STATE COMMISSION ON RAILWAY ACCIDENT INVESTIGATION
Ministry of Interior and Administration

REPORT No. PKBWK 03/2023

on the investigation of the railway accident
that occurred on November 3, 2022 at 18:45
at Krzcięcice passenger stop on track no. 2, at km 244.636
railway line no. 8 Warszawa Zachodnia - Kraków Główny
area of the infrastructure manager PKP PLK S.A. Railway Line Department in Kielce

WARSAW, September 7, 2023.

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

In accordance with the provision of Article.28f (3) of the Railway Transport Law of March 28, 2003, the proceedings conducted by the Commission do not establish guilt or liability

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

STATE COMMISSION ON RAILWAY ACCIDENT INVESTIGATION
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I. SUMMARY

Type of occurrence: Accident involving passengers.

Description: While disembarking from the last door of the fourth section of passenger train MOJ 32318/9 at the Krzcięcice passenger stop, a passenger with a 22-month-old child in a stroller fell off the train onto a track bench near a level crossing. The door of the railway vehicle through which the passenger exited was located about 20 meters from the platform, in a place that did not ensure safe exit of passengers.

Date of occurrence: 03.11.2022 at 18:45.

Site of occurrence: Krzcięcice passenger stop, Jędrzejów - Sędziszów track no. 2, km 244.636 of the railway line No. 8 Warszawa Zachodnia - Kraków Główny.

Implications of the occurrence: As a result of the occurrence, a 22-month-old child was injured, suffering a head injury and concussion, and was hospitalized from 11/04/2022 to 11/07/2022. The child's guardian was not injured and there were no property losses.

Causal factors:
(means any act, omission, event or condition, or combination thereof, which if corrected, eliminated or avoided would most likely have prevented the event)

Driver stopped train MOJ 32318/9 in an inappropriate place that did not allow passengers to safely exit the last section.

Contributing factors:
(means any act, omission, event, or condition that influences the occurrence of an event by increasing its probability, accelerating the consequences over time, or increasing the severity of the consequences, but the elimination of which would not have prevented the event)

1) Lack of monitoring by the train manager of the place where the unit stops and travelers disembarking from the platform plane at Krzcięcice passenger stop.
2) Missing W32 indicators at the Krzcięcice passenger stop.
3) Suggestion to the driver that the length of the trains previously run that day was 64 m (three-car unit) instead of the actual train length of 87 m (four-car unit).
4) Failure to note by the passenger that there was no platform at the level of the open door and continuing to disembark backwards.

Systemic factors: Not stated.

Recommendations and their addressees:

1) RU operating passenger services shall provide refresher training to train crews on compliance with the provisions of the regulations on where to stop the front of the train at the designated location in the station and at the passenger stop.
2) PKP PLK S.A. will supplement W32 indicators in passenger stations and stops preceding W4 train head stop indicators at platforms longer than 100 meters.
3) RU providing passenger transportation will conduct an information campaign among travelers on the purpose and possibility of using

intercoms on passenger trains in situations including emergencies or security threats. At present, the description of their purpose and mode of operation is not very clear and incomprehensible to travelers.

4) RU's providing passenger transportation shall require the train crew, upon arrival of a train at the station of departure, to check the internal communication by means of the intercom and to respond appropriately to the call.
5) RU's operating passenger transportation will be instructed on the issue of information exchange on board the train between the passenger, the train crew, and the train driver, using the available technical means, in situations that pose a threat to the safety of passengers and the train.
6) PKP PLK S.A. Railway Line Department in Kielce will eliminate the irregularities mentioned in point V.3 of the report.

Photo 1 - Site of the occurrence during daylight hours (PKBWK's own material).

Photo 2 - View from the window of passenger stop Krzcięcice during daylight hours (PKBWK's own material).

Photo 3 - Nighttime view of the site from passenger stop Krzcięcice (PKBWK's own material).

Photo 4 - The site of the occurrence at night (PKBWK's own material).

Photo 5 - The site of the occurrence at night with handheld flashlight illumination by the Investigation Team (PKBWK's own material).

II. PROCEEDINGS AND ITS CONTEXT

1. Decision to initiate proceedings

Mr. Tadeusz Ryś, Chairman of the State Commission on Railway Accident Investigation (hereinafter referred to as the "PKBWK" or the "Commission"), issued Resolution No. PKBWK.590.1.2023 of January 9, 2023, on initiation of proceedings to clarify the causes and circumstances of the accident at the passenger stop in Krzcięcice at km 244.636 of railway line No. 8. Taking into account this fact and the provisions of Article 28e paragraph 4 of the Railway Transport Law of March 28, 2003 (i.e. the Journal of Laws of 2021, item 1984, as amended), hereinafter referred to as the "Railway Transport Law", the occurrence was reported to the European Union Railway Agency in due time and registered in the database under the number PL-10352.

2. Reasons for the decision to initiate proceedings

Based on an analysis of the circumstances and taking into account the nature of the occurrence, the Chairman of the PKBWK decided to initiate proceedings by the Commission's Investigation Team in accordance with Article 28e (3)(1) of the Railway Transport Law.

3. The scope and limitations of the proceeding, including its justification, as well as an explanation of any delays that are considered a risk or other impact on the conduct of the proceeding or the conclusions of the proceeding

Proceedings to determine the causes of the occurrence were conducted in accordance with Article 28h (1) of the Railway Transportation Law, which, in accordance with the provision of Article 28f (3), does not determine guilt or liability.

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

The Chairman of the Commission appointed from among the permanent members of the Commission an Investigation Team with qualifications and competence in the field of the investigation.

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

Pursuant to Article 28h (2) (5) of the Railway Transport Law, the Chairman of the PKBWK obligated designated employees of the Infrastructure Manager and the members of the Railway Commission to cooperate with the Investigation Team (letter no. PKBWK. 590.1.1.2023 of 10.01.2023).
On 23.01.2023 at PKP PLK S.A. Railway Lines Department in Kielce there was a protocol handing over of the collected documents constituting the files of the proceedings conducted by the Railway Commission in the period from 03.11.2022 to 13.12.2022. The proceedings were concluded by the Railway Commission by signing the Final Decision dated 13.12.2022.

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

During the ongoing investigation of the circumstances and causes of the occurrence, cooperation with representatives of entities related to the circumstances of the occurrence did not raise any objections from the Investigation Team.

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

Throughout the process of clarifying the causes and circumstances of the occurrence, the Investigation Team took into account the provisions of national regulations, the internal regulations of the infrastructure manager and the RU. It also drew on its own knowledge and experience.
Documentation compiled by the investigation team and documentation collected by the Railway Commission was used.
As part of the event investigation, the Investigation Team performed the following activities, among others:

- Visual inspection of the site, the railway line, and the rolling stock,
- Preparation of photo and video documentation,
- Analysis of the documentation provided by the railway operator and the railway manager,
- Analysis of the documentation of the railway vehicle,
- Hearing of the passenger who is the guardian of the injured child, as well as the employees of the infrastructure manager and the railway company,
- Analysis of the recordings of the monitoring of the interior and exterior of the vehicle and its surroundings, recorded on the railway vehicle,
- Analysis of listening of recorded conversations,
- Analysis of data from the recorder of the parameters of railway vehicle operation.

The following are selected laws, regulations and internal policies used in conducting the investigation:

European Union regulations:

1) Regulation (EU) 2016/679 of the European Parliament and of the Council of April 27, 2016, on the protection of natural persons with regard to the processing of personal data and on the free flow of such data and repealing Directive 95/46/EC (General Data Protection Regulation (Official Journal of the EU L 119 of 04.05.2016. p. 1. as amended)) and the related Act of May 10, 2018 on the Protection of Personal Data (Journal of Laws No. 1000).
2) Commission Implementing Regulation (EU) 2020/572 of April 24, 2020, concerning the reporting structure used for accident investigation reports and railway occurrences (Official Journal of the European Union No. 132 of April 27, 2020.
3) Directive 2016/798/EC of the European Parliament and of the Council of May 11, 2016, on railway safety (Official Journal of the EU L 138, 26.05.2016, p. 102, as amended).

