line M202, derailment of a shunting on the Karlovac station	ii	05 February 2018
27 March 2017	Line M402, derailment tank wagon on the Zagreb Ranžirni	ii	10 February 2018
11 January 2017	Line M104, passenger train 2508 did not stop at station Lužani Malino	ii	22 February 2018
05 October 2016	Trains crossed an unprotected level crossing Danica	ii	27 February 2018
10 March 2017	Line M202, derailment cargo train 46801 near Zvečaj	ii	06 April 2018
04 April 2017	Line M201, drop passengers from passenger wagons on the Križevci station	ii	09 May 2018
12 October 2017	Derailment of an shunting cargo train on the station Zagreb Ranžirni	ii	17 September 2018
28 April 2017	Line M101 passenger train hit buffer stop	ii	10 December 2018

**Basis for investigation:** i = According to the Safety Directive, ii = On national legal basis (covering possible areas excluded in Article 2, §2 of the Safety Directive), iii = Voluntary – other criteria (National rules/regulations not referred to the Safety Directive).

#### Investigations commenced in 2018

Date of occurrence	Title of the investigation (Occurrence type, location)	Legal basis
08 January 2018	Line M101, electric shock unauthorized persons on the Zagreb Zapadni station	i
02 June 2018	Line M103, SPAD train 69327 on the Kutina TK station	ii
27 June 2018	Line M104, derailment of a shunting on the 35. track	ii
11 July 2018	Line M102, derailment of four cargo wagons on the Dugo Selo station	ii
12 October 2018	Line M604, derailment of cargo wagons on the Plaški station	ii
13 October 2018	Line R201, collision on a LC Vernalska	ii
21 October 2018	Line M201, strike passenger train on rail	ii

**Basis for investigation:** i = According to the Safety Directive, ii = On national legal basis (covering possible areas excluded in Article 2, §2 of the Safety Directive), iii = Voluntary – other criteria (National rules/regulations not referred to the Safety Directive).



### 3.3 Research studies (or Safety Studies) commissioned and completed in 2018

#### Safety Studies completed in 2018

Date of commission	Title of the Study (Occurrence type, location)	Legal basis	Completed (date)
28 April 2017	Line M101, passenger train hit buffer stop	ii	10 December 2018

**Basis for investigation:** i = According to the Safety Directive, ii = On national legal basis (covering possible areas excluded in Article 2, §2 of the Safety Directive), iii = Voluntary – other criteria (National rules/regulations not referred to the Safety Directive).

#### Safety Studies commenced in 2018

Date of commission	Title of the Study (Occurrence type, location)	Legal basis	Completed (date)
28 April 2017	Line M101, passenger train hit buffer stop	ii	10 December 2018

**Basis for investigation:** i = According to the Safety Directive, ii = On national legal basis (covering possible areas excluded in Article 2, §2 of the Safety Directive), iii = Voluntary – other criteria (National rules/regulations not referred to the Safety Directive).

### 3.4 Summaries of investigations completed in 2018

See the Annex of the Report.

### 3.5 Comment and introduction or background to the investigations

#### Investigations commenced in 2018 and not followed

Date of occurrence	Title of the investigation (Occurrence type, location)	Legal basis	Reason of non-following or suspension of investigations	Who, why, when (decision)
	none			

**Basis for investigation:** i = According to the Safety Directive, ii = On national legal basis (covering possible areas excluded in Article 2, §2 of the Safety Directive), iii = Voluntary – other criteria (National rules/regulations not referred to the Safety Directive).

### 3.6 Accidents and incidents investigated during last five years (in 2014-2018)

#### Rail investigations completed in 2014–2018

Department for railway traffic accidents investigation has become operational in April 2014, so first investigation was opened in 2014.

The table groups investigations by year of their completion.

Accidents investigated		2014	2015	2016	2017	2018	TOT
Serious accidents (Art 19, 1 + 2)	Train collision	0	1	0	1	0	2
	Train collision with an obstacle	0	2	2	0	0	4
	Train derailment	1	1	1	3	4	10
	Level-crossing accident	0	2	2	2	0	6
	Accident to person caused by RS in motion	0	0	2	2	2	6
	Fire in rolling stock	0	1	0	0	0	1
	Involving dangerous goods	0	0	0	0	0	0
Incidents		0	2	0	3	2	7
TOTAL		1	9	7	11	8	36

## 4 RECOMMENDATIONS

### 4.1 Short review and presentation of recommendations

A safety recommendation can be issued only on a basis of an independent investigation performed by The National Investigation Body (NIB). Safety recommendation is usually issued when an accident occurred without any violation of legislation or internal regulations of infrastructure manager and/or railway undertaking, or if there are other findings relevant for the safety.

