



STATE COMMISSION ON RAILWAY ACCIDENTS INVESTIGATION
Ministry of Interior and Administration

REPORT No PKBWK 05/ 2021

**on the investigation of a serious train accident that occurred on
26 January 2021 at 07:39
on route between Zbąszynek and Lutol Suchy, track no 1,
level crossing category D
at km 10.196 of railway line no 367 Zbąszynek - Gorzów Wielkopolski**

Area of the infrastructure manager PKP PLK S.A. Zakład Linii Kolejowych w Zielonej Górze

WARSAW, 14.10.2021

<https://www.gov.pl/web/mswia/panstwowa-komisja-badania-wypadkow-kolejowych>

This Report has been prepared under the provisions of *Commission Implementing Regulation (EU) 2020/572 of 24 April 2020 on the reporting structure to be used for reports on the reporting structure to be used for railway accidents and incidents investigation report (Official Journal of the European Union No. 132 of 27 April 2020)*

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I. SUMMARY

Type of Event: Serious accident.

Description: An incident on a level crossing involving the entry of a road vehicle, i.e., a Mercedes-Benz Atego truck with a trailer right in front of the front of a railway vehicle (two-unit rail bus SA139-006) running as train ROM 78561 between Zbąszynek and Gorzów Wielkopolski.

Date of event: 26.01.2021 at 07:39.

Place of Event: Railway line no. 367 between Zbąszynek and Gorzów Wielkopolski, route Zbąszynek - Lutol Suchy track no. 1, level crossing cat. D at km 10.196, Identification no. of the crossing 367 010 196, geographical location 52°18'59 "N 15°45'58 "E.

Implications of the event: As a result of the incident the truck driver was killed on the spot, the truck was destroyed, and the front and side planking of the rail bus was damaged.

Causal factor: Truck entering a cat D level crossing, directly in front of an oncoming passenger train ROM 78561.

Contributing factor: 1) Driver's failure to behave with special caution when approaching a level crossing, as provided for in Article 28 of the Act of 20 June 1997 - Road Traffic Law (consolidated text: Journal of Laws of 2020, item 110 as amended.).
2) Lack of warning signs and indicator posts on the municipal access road No. 006323F to the level crossing.
3) No reaction of the truck driver to repeatedly given audible signals "Attention" by the driver of the train ROM 78561.

Systemic factors: Not stated.

Recommendations and their addressees: 1) Road Manager, Mayor of Trzciel will undertake actions aimed at immediate removal of irregularities identified during diagnostic tests or during controls at level crossings and indicated in Railway Infrastructure Manager's applications.
2) Railway undertaking POLREGIO sp. z o.o. will check in all railway vehicles, which are in service of the company, the correctness of operation of installed forecourt image recorders and will take appropriate measures to ensure technical efficiency of those recorders.
3) The administrator of the L class municipal road together with the administrator of the railway infrastructure will adjust the access to the level crossing to the width of 2 x 2,75 m (according to the provisions of §15 subsection 1 point 5 of the Regulation of the Minister of Transport and Maritime Economy of 2 March 1999 on technical conditions to be met by public roads and their location (i.e. Journal of Laws of 2016, item 124 as amended)). The current width of the road meets the requirements of §14 item 3 point 1 of the aforementioned regulation, which is allowed for the time of staging the construction or for the reconstruction of the road.
4) The railway infrastructure manager will maintain the train speed limit of 60 km/h until the width of the access road is adjusted to the width of the crossing platform.



Photo 1- View of the incident site (own material of PKBWK)



Photo 2- View of the place and consequences of the incident (own material of PKBWK)



Photo 3- View of the place and consequences of the incident (own material of PKBWK)

II. THE PROCEDURE AND ITS CONTEXT

1. Decision to initiate proceedings

The Chairman of the State Commission on Railway Accidents Investigation Tadeusz Ryś has issued the decision No. PKBWK.4631.1.2021 of 2 February 2021 to initiate the proceedings on investigating a serious accident at a level crossing called hereinafter referred to as "crossing", category D at km 10,196. Taking this fact and the provisions of article 28e paragraph 4 of the Act of 28 March 2003 on railway transport (consolidated text: Journal of Laws of 2020, item 1043, as amended), hereinafter referred to as "Railway Transport Act", on 12 February 2021 the incident was reported on time to the European Union Agency for Railways and registered in the database under number PL-10018.

2. Grounds for the decision to initiate the procedure

Based on the analysis of circumstances of this incident, taking into account the nature of the incident, which is a series of accidents at D category crossings with fatalities, the Chairman of PKBWK decided to initiate proceedings by the Commission Investigation Team on the basis of article 28e item 1 of the Railway Transport Act.

3. The scope and limitations of the proceeding, including the rationale for the proceeding, and an explanation of any delays that are considered to be a risk or other impact on the proceeding or the conclusions of the proceeding

Proceedings to establish the reasons for the event were conducted pursuant to Article 28h (1) of the Railway on railway transport, which according to the provision of article 28f rec. 3 does not decide about fault or responsibility.

Given the nature of the incident, among other things, following analyses were conducted:

- Documentation of passage, internal rules of railway infrastructure manager and railway undertaking related to the event under investigation the internal rules of the railway infrastructure manager and railway undertaking related to the event under investigation,
- safety management systems (SMS) of the carrier and the infrastructure manager,
- documentation of maintenance system (DSU) of railway vehicle type 223M SA139 series.

There were no restrictions that adversely affected the conduct of the proceedings.

The report was prepared at the headquarters of the State Commission on Railway Accidents Investigation, hereinafter referred to as "PKBWK" or "Commission".

4. Aggregate description of the technical capabilities of the functions within the team of investigators

The Chairman of the Commission appointed from among the permanent members of the Commission a three-member Investigation Team meeting the technical requirements for the proceedings.

5. Description of the communication and consultation process conducted with persons or entities involved in the incident, during the investigation and in relation to the information presented

Pursuant to article 28h (2) (5) of Railway Act, the Chairman of PKBWK obliged indicated persons from among members of railway commission to cooperate with the Investigation Team (letter PKBWK no. 4631.1.1.2021 dated 03.02.2021.).

According to the letter no. PKBWK 4631.1.2.2021 of 11 February 2021, the documentation gathered by the railway commission had been formally handed over in the Operational Section in Zbąszynek of PKP PLK S.A. on the 15.02.2021.

The Commission requested the transport company Trans Logistyka Sp. z o.o. in Słubice (the truck driver's employer) to provide information on the truck driver's work record. The feedback together with the data on the truck driving record just before the incident has been received by the Investigation Team.

The President of PKBWK submitted a letter to the President of railway undertaking POLREGIO sp. z o.o. with the request to provide data concerning among others work of train crew and the vehicle itself. The railway undertaking POLREGIO sp. z o.o. provided relevant materials for the needs of the Team except for recording of foreground image of the railway vehicle.

6. Description of the level of cooperation proposed by the actors involved

During the investigation, the level of cooperation with representatives of entities related to the circumstances of the incident was standard and did not raise major concerns for the Investigation Team.

7. Description of methods and techniques employed in the investigation and methods of analysis used to establish the facts and make the determinations referred to in the report

Throughout the whole process, aimed at clarifying the causes and circumstances of the incident, the investigation team has considered the provisions of national rules, internal rules of the infrastructure manager and railway undertaking and technical documentation. Furthermore, it has used its own knowledge and experience.

Use was made of documentation produced by the Investigation Team and documentation gathered by the Railway Commission and the Prosecution.

As part of the investigation of the incident, the Investigation Team performed the following activities, among others:

- visual inspection of the accident scene on the day of the accident including level crossing, access road, access road marking 006323F, level crossing markings,
- taking photographic and film documentation on the day of the accident and at later dates,
- local inspections at the scene of the incident carried out twice while driving a company car along the access road to the crossing,
- measurements of the visibility triangles of the train head from the approach road at distances of 5, 10 and 20 meters from the crossing,
- performing visibility measurements of the crossing from the access road,
- examination of the documentation submitted by the railway undertaking, the line manager and the owner of the road vehicle and the owner of the road vehicle,
- analysis of the data of the recorder of the railway vehicle driving parameters and the report of the truck driving,
- analysis of the incident using the tree-of-causes method (procedures established depending on the conclusions the Commission wished to draw from the investigation).

The following is a selection of the legal acts, regulations and internal instructions used during the proceedings:

European Union regulations:

- 1) Directive 2016/798/EC of the European Parliament and of the Council of 11 May 2016 on railway safety (OJ L 138, 26.05.2016, p. 102, as amended),
- 2) Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation (Journal of Laws EU L119 of 04.05.2016, p.1. as amended)) and the related Act of 10 May 2018 on personal data protection (Journal of Laws, item 1000),
- 3) Commission Regulation (EU) No 1158/2010 of 9 December 2010 on a common safety method for assessing conformity with the requirements for obtaining railway safety certificates,
- 4) Commission Regulation (EU) No 1169/2010 of 10 December 2010 on a common safety method for assessing conformity with the requirements for obtaining a railway safety authorization,
- 5) Commission Implementing Regulation (EU) 2020/572 of 24 April 2020, concerning the reporting structure to be used for the reporting of investigations of accidents and railway incidents (Official Journal of the European Union No. 132 of 27 April 2020).