National regulations:

1) Railway Transport Law of March 28, 2003 (i.e., Journal of Laws 2021, item 1984, as amended).
2) Act of July 7, 1994, Construction Law (i.e., Journal of Laws of 2020, item 1333, as amended).
3) Regulation of the Minister of Infrastructure of July 18, 2005 on general conditions of railway traffic and signaling (Journal of Laws of 2015, item 360, as amended).
4) Regulation of the Minister of Infrastructure of January 11, 2021, on employees employed in positions directly related to the operation and safety of railway traffic and the operation of certain types of railway vehicles (Journal of Laws of 2021, item 101).

Internal instructions of the infrastructure manager PKP PLK S.A.

1) Ir-1 Instruction on train operation.
2) Ir-8 Instruction on the handling of serious accidents, incidents, and occurrences in rail transport.
3) Ie-1 Signaling Instructions.
4) Technical regulations of Krzcięcice block post.

Internal instructions of RU POLREGIO S.A.

1) Ph-1 Instruction in the field of passenger service, including check-in and control of transport documents and the quality of services provided in the trains of "Przewozy Regionalne" sp. z o.o.
2) Pr-1 Instruction on the technique and organization of the work of the conductor team in passenger trains.
3) Pt-2 Instruction to the traction vehicle team.

8. Description of difficulties and specific challenges encountered during proceedings

The Investigation Team members did not encounter any difficulties or problems that could affect the process, timeliness, or conclusions.

9. All interactions with the judiciary

The Investigation Team did not cooperate with the judicial authorities during the investigation.

10. Other information relevant to the ongoing proceedings

In the course of the investigation, the Investigation Team interviewed the traveler who is the guardian of the injured child, as well as the train driver and the train manager.

III. DESCRIPTION OF THE OCCURRENCE

1. Occurrence and basic information

1.1. Description of the type of occurrence

Accident involving passengers. While disembarking through the last door of the fourth section of passenger train MOJ 32318/9 at Krzcięcice passenger station, a passenger with a 22-month-old child in a stroller fell off the train onto a track bench near a level crossing. The door of the train through which the passenger exited was located approximately 20 meters from the platform, in an area not intended for passenger traffic. As a result of the occurrence, the child was seriously injured.

1.2. Date, exact time and location of the occurrence

The occurrence occurred on 03.11.2022 at 18:45 at Krzcięcice passenger station on track 2, at km 244.636 of railway line No. 8 Warszawa Zachodnia - Kraków Główny, on the territory of PKP PLK S.A. Railway line Department in Kielce.

1.3. Description of the site of the occurrence, including meteorological conditions and geographic conditions at the time of the occurrence, as well as any work being carried out at or near the occurrence site

Krzcięcice passenger station is located at km 244.543 of line Jędrzejów - Sędziszów, on the first double track line no. 8 Warszawa Zachodnia - Kraków Główny. Platform 2 is built next to track 2. At the stop, on platform 1 next to track no. 1, there is Krzcięcice "Kr" block post, manned by a traffic officer.
Platform 2, where train MOJ 32318/9 stopped, is single sided with a length of 199.50 m, width of 4.10 m, height of 38 cm. The W4 indicator is placed on the platform at 1 m before its end at km 244.418 of line no. 8, no W32 indicators. The surface of the platform is made of paving slabs, there are irregularities that make it difficult for passengers to get on and off. The exit from platform 2 leads along track no. 2 directly to the top of the roadway of the level crossing. This descent is secured by a turnstile and fenced with metal mesh over a length of 13 meters.
The category A level crossing at km 244.630, to which the exit from platform 2 is directly adjacent, is operated by the traffic controller of Krzcięcice "Kr" block post. The 33 m long level crossing crosses two railway lines: No. 8 (double-track) and No. 65 (single-track), on which there are two traffic lights, which is not in accordance with *§88 of the Regulation of the Minister of Infrastructure and Development of October 20, 2015 on the technical conditions to be met by intersections of railways and railway sidings with roads and their location (Journal of Laws, item 1744)*, which states: *"The number of light points shall be determined depending on the length and width of the railway crossing or road crossing, taking into account the values of illuminance and uniformity of illumination according to the standard EN 12464-2 Light and illumination*." The underexposure of the site is shown in photos 4 and 5.
The occurrence occurred in darkness, limited visibility, moderate cloud cover, no precipitation, temperature +5° C. No work was being done out around the bus stop and the occurrence site.

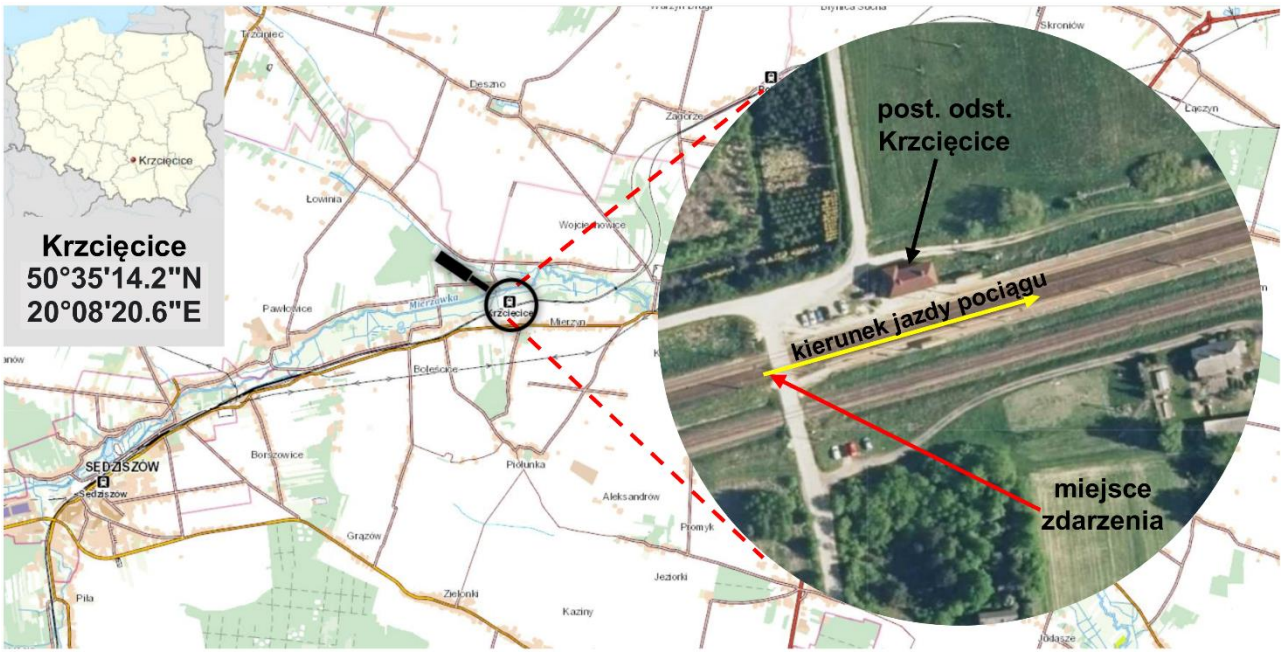


Figure 1 - General view of the site (source: Geoportal)