According to national legislation, safety recommendations are not legally binding. When a recommendation is issued, railway undertakings and infrastructure managers are obliged to adopt their own preventative safety measures based on issued safety recommendation.

#### Implementation of recommendations during 2014 – 2018

Recommendations issued		Recommendation implementation status					
		Implemented		In progress		Not to be implemented	
Year	[No.]	[No.]	[%]	[No.]	[%]	[No.]	[%]
2014	4	2	50%	2	50%	0	0
2015	7	4	58%	1	14%	2	28%
2016	11	2	18%	9	82%	0	0
2017	11	8	71%	1	14%	2	28%
2018	3	3	100%	0	0%	0	0%
TOTAL	36	19	53%	13	33%	4	14%

**Accidents with safety recommendations issued in 2014 – 2018**

<b>Date of occurrence</b>	<b>Title of the investigation (Occurrence type, location)</b>	<b>Status of implem.</b>	<b>Completed (date)</b>
11 July 2014	Derailment of a rolling stock near the Madjarevo station SP/14	Implemented	22 December 2014
19 September 2014	Collision on level crossing in city of Krapina SP 1/14	implemented	02 April 2015
19 September 2014	Collision on level crossing in city of Krapina SP 2/14	Accepted	02 April 2015
19 September 2014	Collision on level crossing in city of Krapina SP 3/14	Accepted	02 April 2015
19 September 2014	Collision on level crossing in city of Krapina SP 1/15	Not accepted	02 April 2015
22 June 2014	Line M102, near miss at the Dugo Selo station, long-distance passenger train no 782 and commuter train no 8087 SP3/15	Accepted	23 October 2015
4 September 2014	The Varaždin Station, fire in DMU SP 2/15	Implemented	18 May 2015
12 January 2015	Collision on a level crossing in village Kupinec SP 6/15	Not implemented	22 December 2015
10 November 2014	Derailment of shunting locomotive in Sisak SP 4/15	Implemented	5 December 2016
11 September 2014	Rock slide near the Kaštel Stari station SP 7/15	Implemented	03 March 2016
27 February 2015	Accident on LC in village Kosovo SP 1/16	Accepted	07 March 2016
27 February 2015	Accident on LC in village Kosovo SP 2/16	Accepted	07 March 2016
27 February 2015	Accident on LC in village Kosovo SP 3/16	Accepted	07 March 2016
27 February 2015	Accident on LC in village Kosovo SP 4/16	Accepted	07 March 2016
27 February 2015	Accident on LC in village Kosovo SP 5/16	Accepted	07 March 2016
11 November 2014	Accident caused by rolling stock in motion, Zdenčina SP 5/15	Implemented	02 November 2015
10 July 2015	Serious accident on the LC in village Švogari SP 6/16	Implemented	12 September 2016
10 July 2015	Serious accident on the LC in village Švogari SP 7/16	Accepted	12 September 2016
10 July 2015	Serious accident on the LC in village Švogari SP 8/16	Accepted	12 September 2016
10 July 2015	Serious accident on the LC in village Švogari SP 9/16	Accepted	12 September 2016

Date of occurrence	Title of the investigation (Occurrence type, location)	Status of implem.	Completed (date)
10 July 2015	Serious accident on the LC in village Švogari SP 10/16	Accepted	12 September 2016
30 June 2015	Station Split Predgrađe run over the shunting worker SP 11/16	Implemented	16 January 2017
28 December 2015	Line L 203, collision on a LC Male Sredice SR 1/17	Implemented	07 July 2017
28 December 2015	Line L 203, collision on a LC Male Sredice SR 2/17	Not implemented	07 July 2017
12 May 2016	Vinkovci Station, a passenger train crossed an unprotected level crossing SR 3/17	Implemented	28 June 2017
14 June 2016	Accident caused by rollingstock in motion, Sljeme Tunnel SR 4/17	Non information	31 August 2017
17 October 2016	Collision on a LC near town of Ivanec, line L 201 SR 5/17	Not implemented	11 October 2017
17 October 2016	Collision on a LC near town of Ivanec, line L 201 SR 6/17	Implemented	11 October 2017
05 September 2016	Collision of two special railway vehicles on the station Zagreb Ranžirni SR 7/17	Implemented	25 October 2017
05 October 2016	Trains crossed an unprotected level crossing Danica SR 8/17	Implemented	27 February 2018
05 October 2016	Trains crossed an unprotected level crossing Danica SR 9/17	Implemented	27 February 2018
05 October 2016	Trains crossed an unprotected level crossing Danica SR 10/17	Implemented	27 February 2018
05 October 2016	Trains crossed an unprotected level crossing Danica SR 11/17	Implemented	27 February 2018
27 March 2017	Line M402, derailment of the tank wagon at the Zagreb Ranžirni SR 1/18	Implemented	27 February 2018
27 March 2017	Line M402 derailment of the tank wagon at the Zagreb Ranžirni SR 2/18	Implemented	27 February 2018
04 April 2017	Line M201, passenger falling out of the passenger wagon at the Križevci station	Implemented	09 May 2018

