STATE COMMISSION ON RAILWAY ACCIDENT INVESTIGATION
Ministry of the Interior and Administration

REPORT No. PKBWK 3/2025

on the investigation of a serious railway accident
that occurred on 3 December 2023 at 10:06 hrs at Jaszczów station
at turnout no. 1 on track 1, at km 201.000 of railway line no. 7
Warszawa Wschodnia Osobowa - Dorohusk,
the area of infrastructure manager PKP PLK S.A. Railway Line Plant in Lublin

WARSAW, 15 April 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. SUMMARY

Type of occurrence: Serious accident.

Description: Two workers of the railway infrastructure manager PKP PLK S.A., Railway Line Plant in Lublin, Operation Section in Lublin, were hit by train ROM 22401 operated by the railway carrier POLREGIO S.A. on the Lublin Główny - Zamość Szopinek route while the train was leaving plain line track no. 1 Minkowice - Jaszów onto track one of Jaszczów station. The said workers were clearing turnout no. 1 in track one of snow using a diesel blower.

Date of the occurrence: 3 December 2023, 10:06 hrs.

Location of the occurrence: Railway line no. 7 Warszawa Wschodnia Osobowa - Dorohusk, turnout no. 1 in track one at Jaszczów station at km 201.000; geographical location 51°12'23.4"N 22°54'02.9"E.

Consequences of the occurrence: One fatality on the spot and one serious injury taken to hospital where he died as a result of the injuries sustained.

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)

Snow clearing carried out at turnout no. 1 by two unsupervised workers, one of whom was using a backpack diesel blower and the other was using a broom, when train ROM 22401 was entering the station, which had resulted in the workers being run over by the railway vehicle.

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) Inappropriate organisation of work involving a lack of communication and coordination of activities, scope and method of work between the workers clearing turnouts of snow.
2) The automation foreman operating the blower, instead of carrying out supervision, to which he was obligated under the "Plan for the conduct of winter works in the 2023/2024 season on the premises of the Railway Line Plant in Lublin" (hereinafter referred to as the Plan).
3) Failure to appoint a signal man to cover the workers clearing turnouts of snow.
4) Failure by the signaller to alert the workers at the turnouts to incoming train ROM 22401.
5) Failure of the Jaszczów station signaller to alert the driver of train ROM 22401 to workers clearing snow of turnouts.

Systemic factors:
(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, including, in particular the regulatory framework conditions, the design and application of the safety management system, skills of

1) Authorisation of the use of a diesel blower under the approved "Plan" for clearing tracks and turnouts of snow without carrying out a risk assessment and without developing detailed rules of safe use of the blower,
2) Failure to develop an effective system of mutual communication during clearing turnouts of snow with a backpack diesel blower that generates a high-intensity noise.

the staff, procedures and maintenance)

Recommendations and their addressees:

1) PKP PLK S.A. shall carry out a risk assessment regarding the use of backpack blowers for snow clearing work.
2) PKP PLK S.A. shall promptly develop and communicate to its subordinate organisational units that use backpack blowers for works on or at railway tracks, a set of requirements concerning safety conditions at work with this type of equipment, and shall enhance supervision of compliance with those requirements.
3) PKP PLK S.A. Railway Line Plant in Lublin shall reposition the end-of-train determination (Skp) camera so that it covers the signal site and, at the same time, turnouts no. 1 and no. 2 at Jaszczów station.
4) Operators of powered railway vehicles shall carry out internal checks on the correctness of recording of train driving parameters by the electronic data recorders installed in railway vehicles in operation.
5) POLREGIO S.A. shall review the front-view cameras installed in railway vehicles in operation for image clarity and time synchronisation.

II. THE INVESTIGATION AND ITS CONTEXT

1. Decision to establish an investigation

The Chairman of the State Commission on Railway Accident Investigation (hereinafter referred to as "PKBWK" or "the Commission") Mr Tadeusz Ryś issued Decision no. PKBWK.590.2.2024 of 2 February 2024 on establishing an investigation to clarify the circumstances of the railway occurrence that took place on 3 December 2023 at 10:06 hrs at Jaszczów station, track 1, km 201.000 of railway line no. 7 Warszawa Wschodnia Osobowa - Dorohusk. Pursuant to the provisions of Article 28e(4) of the Act of 28 March 2003 on rail transport (consolidated text: Journal of of 2023, item 1786, as amended), hereinafter referred to as the "Rail Transport Act", the occurrence was reported to the European Union Railway Agency and registered in its database under number PL-10517.