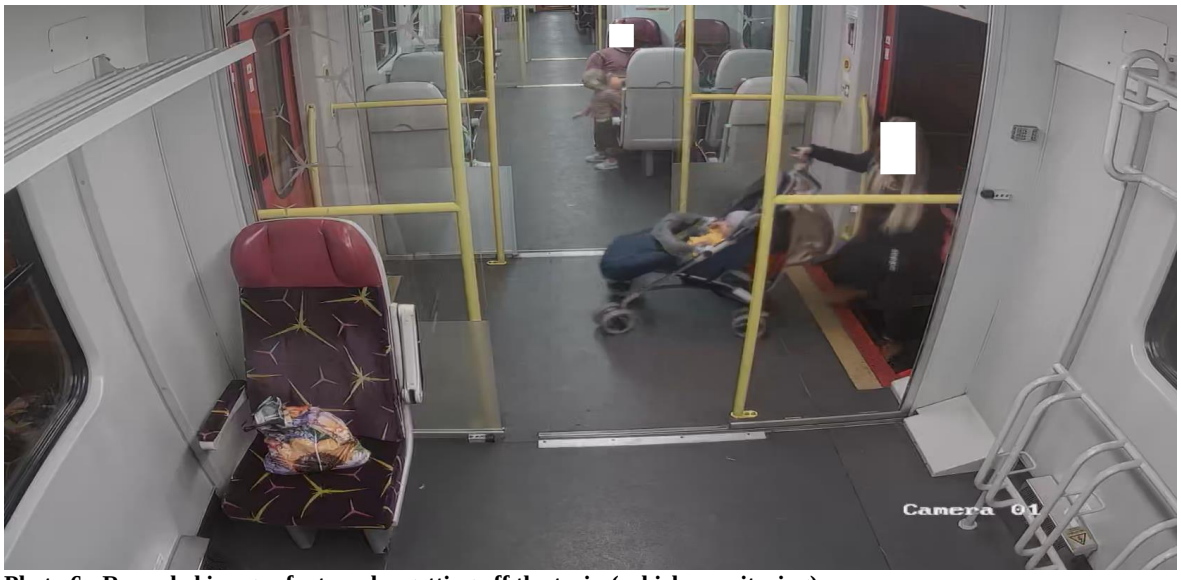


Photo 6 - Recorded image of a traveler getting off the train (vehicle monitoring)

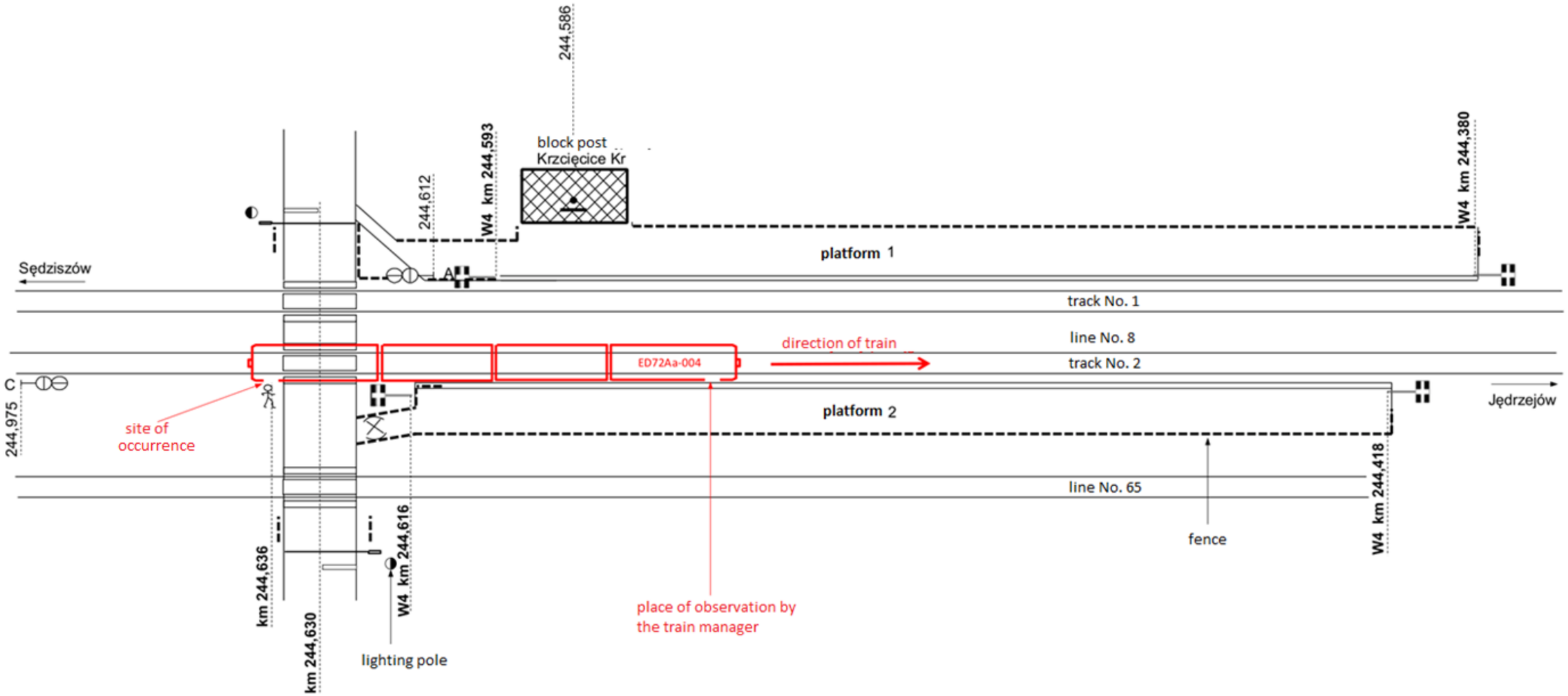


Figure 2 - Sketch of the accident

1.4. Deaths, injuries, and property damage

a) Passengers, employees or contractors, level crossing users, intruders, other people on the platform, other people not on the platform

As a result of the accident, the 22-month-old child suffered a concussion and head injuries.

b) cargo, luggage and other property

There was no damage to the luggage of the train's passengers.

c) rolling stock, infrastructure and environment

There was no damage.

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

Not applicable.

1.6. Identification of the individuals, their functions and the entities involved, including any links to contractors or other relevant parties

The following people were directly involved in the occurrence:
- The driver in charge of train MOJ 32318/9,
- MOJ 32318/9 train manager,
- A passenger on the train with his child.

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

Train MOJ 32318/9 of the carrier POLREGIO S.A. between Kraków Główny and Ostrowiec Świętokrzyski set, as an electric multiple unit ED72Aa-004 with a length of 87 m, gross weight 202 t, consisting of with four segments registered as railway vehicles with EVN: PL-PREG 94 51 2 140 242-0, PL-PREG 94 51 2 140 243-8, PL-PREG 94 51 2 140 244-6, PL-PREG 94 51 2 140 245-3.
The railway vehicle has a "Permission to operate the type of rail vehicle" No. T/2013/0428 and a "Certificate of vehicle worthiness/Return to operation No. POT3/03-41/2021" issued on 21/12/2021, valid until 20/12/2026 for a mileage of 500,000 km, calculated from 109 km.
P2 + PS level review (seasonal review) was performed on 12.10.2022 at PUT Sędziszów. The P1 scope 1 inspection was performed on 31.10.2022 at 04:30 at PUT Sędziszów. The counter of the railway vehicle after the P1 inspection was 118,857 km, on the day of the occurrence 121,978 km.

Train data MOJ 32318/9 - from the brake test card:
- train length..... 87.0 m
- total train weight..... 202 t
- percentage of required braking mass..... 95 %
- percentage of actual braking mass..... 117 %
- braking weight required..... 192 t
- actual braking weight..... 238 t

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

Track

Type of rails.....	-	60E1, jointless track
Railway tie.....	-	wooden
Attachment type.....	-	Type K
Type of ballast.....	-	gravel 35 cm
The highest permissible speed of trains on the route....	-	110 km/h

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

During the course of the investigation by the GDPC Investigation Team and the Railway Commission, the parent of the injured party and employees involved in the occurrence were heard. Those interviewed presented the following course of events.

