STATE COMMISSION ON RAILWAY ACCIDENT INVESTIGATION
Ministry of Interior and Administration

REPORT No. PKBWK 06/2025

on the investigation of the railway accident
that occurred on 3 November 2024 at 16:30 hrs on the Spychowo - Pisz route,
track no. 1, Category D level crossing, at km 76.274
of railway line no. 219 Olsztyn Główny - Ełk,
area of the railway infrastructure manager PKP PLK S.A.
Railway Line Plant in Gdynia

WARSAW, 30 October 2025

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

Pursuant to Article 28f (3) of the Act of 28 March 2003 on rail transport, the Commission's investigation determines neither guilt nor liability.

This Report has been prepared under *Commission Implementing Regulation (EU) 2020/572 of 24 April 2020 on the reporting structure to be followed for railway accident and incident investigation reports (OJ L 132 of 27 April 2020)*

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I. ABSTRACT

Type of occurrence: Accident.

Description of the occurrence: An incident at a Category D level crossing, hereinafter referred to as "level crossing" *(as defined in accordance with the Road Traffic Act)*, involving of passenger train MPS 15102 operated by the railway carrier PKP Intercity S.A. between Warszawa Zachodnia and Gdynia Główna, driven by locomotive SU160-009, running into a road vehicle (a Volvo passenger car) which entered the level crossing directly in front of the head of the train.

Date of the occurrence: 3 November 2024, 16:30 hrs.

Location of the occurrence: Railway line no. 219 Olsztyn Główny - Ełk, Spychowo - Pisz route, track no. 1, Cat. D level crossing at km 76.274, ID number of the level crossing (yellow sticker) 219 076 274, geographical location 53°37'02"N, 21°26'32"E.

Consequences of the occurrence: As a result of the occurrence, the driver of the road vehicle and four passengers in the passenger car died instantly. The passenger car was destroyed and the powered railway vehicle was damaged.

Causal factor:
(means any action, omission, event or condition, or a combination thereof that, if corrected, eliminated, or avoided, would have prevented the occurrence, in all likelihood)

The passenger car entering the Cat. D level crossing directly in front of the oncoming passenger train MPS 15102.

Contributing factors:
(means any action, omission, event or condition that affects an occurrence by increasing its likelihood, accelerating the effect in time or increasing the severity of the consequences, but the elimination of which would not have prevented the occurrence)

1) Failure of the road vehicle to stop before the level crossing as directed by the B-20 "Stop" road sign.
2) Failure of the driver of the road vehicle to take special care when approaching and traversing the said level crossing.

Systemic factor:
(means any causal or contributing factor of an organisational, managerial, societal or regulatory nature that is likely to affect similar and related occurrences in the future)

None found.

Recommendations and their addressees: The carrier PKP Intercity S.A. shall inspect the front-view image recording systems installed on the powered railway vehicles in service for correctness and continuity of image recording. Furthermore, it shall ensure that the camera's field

of view is not obscured by any structural components of the vehicle and that its field of view covers the full front view of the vehicle. If the image is found to be obscured or distorted, the carrier shall either adjust the camera position or make changes to the mounting method.

Photo 1. A view of the consequences of the occurrence (source: the railway commission)

Photo 2. A view of the scene of the occurrence from the direction of the moving train (source: the railway commission)

Photo 3. A view of the level crossing from the direction of the passenger car's travel (source: the railway commission)

II. THE INVESTIGATION AND ITS CONTEXT

1. Decision to establish an investigation

The Chairman of the State Commission on Rail Accident Investigation (hereinafter referred to as "PKBWK" or "the Commission") Mr Tadeusz Ryś issued Decision no. PKBWK.590.5.2024 of 15 November 2024 on establishing an investigation into the causes and circumstances of the accident at the Category D level crossing at km 76.274 of railway line no. 219 Olsztyn Główny – Ełk.
Considering this fact and the provisions of Article 28e(4) of the Act on rail transport Act (consolidated text: Journal of Laws of Laws of 2024, item 697, as amended), hereinafter referred to as "the Rail Transport Act", the occurrence was reported to the European Union Railway Agency on 19 November 2024 and registered in the EURA's database under number PL-10628.

2. Motivation for the decision to establish an investigation

Based on an analysis of the circumstances of the occurrence and taking into account its nature, the Chairman of PKBWK decided that an investigation should be conducted by the Commission's Investigation Team pursuant to Article 28e(3)(2) of the Rail Transport Act due to the fact that the accident formed a series of accidents and incidents.

3. Scope and limits of the investigation including a justification thereof, as well as an explanation of any delay that is considered a risk or other impact to the conduct of the investigation or its conclusions

The investigation into the causal factors and circumstances of the occurrence was conducted under Article 28h(1) of the Rail Transport Act and, in accordance with the provisions of Article 28f(3), does not determine guilt or liability.
There were no limits during the investigation that would have a negative impact on its course.

4. An aggregated description of the technical capabilities and the functions in the team of investigators

The Chairman of the Commission nominated an Investigation Team from among the standing members of the Commission with qualifications and competencies suitable for the investigation concerned.

5. A description of the communication and consultation process established with persons or entities involved in the occurrence during the investigation and in relation to the information provided

In accordance with Article 28h(2)(5) of the Rail Transport Act, the Chairman of PKBWK obliged the designated members of the railway commission to cooperate with the Investigation Team under a written request no. PKBWK.590. 590.5.1.2024 of 15 November 2024 addressed to their respective employers.

On 26 November 2024, at the head office of the Control and Instruction Department of PKP PLK S.A. Railway Lines Division. in Olsztyn, the chairman of the railway commission formally submitted the documentation gathered by the railway commission to the Investigation Team.

6. A description of the level of cooperation offered by the entities involved

During the investigation, the level of cooperation with the representatives of the entities involved in the circumstances of the occurrence was standard and did not raise any reservations of the Investigation Team.

7. A description of the investigation methods and techniques as well as analysis methods applied to establish the facts and findings referred to in the report

Throughout the process aimed at clarifying the causes and circumstances of the occurrence, the Investigation Team relied on their own knowledge, experience and established findings.
The Team used their own documentation as well as documentation gathered by the railway commission, prosecutor's office and police.
Within the framework of the investigation, the Investigation Team applied inter alia the following methods:

- examination of the scene after the accident,
- site inspections of the occurrence site,
- an interview with the train driver,
- an analysis of the documentation gathered,
- an analysis of the contents of the train event data recorder,
- an analysis of front-view image recordings from the vehicle's camera.

Below is a list of selected legal acts, rules and internal instructions used
in the course of the investigation.