#### 4.2 Safety Recommendations issued in 2018

No of the recommendation: SP 8/17	
Date of occurrence	Title of the investigation
05 October 2016	Trains crossed an unprotected level crossing Danica
<b>Addressed to the Ministry of Transport.</b> In the Regulations on Technical Conditions for the Traffic Control and Signalling and Safety Railway Infrastructure System (OG 97/15) in the Art. 10 point 1: work monitoring rule should be extended to the LC that are derived as automatic devices.	
<b>STATUS : Implemented (Ministry of Transport)</b>	

No of the recommendation: SP 9/17	
Date of occurrence	Title of the investigation
05 October 2016	Trains crossed an unprotected level crossing Danica
<p><b>Addressed to the Ministry of Transport.</b></p> <p>In the Ordinance on Technical Conditions for Traffic Control and Signalling and-Safety Railway Infrastructure (OG 97/15) in Art. 10 point 3 should be clarified what additional measures the infrastructure manager is obliged to introduce.</p>	
<b>STATUS : Implemented (Ministry of Transport)</b>	

No of the recommendation: SP 10/17	
Date of occurrence	Title of the investigation
05 October 2016	Trains crossed an unprotected level crossing Danica
<p><b>Addressed to the NSA.</b></p> <p>The Infrastructure Manager should take measures to reliably eliminate the induced interference that could affect the operation of signalling and safety equipment, with the emphasis being on the use of passive measures that are more reliable and in the long run cheaper.</p>	
<b>STATUS : Implemented (HŽI)</b>	

No of the recommendation: SP 11/17	
Date of occurrence	Title of the investigation
05 October 2016	Trains crossed an unprotected level crossing Danica
<p><b>Addressed to the equipment manufacturer.</b></p> <p>The manufacturer of the equipment should in instructions put information that TRD 14 device, in conditions where there are large quantities of electromagnetic disturbances in signalling cables (outside of limits defined in international standards), can be susceptible to induced electromagnetic interference.</p>	
<b>STATUS : Implemented (ALTPRO)</b>	



No of the recommendation: SR 1/18	
Date of occurrence	Title of the investigation
27 March 2017	Line M402, derailment of the tank wagon at the Zagreb Ranžirni station
<b>Addressed to the NSA.</b> The Infrastructure Manager should establish track maintenance processes of shunting yards, such that in track maintenance process can be determine actual track condition including track loads and other relevant indicators.	
<b>STATUS : Implemented (HŽI)</b>	

No of the recommendation: SR 2/18	
Date of occurrence	Title of the investigation
27 March 2017	Line M402, derailment of the tank wagon at the Zagreb Ranžirni station
<b>Addressed to the NSA.</b> The Infrastructure Manager should, through regular meetings of organizational units dealing with traffic management and infrastructure maintenance, coordinate the technological processes of these units that affect each other's work.	
<b>STATUS : Implemented (HŽI)</b>	

No of the recommendation: SR 3/18	
Date of occurrence	Title of the investigation
04 April 2017	Line M201, passenger falling out of the passenger wagon at the Križevci station
<b>Addressed to the NSA.</b> The owner of the vehicle should supplement the Training Plain NPV/PV workers related to the inspection of the door function on passenger wagons at the receiving / shipped stations.	
<b>STATUS : Implemented (HŽPP)</b>	

ACCIDENTS COMPLETED IN 2018 SUMMARY

**Derailment of shunting wagons on the Karlovac station**

Grade:	Accident;
Date and time:	19 February 2017, 20:13 (09:13 GMT);
Occurrence type:	derailment of shunting wagons;
Description:	On 19 February 2017, at 20:13 on the M202 line in the Karlovac station, during the shunting of four freight wagons, there was a derailment of wagon number: 37 80 7846 169-6. Derailed happened in 477+300 KM, while vehicle was driving over the Switch number 38. Derailed wagon was second behind the locomotive. The wagon derailed with first axle in the direction of driving.
Type of train:	shunting train;
Location:	line No M 202, Karlovac station, on the Switch number 38. ;
Parties:	HŽ Infrastruktura Ltd (IM) and HŽ Cargo Ltd (RU);
Consequences:	material damage on vehicles and infrastructure;
Direct cause:	derailment of a cargo wagon with first axle;
Recommendation:	no safety recommendation.