A parent and his child started their journey in Gdynia and arrived in Kraków. In Kraków he changed trains to POLREGIO. At the end of the journey, he was tired. He bought a ticket for the POLREGIO S.A. train to Krzcięcice from a ticket machine in Kraków. After the train stopped in Krzcięcice, he opened the door with a button after the driver unlocked it. He asked another passenger to help him lift the stroller. He thought he was on the platform, but it was dark, and the platform was unlit due to repairs. The traveler saw that other passengers were getting off, so he started to get off. As he disembarked backwards, he fell over, pulling the stroller behind him. The stroller with the child in it overturned, but the child did not fall out because it was secured with a harness. The traveler wanted to get home to his family as soon as possible to check on the baby. A witness to the occurrence got off the train to help. At that moment, the door began to close and other passengers held the door open for him to board the train. After a while, the train left. The traveler was approached by two waiting family members. From the station to the traveler's father's house is about 3 km, so the family gave the traveler and his child a ride in their car. The child calmed down and fell asleep. The next day the traveler and his child went to the family doctor in Sędziszów. The doctor conducted an examination and wrote a referral to the hospital, where a CT scan of the head was performed, revealing a concussion. The traveler and his child returned to Gdynia, where another medical examination was conducted, which showed that the child was fine.

The train driver in charge of passenger train MOJ 32318/9 on the day of the accident on line Sędziszów - Kielce started work in Sędziszów at about 13:00 on a three-car EN 57 train heading for Kielce. There he picked up another EN 57 three-car train, which took him to Sędziszów. Then, at Sędziszów station, he took over an ED 72 EZT - a four-car set for train MOJ 32318/9 coming from Kraków. As he explained, there are times when he operates four different trains depending on the schedule. He took over the MOJ 32318/9 train "hand to hand" at about 6:40 p.m. After leaving Sędziszów station, he performed a control braking and continued to the Krzcięcice passenger stop and then to the Kielce station. On the day of the occurrence, according to his statements, the trip went smoothly, and he had no information about the occurrence.
At Kielce station he handed over the train "from hand to hand" and took another train to Sędziszów. He finished his work around 10 p.m. On 10.11.2022 he learned from his superior about the occurrence of 3.11.2022. The supervisor informed him that the Department had received an inquiry and asked for an explanation of the situation recorded on 3.11.2022 by the CCTV installed in the last section of the train. Based on the materials presented, he explained that the train stopped at Krzcięcice passenger station on the platform located on track 2. He said that the platform is very long, which is 200 meters long, there was no indicator, W32, so he stopped so that the passengers have the shortest way when they go to the end of the train, mentioning that there is no good visibility on the platforms in Krzcięcice due to poor lighting, and in his opinion he stopped correctly. Nobody gave him information that the train had stopped in the wrong place. Normally, he stops the train so that passengers have the shortest way to cross the tracks. On this day, however,

the conductor complained that he was not feeling well. At the Krzcięcice passenger stop, the manager, after serving passengers, gave the "ready to depart" signal by standing in the first compartment door just behind the cab and leaning out, blocking the view of the rearview mirror. In general, the "ready to depart" signal is given from the platform level. There is a monitor in the cab so that there is a view inside the train, but as he testified, the monitor is in the upper left corner, which is poorly visible because of its low resolution, and the monitor is split into images from 16 cameras. He added that once the train starts moving, the mirrors fold down, so he had no way of seeing the end of the train, as well as the monitors, because he was concentrating on the front of the train and observing the indicators. Receiving the vehicle "hand to hand " is done very quickly: greeting, taking a seat and, at the same time, receiving verbal information about the train's condition from the passing engineer and filling out the train's driver's logbook, checking the train's documentation.

The manager of train MOJ 32318/9 on 03.11.2022 on section Kraków Główny - Kielce stated that on 03.11.2022 he started his work shift in Sędziszów on train No. 23314/15 at 11:13 Ostrowiec Świętokrzyski - Kraków Główny. At Kraków Główny station, during the break, he went to the pharmacy to get blood pressure medicine, as he felt unwell that day. Train MOJ 32318/9 departed from Kraków Główny on schedule. At Sędziszów station a scheduled change of the traction team took place, the trip continued as planned. After leaving Sędziszów, the train was in the first compartment behind the driver. The train stopped in Krzcięcice, no one got on, no one got off, the stop lasted about a minute and the train started at the scheduled time. In Kielce, the traction and conductor team were changed, he returned to Sędziszów by train, where he finished his work around 10 p.m. He explained that the train stopped in the middle of the platform. There was a rule that passengers had to open the door individually after the driver unlocked it. During the stop at the Krzcięcice passenger stop, he observed the train and the platform from the first door. No one was getting on or off the train. He gave the signal "ready for departure" to the train driver. After the train departed, no one informed him of the occurrence with the passenger. He learned about the occurrence of the occurrence on 3/11/2022 from his supervisor on 10/11/2022. The supervisor informed him that the department had received a request and asked for an explanation of the situation recorded on 3.11.2022 by the CCTV installed in the last section of the train. Based on the material provided, he explained that he had worked overtime the week before the occurrence. On the day of the occurrence, he felt generally unwell, with pain in the back of his head because of hypertension, for which he has been treated for 10 years.

The train dispatcher on duty at Krzcięcice block post on 03.11.2022 stated that the day's duty went smoothly, there were no occurrences. There were no reports from train conductors or drivers. On that day, train MOJ 32318/9 passed through Krzcięcice station according to the timetable, stopping at a passenger stop. While observing the train's arrival and after it stopped, he saw only a part of the train. At 19:00 he handed over the duty, no one reported to the station with information about the occurrence or a request for help. The train crew did not report any difficulties.

2. Fact-based account of events

2.1 Chain of contiguous events that led to the occurrence, including: actions taken by the persons involved; operation of rolling stock and technical installations; operation of the operating system.

Train MOJ 32318/9 between Kraków Główny and Ostrowiec was operated by a train crew consisting of the driver and the train manager. At the station in Sędziszów there was a change of the train crew, i.e., a handover of the vehicle ED72Aa-004. The train entered Sędziszów station and departed at 18:40 according to the timetable. It entered the Krzcięcice passenger station at 18:45. The train stopped on platform 2, and the door of the last carriage from which the passenger got off was located at a distance of 20 meters from the platform. After the train stopped, a passenger disembarked from the last car at the last door with a child in a stroller. Before the train stopped, the passenger was prepared to disembark and observed the train entering the station on both the left and right sides of the train's side door. Due to the darkness and limited visibility, the passenger was not sure which side to exit. After the train stopped, he pushed the button for the single door opening on

the right side according to the direction of the train. The door opened and the passenger exited backwards, pulling a stroller with a child behind him. Another passenger in the car tried to help him get off, but was unable to catch the stroller, and the traveler lost his balance and fell onto the track bench with the child in the stroller. There were three other adults and one child in the car. One of the people got up from his seat and ran to the door.

At that moment, the door began to close with a time delay. A passenger inside the car pressed the button to reopen the single outside door, and a passenger who had jumped out to help the victim, blocking the door, boarded the train. After he boarded, the door closed, and the train started. The train stopped for 59 seconds. There was no conductor team in this car, as it was a one-man service - the train manager, who was in the first car, and witnesses to the occurrence did not inform the train crew of the occurrence by any means.

2.2. The sequence of events from the occurrence of the occurrence to the completion of the emergency services, including: measures taken to protect and secure the occurrence site; efforts of rescue and emergency services

The train crew and the train dispatcher of Krzcięcice block post did not know about the occurrence and therefore did not take appropriate measures. This lack of knowledge is confirmed by the analysis of the collected material.

After the occurrence, the victims went home without reporting the situation to the railway employees. At home, the child showed symptoms consistent with a head injury. On the second day, the traveler with the injured child went to a doctor, who referred the child to the hospital. From 04/11/2022 to 07/11/2022, the child was hospitalized with a diagnosed concussion.

Based on the information received by e-mail from POLREGIO S.A. Zakład Świętokrzyski w Kielcach on 10.11.2022, and after ensuring the monitoring from the vehicle and confirming the circumstances of the occurrence, the Railway Infrastructure Manager PKP PLK S.A. Railway Line Department in Kielce was notified by letter No. PRB.723.111.2022 dated November 14, 2022.