European Union rules:

1) 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) (OJ EU L 119 of 4 May 2016, p. 1, as amended).
2) Commission Implementing Regulation (EU) 2020/572 of 24 April 2020 on the reporting structure to be followed for railway accident and incident investigation reports (OJ EU L 132 of 27 April 2020).
3) Directive (EU) 2016/798 of the European Parliament and of the Council of 11 May 2016 on railway safety (OJ EU L 138 of 26 May 2016, p. 102, as amended).

National rules:

1) Rail Transport Act of 28 March 2003 (consolidated text: Journal of Laws of 2024, item 697, as amended).
2) Construction Law Act of 7 July 1994 (consolidated text: Journal of Laws of 2023, item 682, as amended).
3) Act of 20 June 1997 on the Road Traffic Law (consolidated text: Journal of Laws of 2024, item 1251, as amended).
4) Act of 10 May 2018 on the protection of personal data (Journal of Laws, item 1000).
5) Act of 21 March 1985 on public roads (consolidated text: (Journal of Laws of 2024, item 320).
6) 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 sidings with roads, and on their positioning (Journal of Laws of 2015, item 1744, as amended).
7) Regulation of the Minister of Infrastructure of 11 January 2021 on personnel employed on positions related directly to the operation and safety of rail traffic and to driving of specific types of railway vehicles (consolidated text: Journal of Laws of 2024, item 780).

8) Regulation of the Minister of Infrastructure of 18 July 2005 on general conditions for rail traffic operation and signalling (consolidated text: Journalof Laws of 2015, item 360, as amended).
9) Regulation of the Ministers of Infrastructure and of the Interior and Administration of 31 July 2002 on road signs and signals (consolidated text: Journal of Laws of 2019, item 2310, as amended).
10) Regulation of the Minister of Infrastructure of 24 June 2022 on the technical and construction rules applicable to public roads (Journal of Laws of 2022, item 1518).

Internal instructions of the railway carrier PKP Intercity S.A.

1) Instruction for a driver of a traction vehicle - Bt-1
2) Instruction for conductor teams regarding operation of passenger trains in service with PKP Intercity S.A. - Br-21

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

1) Ie-1 (E-1) Instruction on signalling operations,
2) Ir-1 Instruction on operating railway traffic
3) Ir-8 Instruction on the handling of serious accidents, accidents and incidents in railway transport
4) Id-1 (D -1) Technical conditions for the maintenance of the surface of railway lines
5) Ik-2 Instruction on inspections concerning railway traffic safety
6) Id-7 Instructions for surveillance of railway lines.

8. A description of the difficulties and specific challenges encountered during the investigation

Members of the Investigation Team did not encounter any difficulties or problems that could have impact on the course, timeliness or conclusions of the investigation.

9. Any interaction with the judicial authorities.

In letter no. PKBWK.590.5.6.2024/2025 of 30 April 2025, the Chairman of PKBWK requested the District Public Prosecutor's Office in Pisz to provide access to the documents gathered during its investigation in connection with the occurrence that were relevant to establishing the circumstances and causal factors of the occurrence. The documents were made available to the extent specified in the said letter.

10. Other information relevant in the context of the investigation

No other relevant information.

III. DESCRIPTION OF THE OCCURRENCE

1. The occurrence and background information

1.1. Description of the type of occurrence

During the travel of a Warszawa Zachodnia - Gdynia Główna passenger train operated by the railway carrier PKP Intercity S.A., at a Cat. D level crossing (not equipped with any railway traffic control systems or equipment), the driver of a road vehicle, i.e. a Volvo passenger car, drove directly in front of the head of locomotive SU160-009 leading train MPS 15102. The road vehicle entered the level crossing from the left side of the moving train. The rail vehicle hit the right side of a passenger car. As a result of the impact, the car was pushed about 500 m until the train came to a complete stop. The driver of the car and four of his passengers died instantly. The rail vehicle was not derailed.

1.2. The date, exact time and location of the occurrence

The occurrence took place on 3 November 2024 at 16:30 hrs on the Spychowo - Pisz route, at Cat. D railway crossing at km 76.274 of railway line no. 219 Olsztyn Główny - Elk, level crossing ID no. 219 076 274 (a yellow sticker placed on the track side of the St. Andrew's Cross).

Photo 4. Location of the crossing (source: Google maps)

1.3. The description of the occurrence site, including weather and geographical conditions at the moment of the occurrence and if any works were carried out at or in the vicinity of the site

The Category D level crossing where the occurrence took place is located on county road no. 1773N in the village of Karwica Mazurska. Coordinates of the level crossing: 53°37’02”N, 21°26’32”E. Road surface: bitumen. The permitted speed of vehicles on the road in the area of the level crossing is 90 km/h. The road crosses the railway track at the angle of 72°. The area where the road intersects with the railway line is located in a wooded, flat and non-built-up area. The visibility of the level crossing from the road from the car's direction of travel meets the requirements of the 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 sidings with roads, and on their positioning (Journal of Laws of 2015, item 1744, as amended). There are isolated trees and shrubs in the visibility triangles of the train head from the car's direction of travel in the immediate vicinity of the track. There are B-20 "Stop" road signs positioned and P-12 absolute stop lines painted ahead of the level crossing on both sides of the road. In addition, there are vibration-acoustic strips on the approaches to the level crossing. No works on the rail or road infrastructure were being carried out in the area of the level crossing on the day of the occurrence.