National regulations:

- 1) Railway Transport Act of 28 March 2003 (i.e. Journal of Laws of 2020, item 1043 as amended),
- 2) Regulation of the Minister of Infrastructure and Development of 20 October 2015 on the technical conditions to be met by crossings of railway lines and railway sidings with roads and their location (Journal of Laws, item 1744, as amended),
- 3) Decree of the Minister of Infrastructure of 11 January 2021 on workers employed in positions directly related to conducting railway traffic safety and driving specific types of railway vehicles (Journal of Laws of 2021, item 101),
- 4) Regulation of the Minister of Infrastructure of 18 July 2005 on general conditions for railway traffic and signaling (Journal of Laws of 2015, item 360, as amended),
- 5) Act of 7 July 1994 Construction Law (Journal of Laws of 2020, item 1333, as amended),
- 6) Act of 20 June 1997 - Law on Road Traffic (Journal of Laws of 2020, item 110 as amended),
- 7) Ordinance of the Ministers of Infrastructure and Internal Affairs and Administration of 31 July 2002 on road signs and signals (Journal of Laws of 2019, item 2310, as amended).

Internal instructions of railway undertaking POLREGIO sp. z o.o.

- 1) Pt-2 Instruction to traction vehicle crew,
- 2) Pt-5 Manual for the maintenance of powered railway vehicles.

Internal instructions of infrastructure manager PKP PLK S.A.

- 1) Ir-8 Instruction on dealing with serious accidents, incidents and occurrences in railway transport,
- 2) Id-1 (D-1) Technical conditions for pavement maintenance on railway lines,
- 3) Ik-2 Railway Safety Inspection Manual,
- 4) Id-7 Instruction to line supervision.

8. Description of the difficulties and specific challenges encountered during the proceedings

The Investigation Team members did not encounter difficulties or problems that could affect the conduct of the proceedings, timeliness, or its conclusions.

9. Any interaction with the judicial authorities

The Chairman of PKBWK applied by letter No. PKBWK.4631.1.5.2021 of 16 February 2021 to the Regional Prosecutor's Office and the District Police Headquarters in Miedzyrzecz Wielkopolski, to obtain access to collected documents which are related to establishing the circumstances and causes of the incident. The documents were made available within the scope specified in the said letter.

10. Other information relevant to the proceedings

No other relevant information.

III. DESCRIPTION OF THE INCIDENT

1. Event and background information

1.1. Description of the type of event

During train running in relation Zbąszynek - Gorzów Wielkopolski on railway route Zbąszynek - Lutol Suchy, at the crossing not equipped with traffic protection systems and devices, the driver of a truck with a trailer drove directly in front of the head of a rail bus running as passenger train. The road vehicle entered the crossing from the left side of the moving train. This resulted in a collision between the train and the road vehicle. The rail bus struck the right side of the cab of the road vehicle. As a result of the impact and the forces involved, the driver of the truck fell from the cab and was killed on the spot. The truck was destroyed and thrown to the left side of the track in such a way that the cab together with the cargo box remained in the track gauge, and the trailer blocked the road. The railway vehicle was not derailed. The incident was classified as a serious accident.

1.2. Date, exact time, and place of event

The incident happened on 26.01.2021 at 07:39 on level crossing cat. D, railway route Zbąszynek – Lutol Suchy, track no. 1, km 10,196 of railway line no. 367 Zbąszynek - Gorzów Wielkopolski.

1.3. Description of the site of the occurrence, including meteorological and geographical conditions at the time of the occurrence and any works carried out at or near the site of the occurrence

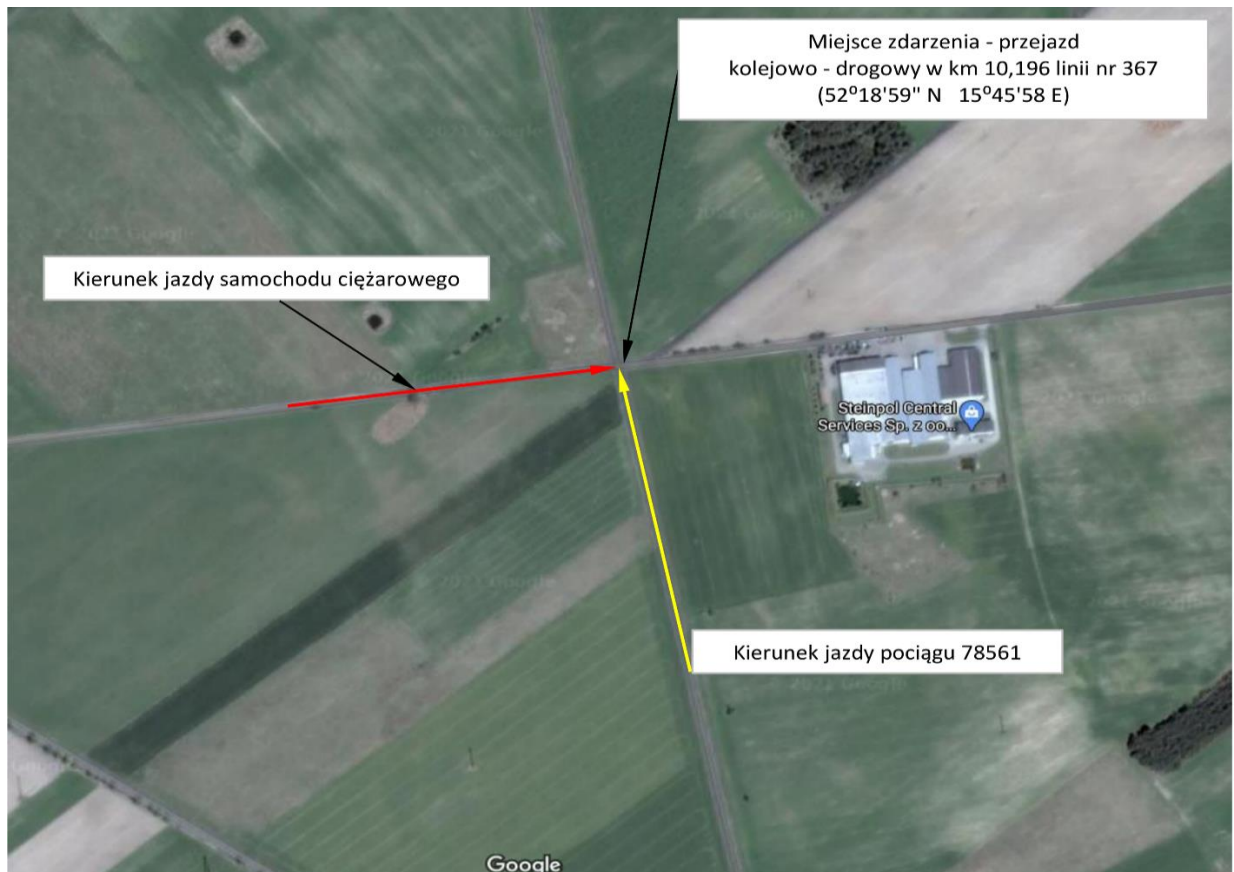
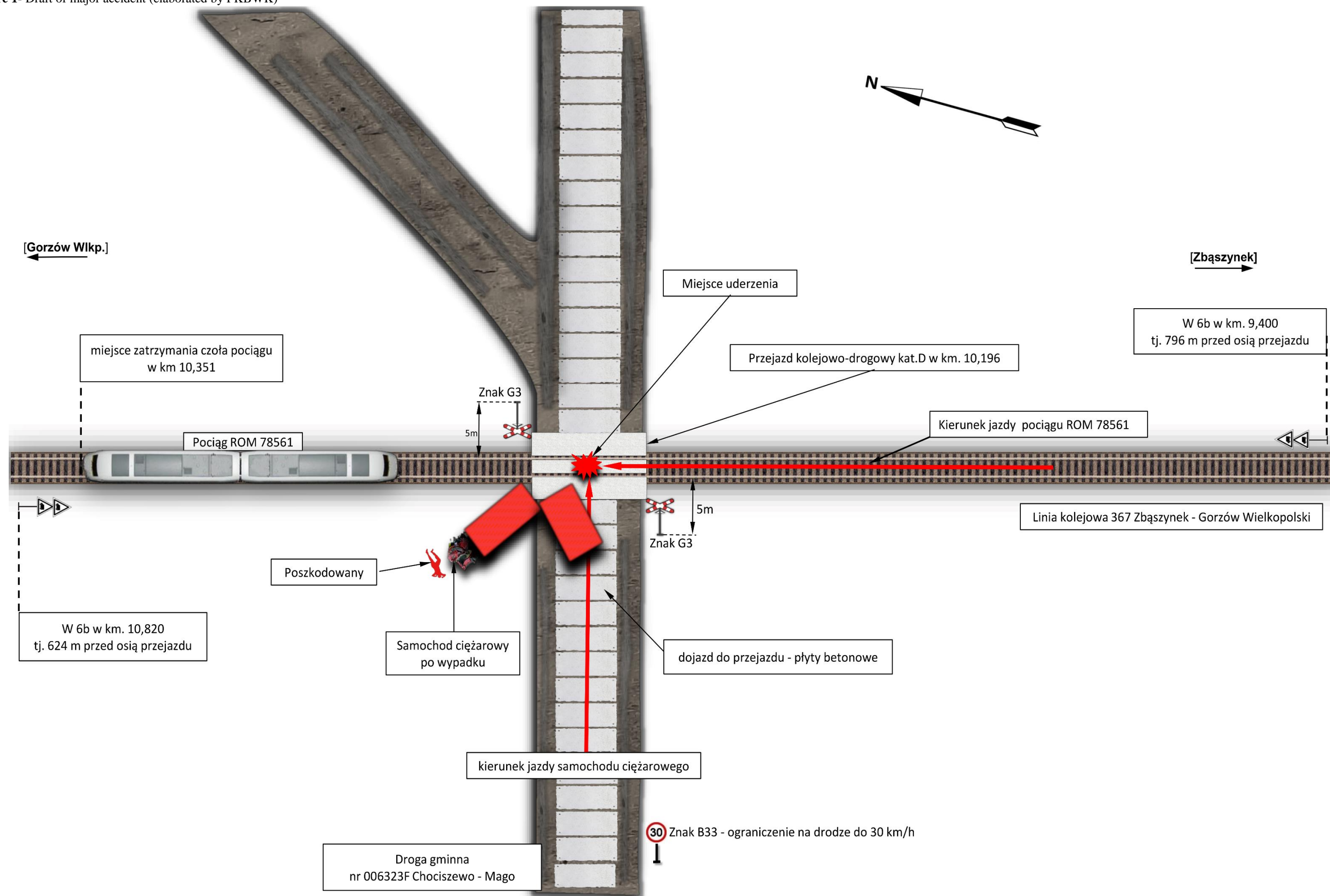