As a result, PKP PLK S.A. Railway Line Department in Kielce appointed a Railway Commission on 16.11.2022, which classified the occurrence as a C65 occurrence.

IV. OCCURRENCE ANALYSIS

1. Roles and responsibilities

1.1.Railway companies or infrastructure managers

Infrastructure manager PKP PLK S.A. Railway Line Department in Kielce

In particular, the main task of the railway infrastructure manager is the safe operation of railway traffic.
The duties of the Infrastructure Manager in the area of safe operation of railway traffic are defined by the *Instruction on conducting train traffic Ir-1*, *Instruction on signaling Ie-1(E-1)* and *Technical Regulations of Krzcięcice block post.*
Instruction Ie-1 introduces the use of indicator W 32 "Train front indicator", which was not installed at the passenger stop on the day of the occurrence, which was recognized by the Investigation Team as a contributing factor to the occurrence. This indicator, marked "100", was added at the request of the Railway Commission.

Railway undertaking POLREGIO S.A. Zakład Świętokrzyski w Kielcach

Obligations of railway operators in the area of safe driving are defined by the Infrastructure Manager's *Instruction on Train Operation Ir-1, Instruction on Signaling Ie-1(E-1)*, as well as the RU's internal instructions *Instruction on Technique and Organization of Work of Conductor Teams on Passenger Trains Pr-1 and Instruction for the Traction Vehicle Team Pt-2*. The designated train crew operating train MOJ 32318/9 possessed all authorizations and qualifications required by the regulations. The train was operated according to the timetable. Based on the analysis of the collected material, the Investigation Team found irregularities in the conduct of the train crew at the passenger stop in Krzcięcice:
1) The driver stopped the train, MOJ 32318/9, in a place that did not allow passengers to get off safely. The last quarter of the train was outside the platform, and the door through which the passenger got off was 20 meters in front of the platform.
2) The head of the train did not stay on platform 2 during its stop at the Krzcięcice passenger station.
He did not get off the train and limited himself to observing passengers through the open door, being the first behind the driver's cab, which is a violation of §6(1) of the *Instruction on the technique and organization of the work of conductor teams Pr-1*.
The driver's improper stopping of the front end of the 87-meter-long MOJ 32318/9 train and the failure of the train dispatcher to react to the improper stopping of the front end of the train and the location of the fourth section of the train set outside the platform were considered by the Investigation Team to be causal factors and contributed to the occurrence of the accident. and contributing to the occurrence of the accident.

1.2. Maintenance entities, maintenance workshops or any other maintenance providers

RU POLREGIO S.A., which supplies the rolling stock, is responsible for its efficiency, technical condition and compliance with the vehicle maintenance process. The electric multiple unit ED72Aa-004 had a railway vehicle type certificate and a current technical efficiency certificate. RU provided documentation of the last technical inspections of the rolling stock. The Investigation Team did not find any irregularities in the maintenance of the rolling stock. The technical condition of the rolling stock had no influence on the accident. However, the Investigation Team found that the internal devices for communication between the passenger and the train crew were inadequately described and the rules for their use were unclear to passengers. In addition, these devices come in different configurations and are installed in different locations, which confuses passengers.

1.3. Rolling stock manufacturers or other suppliers of railway products

Based on the research material collected, the Investigation Team did not identify any factors influencing rolling stock manufacturers and suppliers of railway products to the occurrence.

1.4. National safety authorities or the European Union Railway Agency

The President of the Office of Rail Transport (UTK) supervises the safety of railway transport. The Investigation Team found that there were 4 inspections conducted by this authority in 2021 – 2022 and did not address issues related to the factors identified by the Investigation Team.

1.5. Notified bodies, designated bodies or risk assessment authorities

Based on the research material collected, the Investigation Team did not identify any factors influencing notified bodies and risk assessment authorities on the occurrence of the occurrence.

1.6. Certification bodies of entities responsible for maintenance listed in section 1.2

Not applicable.

1.7. Any other person or entity with a connection to the occurrence, as possibly documented in one of the relevant security management systems, or referred to in the registry or the relevant legal framework

Not applicable.

2. Rolling stock and technical installations

Powered railway vehicle
The ED72Aa-004 electric multiple unit is equipped by the manufacturer with the DEUTA WERKE ADS3 electronic system for recording driving parameters.
The Investigation Team analyzed selected driving parameters recorded in the system immediately before the occurrence. The driving parameters of the train on the 1-kilometer route and during the 1 minute before the occurrence to the moment of stopping after the occurrence are shown in the following graph with description.
The following chart shows the following driving parameters of the MOJ 32318/9 train:
1) pressure in the main line,
2) pressure in the supply line,
3) brake cylinder pressure,
4) speed,
5) forced braking,
6) activation of emergency braking,
7) Initiation - SHP light on,
8) deleting CA and SHP lights,
9) giving the attention signal.

Analysis of the records of the DEUTA WERKE ADS3 recorder revealed the following events:

- 18:40:27 at the departure of the train from Sędziszów station, there was a gradual increase in speed to V-60 km/h,
- 18:40:40 registered pressure in brake cylinders with simultaneous decrease of speed to V-26 km/h,
- After that, the speed was gradually increased to 106 km/h, and the train continued to run at the set speed until 18:44:24, at which time electrodynamic braking was recorded with a decrease in speed to a complete stop, i.e., 18:45:03,
- Stop from 18:45:03 to 18:46:02. The distance covered by the train from Sędziszów station corresponds to the stopping point at Krzcięcice station. The length of the platform edge is 199.5 m. The front of the train stops at km 244.549, occupying 69 m of the initial part of the platform.