2. Motivation for the decision to establish an investigation

Based on an analysis of the circumstances, considering the nature of the occurrence, which constitutes a serious accident, and that the occurrence clearly affects railway safety regulations and safety management, the Chairman of PKBWK decided to establish an investigation to be conducted by the Commission's Investigation Team pursuant to Article 28e(2) of the Railway Transport Act.

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 of the causal, contributing and systemic factors 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

Under Article 28h(2)(5) of the Rail Transport Act, the Chairman of PKBWK obligated specific persons from the railway commission to cooperate with the Investigation Team (Letter no. PKBWK.590.2.2024 of 2 January 2024).
On 7 February 2024, the chairman of the railway commission formally submitted the documentation gathered by the railway commission in relation to the occurrence concerned to the head of the Commission's Investigation Team.

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

During the course of the investigation, cooperation with representatives of entities linked to the circumstances of the occurrence did not raise any concerns with 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

In the course of the investigation, the Investigation Team took into account the provisions of national regulations, the internal rules of the infrastructure manager and the railway carrier as well as the technical documentation of Jaszczów station. Furthermore, the Investigation Team relied on their own knowledge and experience, documentation produced during the investigation concerned, as well as on the documentation gathered the railway commission.
Within the investigation, the Investigation Team carried out inter alia the following activities:

- visual inspection of the occurrence site during an on-site visit,
- simulation of the occurrence with the same type of railway vehicle and in similar circumstances at Jaszczów station,
- measurements of the operating noise of the equipment (a backpack diesel blower) at the occurrence site in similar meteorological conditions,
- production of photographic and film documentation,
- analysis of the documentation and voice recordings provided by the infrastructure manager,
- analysis of the data from the event recorder of the railway vehicle (SA134-019),
- image analysis of the front-view footage recorded on the railway vehicle (SA134-019),
- image analysis of the front-view footage recorded on railway vehicle SU4210-003 of the train running on track two of Jaszczów station in the opposite direction prior to the occurrence.

Below is a list of selected legal acts, rules and internal instructions used during 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 L 119, 04.05.2016, 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 L 132, 27.04.2020).
3) Directive (EU) 2016/798 of the European Parliament and of the Council of 11 May 2016 on railway safety (OJ L 138, 26.5.2016, p. 102, as amended).

National rules:

1) Act of 28 March 2003 on rail transport (consolidated text: Journal of Laws of 2023, item 1786, as amended).
2) Regulation of the Minister of Infrastructure of 18 July 2005 on general conditions for rail traffic operation and signalling (consolidated text: Journal of Laws of 2015, item 360, as amended).
3) 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 (Journal of Laws of 2021, item 101).
4) Act of 10 May 2018 on the protection of personal data (consolidated text: Journal of Laws of 2019, item 1781).

5) Regulation of the Minister of Transport and Maritime Economy of 10 September 1998 on the technical conditions to be met by railway structures and on their positioning (Journal of Laws No. 151, item 987).

Internal instructions of the infrastructure manager PKP PLK S.A. (selected)

1) Ir-1 Instruction on operating railway traffic.
2) Ir-2 (R-7) Instruction for control post personnel.
3) Ir-5 (Ir-12) Instruction on the use of train radio equipment.
4) Ir-8 Instruction on the handling of serious accidents, accidents and incidents in railway transport.
5) Ir-17 Instructions on ensuring railway operability in winter.
6) Ie-1 Instruction on signalling operations.
7) Ie-14 Instruction on the organisation and use of radiotelephone networks.
8) Id-1 Technical conditions on the maintenance of the surface of railway lines.
9) Id-4 Instruction on inspecting, technical testing and maintaining turnouts.
10) Plan for the conduct of winter works in the 2023/2024 season on the premises of the Railway Line Plant in Lublin.

Internal instructions of the railway carrier POLREGIO S.A. (selected)

1) Pt-2 Instructions for traction vehicle crews.