Photo 4- General view of the incident site (source: Google maps)

The D-category crossing where the accident happened is located on a communal dirt road No. 006323F Chociszewo - Mago, made partly of 3 m wide concrete road plates with dirt roadside. The crossing location coordinates are 52°18'59 "N 15°45'58 "E. The maximum speed of road vehicles on the road in the area of the crossing is 30 km/h, according to the road sign. The road is crossing the railway track at an angle of 90 °. The area of the railway line and road crossing is flat, undeveloped, and in fields area. Visibility of the crossing measured along the road axis is normal (higher than the required 60m). Visibility of train head from the road for the required triangles of 5 m, 10 m and 20 m preserved. In the field of visibility triangles there are no bushes and trees and no other obstacles limiting the field of vision. On the day of the incident, that is on 26 January, no works were carried out in the area of the crossing. On that day the weather conditions were good, there was no rain or fog. It was morning, before sunrise, the sky was slightly cloudy, the temperature was approx. 1° C. Moreover, in the area of the crossing at the time of the incident there were no other road users who could absorb the attention of the driver of the road vehicle.

Figure 1- Draft of major accident (elaborated by PKBWK)



1.4. Deaths, injuries and damage to property

a) passengers, employees or contractors, level crossing users, trespassers, other persons on the platform, other persons not on the platform

As a result of the incident, the user of the crossing - the driver of the truck - died on the spot. There were no injuries to the train operator's employees or train passengers.

b) cargo, luggage and other property

Destroyed Mercedes-Benz Atego truck. The truck was unloaded. There was no damage to belongings or luggage carried on the train.

c) rolling stock, infrastructure and environment

Extent of damage to railway vehicle SA139-006:

- broken wiper mechanism cover and siren,
- damaged left headlight,
- damaged track scraper with cover,
- damaged painting of the cab on the left side and the handrail to the driver's cab,
- defective air hose in the brake indicators,
- damaged absorber cover on the left side,
- curved structure of the obstacle deflector,
- Torn out inner fitting of the coupling cover,
- bent handle over the left headlight,
- a crack in the driver's cab laminate on the outside and inside in the area of the cab's attachment to the wheelhouse and the vehicle body,
- faulty coupling valve,
- Defective coupling cylinder connector,
- a crack in the driver's cab windscreen.

The estimated cost of damage to the vehicle amounted to PLN 92 thous.



Photo 5- View of damage to the front of a railway vehicle after an accident

Damage to the vehicle allowed it to drive to a maintenance facility. There was no damage to the railway infrastructure and no damage to the environment.

1.5. Description of other effects, including the impact of the event on the regular activities of the entities involved

As a result of the incident, track no. 1 between Zbąszynek and Lutol Suchy was closed to train traffic from 07:40 to 12:55. Three passenger trains were delayed, for a total of 227 minutes.

A replacement bus service has been launched:

- on section Zbąszynek - Lutol Suchy for three trains
- on section from Zbąszynek to Gorzów Wielkopolski for two trains.

1.6. Identification of the persons, their functions and the entities involved, including possible links with contractors or other relevant parties

The Investigation Team identified individuals directly connected to the incident:

- Train driver operating train ROM 78561 - employee of railway undertaking POLREGIO sp. z o.o.
- train manager ROM 78561 - employee of railway undertaking POLREGIO sp. z o.o.
- driver of a Mercedes-Benz Atego truck - employee of Trans Logistyka sp. z o.o.

1.7. Description and identifiers of trains and their composition including associated rolling stock and registration numbers

Dyadic diesel rail bus of SA139-006 series operated by POLREGIO sp. z o.o. railway operator was running as passenger train ROM 78561.

Certificate No. PBO5/2-02/2020 of technical operability of railway vehicle - type 223M rail bus, year of construction 2013, serial number A653BNA006 produced by PESA Bydgoszcz, issued based on the certificate of admission to operation of a railway vehicle type No T/2013/0270, Identification of railway vehicle PL-PREG EVN 95 51 2 720 122-1 section A, 95 51 2 720 123-9 section B.

Certificate of technical operability of railway vehicle valid until 13.12.2023 or a mileage of 456,721 km calculated from the odometer value of 743,279 km (i.e. up to 1,200,000 km). Mileage at the time of the incident was 919,158 km. The P1 level inspection was performed on 26.01.2021 at a mileage of 919,029 km.

Train data ROM 78561- from brake test card and vehicle nameplate:

– train length.....	43,7 m
– total train weight.....	88 tons
– percentage of braking weight required....	108%
– percentage of actual braking mass.....	165%
– braking mass required.....	98 tons
– actual braking mass.....	203 tons.

1.8. Description of the relevant parts of infrastructure and signaling - track type, switch, interlocking, signal, train protection systems

Track

Rails of type.....	– 49E1 - year 2010
Primers.....	– pre-stressed concrete PS83 type
Attachment type.....	– Type K within the level crossing followed by type SB

Type of ballast.....	–	gravel, thickness 25 cm
Highest permissible train speed on the route...	–	100 km/h
Track gradient in the crossing area.....	–	0 ‰

Run (based on visual inspection by the Investigation Team and run metrics)

- D category crossing being the intersection of railway line no. 367 Zbąszynek - Gorzów Wlkp. with municipal road no. 006323F Chociszewo - Mago, road administrator - Mayor of Trzciel
- individual journey identification number: 367 010 196
- Passage axis - km 10.196
- Angle of road crossing with railway track - 90°
- Surface of the crossing is made of prefabricated ferroconcrete CBP crossing slabs - 2 sets
- Road surface on access roads - concrete road slabs
- Level of the access road:
 - right side - 0.5%
 - left side (direction of vehicle entrance at the crossing) 0,4%
- Crossing traffic product - 4122.5 measurements were taken on May 10 and 11, 2017.
- visibility of the level crossing from the access road:
 - left side - 285 m (from Chociszewo village)
 - right side - 215 m
- length of the straight section of road, measured from the outermost rail:
 - left side - 270 m
 - right side - 228 m
- overall passage length - 9.5 m
- width of the road crown at the crossing - 6.0 m
- width of roadway at the crossing according to metric - 6.0 m
- width of roadway on access roads - left and right sides - 3.0 m
- crossing fencing - none
- maximum speed of road vehicles through the crossing - 30 km/h
- unlit crossing.

Crossing markings on the day of the incident:

- 1) From the side of the road the crossing marked with St Andrew's crosses: two G3 signs placed on the right side of the road on both sides of the track at a distance of 5 meters from the outermost rail, on the day of the serious accident there were deficiencies in the marking of the access road to the crossing, i.e.
 - no G-1c sign on the right
 - On the left side (i.e., from the side of the moving truck) there are no signs: A-10, G-1a, G-1b, G-1c.
- 2) W6b indicators set up on the track side:
 - from the direction of the moving train located 796 meters before the crossing, i.e., at km 9,400
 - from the opposite direction of travel at km 10.820, i.e., 624 meters from the centerline of the crossing.