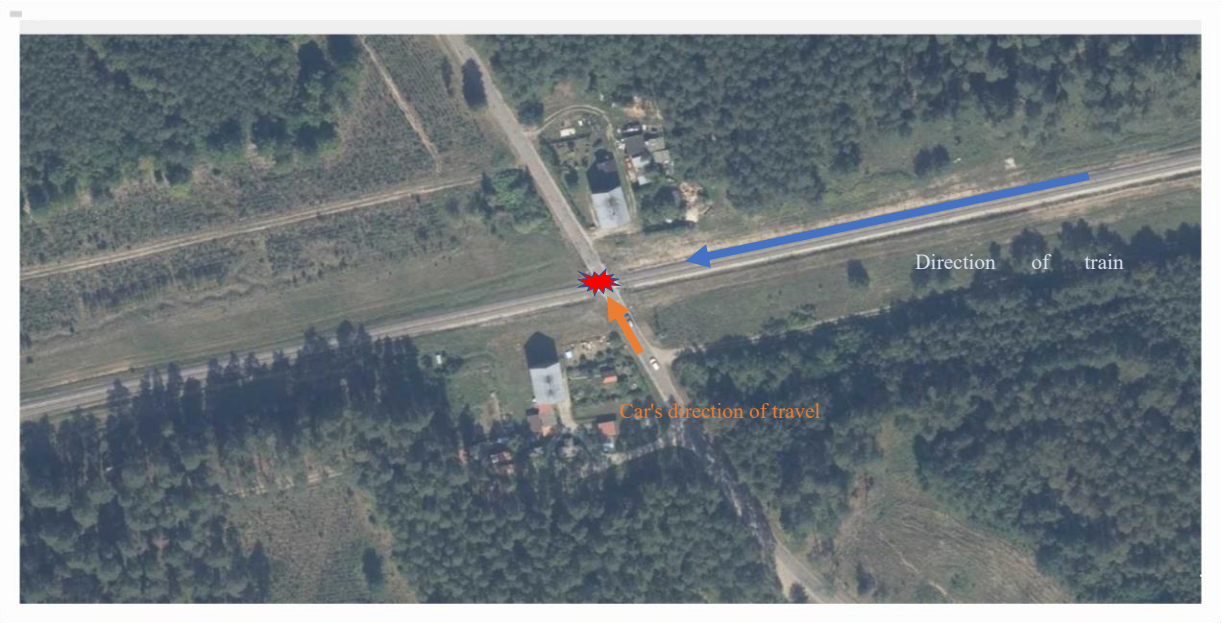
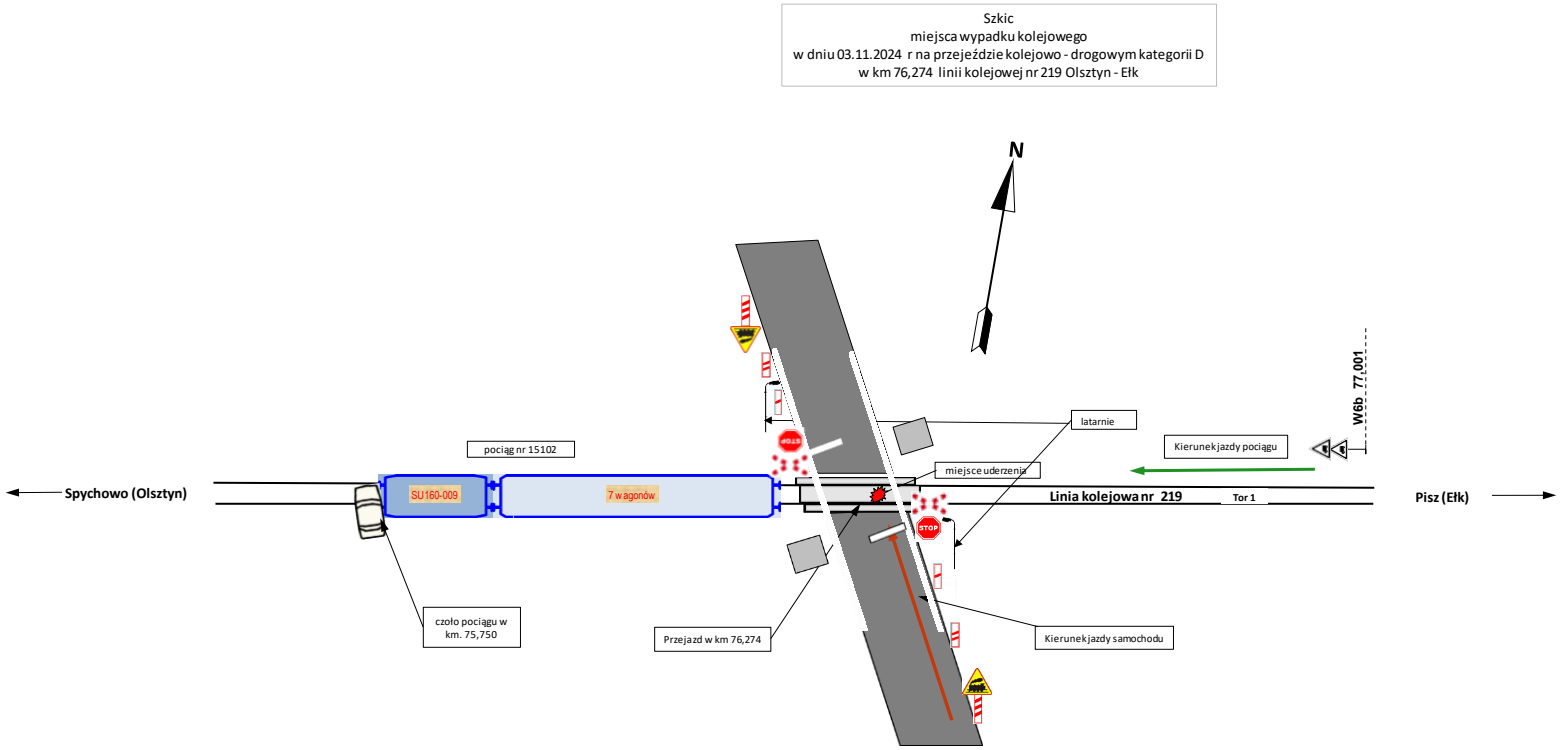


Photo 5. Positioning of the vehicles before the accident (source: Google maps)

The weather conditions on the day of the accident were good, with no rain or fog. Afternoon - dusk (about half an hour after sunset), cloudless sky, temperature around 10º C. There were no other road users within the level crossing at the time of the occurrence who could likely to attract the attention of the driver of the road vehicle.

Figure 1. A sketch of the accident (author: PKBWK)



1.4. Deaths, injuries and material damage

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

As a result of the incident, the driver of the road vehicle and four passengers died instantly.
There were no injuries to the train operator's employees or train passengers.

b) cargo, luggage and other property

The Volvo passenger car was completely destroyed
There was no damage to items or luggage carried in the train.

c) rolling stock, infrastructure and the environment

The extent of the damage to locomotive SU160-009 prevented further travel.
Damage:

- damaged two ladders with brackets on the end beam platform (the right and left side in the direction of travel)
- damaged entrance ladder to the driver's cab / left side, > damaged fender (bends, scratches)
- scratches on the mounting brackets of the fender
- damaged 2 "WN" train heating sockets with brackets
- damaged 3 air end taps with mountings
- damaged draw hook guide
- damaged laminate coupling cover
- damaged front-view camera
- broken protective glass of the front-view camera
- broken protective glass on the headlight (right side)
- damaged front skin of the cabin below the headlights
- damaged 2 access platforms on the end beam platform
- damaged bumper absorber (right side)
- damaged sandbox (left side)
- damaged vehicle emergency extinguisher button
- damaged sandbox check button (left side)
- torn inspection flap for the windshield washer fluid container
- damaged locomotive external charging socket 3x400V (right side)
- damaged 4 air coupling head hangers
- damaged 1 IC socket
- damaged metal parts, so-called fairings/fillings
- damaged clutch disc on the 1st drive unit
- the locomotive's undercarriage badly battered by ballast.