**Derailment of shunting wagons on the Zagreb Ranžirni station**

Grade:	Accident;
Date and time:	27 March 2017, 06:05 (05:05 GMT);
Occurrence type:	derailment of shunting wagons;
Description:	On March 27, 2017, at 6:05 am at the Zagreb Ranžirni railway station during the shunting of locomotives and twenty loaded freight wagons, the shunting locomotives and the first three wagons derailed. There were no injuries in the accident, but great material damage was caused to vehicles, cargo and infrastructure. The accident did not cause traffic interruption.
Type of train:	shunting train;
Location:	line No M 402, Zagreb Ranžirni station, on the Switch number 128. ;
Parties:	HŽ Infrastruktura Ltd (IM) and RCC Croatia Ltd (RU);
Consequences:	material damage on vehicles and infrastructure;
Direct cause:	derailment of the second wagon of the manoeuvring composition due to the poor condition of parts of track gauge P2;

## Safety recommendation

Air, Maritime and Railway Accidents Investigation Agency in order to improve the safety of the railway system issued to Croatian Railway Safety Agency following safety recommendations:

**AIN/06 SR 1/2018:** The Infrastructure Manager should establish track maintenance processes of shunting yards, such that in track maintenance process can be determine actual track condition including track loads and other relevant indicators.

**AIN/06 SR 2/2018:** The Infrastructure Manager should, through regular meetings of organizational units dealing with traffic management and infrastructure maintenance, coordinate the technological processes of these units that affect each other's work.

### Incident on line M104, passenger train 2508 did not stop at station Lužani Malino

Grade:	Incident;
Date and time:	11 January 2017, 20:02 (19:02 GMT);
Occurrence type:	other;
Description:	On January 11, 2017 at 20:02 on the M104 line, in the Lužani-Malino station, passenger train number 2508, which operated on the Vinkovci - Novska route, passed through the stated position without stopping even though the timetable was scheduled to stop.
Type of train:	passenger train;
Location:	line No M104, Lužani station;
Parties:	HŽ Infrastruktura ltd (IM) and HŽ PP ltd (RU);
Consequences:	no material damage on the train and infrastructure;
Direct cause:	the immediate cause of this incident could not be established but based on the study it was concluded that the incident was contributed to the weather conditions;
Recommendation:	no safety recommendation.

### Incident on line M201, trains crossed an unprotected level crossing Danica

Grade:	Incident;
Date and time:	05 and 06. October 2016;
Occurrence type:	other;
Description:	On 05 and 06 October 2016, during ride of trains No 69702 and 89885 on the line M201, between stations Botovo and Koprivnica, over the Level Crossing No 28 (LC Danica), the Safety Device recorded Malfunctions of the Level Crossing Device. Trains drivers reported traffic controllers in Station Koprivnica that halve barriers of the LC 28 didn't come



down when the trains arrived at the LC. In those two incidents no one was injured and there was no obstruction of traffic.

Type of train:	freight train;
Location:	line No M201, LC Danica, Koprivnica;
Parties:	HŽ Infrastruktura ltd (IM), HŽ Cargo ltd (RU) and RCC Croatia ltd (RU);
Consequences:	no material damage on the train and infrastructure;
Direct cause:	induced disturbances in the signal cable of the Automated Level Crossing safety device, due to which, during train passing over, on the LC No. 28, in the cases concerned, were not lowered to the halve barriers. The cause of the disruption is the electromagnetic impact of electric traction on the signaling cables along the track;

### **Safety recommendation**

Air, Maritime and Railway Traffic Accidents Investigation Agency based on results of this investigation to Improve Rail Safety, issues the following safety recommendations to the Ministry of Transport:

**AIN / 06 SR 8/2017:** In the Regulations on Technical Conditions for the Traffic Control and Signalling and Safety Railway Infrastructure System (OG 97/15) in the Art. 10 point 1: work monitoring rule should be extend to the LC that are derived as automatic devices.

**AIN / 06 SR 9/2017:** In the Ordinance on Technical Conditions for Traffic Control and Signalling and Safety Railway Infrastructure (OG 97/15) in Art. 10 point 3 should be clarified what additional measures the infrastructure manager is obliged to introduce.