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

The Investigation Team did not encounter any other difficulties or problems that could affect the course or conclusions of the investigation.

9. Any interaction with the judicial authorities

Not applicable.

10. Other information relevant in the context of the investigation

None identified.

III. Description of the occurrence:

1. The occurrence and background information

1.1. Description of the type of occurrence

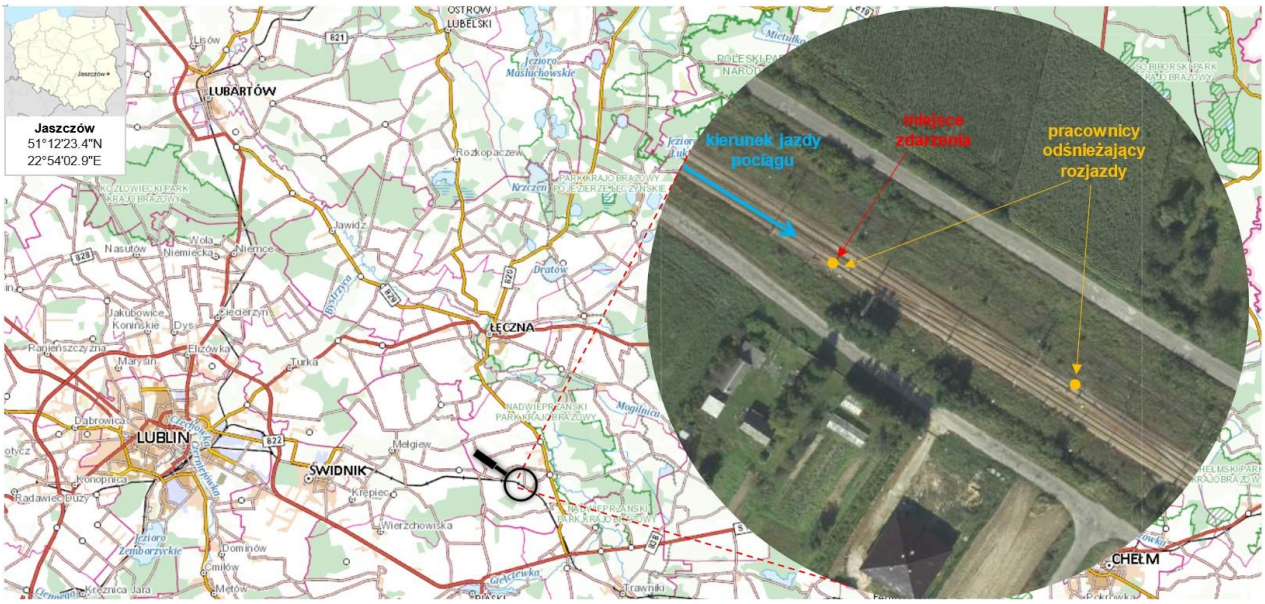
A serious accident involving two workers clearing a turnout of snow being fatally hit by a train.
Two workers of PKP PLK S.A., Railway Line Plant in Lublin, Operation Section in Lublin, were hit by train ROM 22401 operated by the railway carrier POLREGIO S.A. on the Lublin Główny - Zamość Szopinek route while the train was leaving plain line track no. 1 Minkowice - Jaszów onto track one of Jaszczów station. The said workers were clearing snow of turnout no. 1 in track one using a diesel blower, among other things.

1.2 The date, exact time and location of the occurrence

The occurrence took place on 3 December 2023 at 10:06 hrs at Jaszczów station, junction no. 1 on track one, km 201.000 of railway line no. 7 Warszawa Wschodnia Osobowa - Dorohusk, the area of the infrastructure manager PKP PLK S.A., Railway Line Plant in Lublin, Operation Section in Lublin.

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 occurrence took place at Jaszczów station. The station is a single control area. Train traffic operations and rolling stock shunting are carried out from the command box "Jw". The station is staffed by a signaller in charge, a switchman and a passenger information operator. The station has Type E relay signalling equipment with light signals. The main and auxiliary station tracks are electrified. Turnouts no. 1 and 2, where snow clearance work was being carried out, are not visible from the command box "Jw" located 1,294 m away. These turnouts are not under CCTV monitoring.