In the track between the level crossing and the site where the train head stopped , the ballast prism and track bed were disturbed, the W13 indicators and the kilometre and hectometre signs were damaged. There were no environmental losses.

1.5. The description of other consequences, including the impact of the occurrence in the regular operations of the actors involved

As a result of the occurrence, the plain track Spychowo - Pisz was closed from 16:32 hrs on 3 November 2024 until 02:15 hrs on 4 November 2024; 28 trains were delayed for 854 minutes.
Backup transport: PKP Intercity S.A. launched 18 buses to Olsztyn station, and POLREGIO S.A. launched 3 buses to replace trains no. 90954 and 90947.

1.6. The identification of the persons, their functions, and entities involved, including possible interfaces to contractors and/or other relevant parties

The Investigation Team identified the following persons as directly involved in the occurrence:
- the driver of train MPS 15102, an employee of the railway carrier PKP Intercity S.A.
- the manager of train MPS 15102, an employee of the railway carrier Intercity S.A.
- the conductor of train MPS 15102, an employee of the railway carrier intercity S.A.

1.7. The description and identifiers of train(s) and their composition including the rolling stock involved and their registration numbers

Passenger train MPS 15102 was made up of diesel locomotive SU160-009 and 7 wagons of the railway carrier PKP Intercity S.A.
The traction vehicle has the notice of return of a rail vehicle to operation no. 087/08/2024 of 29 August 2024, issued after P4 maintenance and emergency repair; the EVN of the rail vehicle is PL-PKP IC 92 51 5 650 009-0.
The mileage at the time of the occurrence was 494,411 km. P1 maintenance and seasonal inspection were conducted on 16 October 2024 at the mileage of 482,006 km.

MPS 15102 data:

– train length	188,00 m
– total weight of the train	407 tonnes
– percentage of braked mass required	108 %
– actual braked mass percentage	145%
– required braked mass	440 tonnes
– actual braked mass	593 tonnes

1.8. A description of the relevant parts of the infrastructure and signalling system – track type, switch, interlocking, signal, train protection systems

1) Track:

rail type	–	49E1 - year 2010
sleepers	–	pre-stressed concrete PS83 type
attachment type	–	type SB4
ballast type	–	crushed stone
maximum permitted train speed en route	–	120 km/h

2) Railway crossing:
- Category D level crossing forming an intersection of railway line no. 219 Olsztyn Główny - Ełk with county road no. 1773N,
- individual ID number of the crossing: 219 076 274 (a yellow sticker placed on the track side of St. the Andrew's Cross),
- axis of the level crossing – km 76.274,
- road-railway track intersection angle – 72°,
- the surface of the level crossing is made of prefabricated reinforced CBP slabs - 3 sets,
- the road surface on the approaches – bitumen,
- approach gradeline:
  - right side + 1.2 % drop towards the crossing over the distance of 8.27 m,

- left side (direction of the car's entry onto the level crossing) - 0.8% drop towards the crossing over the distance of 8.27 m,

- traffic ratio at the crossing - 1,467; measured on 13 and 14 October 2021,
- length of the straight section of the road; measured from the outermost rail:
  - left side - 1,105.0 m
  - right side - 62.0 m
- length of the level crossing - 9.6 m,
- width of the road crown at the level crossing – 9.0 m,
- width of the roadway at the level crossing - 4.6 m,
- width of the roadway on the approaches, left and right - 4.4 m,
- fencing of the level crossing - yes,
- maximum speed of road vehicles at the level crossing – 90 km/h,
- the level crossing is illuminated after dark.

3) Signage of the level crossing on the day of the occurrence:
   - from the side of the road, the level crossing is marked with G-3 signs - St. Andrew's Crosses, B-20 "Stop" signs, and A-10, G-1a, G-1b, G-1c signs positioned on the right-hand side of the road on both sides of the track (the positioning of the signs from the car's direction of travel is shown in photographs 6, 7, 8),
   - W6b indicators on the track side:
     - from the direction of the incoming train, positioned at km 77.001, i.e. 727 metres ahead of the level crossing,
     - from the opposite direction, positioned at km 75.714, i.e. 560 metres ahead of the level crossing (70km/h train speed limit due to limited visibility of the train head at the crossing).
4) Visibility conditions for the level crossing and the train head from the road.
   The required minimum visibility of the level crossing from the approach road is 120 metres. The actual visibility of the level crossing from the road, as measured on 5 November 2024 by the County Road Administration in Pisz, is:
   - left side - 300 m
   - right side - 130 m

   The conditions of visibility of the level crossing from the road meet the requirements of the *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 sidings with roads, and on their positioning (Journal of Laws of 2015, item 1744, as amended)*.

Photo 6. A10, G1a signs positioned approximately 160m before the level crossing (source: the railway commission)

Photo 7. A G-1b sign positioned approximately 105m before the level crossing (source: the railway commission)

Photo 8. A G-1c sign positioned approximately 60 m before the level crossing (source: the railway commission)

The conditions of visibility of the train head from the road, as measured by the railway commission on 4 November 2024, are shown in Table 1.

Table 1. Conditions of visibility of the train head from the road (Point 6.1 of the data sheet)

distance measured from the outermost rail												track axis-to-axis distance "d"	Speed V in the area of the crossing	required visibility conditions		
5m track side				10 m track side				20 m track side								
right		left		right		left		right		left						
to the right	to the left	to the right	to the left	to the right	to the left	to the right	to the left	to the right	to the left	to the right	to the left			from 5 and 10 m	from 20 m	from 4 m
760	**450**	**450**	**700**	**660**	**400**	**450**	**600**	**700**	**270**	**550**	**130**	**-**	**120km/h - P** **70km/h - N**	**660** **385**	**432** **252**	**-**

The orange colour indicates the visibility distances of the train head from the road from the direction of travel of the road vehicle, as included in the level crossing's data sheet.

Photo 9. Visibility of the head of the train from the road from the direction of travel of the road vehicle (from 5m)

1.9. Any other information relevant for the purpose of the description of the occurrence and background information

No other relevant information was identified in the context of the occurrence description.