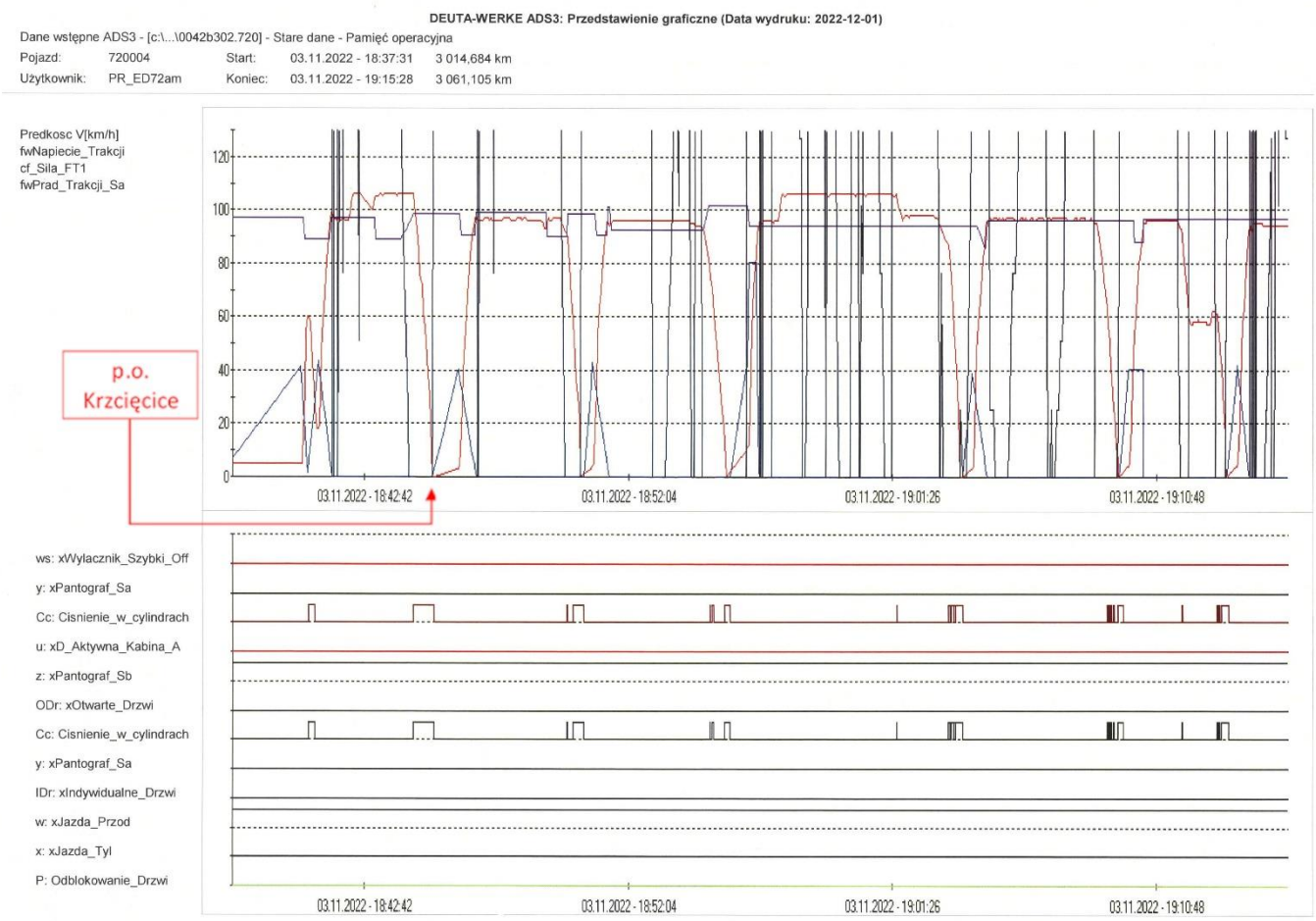


Figure 3 - Graph of driving parameters of the ED72Aa-004 locomotive as a function of time

During the operation of the train, the driver's reactions to the operation of the ABP (Automated Train Safety) equipment - correct. The planned speed of the train on this section is up to 110 km/h.
The ED72Aa-004 electric multiple unit is equipped with a system of centralized opening of the doors by the driver. In this system, the passenger opens the door individually after the train stops.
Each entrance door of the ED72Aa-004 train is equipped with an intercom system for voice communication with the driver. The device was not used on the day of the occurrence.

Photo 7 - View from inside the vehicle of the installed intercom at the front door (vehicle monitoring).

In the driver's cab of the ED72Aa-004 train, an LCD monitor with a split of 16 images from surveillance cameras is installed for real-time viewing and recording of events inside the train. The Investigation Team found that the driver could not assess the location of the stop and the occurrence that occurred at the Krzcięcice passenger stop based on the view from the cameras installed inside the train.

Photo 8 - Driver's cab equipped with CCTV viewing (PKBWK's own material).

The electric multiple unit ED72Aa-004 had the appropriate license for operation on the rail network and was technically sound.

3. Human factors

3.1 Human and individual characteristics

Testimony from the train manager and the train driver indicates that on the day of the occurrence, the train manager complained of feeling unwell due to severe headaches caused by high blood pressure, which may have limited his ability to concentrate and observe.

The passenger - the child's guardian on the day of the occurrence - was on a long trip of more than 10 hours. Such a trip contributed to the traveler's general fatigue and misjudgement of space when getting off the train.

3.2 Job-related factors

The Investigation Team raises no objections to workplace factors.

3.3 Organizational factors and tasks

The working hours of the train crew were in accordance with current standards. The train crew of train MOJ 32318/9 had the required rest period before starting work. The train driver was authorized to drive ED72Aa series locomotives and had other training related to the position. The train manager was authorized to perform the activities of his position. The train crew had current medical examinations that allowed them to perform the activities of their positions.

3.4 Environmental factors

Dark season, no rainfall, temperature about +5 C.º

3.5 Any other factors relevant to proceedings

Not applicable.

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

Conditions for the appropriate regulatory framework

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

POLREGIO S.A. has identified the risks related to the human factor of the employees working in positions directly related to the operation and safety of railway traffic, as well as the drivers and operators of railway vehicles, which are included in the *Register of Significant Risks.*

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

Railway infrastructure manager PKP Polskie Linie Kolejowe S.A.

The Safety Management System (SMS) at PKP Polskie Linie Kolejowe S.A., was introduced by Resolution No. 30/2011 of January 24, 2011 on the adoption of the directive introducing the Safety Management System at PKP Polskie Linie Kolejowe S.A.
The Investigation Team did not identify a causal link between the occurrence and the adopted and applied procedures at the infrastructure manager.

RU POLREGIO S.A.
The SMS/MMS Safety and Maintenance Management System, Edition I, has been amended by Resolution No. 164/2022 dated April 28, 2022, by introducing Amendment No. 1. The following is a summary of selected SMS/MMS elements used at POLREGIO S.A.

The SMS/MMS Transportation Procedure specifies how the train crew should proceed during the transportation process.
There is a procedure No. 012, i.e., *"Procedure for preparation and execution of train services in cases when the doors for passenger disembarkation are located beyond the edge of the platform where the train stop is designated"*. The purpose of this procedure is to define the rules for the proper performance of the Company's train services to ensure safe disembarkation from the train in cases where the doors for passenger disembarkation are located beyond the edge of the platform at passenger stops or stations.
The procedure obliges the employees of POLREGIO S.A. to properly organize, inform and conduct, especially the teams of the train crew during the transportation, in order to ensure the safe disembarkation from the train in cases when the doors for passenger disembarkation are located beyond the edge of the platform at passenger stops or stations where commercial stops of the train are ordered, as well as in cases of emergency.
The above-mentioned procedure covers situations determined by the RU. The situation on the day of the occurrence, when part of the train was outside the platform, was caused by the driver stopping the front of the train in the wrong place. Such a stop was unintentional, and the train crew was not aware of the mistake made and therefore did not follow procedure 012.

4.3. The management system of the entity(ies) responsible for maintenance and maintenance workshops, taking into account the functions set forth in Article 14 (3) of Directive (EU) 2016/798 and Annex III thereto 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

Not applicable

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

Railway infrastructure manager: PKP Polskie Linie Kolejowe S.A. holds:
Security Authorization:
- number EU PL2120210000,
- release date 26.02.2021,
- expiration date 01/03/2026,
- Type of infrastructure; normal-track (99.2%), broad-track (0.8%).

Size of managed infrastructure:
- Total length of railway lines 18,566 km,
- Total track length 36,042 km,
- 39,389 turnout units,
- 13,695 rail-level crossings,
  including 11,938 on rail lines in service.

RU: POLREGIO S.A.:
POLREGIO S.A., as of December 1, 2021, has a unified safety certificate No. PL1020210197, valid until December 1, 2026.

4.6. Other system factors

Not identified

5. Previous occurrences of a similar nature

As part of their investigation, the Investigation Team analyzed Cat. B35 accidents that occurred under similar circumstances between 2020 and 2022. A total of 23 accidents of the aforementioned category occurred during the period in question, of which:
- 2020. - 5 occurrences,
- 2021. - 9,
- 2022. - 9.

A brief description of the events and their consequences.
The following accidents are particularly noteworthy:

1) Accident cat. B35 occurred on 14.08.2020 on the route Hel - Jastarnia.

On 14.08.2020 at 15:21 the train ROS 90550 of Polregio Sp. z o.o. between Hel and Władysławowo departed from Hel station. At 15:30 the train stopped at Jurata passenger station after changing passengers, the train crew did not notice any dangerous situation and continued to Władysławowo station. After receiving information from the emergency number 112 at 16:10 to the dispatcher that, according to a witness, a person jumped off the above-mentioned train at the Jurata passenger station, resulting in injuries. The injured person was taken to the hospital in Wejherowo. The train consisted of SA137-007 car type 120A and SA137-006 total weight 246 tons length 110 meters.
Causes of the accident:
Direct: disembarking from a moving train from the wrong side of the track without a platform edge,
Primary: Failure to comply with the rules of order governing railway areas,
Indirect: the victim in a state of intoxication of 1.70 mg of alcohol/1 dm3 (3.55‰),
Systemic: none.

2) Accident cat. B35 occurred on 24.11.2021 in Nidzica station.