Photograph 1– A general view of the occurrence site (source: Geoportal)

Before the station entry, track 1 is situated on a slope gradient of 8.6 ‰ and in a right-hand curve with a radius of R=903 m.
Meteorological conditions: overcast sky, sparse snowfall, good visibility and audibility, air temperature minus 3˚C, moderate gusts of wind, 22 cm snow cover.
No other works were being carried out at the occurrence site or in its vicinity apart from the snow clearance works.

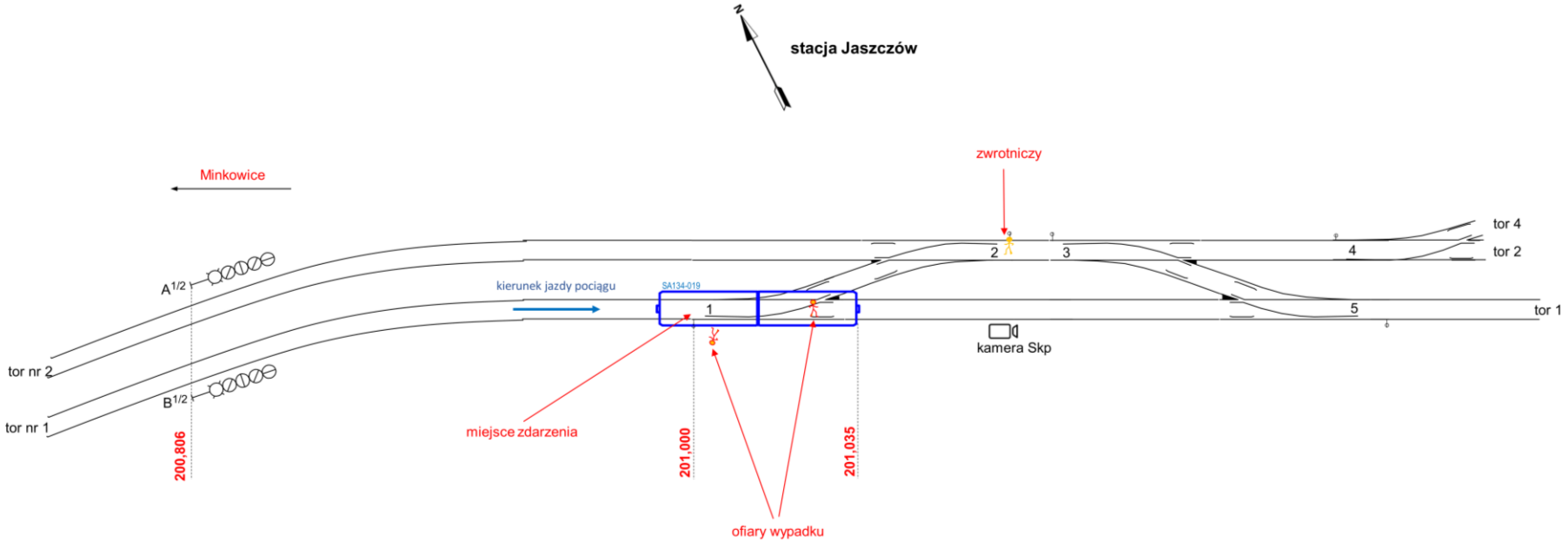


Figure 2 - A sketch plan of the occurrence scene

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 accident, one craftsman specialist died on the spot. The other worker, an automation foreman, was taken to hospital, where he died of injuries. The said workers were employed by PKP PLK S.A., Railway Line Plant, Operating Section in Lublin

b) cargo, luggage and other property

Not applicable.

c) rolling stock, infrastructure and the environment

Not applicable.

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, plain line tracks no. 1 and 2 of the Minkowice-Jaszczów route were closed from 10:20 hrs to 14:42 hrs on 3 December 2023.
Eight passenger trains were delayed for 742 minutes and there were secondary delays of 18 trains for 625 minutes, as well as 6 freight trains for 1,130 minutes and secondary delays of 3 trains for 371 minutes.

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

Workers of PKP PLK S.A., Railway Line Plant in Lublin, Operations Section in Lublin
- an automation foreman - a victim of a serious accident,
- a craftsman specialist - a victim of a serious accident,
- a switchman,
- a signaller in charge,

Workers of POLREGIO S.A., Lublin Plant in Lublin
- the driver of train ROM 22401,
- the manager of train ROM 22401.