2. The factual description of the events

2.1. The proximate chain of events leading up to the occurrence, including actions taken by persons involved, the functioning of rolling stock and technical installations, the functioning of the operating system

On 3 November 2024 at approximately 15:45 hrs, a road vehicle (a Volvo passenger car) departed from the village of Kolno. The driver of the road vehicle was driving his family from Kolno to Olsztyn.
On the same day, at 13:18 hrs, PKP INTERCIY S.A. train MPS 15102 running from Warszawa Zachodnia to Gdynia had been dispatched from Białystok station. The train arrived at Pisz station 5 minutes late. At Pisz station, the stop was extended due to deconfliction with a POLREGIO S.A. train, and the train departed from the station to continue its journey at 16:09 hrs with a 10-minute delay. The train made its last stop between 16:21 hrs and 16:22 hrs at Ruciane-Nida passenger stop, from where it departed at 16:22 hrs with an 11-minute delay. After departing, the train was approaching the level crossing at km 76.274 at a speed of not more than 120 km/h. After passing the level crossing indicator W6b at km 77.001, the train driver gave the sound signal "Attention" twice - first at 16:29:33 hrs and next at 16:29:41 hrs. Approaching the level crossing as he continued driving, the train driver a passenger car incoming from the left. Seeing that the passenger car driver had failed to react to the approaching train, the train driver repeated the "Attention" signal at 16:29:47 hrs and 16:29:49 hrs, and then he implemented emergency braking at 16:29:50 hrs. Despite the signals given, the car continued to drive with unreduced speed without stopping at the B-20 "Stop" road sign. In consequence, the car entered the level crossing directly in front of the front of train MPS 15102 and the train ran into it. The locomotive hit the right side of the passenger car. The speed of the train at the moment of the collision with the car was 117.056 km/h. The head of the train stopped at km 75,750, i.e. 524 metres from the axis of the level crossing.
As a result of the impact, the driver of the road vehicle and four passengers died instantly. The road vehicle, jammed on the locomotive's coupling, was pushed by the train until it came to a complete stop at 16:30:20 hrs at km 75.750. There were no casualties among the train's passengers. The occurrence did not result in derailment of the train.

2.2. The chain of events from the occurrence until the end of the actions of the rescue services, including measures taken to protect and safeguard the site of the occurrence, the efforts of the rescue and emergency services

After stopping the train, the train driver reported the occurrence to the signaller in Szczytno by train radio and remained in the cab until the police arrived. The signaller notified the accident to: emergency services at 112 at 16:32 hrs, the plant dispatcher (Olsztyn) at 16:32 hrs, the line dispatcher (Gdańsk) at 16:33 hrs, and the Railway Security Guard SOK (Ełk) at 16:40 hrs. At the same time, a witness to the occurrence, a resident of Karwica Mazurska who lived near the crossing and saw the accident from his own yard, called the emergency line at 112.
The train manager was in the middle section of the train at the time of the collision. Once the train was stopped, he contacted the train driver, who informed him about the accident with the car. The manager and the conductor then went to the head of the train to check what had happened and to provide possible assistance.
On reaching the head of the train, the conductor found that the car was jammed on the front coupling of the locomotive. The car door and boot lid could not be opened and the driver gave no signs of life. The passengers could not bee seen in the crashed car. The train manager then went to the train to inform the passengers of the occurrence.
The ambulance service arrived at the scene at 16:48 hrs, the fire brigade at 16:56 hrs, the police at 17:00 hrs, the Chief of the Operations Section in Ełk at 17:00 hrs, the prosecutor at 18:35 hrs, and the County Governor at 19:08 hrs.
The rescue operation was ended at 00:11 hrs on 4 November 2024.
The Spychowo - Pisz plain track was closed from 16.32 hrs on 3 November 2024 to 02.15 hrs on 4 November 2024.

IV. ANALYSIS OF THE OCCURRENCE

1. Roles and duties

1.1. Railway undertaking(s) or infrastructure manager(s)

Infrastructure operator PKP PLK S.A. Railway Line Plant in Gdynia

The railway infrastructure manager is responsible for the proper maintenance of the railway line and level crossings. The obligations imposed on the manager are set out, inter alia, in the provisions of Article 62(1)(1) and (2) of the Construction Law, which requires managers to conduct periodic (annual and five-year) inspections of structures, including level crossings. §31 of the internal instruction Ie-1 of the infrastructure manager requires that a diagnostic examination of the structure be conducted at least once a year.
The last periodic (five-year) inspection of the level crossing before the accident took place on 2 August 2024. The infrastructure manager carried out the required checks and documented those activities in a report. It was concluded in the course of the inspection that the technical condition of the crossing was good and permitted further operation. No irregularities were found and no recommendations were made.
The infrastructure manager's personnel who first arrived at the scene of the occurrence acted in accordance with the provisions of §5 of the Instruction Ir-8 on handling serious accidents, accidents and incidents in railway transport.

Railway carrier PKP INTERCITY S.A.

To carry out the transport task, the carrier designated locomotive SU160-009 , which had operation approval certificate no. 087/08/2024 of 29 August 2024 issued by ECM PESA Bydgoszcz S.A. The designated train crew that operated the train held all ratings and qualifications required by law. The train was run based on a timetable. The responsibilities of a railway carrier concerning safe operation of a rail vehicle are set forth in the internal rules of the infrastructure manager: Instruction Ir-1 *on the conduct of train traffic operations*, Instruction Ie-1(E-1) *on signalling*, and the carrier's internal Instruction Bt-1 *for a traction vehicle driver*. Based on an analysis of the material gathered in the case, the Investigation Team did not find any irregularities in the conduct of the train crew during operation of the train or after the occurrence. The driver scanned the train's route and, once he noticed a road vehicle approaching the crossing, immediately implemented emergency braking while giving the Rp1 "Attention" signal.

1.2. The entities in charge of maintenance, the maintenance workshops, or any other maintenance suppliers

PKP Intercity S.A. is in charge of maintenance of rail vehicles. As regards P1 and P2 maintenance (in accordance with the Maintenance System Documentation, MSD), the company carries out its tasks by own means, while other maintenance levels (P3, P4 and P5) included in the MSD are outsourced to external entities. The maintenance of the vehicle indicated in the MSD was carried out in accordance with the cycles specified in the documentation. The manner of rail vehicle maintenance had no influence on the occurrence.

1.3. Manufacturers of rolling stock or other suppliers of rail products

Based on the evidence gathered, the Investigation Team did not establish any links between the occurrence and rolling stock manufacturers or service providers.

1.4. 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 the evidence gathered, the Investigation Team did not establish any relation between the national safety authority and the occurrence under investigation.

1.5. Notified bodies, designated bodies or risk assessment bodies

Based on the evidence gathered, the Investigation Team did not identify any relation between the accident and notified bodies or risk assessment bodies.

1.6. Certification bodies of entities in charge of maintenance mentioned under Point 1.2.

Based on the evidence gathered, the Investigation Team did not establish any relation between the railway carrier's certification body and the occurrence under investigation.

1.7. Any other person or entity relevant to the occurrence, documented or not in one of the relevant safety management systems or referred to in a register or relevant legal framework

The responsibility for the proper marking of the approach road to the level crossing lies with the county road manager, i.e. the Pisz County Board.
Based on the evidence gathered in the case, the Investigation Team did not find any irregularities in the in the marking of the approach road to the level crossing.