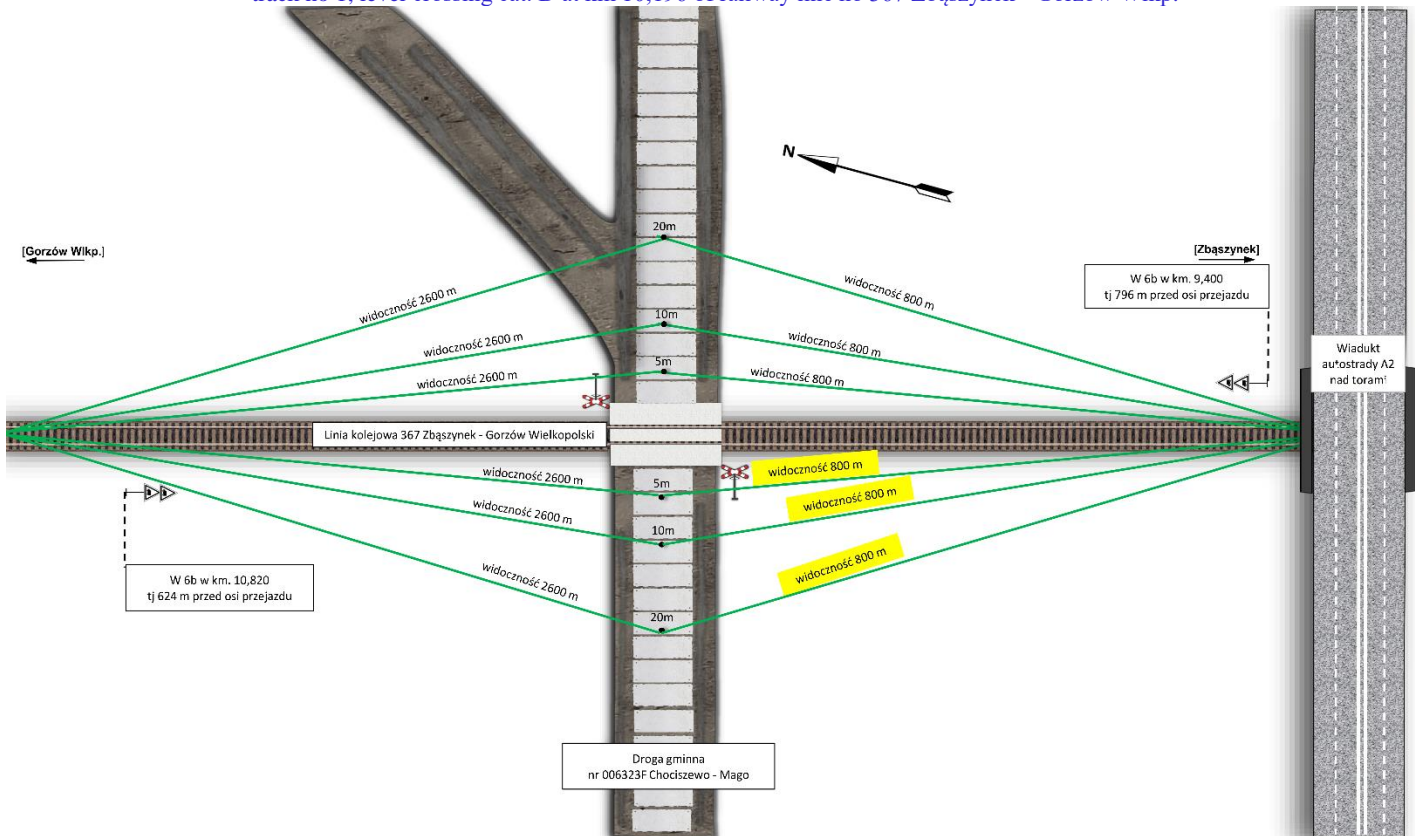
Visibility of train fronts

Table 1- Conditions for train head visibility from the road

distance measured from the outermost rail												centre-to-centre distance tracks "d"	speed V in the passing area	required visibility conditions			
5 m				10 m				20 m									
track side		track side		track side		track side		track side		track side							
rights		left		rights		left		rights		left				from 5 and 10 m	from 20 m	from 4 m	
right	left	right	left	right	left	right	left	right	left	right	left						
Measurements according to level crossing metrics																	
550	550	550	550	550	550	550	550	550	550	550	550	550	Not applicable	100	550	360	-
Measurements taken after the accident by the Investigation Team																	
2600	800	800	2600	2600	800	800	2600	2600	800	800	2600	2600	Not applicable	100	550	360	-

The yellow marking indicates visibility of train head for the direction from which the road and rail vehicle were running

Figure 2- Visibility triangles at level crossing (based on PKBWK)



Visibility of the crossing from the road

Table 2- Conditions of visibility of the crossing from the road

actual conditions [m]		required conditions[m]	
L side	285	L side	60
R side	215	R side	60

The yellow marking indicates the visibility of the crossing from the direction of the truck.

1.9. Any other information relevant to the description of the event and background information

Road Infrastructure:

The surface of the municipal road no. 006323F to the crossing is made of concrete road plates. The technical condition is good. The width of the road slabs is 3 meters. The slabs are located in the axis of the road. No required warning signs and poles indicating the approach to the crossing (A-10, G-1a, G-1b, G-1c).

2. A factual account of events

2.1 The chain of events leading up to the incident, including: actions taken by the persons involved; functioning of the rolling stock operation of rolling stock and technical installations; operation of operational system

On 26 January 2021, at 6:06 a.m. a Mercedes-Benz Atego truck left the vehicle base of Trans Logistyka company in Słubice. The driver of the vehicle, in accordance with the order, was going to a production plant in Chociszewo. The driver was driving on this section of municipal road for the first time. After entering the municipal road No. 006323F leading to the plant, he drove at a speed of approx. 20 km/h. At a distance of 130 meters before the crossing, he slowed down to a speed of 11 km/h and entered the crossing at that speed.

On the same day at 07:28 a passenger train ROM 78561 in relation Zbąszynek and Gorzów Wielkopolski was set off from Zbąszynek station. The last scheduled stop of this train was at Chociszewo-Rogoziniec passenger stop at 07:37. After departure from the stop and reaching 85 km/h, the train was approaching the crossing at kilometer 10.196. After passing indicator W6b referring to this crossing, the driver gave the sound signal "Attention" three times. As he continued driving, the driver noticed a truck slowly approaching the crossing from the left. At a distance of about 100 meters before the crossing, the driver noticed that the truck did not stop, again gave the "Attention" signal and implemented emergency braking. The car continued to drive and drove directly in front of passenger train ROM 78561. The speed of the train at the time of the impact was 78 km/h. The impact was on the right side of the driver's cab of the Mercedes-Benz Atego truck. As a result of this impact, the truck was ejected to the left side as viewed in the direction of travel of the train. After the impact, the train run 155 meters past the centerline of the crossing and came to a stop at km 10.351. The incident did not cause a derailment of the rail vehicle.

2.2 The sequence of events from the occurrence of an incident until the end of the rescue services' operations, including: measures taken to protect and preserve the scene; efforts of rescue and emergency services

After stopping and securing the train, the engine driver notified the traffic officer on duty at the Lutol Suchy station about the accident and went to the crossing to check the consequences of the incident and to provide possible assistance to the injured. In the meantime, the train manager went to the passenger section to check if any passengers were injured.

At the time of the incident, a group of employees of the railway infrastructure manager, passing the town of Chociszewo in a company car to perform other official activities, noticed the accident from a distance of approx. 500 m. They immediately went to the scene and upon arrival at the accident scene they notified the police and emergency medical services by calling the emergency number 112.

At the same time, they checked for vital functions of the injured person and made an inspection whether there were any other casualties. While checking the smashed cab of the truck, they did not find any other casualties. Then, they secured the scene until the arrival of the emergency services. The Fire Brigade which arrived on the scene took over securing the scene and further conducting the rescue operation. After several minutes the medical rescue team arrived, and the doctor confirmed the death of the truck driver. The police arrived at the scene at 08:05 and were conducting operational activities. The prosecutor arrived at the scene of the accident at 09:00. Operational activities of the police and the prosecutor were carried out until 12:55 and at that time the prosecutor allowed to remove the wreckage from the crossing and to resume the railway traffic on the track Zbąszynek - Lutol Suchy, railway line no. 367.

IV. ANALYSIS OF THE INCIDENT

1. Roles and responsibilities

1.1. Railway undertakings or infrastructure managers

Infrastructure manager PKP PLK S.A. Railway Linkage Department in Zielona Góra

Railway infrastructure manager is responsible for proper maintenance of railway line including level crossings. Duties of railway infrastructure manager are specified in article 62 of the act dated 7 July 1994 - Construction Law. This provision obliges managers to carry out annual and five-year inspections of buildings (including crossings). Internal Instruction of infrastructure manager Id-1 in §31 imposes an obligation to carry out diagnostic examination of a structure at least once a year.