On 24.11.2021 at 11:30 a.m. the driver of train no. 90600 (POLREGIO S.A.) Olsztyn Główny - Działdowo, operating EN57-1332, after the departure of the train from Nidzica station platform 1, sees on the repeater that there are open doors implemented braking at a speed of about 25 km/h, during braking, he sees in the mirror that a person jumps out of the train. After investigation by the train manager, it turned out that one of the passengers, after the train had left, broke the seal by himself, opened the door and jumped out on the intermediate track between tracks 1 and 5 (25 m behind the platform) at km 24.362. The front of the train stopped at km 24.255. The driver informed ISEDR St. Nidzica of the above. ISEDR Nidzica notified the service via emergency telephone 112 operator no. 16 at 11:34. Ambulance on the scene at 11:42. The passenger (conscious) was taken to the hospital in Nidzica for examination and assistance (occipital contusion).
Causes of the accident:
Direct: occurrences with persons related to the movement of a railway vehicle - a passenger falling off a train,
Primary: The seal is broken, the door opened by himself, and a passenger jumps off the train while it is moving,
Indirect: none,
Systemic: none.

3) Accident cat. B35 occurred on 12.05.2022 at the passenger station Przemyśl Zasanie.

Based on the material from the monitoring of the locomotive EU160-023 and the collected documentation, it was established that after the train No. 13101 stopped at the Przemyśl Zasanie station at 11:42:35 and after the passengers had left the train, the train manager boarded the train at 11:42:35 after performing actions in accordance with Br-21 §4. 11:43:01. The train departed from Przemyśl Zasanie passenger station at 11:43:08, and at 11:43:15 a female passenger jumped from the rear of the train onto platform No. 1. The train continued to Przemyśl Główny station. According to the testimony of the child's mother, the passenger got off the train on the platform, and when she heard the whistle, the train immediately started moving, then she grabbed the baby stroller, which was in the carriage by the lower part of the frame, and while pulling the baby stroller with the child, she fell on the platform. The footage from the locomotive's camera did not show that the woman got out of the carriage and went back to get the stroller, but only that she started to get out of the carriage with the children about 5 seconds after the train left the Przemyśl Zasanie passenger station. The passenger failed to ensure the safety of exiting the train during the journey, thus exposing herself and the children to serious health and life risks.

Causes of the accident:

Direct: Passengers jump out of the car when the train starts after a scheduled stop at a station,

Primary: None,

Indirect: Passengers failing to comply with information posted on the car door that it is prohibited to exit the car while the train is in motion,

Systemic: None.

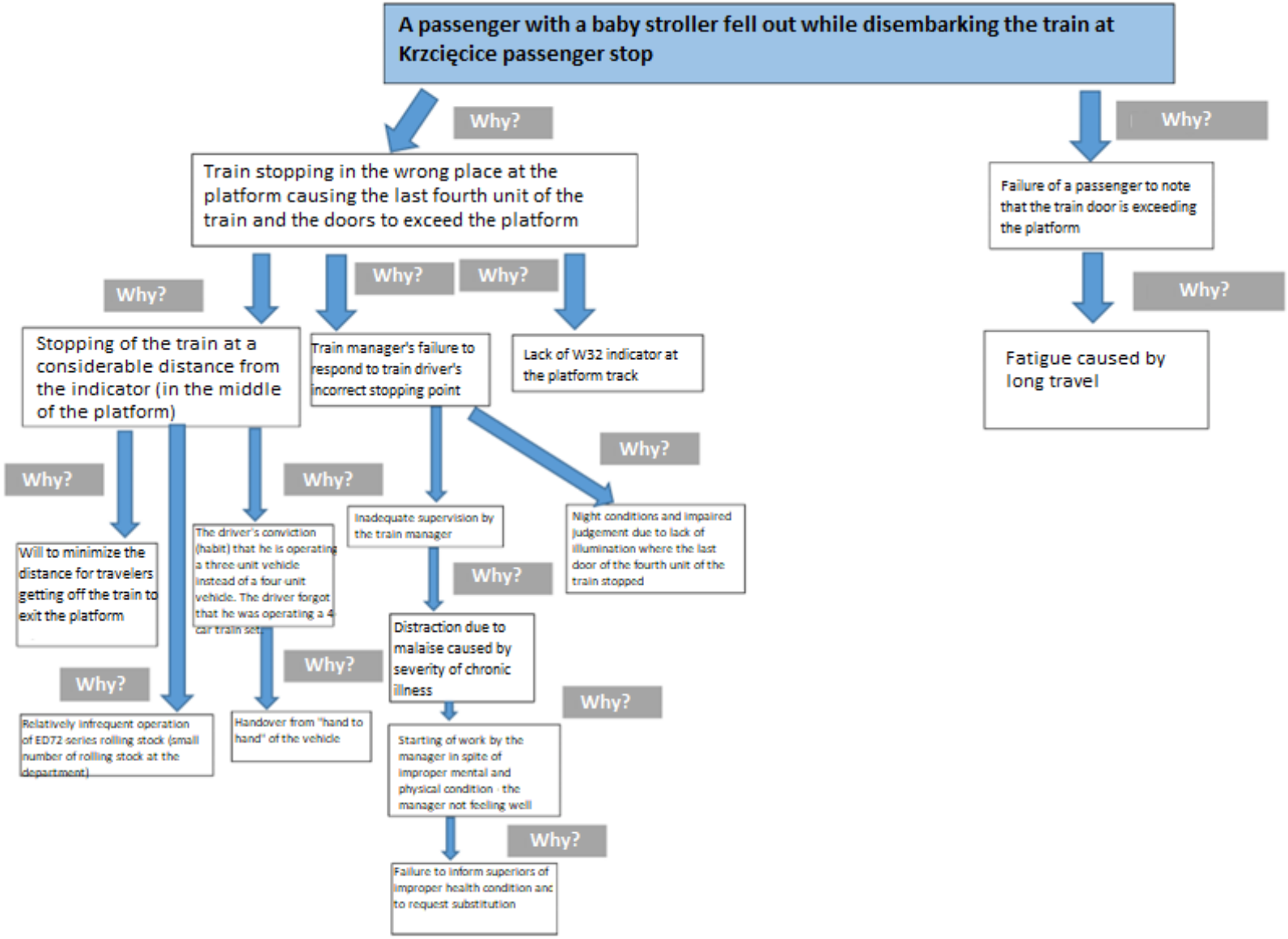
V. CONCLUSIONS

1. Summary of analysis and conclusions about the causes of the occurrence

Analysis of the collected material showed that the train manager was in the front part of the train, directly behind the driver's cab. After the train stopped at the Krzcięcice block post, the train manager went to the first door directly behind the active driver's cab and, without going to the platform, observed the train from the open door while standing inside the train. Looking to the rear of the train, after 59 seconds of standstill, he gave the RP-13 departure signal to the driver via the radio telephone and then went to the driver's cab.

Analyzing the records of the DEUTA WERKE ADS3 recorder, it was found that the distance covered by the train from the Sędziszów station corresponds to the stopping point at the Krzcięcice passenger stop. The length of the platform edge is 199.5 m, and the end of the train running on track 2 was outside platform 2.
The driver had no reservations about the technical condition of the vehicle and the efficiency of the brakes when he took the train "from hand to hand" at the Sędziszów station. After stopping the train at the passenger stop in Krzcięcice, the driver did not notice that the train was stopped at the wrong place, nor did he receive any information from the train manager or the trina dispatcher about the fact that a part of the train was exceeding the platform.
Based on the complaint received by POLREGIO S.A. Swietokrzyski Zakład w Kielcach on 10.11.2022, and after ensuring the monitoring from the vehicle and confirming the circumstances of the occurrence, the Railway Infrastructure Manager PKP PLK S.A. Railway Lines Department in Kielce was notified by letter no. PRB.723.111.2 of 14.11.2022 dated November 14, 2022.
As a result, PKP PLK S.A. Railway Lines Department in Kielce appointed a Railway Commission on 16.11.2022, which classified the occurrence as a category C65 occurrence.
The analysis of the collected material showed that the rolling stock involved in the accident, as well as elements of the railway infrastructure, were technically sound and did not contribute to the occurrence. The Investigation Team considered as a causal factor the stopping of train MOJ 32318/9 by the driver in the wrong place, which did not ensure safe disembarkation of passengers from the last section.
The Investigation team identified the following factors as contributing to the occurrence:

1) Lack of monitoring by the conductor of the platform level, the place where the depot is located, and of passengers getting off at the Krzcięcice passenger stop.
2) W32 indicators are missing at the Krzcięcice passenger stop.
3) The driver's suggestion of the length of the trains previously run that day, which was 64 meters (three-car unit), instead of the actual train length of 87 meters (four-car unit).
4) Failure of a passenger to point out that there was no platform at the level of the open door and continuing to disembark backwards.