2. Rolling stock and technical installations

Locomotive SU160-009 is equipped by the manufacturer with the event data recording system TELOC 1500 and a front-view image recording system.
The Investigation Team analysed selected train event data recorded by the electronic data recorder to investigate the train driving characteristics immediately prior to the occurrence.

Figure 2. Diagram of the driving parameters of diesel multiple unit SU160-009 as a function of distance (author: PKBWK)

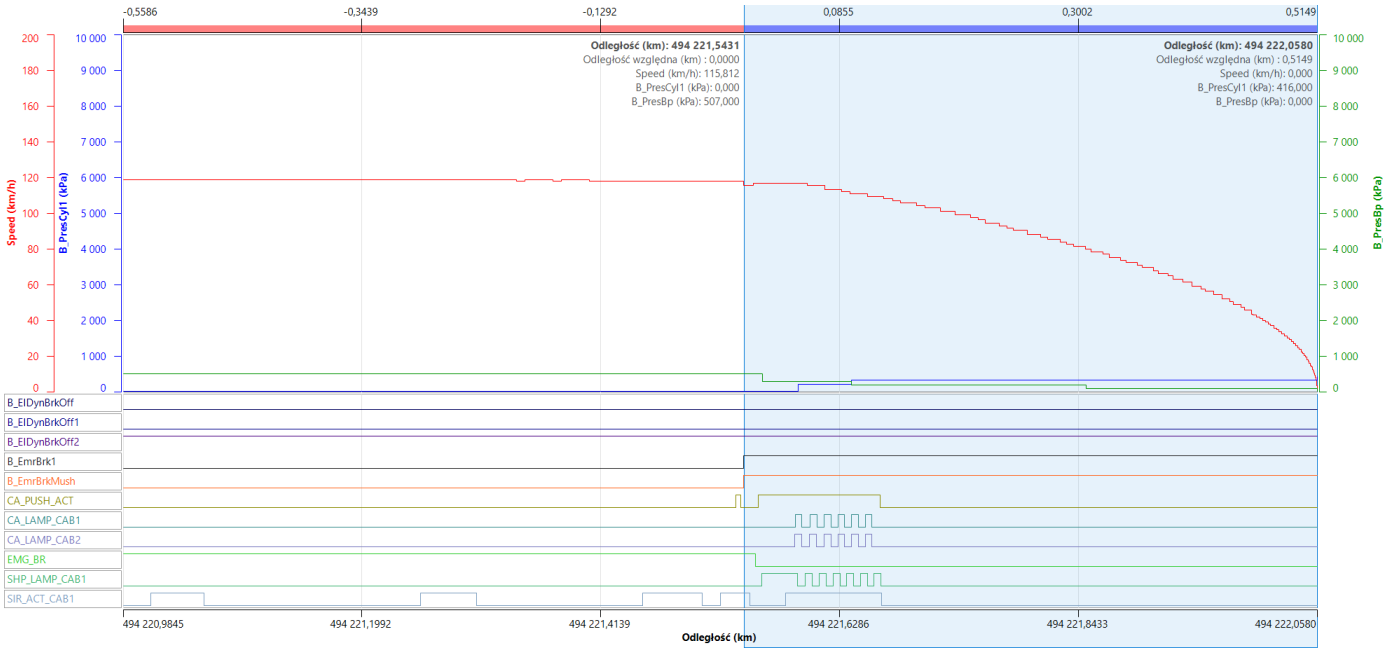
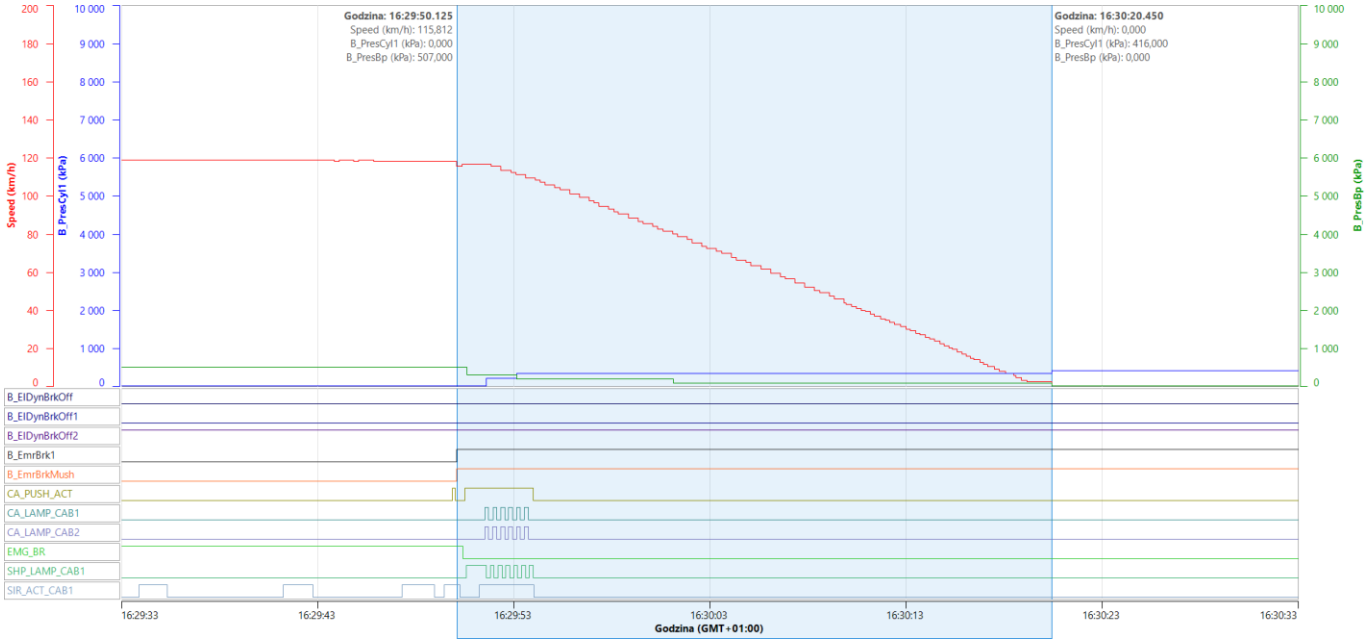


Figure 3. Diagram of the driving parameters of diesel multiple unit SU160-009 as a function of time (author: **PKBWK)**



The diagrams below show, among others, the following driving parameters of train MPS 15102:

1. speed,
2. pressure in the main line,
3. pressure in the air reservoir,
4. use of the active vigilance device button,
5. use of the Automatic Train Braking (SHP) button,
6. use of the sound signal,
7. cabin identification - control from cabin B.