The Investigation Team found that the required tests were carried out and protocols were drawn up from these activities. Additionally, on the order of the Safety Office Manager included in letter IBR1-0330-05.1-4/III/20, on 17.07.2020 a check was carried out on the correctness of the marking of the crossings from the side of the tracks and from the side of the road, as well as verification of metric records in the scope of longitudinal gradients of the roadway on the access roads to the crossings. The order was carried out and the information about the irregularities found at the crossing in question, i.e., lack of A-10, G-1a, G-1b, G-1c signs, was provided in writing by the railway infrastructure manager to the municipal road manager. The Investigation Team does not raise any objections to fulfilling the obligations imposed on the manager of the railway infrastructure in the scope of maintenance of the railway road and the level crossing at km 10,196 of line 367.

The infrastructure manager's employees, who first arrived at the scene of the accident, acted in accordance with the provisions of §5 of Instruction *Ir-8 on handling serious accidents, incidents and railway accidents*, notified the police about the incident and, after administering first aid to the injured person, secured the scene of the accident until the arrival of emergency services.

Railway undertaking POLREGIO sp. z o.o. Lubuski Plant in Zielona Góra

For carrying out a transport task, the carrier is obliged to appoint railway vehicles with a certificate of admission to operation of a railway vehicle type and a certificate of technical operability of the vehicle. The Investigation Team stated that the rail vehicle involved in the incident met the conditions for admission to operation and had the required documents.

Responsibilities of railway undertaking for safe driving are defined in internal rules of infrastructure manager and railway undertaking.

The appointed train crew operating the train had all the authorizations and qualifications required by law. The train was operated based on annual timetable. Analyzing collected material, the Investigation Team found proper behavior of train crew during and after the incident.

1.2. Entities in charge of maintenance, maintenance workshops or any other providers of maintenance services

POLREGIO sp. z o.o. is responsible for maintenance of railway vehicles. Within the scope of maintenance of P1 level, in accordance with Maintenance System Documentation (DSU), the company carries out tasks on its own, while the remaining P2, P3 and P4 levels of maintenance, specified in DSU for this type of vehicle, are carried out by external entities. The maintenance inspections were carried out in accordance with the cycles specified in the documentation.

For the SA139 series vehicle involved in the incident, the documentation specifies the scope and frequency of inspections of the external monitoring system, including registration of the foreground image. Additionally, the Managing Director for Operations of POLREGIO sp. z o.o., in letter No. POB2b.731.1/2021 dated 19 January 2021, reminded the subordinate units of the obligation to check image recording on disks and their archiving in the case of participation of a vehicle in railway incidents.

If the video recording system was found to be damaged, he recommended that immediate action be taken to repair it.

Zakład Lubuski in Zielona Góra did not provide documents confirming that the required inspections of the outdoor monitoring system specified in the DSU had been carried out, nor did it provide information regarding the repair of the video recording system.

1.3. Rolling stock manufacturers or other suppliers of railway products

Based on the research material collected, the Investigation Team did not identify factors influencing rolling stock manufacturers and rail product suppliers in the occurrence of the incident.

1.4. The National Safety Authorities or the European Union Agency for Railways

The President of the Office of Rail Transport (UTK) supervises railway traffic safety. Based on collected research material, the Investigation Team did not identify any factors influencing the occurrence of the incident by the national safety authority.

1.5. Notified bodies, designated bodies, or risk assessment bodies

The Investigation Team, based on the study material collected, did not identify factors influencing notified bodies and risk assessment bodies in the occurrence of the incident.

1.6. The certification bodies of entities in charge of maintenance listed in point 1.2.

The body which certifies railway undertaking POLREGIO sp. z o.o. as responsible for maintenance within Safety Management System (SMS) is the President of the Office of Rail Transport. Based on collected research material, the Investigation Team has not identified any factors influencing the occurrence of the event by the certification body of the railway undertaking.

1.7. Any other person or entity involved in the incident, as may be documented in one of the relevant safety management systems, or as referred to in the register or relevant legal framework

Pursuant to §81 of the Regulation of the Minister of Infrastructure and Development of 20 October 2015 *on technical conditions to be met by crossings of railway lines and railway sidings with roads and their location* (Journal of Laws 2015 pos.1744 as amended) the obligations of proper marking of the access road to the crossing belong to the road manager. The administrator of the municipal road no 006323F is the Mayor of Trzciel.

The railway infrastructure manager - PKP PLK S.A. Zakład Linii Kolejowych w Zielonej Górze in the Report from annual examination of crossing No. IZKI-09212-131/2020 dated 17 July 2020 and in the Report No. 8/2020 dated July 28, 2020 on the five-year periodic inspection, showed the absence of signs A-10, G-1a, G-1b and G-1c on Borough Road No. 006323F accessing the Cat D crossing at mileage 10.196.

On 21 August 2020, the Director of Zakład Linii Kolejowych w Zielonej Górze requested the road administrator to complete the missing marking of the municipal road by letter No. IZDKb-0920-3A/2020. By 24 November 2020, the marking of the commune road had not been completed and on that day the Director of Zakład Linii Kolejowych w Zielonej Górze reapplied to the road administrator by letter No. IZDKb-0920-3B/2020 for the completion of the marking of the access roads to that crossing. The Mayor of Trzciel, as the administrator of the road until the day of the incident, that is until 26 January 2021, did not implement the recommendation related to the improvement of traffic safety and did not complete the missing signs. The Investigation Team recognized the lack of signs as a factor contributing to the occurrence of the accident.

After the incident, on 01.02.2021, there was a commission check of visibility conditions at the cat D crossing at km 10.196. The inspection took place with the participation of representatives of the infrastructure manager, the administrator of the municipal road, and the Police. The protocol from this inspection also included a recommendation for the municipal road manager to complete the missing signs. Fulfilling the conclusions and recommendations from the meeting, the administrator of the road completed the missing signs on the municipal road in the vicinity of the crossing one month after the incident.

2. Rolling stock and technical installations

Powered railway vehicle - two-unit rail bus of SA139-006 series is equipped by the manufacturer with the HASLER TELOC 1500 electronic system for recording of driving parameters as well as the system for recording of the image of the driving field and the vehicle interior.

The Investigation Team analyzed selected driving parameters recorded on the TELOC 1500 system immediately before the event. Driving parameters of the rail bus on the section from the passenger stop Chociszewo - Rogoziniec to the moment of stopping after the event are presented in the following graphs with description.

Figure 3- Graph of rail bus SA139-006 driving parameters in the function of time (elaborate by PKBWK)

Zestaw danych TELOC 26.01.21 07:35:51 26.01.21 07:40:51

C:\Users\bkugielski\Desktop\SA139-006\RAWD001.TEL\Rawd000.X02

Konfiguracja	: 056_14C01_I04_04	Id pojazdu	: 006	Godzina początkowa	: 22.01.21 15:45:08.293	Odległość początkowa	: 916 727,5447 km
Id klienta	: Zielona Gora	Typ pojazdu	: LINK 223M	Godzina końcowa	: 27.01.21 08:35:18.821	Odległość końcowa	: 919 249,3610 km
Typ pamięci	: FLEXM_2_LTM	Numer seryjny	: 13080748_HW_Rev_A	Średnica koła	: 850 mm	Licznik odległości	: 919 249,3610 km