A passenger with a baby stroller fell out while disembarking the train at Krzcięcice passenger stop
Why?
Train stopping in the wrong place at the platform causing the last fourth unit of the train and the doors to exceed the platform
Why?
Failure of a passenger to note that the train door is exceeding the platform
Why?
Why?
Why?
Why?
Stopping of the train at a considerable distance from the indicator (in the middle of the platform)
Train manager's failure to respond to train driver's incorrect stopping point
Lack of W32 indicator at the platform track
Fatigue caused by long travel
Why?
Why?
Why?
Why?
Will to minimize the distance for travelers getting off the train to exit the platform
The driver's conviction (habit) that he is operating a three unit vehicle instead of a four unit vehicle. The driver forgot that he was operating a 4 car train set
Inadequate supervision by the train manager
Night conditions and impaired judgement due to lack of illumination where the last door of the fourth unit of the train stopped
Why?
Why?
Why?
Why?
Relatively infrequent operation of ED72 series rolling stock (small number of rolling stock at the department)
Handover from "hand to hand" of the vehicle
Distraction due to malaise caused by severity of chronic illness
Starting of work by the manager in spite of improper mental and physical condition - the manager not feeling well
Why?
Why?
Failure to inform superiors of improper health condition and to request substitution

2. Measures taken since the occurrence

The Railway Commission classified the occurrence as a Category C-65 occurrence and, upon completion of the investigation, issued the following precautionary conclusions in the Final Findings Protocol:

1. *The Infrastructure Manager shall consider installing a monitoring system at the level crossing at km 244,630 to investigate the possible consequences of similar occurrences.*
2. *With regard to the Regulation of the Minister of Transport and Maritime Economy of September 10, 1998, on technical requirements for railway structures and their location (Journal of Law No. 151 item 987), reference is made to regulation S 98 paragraph 9a. In the case of platforms longer than 85 m, the W 4 "Stop indicator" at the Krzcięcice passenger station should be preceded by the W 32 "Train front indicator" for the even direction (applies to both platforms). Consideration of installation of W 32 indicators, analysis of local conditions for other locations on the territory of PKP PLK S.A.*
3. *RU POLREGIO S.A. with reference to Resolution No. 2/2021 of the Chairman of the Emergency Management Team of POLREGIO Sp. z o.o. dated 05.02.2021. Note S 1 cancelling the Order No. PB03d-074-32/2020 of 13.03.2020 concerning the requirement of central door opening (exclusion of the individual door opening button) for the driver of the railway vehicle. Due to the low temperatures and adverse weather conditions affecting the possibility of cooling the vehicles, the Company's Departments undertake to remove the information on automatic door opening posted in the operating vehicles and to prove the notification of the train crews of the changes made. The Commission proposes to repeal the above provision in order to restore the use of central door opening by the driver. Justification: With the ongoing upgrading of the railways, alternating trains on tracks 1 and 2 (running in the opposite direction to the main line), emergency track closures, the passenger does not know which side he/she will be getting off - especially in the dark, this applies in particular to the elderly, people with reduced mobility, women with children, etc. Stops at bus stops are limited to 0.5 minutes. Permission to open doors individually is justified for the departure station (do not make the train colder, save energy).*
4. *POLREGIO S.A. Zakład Swietokrzyski in Kielce will prepare an information bulletin on the occurrence. The bulletin will be discussed at the next periodic instructions for: train crews, traffic controllers, signalmen, switchmen, level crossing supervisors.*
5. *In addition, ISE Włoszczowa Pln. will discuss with the traffic officers of the Krzcięcice interchange station, in the form of additional training, the scope of the occurrence that occurred and the possible course of action in similar situations with a copy in the technical and traffic documentation.*

3. Additional notes

During an on-site visit to the Krzcięcice passenger station, the Investigative Team found the following irregularities, which did not contribute to the causal and contributing factors of the accident:

1. At a cat. A level crossing with a length of 33 m, which crosses two railroads: no. 8 (double-track) at km 244.630 and no. 65 (single-track) at km 311.347; two light points are installed, which is not in accordance with *§ Article 88 of the Regulation of the Minister of Infrastructure and Development of October 20, 2015, on the technical conditions to be met by crossings of railway lines and railway sidings with roads and their location (Journal of Laws, No. 1744), which states "The number of lighting points shall be determined depending on the length and width of the railway crossing or road crossing, taking into account the values of illuminance and uniformity of illumination in accordance with PN-EN 12464-2 Light and Illumination".*
2. Unnecessary absolute stop lines P12 at the Cat A crossing at km 244.630.
3. The fencing of the cat. A crossing km 244.630 inconsistent with *Regulation of the Minister of Infrastructure and Development of October 20, 2015, on the technical conditions to be met by intersections of railway lines and railway sidings with roads and their location (Journal of Laws, item 1744), which states The sections between the track and the horns shall be separated by handrails preventing access to the track bypassing the horns, if the location of the horns allows it. The ends of the handrails closest to the track shall be located 3 m from the outermost rail.*

Photo 9 - View of the Cat A crossing km 244.630 with fencing (PKBWK's own material).

Photo 10 - View of the Cat A crossing km 244.630 with fencing (PKBWK's own material).

4. Platform 2, which is made of paving slabs, has unevenness that is a difficulty when boarding and alighting travelers.

Photo 11 - View of Platform 2 with uneven pavement (PKBWK's own material).

The above anomalies affect the safety of passengers using the platform and the safety of users of the crossing. These irregularities may contribute to the occurrence of occurrences and accidents involving travelers. The study team sees the need to eliminate them.

VI. SAFETY RECOMMENDATIONS

1) RU's operating passenger services shall provide refresher training to train crews on compliance with the provisions of the Regulations on the place of the front of the train stop at the designated place in the station and at the passenger stop.
2) PKP PLK S.A. will supplement W32 indicators in passenger stations and stops with W4 indicators for the front of trains on platforms longer than 100 meters.
3) RU's providing passenger transportation will conduct an information campaign among travelers on the purpose and possibility of using the intercoms installed on passenger trains, including in emergency or safety threatening situations. Currently, the description of their purpose and mode of operation is not very clear and incomprehensible to travelers.
4) RU's operating passenger services shall require train crews to check internal communication by intercom when receiving a train at the originating station and to respond appropriately to the call.
5) RU's providing passenger transport services shall include in their instructions the issue of information exchange on board the train, using available technical means, between the passenger, the train crew and the locomotive driver, in situations that pose a threat to the safety of passengers and the train.
6) PKP Polish Railway Line Department in Kielce will eliminate the irregularities mentioned in point V.3 of the report.

STATE COMMISSION ON RAILWAY ACCIDENT INVESTIGATION
CHAIRMAN

.....
Tadeusz Ryś

List of entities appearing in the contents of Report No. PKBWK 03/2023

No.	Symbol (abbreviation)	Explanation
1	*2*	*3*
1.	EUAR	European Union Railway Agency
2.	PKBWK	State Commission on Railway Accident Investigation
3.	UTK	Office of Rail Transport
4.	PKP PLK S.A.	Infrastructure manager
5.	IZ	PKP PLK S.A. Railway Line Department
6.	POLREGIO S.A.	RU

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