A description of the event data recorded by TELOC 1500 (device ID: 15070756_HW_Rev_A, installed in SU160-009) on 3 November 2024 during the journey of MPS 15102 on the Warszawa Zachodnia - Gdynia Główna route.

- Time: hrs - start up of the train at Pisz station and increase in speed to approximately 120 km/h (with the speed permitted for this train on this section of the line being 120 km/h).
- Time: hrs - signal "Attention" given.
- Time: 16:29:41 hrs - 16:29:42 hrs - signal "Attention" given".
- Time: hrs - 16:29:48 hrs - signal "Attention" given.
- Time: hrs - 16:29:50 hrs - signal "Attention" given.
- From 16:29:50 hrs to 16:30:20 hrs, the pressure in the main line dropped from 5.07 bar to 0.86 bar, with a simultaneous drop in speed from 117.056 km/h to 0.000 km/h over the braking distance of 499.3 m.
- Time: hrs - 16:29:54 hrs - signal "Attention" given.
- Time: hrs - train stopped.

The front-view image for this vehicle was not recorded due to the malfunction of the image recording system.

3. Human factors

3.1. Human and individual characteristics

According to the testimony of a witness, a relative of the passengers in the road vehicle, the person driving the vehicle was a good driver and was rested and sober when starting the journey at around 15:45 hrs. According to a forensic toxicology expert, no psychoactive substances or ethanol were found in the blood samples taken from the driver of the road vehicle.
The Traffic Law of 20 June 1997, also known as the "Traffic Code", is the primary regulation applicable to users of public roads.
Specific rules concerning level crossings and applicable to road vehicle drivers are contained in Article 28 of the Road Traffic Act. They provide that:
"1. When approaching and driving through a level crossing, the driver of a vehicle is obliged to take special caution. Before entering the track, he is obliged to make sure whether or not a rail vehicle is approaching and take appropriate precautions, in particular where air transparency is reduced due to fog or other causes.
2. The driver of a vehicle is obliged to drive his/her vehicle with a speed that allows him/her to stop the vehicle in a safe place if a rail vehicle is approaching or if a protection device or signal indicated prohibits entry to the crossing."
Despite the crossing being marked with a B-20 "Stop" road sign, instructing road users to stop, and a G3 "St. Andrew's Cross" sign, the driver of the passenger car did not exercise particular caution when approaching the level crossing and, passing the B-20 and G-3 vertical signs and the P-12 horizontal line sign, entered the level crossing without stopping directly in front of the head of the incoming train, despite the "Attention" signal given several times by the train driver.
The Investigation Team concluded that the driver of train MPS 15102 had acted correctly. Upon noticing a car approaching from the left side of the crossing, he immediately implemented emergency braking while giving the Rp1 "Attention" signal. Tests carried out on the train driver did not show the presence of alcohol or psychoactive substances in his organism. The train driver's work time was in compliance with the applicable standards. The train driver held the required documents and had received training required for operating traction vehicles, and had completed other training courses related to his job.
The train manager did not see the accident itself, but he participated in the activities afterwards. He had the required documents and qualifications. A breathalyser test did not show any alcohol content in his breath.
The Investigation Team considered the entry of the passenger car onto the Cat. d level crossing, directly in front of the incoming passenger train MPS 15102, as the causal factor in the occurrence.
The failure of the road vehicle to stop at the B-20 "Stop" sign ahead of the level crossing and to exercise particular caution when approaching and traversing the level crossing were identified as contributing factors in the occurrence.

3.2. Job factors

Locomotive SU160-009 had been approved for operation on the railway network in Poland. The Investigation Team did not raise any objections regarding the job of the traction vehicle driver.
The road vehicle, a passenger car, had a roadworthiness certificate valid until 7 May 2025.

3.3. Organisational factors and assignments

As transpires from the evidence gathered in the case by the Investigating Team, the employer provided the train crew involved in the occurrence incident with the statutorily required rest time. In accordance with the Safety Management System in place, the railway carrier PKP Intercity S.A. ensured recurrent training for its employees as part of competence management at the positions directly involved in operation and safety of railway traffic. The employees involved held all ratings and authorisations required by the applicable law and instructions for actions performed on the job concerned. The said employees were equipped with necessary instructions and regulations to ensure safe performance of work.

3.4. Environmental factors

The occurrence took place in good weather, with no rain or fog. Dark time of the day - dusk, no clouds, temperature around +10ºC. There were no other road users in the area of the level crossing at the time of the occurrence that could attract the attention of the driver of the road vehicle. No works were being carried out in the area of the level crossing. The level crossing was illuminated by two lamps. The railway line and the road intersecting at the level crossing run through a tall mixed forest. There are two residential buildings next to the level crossing.

3.5. Any other factors relevant for the purpose of the investigation

None identified.

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

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

Infrastructure manager PKP PLK S.A. keeps the so-called *Hazard Record* as part of its Safety Management System (SMS). The record is updated by the infrastructure manager on an on-going basis and contains the following elements: hazard name, hazard number, hazard source, outcomes, risk control measures, hazard source manager, and risk acceptance rules.
As part of the investigation, the Commission's Investigation Team analysed the contents of the *Hazard Record*, which is one of the most critical elements of the Safety Management System in place at the infrastructure manager PKP Polskie Linie Kolejowe S.A. The Investigation Team does not raise any comments concerning the Hazard Record.

Procedure SMS-PW-01 Maintenance of a railway line in technical and organisational serviceability.
The purpose of the procedure is to define the rules and processes of maintenance of railway lines in technical and organisational serviceability to ensure safe operation of railway traffic by PKP Polskie Linie Kolejowe S.A. Among the documents related to that procedure are, in particular: the Construction Law, the Rail Transport Act, national regulations, Book and procedures of the Safety Management System of PKP Polskie Linie Kolejowe S.A., Organisational Regulations of PKP Polskie Linie Kolejowe S.A., internal regulations of the Company concerning railway traffic ("Ir"), internal regulations of the Company concerning railways ("Id"). Maintenance of level crossings (of all categories) is described as a supporting process in procedure SMSPW-01: "Maintenance of a railway line in technical and organisational serviceability" of the Safety Management System. According to §16 of SMS-PW-01, the sources for assessing the risk of a failure or accident shall be the parallel processes of level crossing diagnostics and surveillance, the results of level crossing inspections carried out in accordance with internal regulations, as well as information from outside. SMS-PW-01 includes a requirement to carry out diagnostic tests of the crossing at least once a year, including visibility condition checks, in accordance with the requirements of Instruction Id-1 and applicable 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 sidings with roads, and on their positioning (Journal of Laws, item 1744, as amended). The diagnostic process is organised by the competent Director of the Railway Line Plant in cooperation with heads of diagnostic teams. Diagnostic team members analyse, evaluate and interpret the results of diagnostic tests, and formulate conclusions. The process of technical surveillance of level crossings, including their inspections (conducted by employees of the Operations Section and field commissions with the participation of a representative of the road manager) is organised separately by the Deputy Director of the Railway Line Plant for technical matters. The Investigation Team does not raise any comments concerning the manner of implementation of the procedure.