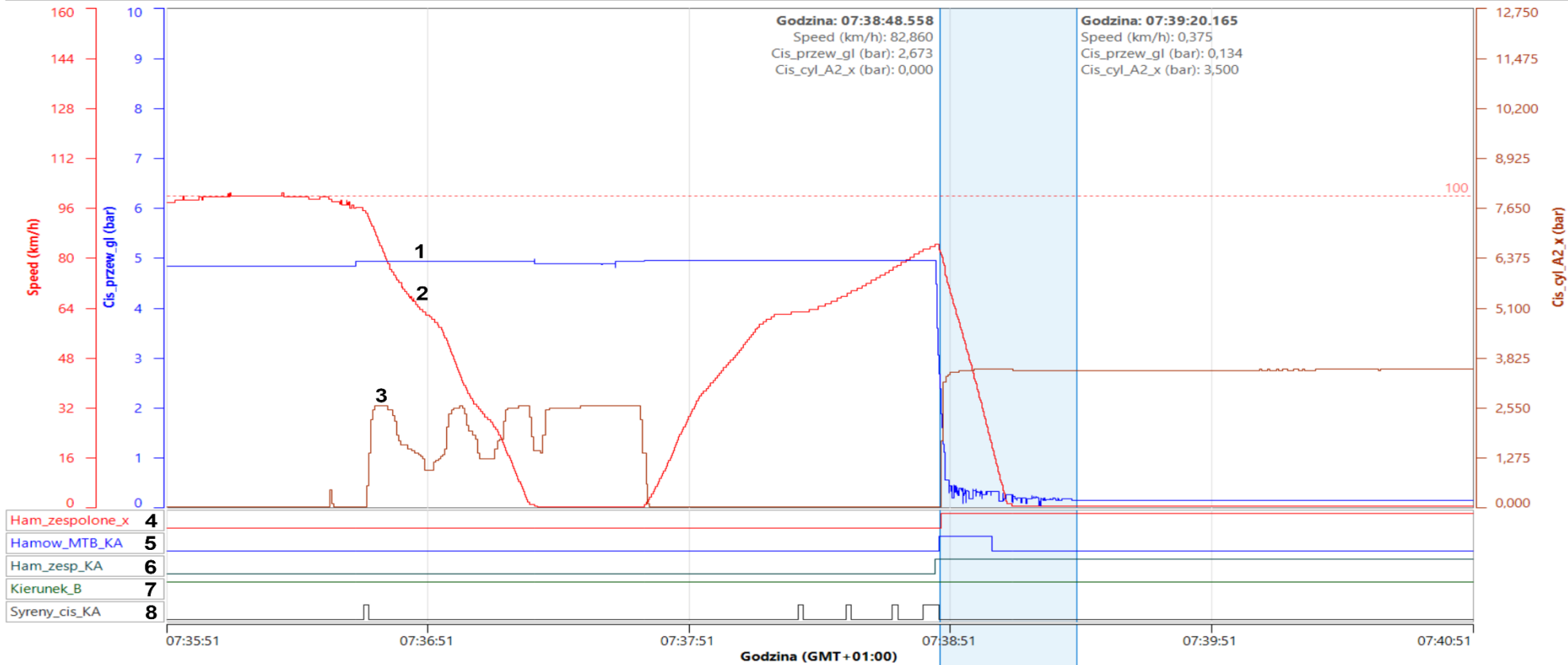
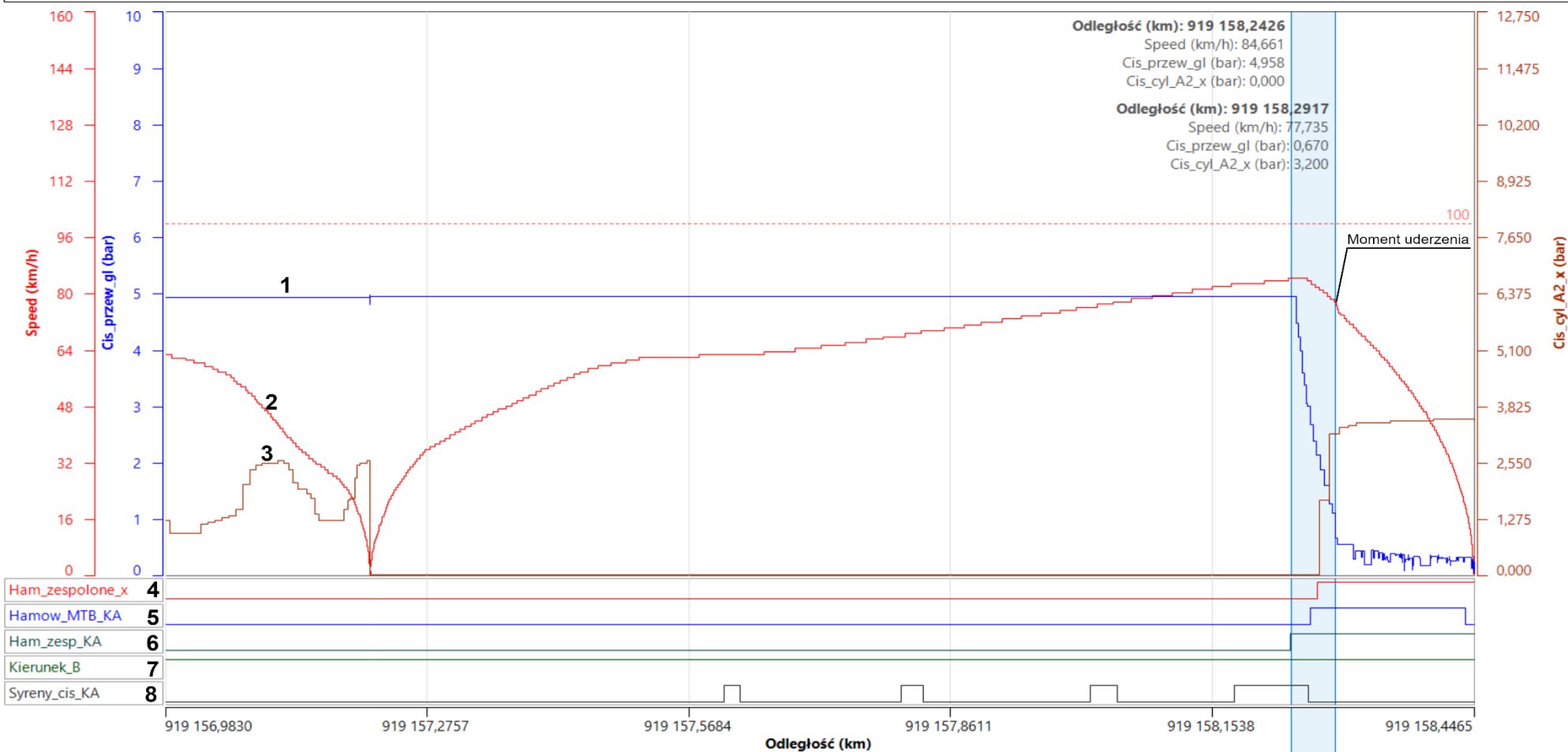


Figure 4- Diagram of the driving parameters of the rail bus SA139-006 as function of distance (elaborated by PKBWK)

Zestaw danych TELOC (26.01.21 07:36:50.097) (26.01.21 07:41:47.008)

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Konfiguracja	: 056_14C01_I04_04	Id pojazdu	: 006	Godzina początkowa	: 22.01.21 15:45:08.293	Odległość początkowa	: 916 727,5447 km
Id klienta	: Zielona Gora	Typ pojazdu	: LINK 223M	Godzina końcowa	: 27.01.21 08:35:18.821	Odległość końcowa	: 919 249,3610 km
Typ pamięci	: FLEXM_2_LTM	Numer seryjny	: 13080748_HW_Rev_A	Średnica koła	: 850 mm	Licznik odległości	: 919 249,3610 km



The above diagrams show the following parameters of the ROM 78561 train run:

1. Main line pressure
- 2 Speed
3. Brake cylinder pressures
4. Operation of the combined brake
5. Brake operation (MTB KA braking)
- 6 Emergency braking application
- 7 Cabin identification - control from cabin B
8. Use of a beep signal.

The analysis of the driving parameters shows, among others, that the driver gave the Rp1 signal "Attention" four times. Approaching the crossing (after passing the W6b indicator referring to this crossing) he gave short signals three times and then, at a distance of 108 meters before the crossing, the beginning of the fourth sound signal is registered as continuous until the moment of the event. The train running parameters indicate that the driver implemented emergency braking of the train 50 meters before the crossing and the train speed decreased from 84.6 km/h to 77.7 km/h with which the impact with the road vehicle occurred. From the time the emergency braking was implemented, and the mainline pressure dropped to a stop, the train travelled 207.2m.

The investigation team had no possibility to analyze the course of the incident based on the monitoring installed in the rail vehicle. The carrier informed that due to a technical fault of the image recording system, making the recordings available is impossible, without explaining the reasons for the fault and actions taken to remove it. and actions taken to remedy it.

3. Human factors

3.1 Human and individual characteristics

The investigation did not reveal the influence of the individual characteristics of the driver and the driver of the road vehicle on the incident.

The Investigation Team did not identify the influence of health condition, fatigue, stress, of the participants of the incident on its causes.

The test carried out on the driver of the road vehicle and the train driver did not show the presence of alcohol in blood, as well as other psychoactive compounds. On that day, the driver of the road vehicle had driven 97 km up to the time of the incident. A small distance travelled that day before the incident and a relatively short driving time (1 hour 30 minutes) did not, in the opinion of the Investigation Team, significantly influence fatigue and concentration deterioration of the truck driver.

The injured party, a citizen of Ukraine, was employed by the Polish transport company from 15. 07. 2019 based on an employment contract for indefinite period as a truck driver. He had the required qualifications to drive trucks with trailers confirmed by an international driving licence. Medical and psychological examinations found no contraindications to work in the occupied position. The employer trained the employee in the operation and maintenance of vehicles, in the health and safety regulations applicable to the position of a truck driver, in the road traffic regulations applicable in Poland and other European countries and familiarized him with the occupational risks. According to the employer, the employee was diligent and responsible. He was planning to stay in Poland for the future and was trying to bring his family from Ukraine to Poland. One day before the accident, he received a Temporary Residence Card in Poland.

3.2 Job-related factors

The SA139-006 railcar has the relevant admission to operate on the PKP PLK S.A. network. The truck had valid technical examination allowing for its safe operation. Working time of train crew and truck driver complies with applicable standards. The testing team did not raise any objections to factors connected with the work position of the motive power unit driver and the truck driver.