Air, Maritime and Railway Accidents Investigation Agency in order to improve the safety of the railway system issued to Croatian Railway Safety Agency following safety recommendations:

**AIN / 06 SR 10/2017:** The Infrastructure Manager should take measures to reliably eliminate the induced interference that could affect the operation of signalling and safety equipment, with the emphasis being on the use of passive measures that are more reliable and in the long run cheaper.

Air, Maritime and Railway Traffic Accidents Investigation Agency, based on the investigation of those incidents, in order to improve the safety of the railway system, issues to the equipment manufacturer the following safety recommendation:

**AIN / 06 SR 11/2017:** The manufacturer of the equipment should in instructions put information that TRD 14 device, in conditions where there are large quantities of electromagnetic disturbances in signalling cables (outside of limits defined in international standards), can be susceptible to induced electromagnetic interference.

### **Derailment of freight trains 46801 near the Zvečaj station, line M202**

Grade:	Accident;
Date and time:	10 March 2017, 23:58 (22:48 GMT);
Occurrence type:	derailment of wagons;

Description:	On 10 Mart 2017, at 23:58 on the M202 line, there was a derailment of two rolling stocks, with three bogies, of the freight train, No 46801. The train was traveling between Duga Resa and Zvečaj stations. The derailment happened near the Zvečaj station. In this accident no one was hurt, but it caused a significant damage on infrastructure and vehicles.
Type of train:	freight train;
Location:	line No M 202, near the Zvečaj station;
Parties:	HŽ Infrastruktura ltd (IM) and HŽ Cargo ltd (RU);
Consequences:	material damage on vehicles and infrastructure;
Direct cause:	derailment is caused by the climb of the left wheel to the rail. The immediate cause of the climb of the left wheel on the rail during the investigation was not possible to determine;
Recommendation:	no safety recommendation.

Following the analysis of the data collected during the investigation, the Accident Investigation Chief Investigator concluded that all involved parties took appropriate measures to prevent future accidents, so the further investigation of this case is not necessary because the measures taken are fulfilled for the purposes of security investigations, which is to prevent repetition accidents and increased system security.

#### **Drop passengers from passenger wagon on the Križevci station, line M201**

Grade:	Accident;
Date and time:	04 April 2017, 16:54 (15:54 GMT);
Occurrence type:	other;
Description:	On 04 April 2017, at 16:54 on the M201 line in station Križevci, when the passenger was leaving wagon No. 61 78 20-00 058-7 which was part of train No. 201, side wagon door severely injured passenger.
Type of train:	passenger train;
Location:	line No M 201, in the Križevci station;
Parties:	HŽ Infrastruktura ltd (IM) and HŽ PP ltd (RU);
Consequences:	serious injured passenger while no damage was caused to the wagon and the railway infrastructure;
Direct cause:	press of the side door of the passenger when leaving the passenger wagon;

### ***Safety recommendation***

Air, Maritime and Railway Accidents Investigation Agency in order to improve the safety of the railway system issued to Croatian Railway Safety Agency following safety recommendations:

**AIN/06 SR 3/2018**: The owner of the vehicle should supplement the Training Plain NPV/PV workers related to the inspection of the door function on passenger wagons at the receiving / shipped stations.

### **Derailment of shunting wagons on the Zagreb Ranžirni station**

Grade: Accident;

Date and time: 12 October 2017, 16:30 (15:30 GMT);

Occurrence type: derailment of shunting wagons;

Description: On October 12, 2017, at 4:30 pm at the Zagreb Ranžirni railway station during the shunting of locomotive and six empty freight wagons on line S-52 at switch number 340 during operation of a shunting second wagon No 41 78 9003 048-5 series Uckk-z with two axle derailed.

Type of train: shunting train;

Location: line No M 402, Zagreb Ranžirni station, on the Switch number 340. ;

Parties: HŽ Infrastruktura ltd (IM) and HŽ Cargo ltd (RU);

Consequences: material damage on infrastructure;

Direct cause: derailment of the fifth wagon with two axle in direction of shunting;

Recommendation: no safety recommendation.

### **Passenger train hit the obstacle on the end of the track, line M101**

Grade: Accident;

Date and time: 28 April 2017, 16:05 (15:05 GMT);

Occurrence type: other;

Description: On April 28<sup>th</sup> 2017, at 16:05, in the Zagreb Glavni Station, during the shunting operation of an EMU, the EMU hit the obstacle on the end of the track.

Type of train: passenger train;

Location: line No M 202, Zagreb Glavni station;

Parties: HŽ Infrastruktura ltd (IM) and HŽ PP ltd (RU);

Consequences: material damage on infrastructure;

Direct cause: could not be established but based on the analyzes it was concluded that the incident was contributed to the weather conditions;

Recommendation: no safety recommendation.