5. Previous occurrences of a similar character

Previous occurrences at the level crossing at km 76.274 of railway line no. 219 Olsztyn Główny - Elk:

1) On 25 July 1992, train 45685 ran into a Nysa car - no casualties.
2) On 15 February 2013, a lorry ran into a train - no casualties.
3) On 12 August 2013, a lorry ran into a train - no casualties.

The occurrences took place before the revitalisation of line no. 219, which was carried out in 2018 - 2019.

The following occurrences of a similar nature took place on railway line no. 219 Olsztyn Główny - Elk:

1) On 3 January 2024 at 17:09 hrs, at the Cat. D level crossing at km 107.549, a Peugeot passenger car ran into the side of locomotive SU160-007 of fast train 15102 operated by PKP Intercity S.A. between Warszawa Wschodnia and Gdynia Główna. No casualties. The technical condition of the locomotive allowed it to continue to run on its own.
2) On 6 January 2024 at 08:46 hrs, at the Cat. D level crossing at km 58.145, a van (bus) ran into locomotive SU160-003 of fast train 18105/4 operated by PKP Intercity S.A. between Białystok and Szczecin Główny. No casualties.
3) On 3 February 2024 at 12:20 hrs, at the Cat. D level crossing at km 148.947 of the Drygały - Ełk route, a Mercedes Vito van ran into locomotive SU160-002 of train 15102/3 operated by PKP Intercity S.A. between Gdynia Główna and Warszawa Wschodnia. No casualties.
4) On 9 February 2024 at 07:28 hrs, at the Cat. D level crossing at km 60.093 of the Szczytno - Spychowo route, a passenger car collided with incoming train 90947 operated by POLREGIO S.A. between Olsztyn Główny and Ełk (rail bus SA133-015). No casualties.
5) On 28 March 2024 at 11:10 hrs, at the Cat. D level crossing at km 48.563 of the Szczytno - Spychowo route, a Citroen Berlingo van collided with train 51102/3 operated by PKP Intercity S.A. between Gdynia Główna and Warszawa Wschodnia. No casualties.
6) On 25 April 2024 at 01:01 hrs, at the Cat. D level crossing at km 148.947 of the Drygały - Ełk route, a Toyota Yaris passenger car ran into train 90952 Ełk - Olsztyn Główny. No casualties.
7) On 19 May 2024 at 10:37 hrs, at the Cat. D level crossing at km 5.308 of the Olsztyn - Marcinkowo route, a Subaru passenger car collided with train 51102/3 (PKP Intercity S.A.) operated between Gdynia Główna and Warsaw. No casualties.
8) On 10 June 2024 at 10:29 hrs, at the Cat. D level crossing at km 59.677 of the Szczytno - Pisz route, train 90941 (POLREGIO S.A.) operated between Olsztyn Główny and Elk ran into a passenger car. 2 people injured - users of the level crossing.

All the occurrences mentioned above took place at level crossings ahead of which B-20 "Stop" road signs were positioned. In all cases, the railway commission recommended requesting the Police to increase the number of road checks in the area of the crossing.

V. CONCLUSIONS

1. A summary of the analysis and conclusions with regard to the causes of the occurrence

The analysis shows that the infrastructure manager is carrying out its infrastructure maintenance responsibilities correctly. The Investigation Team raises no reservations concerning the execution of the railway carrier's tasks either.
The Investigation Team found that the driver of the road vehicle, when approaching the level crossing, ignored the B-20 "Stop" and G-3 signs, despite an incoming train and the Rp 1 "Attention" signal given by the train driver warning road users approaching the level crossing of an incoming train, and drove onto the level crossing directly in front of train MPS 15102.
The Investigation Team considered the causal factor to be:

- entry of the passenger car onto the Cat. D level crossing directly in front of the incoming passenger train MPS 15102.

The Investigation Team found the contributing factors to be:

- failure of the road vehicle to stop before the level crossing as directed by the B-20 "Stop" road sign,
- failure of the driver of the road vehicle to take special care when approaching and traversing the level crossing.

The Investigation Team considered that, in order to specifically draw the attention of drivers approaching level crossings in front of which the B-20 "Stop" road sign is permanently positioned, the A-7 "Give Way" warning sign should be positioned additionally, with the T-1 plate indicating the distance to the danger area.
This will enable the drivers to adjust their vehicle speed in advance, so that they could stop before the crossing. The introduction of such a speed limit would also aim to draw the attention of road vehicle drivers to the fact that they are approaching a level crossing, while at the same time increasing their vigilance and facilitating observation of the tracks before deciding whether to drive onto the crossing.

2. Measures taken since the occurrence

After the accident, the Pisz County Road Administration renovated the poorly visible P-12 horizontal lines on both sides of the level crossing and conducted a survey of visibility conditions from the road at the level crossing. For the direction of travel of the car involved in the accident, the visibility of the crossing from the road is 130 m, with the required visibility 120 m.

Furthermore, after the accident, the road manager introduced a speed limit by positioning B-33 signs on the road side in front of the crossing on both sides, limiting the speed to 60 km/h and then to 30 km/h right before the level crossing.

In view of the actions taken by the road manager, the Investigation Team refrained from making recommendations regarding the organisation of traffic in the area of the crossing.

3. Additional comments

During the recovery of the footage by PKP Intercity S.A. personnel, it was found the memory of the front-view monitoring system installed in locomotive SU160-009 contained no recordings of the accident.

VI. SAFETY RECOMMENDATIONS

The carrier PKP Intercity S.A. shall inspect the front-view image recording systems installed on the powered railway vehicles in service for correctness and continuity of image recording. Furthermore, it shall ensure that the camera's field of view is not obscured by any structural components of the vehicle and that its field of view covers the full front view of the vehicle. If the image is found to be obscured or distorted, the carrier shall either adjust the camera position or make changes to the mounting method.

PRESIDENT
OF STATE COMMISSION ON RAILWAY ACCIDENT INVESTIGATION

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Tadeusz Ryś

List of acronyms used in Report **No. PKBWK 06/2025**

No	Symbol (acronym)	Explanation
1	*2*	*3*
1.	UTK	Office of Rail Transport (Polish: Urząd Transportu Kolejowego)
2.	PKBWK	State Commission on Railway Accident Investigation (Polish: Państwowa Komisja Badania Wypadków Kolejowych)
3.	IZ	PKP PLK S.A. – Railway Line Plant
4.	ECM	Entity in charge of maintenance