3.3 Organizational factors and tasks

From the material collected by the Investigating Team it results that the employer provided the train crew involved in the incident with rest time required by law. The carrier POLREGIO sp. z o.o. in accordance to accepted Safety Management System within management of competences on positions directly connected

Report on the investigation of a serious railway accident that occurred on 26.01.2021 at 07:39 on the route Zbąszynek and Lutol Suchy, track no 1, level crossing cat. D at km 10,196 of railway line no 367 Zbąszynek - Gorzów Wlkp.

with managing and safety of railway traffic, ensured cyclic trainings for employees. Employees taking part in the accident had all required licenses and authorizations related to with activities performed on a given work position. These employees were equipped with necessary instructions and regulations to ensure safe performance of work.

The truck driver was provided with statutory rest periods, was trained in his job, and familiarized with the occupational risk assessment.

3.4 Environmental factors

The event took place in the morning hours with good air transparency, the lie of the land ensured good visibility of the crossing and the approaching train. In the area of the crossing there were no elements of the environment that could impair the audibility of the audible signal given by the approaching train or elements that could limit visibility. No works were carried out in the area of the crossing.

The Investigation Team concludes that the weather conditions and the topographical and technical conditions of the level crossing were not causally related to the incident. A view of the crossing from the direction of the truck is shown in photo 7.



Photo 6- View of the railway track from the access road from 10m (source PKBWK)



Photo 7- View of the crossing from the direction of the truck

3.5 Any other factors relevant to the proceedings

The Investigation Team did not identify other factors closely related to the incident and behavior of the truck driver which would have contributed to the serious accident. In view of the described visibility conditions at the level crossing, the driver's license, state of his health, training he had received, as well as the technical condition of the road vehicle, the driver had conditions to comply with the provisions of the Road Traffic Law, which are the basic regulation for the users of public roads referred to as the "Traffic Code", i.e., the provisions of the Act of 20 June 1997. - Road Traffic Law (Journal of Laws of 2020, item 110, as amended).

Special provisions concerning level crossings are contained in Article 28 of this Act and state that:

"1. The driver of a vehicle, while approaching a level crossing and while crossing, is obliged to exercise particular caution. Before entering the track, he is obliged to check if a rail vehicle is approaching and to take appropriate precautions, especially if the air clarity is reduced due to fog or other reasons.

2. The driver shall drive the vehicle at such a speed that he can stop it in a safe place when a rail vehicle is approaching or when a safety device or signal given prohibits entry to the crossing."

The Ordinance of the Ministers of Infrastructure and Internal Affairs and Administration of 31 July 2002 on road signs and signals (Journal of Laws 2019, item 2310, as amended) in § 78, item 5 states that:

"1. Sign G-3 "St Andrew's Cross before a level crossing" - designates a place to stop for the movement of a train or other railway vehicle at a level crossing without barriers or semi-barriers,..."

The failure of the driver of the Mercedes-Benz Atego truck to comply with traffic regulations when approaching and passing through the crossing was considered by the Investigation Team as a contributing factor to the incident.

The speed of the road vehicle immediately prior to entering the crossing was 11 km/h as determined by the GPS data contained in the driving report of that vehicle.

The vehicle and the truck trailer were technically sound. The speed of the vehicle and its technical condition allowed to safely stop the vehicle before the crossing in a safe place designated by the G-3 sign "St. Andrew's cross". For unexplained reasons, the driver of the truck did not stop the vehicle before the crossing, despite the train driver repeatedly giving the audible signal "Attention", which was recognized by the Investigating Team as a factor contributing to the occurrence of the accident.

4. Feedback and control mechanisms, including risk and safety management and monitoring processes

Conditions for an appropriate regulatory framework :

4.1. The processes, methods, contents and results of risk assessment and monitoring activities carried out by any of the parties involved: railway undertakings, infrastructure managers, entities in charge of maintenance, maintenance workshops, other maintenance providers, manufacturers and other entities, and the independent assessment reports referred to in Article 6 of Implementing Regulation (EU) No 402/2013

Within the framework of the proceedings in question, the Commission's Investigation Team conducted an analysis of the "Threat Register", which is one of the most important elements of the Safety Management System of the infrastructure manager PKP Polskie Linie Kolejowe S.A.

Chapter 5 covers those hazards related to level crossings and pedestrian crossings as elements of railway infrastructure. These are dangers caused by various irregularities in the scope of formal and legal requirements, diagnostics, operation of devices and maintenance of the crossing or level crossing. This chapter also includes hazards caused by users of level crossings or crossings and other reasons.

The following risks are associated with the event under study:

- 5.7 of the Register: "irregularities in the maintenance of a level crossing",
- 5.7.8. 'inadequate or incomplete marking on the road side of the level crossing',
- 5.7.9. "deficiencies in the marking of road-rail level crossings due to negligent maintenance",
- 5.9 of the Register: "failure of users of level crossings and pedestrian crossings to comply with traffic laws",
- 5.9.4 'failure to comply with information on vertical road signs'.

The investigation team finds that the driver of the car, while approaching the crossing, failed to obey the G-3 sign despite the oncoming train and entered the crossing directly in front of train ROM 78561.

In the *Register of substantial risks of railway undertaking POLREGIO sp. z o.o.* prepared on 17.12.2020, under item no. 20, there was described a risk consisting in "an impact of a railway vehicle on a road vehicle (other road machine, agricultural machine) or vice versa on a level crossing not equipped with a crossing system (cat. D)". This risk was assessed by the interdisciplinary team as a third party risk for which a value of 150 was assumed and based on the risk matrix, the risk was identified as tolerable ($120 \leq R \leq 150$).

4.2. Safety management system of the railway undertakings and infrastructure managers involved taking into account the essential elements set out in Article 9(3) of Directive (EU) 2016/798 and any implementing EU acts

Infrastructure manager PKP Polskie Linie Kolejowe S.A.

Safety Management System (SMS) in PKP Polskie Linie Kolejowe S.A. was introduced by the Resolution no. 30/2011 of 24 January 2011 on the adoption of the order introducing Safety Management System in PKP Polskie Linie Kolejowe S.A. Specification of selected elements of SMS applicable in PKP PLK S.A. is presented in the table below.

Table 3-Set of selected SMS elements used in PKP PLK S.A. related to the incident.

No	Symbol/ Procedure No	Name of document / procedure
Main process		
1.	SMS-PG-01	Provision of railway infrastructure and operation of rail traffic
Supporting process procedures		
2.	SMS-PW-01	Maintenance of the railway line in a technical

		and organizational condition
3.	SMS/MMS-PW-03	Handling of railway incidents
4.	SMS-PW-04	Carrying out actions to remove the consequences of railway accidents
5.		Hazard register
6.		Railway Traffic Safety Improvement Program of PKP Polskie Linie Kolejowe S.A. for 2021

The Investigation Team found that the railway infrastructure manager's staff were familiar with the SMS safety system. The staff is periodically trained and has access to up-to-date versions of individual procedures. In result of analysis of SMS documentation binding for infrastructure manager PKP PLK S.A., the Investigation Team does not raise any objections to the method of functioning of safety management system, keeping the register of threats and realization of safety improvement program for 2021.

Railway carrier POLREGIO sp. z o. o.

Safety Management System (SMS) at POLREGIO sp. z o. o. The system was introduced by means of Resolution no. 312/2020 of 23 September 2020 on the adoption of an order introducing the Safety Management System 3rd Edition in POLREGIO Sp. z o. o. List of selected elements of SMS applied in POLREGIO sp. z o. o.

Table 4- List of selected elements of SMS POLREGIO sp. z o.o. connected with the event.

No	Document No	Name of document / procedure
1.	01	Transport process
SUBSYSTEMS OF THE SAFETY MANAGEMENT SYSTEM		
2.	11	Purchase and maintenance of railway vehicles
3.	21	Competency management in positions: 1. directly related to the operation and safety of and safety of railway traffic and of the driver and driving the vehicles, 2. indirectly linked to the operation and safety of rail traffic
4.		Register of risks and hazards
5.		Safety Improvement Program 2020
6.		Safety Improvement Program 2021

The Investigation Team found that the rail carrier's employees are familiar with the SMS safety system. Employees are trained periodically and have access to current versions of particular procedures. In the result of analysis of SMS documentation being valid at railway undertaking POLREGIO sp. z o. o., the Investigation Team does not raise any objections to the way of functioning of the safety management system, keeping the register of risks and realization of the safety improvement program for the year 2021.

4.3. Management system of the entity/entities in charge of maintenance and maintenance workshops, considering the functions laid down in Article 14(3) of and Annex III to Directive (EU) 2016/798 and any subsequent implementing acts

Not applicable.

4.4. Results of supervision by national safety authorities in accordance with Article 17 of Directive (EU) 2016/798

Within the framework of supervision, the President of the Office of Rail Transport conducted the following inspections:

- at the manager of railway infrastructure - PKP PLK S.A. Zakład Linii Kolejowych in Zielona Góra on 21 July 2020 and in December 2020. ,
- at the railway undertaking - Lubuski Zakład w Zielonej Górze of POLREGIO sp. z o.o. from 28 January 2020 to 4 February 2020

The scope of inspections of crossings conducted at the infrastructure manager's office did not include the crossing at km 10.196 of line No 367. The inspections carried out included other crossings in the area of Zielona Góra, i.e. :

- railway line no. 3 - two level crossings of category A,
- Railway line no. 203 - four category D crossings and two category F crossings,
- Line No. 357 - one Cat C and three Cat D crossings,
- line no. 359 - one cat C and three cat D crossings,
- line 367 - one cat F crossing.

The scope of control carried out at railway undertaking included control of supervision over preparation and realization of transport process, including preparation of train for running with special attention paid to passengers' rights and quality of service in railway transport.

The carrier was found 6 irregularities during the audit, which were included in the post-audit report. According to the carrier's information addressed to the President of UTK in the letter no. PRB-SZB-092-02.2/2020 of 4 March 2020, these irregularities were removed.

4.5. Authorisations, certificates, and assessment reports issued by the Agency, national safety authorities or other conformity assessment bodies

Infrastructure manager: PKP Polskie Linie Kolejowe S.A. holds:

Safety Authorization:

- EU number PL2120150007
- Issue date 30/12/2015.
- Expiry date 30.12.2020 *
- Type of infrastructure: normal rail (99.2%), broad gauge (0.8%)

The size of the managed infrastructure:

- total line length 18 532 km
- total length of track 36 440 km

Managed rail lines:

- mains 23%
- primary 54%
- secondary 17%
- local significance 6%.

The current "Security Authorization" is an extension of the previous authorization no. PL2120140003, valid until 29.12.2015.

**Note: A security authorization that expires during an outbreak or outbreak status, i.e., from March 20 until revoked, is extended for 180 days from the date the outbreak or outbreak status is revoked, whichever is later.* (Source: <https://www.utk.gov.pl/pl/rejstry/autoryzacje-bezpieczens/17388>, Register-authorization.html).

Railway undertaking: POLREGIO sp. z o. o. owns:

1) Safety Certificate - Part A:

- EU number PL1120200052
- Release date 20.10.2020

- Expiry date 22.10.2025
- Type of transport passenger services, excluding high-speed services
- Transport volume 200 million or more passenger-kilometers per year
- Company size - large

Safety certificate part A covers railway sidings operated by POLREGIO sp. z o.o.

2) Safety Certificate - Part B:

- EU number EN1220200065
- Release date 20.10.2020
- Expiry date 22.10.2025
- Type of transport..... passenger services, excluding high-speed services
- Serviced lines: PKP Polskie Linie Kolejowe S.A., PMT Linie Kolejowe sp. z o. o., PKP Szybka Kolej Miejska w Trójmieście sp. z o. o., Pomorska Kolej Metropolitalna S.A.

4.6 Other systemic factors

The Investigation Team did not identify other systemic factors influencing the incident.

5. Previous occurrences of a similar nature

The Investigation Team, as part of its investigation, analyzed selected train accidents with road vehicles at category D level crossings occurring between 2017 and 2020.

A brief description of selected incidents and results caused by the lack of special caution by drivers of road vehicles when approaching and passing through a crossing:

- 1) On 13 June 2018 at 12:54 on the crossing of category D at km 342.231 of line 273 Wrocław Główny - Szczecin Główny directly in front of an oncoming passenger train on the relation Szczecin Główny - Zielona Góra a truck (tractor) with a semi-trailer loaded with wooden bales entered. The train consisted of a three-unit electric multiple unit type EN57AL (carrier Przewozy Regionalne Sp. z o.o.). The train hit the road vehicle between the driver's cab and the saddle of the tractor. As a result of the incident the driver of the vehicle died on the spot and 23 passengers of the passenger train and 3 train crew members were injured, including the driver who was seriously injured and was transported by the air ambulance. There was a total destruction of the 'Rb' section and a partial destruction of the 'Ra' and 'Rs' sections of the electric multiple unit. The cab of the truck was completely destroyed.
- 2) On 02.08.2019 at 19:42 on the crossing of category D at km 34.751 of line 64 Kozłów - Koniecpol, a passenger car Toyota Yaris drove directly in front of the oncoming passenger train EIE 8306 relation Kołobrzeg - Przemyśl Główny. The train consisted of a locomotive type EP09 and 12 passenger coaches (carrier PKP Intercity S.A.). The train hit the central part of the car. As a result of the incident the driver of the car died on the spot. The staff and passengers of the train were not injured. The passenger car was completely destroyed.
- 3) On 17 February 2020 at 19:34 at level crossing cat D at km 7.765 of line no 356 Poznań Wschód - Bydgoszcz Główna a MAN truck with trailer drove directly in front of an oncoming passenger train no 77486/7 Wągrowiec - Poznań Główny. The train consisted of a diesel multiple unit type VT628 (carrier Koleje Wielkopolskie Sp. z o. o.). The impact of the train occurred between the car and the trailer. As a result of the incident no one was injured. A railway vehicle, a road vehicle and elements of the railway infrastructure were considerably damaged.

V. CONCLUSIONS

1. Summary of analysis and conclusions on the causes of the incident

The analysis showed that a significant contributing factor to the incident was the failure of the driver of the Mercedes-Benz Atego truck to obey traffic laws when approaching and passing the crossing. The speed of the road vehicle immediately prior to entering the crossing was slow at 11 km/h. The vehicle and trailer of the truck were technically sound. The speed of the vehicle and its technical condition allowed to stop the vehicle before the crossing in a safe place designated by the G-3 sign "St. Andrew's cross". The driver of the road vehicle, despite the technical condition of the vehicle, low speed of the vehicle, good visibility, and the sound signal Rp1 "Attention" given by the driver of the railway vehicle, did not stop in front of the oncoming train in the place indicated by the G-3 sign. The behavior of the driver of the road vehicle consisting in entering the crossing directly in front of the oncoming train was considered by the Investigating Team as a causal factor. The lack of special caution by the driver when approaching the level crossing was considered by the Investigating Team as a factor contributing to the occurrence of the accident.

In addition, on the day of the incident, the access road to the crossing was not equipped with A-10 warning signs, G-1a, G-1b and G-1c. The lack of these signs was considered by the Investigation Team as a factor contributing to the incident.

Human and workstation factors as well as organizational tasks performed by the entities involved in the incident did not contribute to the occurrence of the incident in question.

2. Measures taken since the incident

Immediately after the incident on 27 January 2021. Zakład Linii Kolejowych w Zielonej Górze issued a reminder to the Mayor of Trzciel regarding the marking of the communal road No. 006323F Chociszewo - Mago. On 01.02.2021a commission check on visibility conditions at the cat. D level crossing at km 10.196 was held with the participation of representatives of the infrastructure manager, the administrator of the municipal road and the police. In the protocol from this check, the recommendation for the municipal road manager to complete the missing signs was repeated. Fulfilling the conclusions and recommendations from the meeting, the road manager completed the missing signs on the municipal road in the area of the crossing, about a month after the incident. The chairman of PKBWK on 01.09.2021 issued a recommendation to restrict the speed of trains to 60 km/h in both directions on a stretch of 550 meters before the cat D level crossing at km 10.196 due to the difficulty of passing through the crossing as a result of the mismatch between the width of the access road and the width of the crossing platform.

3. Additional remarks

Lack of efficient system of recording images of the foreground of the rail bus SA139-006 of carrier POLREGIO sp. z o.o. The Investigation Team regarded it as another irregularity that was not connected with the occurrence of the incident.

VI. SAFETY RECOMMENDATIONS

- 1) The road manager, Mayor of Trzciel will undertake actions aimed at immediate removal of irregularities identified in the applications of the railway infrastructure manager during diagnostic tests or controls at crossings.
- 2) Railway undertaking POLREGIO sp. z o.o. will check in all railway vehicles, which are in use of the company, correctness of operation of installed forecourt recorders and will take appropriate measures to ensure technical efficiency of these recorders.
- 3) The administrator of the L class municipal road together with the administrator of the railway infrastructure will adjust the access to the level crossing to the width of 2 x 2,75 m on the length of at least 34 m (according to the provisions of § 15 clause 1 item 5 of the Regulation of the Minister of Transport and Maritime Economy of 2 March 1999 on technical conditions to be met by public roads and their location (i.e. Journal of Laws 2016, item 124, as amended)). The current width of the road meets the requirements of §14 item 3 point 1 of the aforementioned regulation, which is allowed for the time of staging the construction or for the reconstruction of the road.
- 4) The railway infrastructure manager will maintain the train speed limit of 60 km/h until the width of the access road is adjusted to the width of the crossing platform.

PRESIDENT
OF STATE COMMISSION ON RAILWAY ACCIDENT INVESTIGATION

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Tadeusz Ryś

List of entities appearing in the contents of Report No. PKBWK 05/2021

No	Symbol (abbreviation)	Explanation
<i>1</i>	<i>2</i>	<i>3</i>
1.	EUAR	European Union Railway Agency
2.	PKBWK	State Commission on Railway Accidents Investigation
3.	UTK	Office of Rail Transport
4.	IZ	PKP PLK S.A. Zakład Linii Kolejowych
5.	POLREGIO sp. z o.o.	Railway Undertaking
6.	Trans Logistyka Sp. z o.o. in Słubice	Road transport carrier