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

Train ROM 22401 running on the Lublin Główny - Zamość Szopinek route, operated by diesel multiple unit SA134-019.
A Type 218Md, Series SA134, double unit with the railway vehicle identifier EVN no. PL-PREG A 95 51 2 720 100-7 and PL-PREG B 95 51 2 720 101-5; year of manufacture 2010, serial number: 019, manufactured by the consortium ZNTK "Mińsk Mazowiecki" S.A. - Pojazdy Szynowe PESA Bydgoszcz S.A. Holding, with Technical Railworthiness Certificate No. POT3/7-24/2022, issued on 30 June 2022 and valid until 26 November 2029 or for a mileage of 1,088,725 km counted from 111,387 km. The actual mileage prior to the occurrence was 265,504 km.
Train data:
- train length…… 41.7 m
- total weight of the train…….. 98 t
- required braked mass percentage…… 107%
- actual braked mass percentage…… 150%
- required braked mass…… 107 t
- actual braked mass…… 147 t

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

Track 1

Rail type……..	–	60E1, contactless track
Sleepers…….	–	Type k94 pre-tensioned prestressed
Attachment type……	–	flexible
Ballast type……	–	crushed stone
Turnout no. 1	–	common left Rz60E1 - 1:9 - 300
Highest permitted speed at the station.....	–	120 km/h

Track condition good.

The turnout switch is fitted with an EEA-5 type switch drive. The switch has switch blade control and track occupancy detection, and is electrically heated. A camera is installed at the station at km 201.040 at track 1, and the command box "Jw" has a CCTV monitor for determining the end of trains entering the station from the direction of Minkowice station. The camera does not monitor turnouts no. 1 and 2, where the workers were preforming snow clearance.

Photograph 1 - The signaller's view of turnouts no. 3, 4 and 5.

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

The plan for the conduct of winter works in the 2023/2024 season on the premises of the Railway Line Plant in Lublin, approved by the Director of Railway Line Plant in Lublin on 11 October 2023, provides in point

6.2 "*Machines, vehicles and mechanised equipment used for snow clearing works*" of Annex 4 that a backpack diesel blower may be used for snow clearing but there are no rules for its safe use on the tracks. Approving a backpack diesel blower for use without carrying out a risk assessment and without developing alerting rules for workers who operate this type of high-intensity noise equipment are, in the opinion of the Investigation Team, systemic factors. Despite the above reservations and the manufacturer's restrictions, the Management Board of PKP PLK S.A. adopted Resolution No. 516 of 31 August 2021 on authorising the use of backpack diesel blowers as equipment for clearing turnouts of snow.

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 2 December 2023, Phase II of winter readiness was introduced in the area of Railway Line Plant in Lublin. The prepared and approved "Plan for employing winter readiness personnel in the 2023/2024 season" provided for Phase II that 5 workers, including 2 supervision staff, were to be employed at Jaszczów station. On 3 December 2023, beginning at 07:00 hrs, the command box "Jw" at Jaszczów station was manned by a signaller in charge, a switchman and a dynamic passenger information system operator (making public address announcements), the latter of whom had been late for work due to difficult weather conditions. Due to the above, the signaller at the command box "Jw" at the Jaszczów station was also performing (in accordance with the regulations) the responsibilities the passenger information operator. On the same day at 07:00 hrs, two workers from the Lublin Operations Section assigned to winter works - i.e. an automation foreman, as the supervisor, and a craftsman specialist - reported to the command box "Jw". This fact was confirmed by an entry in the Turnout Inspection Log (D-831). Subsequently, at 07:30 hrs, the switchman made an entry in D-831 regarding turnouts no. 1 to no. 44 stating: "*Reporting deployment to the turnouts for ext. turnout inspection. Radio notification and alerting agreed with ISEDR ...".* However, he did not go to the field, but remained in the command box. The switchman made another entry in D-831 at 08:30 hrs: "*Reporting deployment to turnouts 1/15 for snow clearing. Requesting alerts by radio. Agreed with ISEDR ...".* The entry was supplemented with the names of the automation foreman, craftsman specialist and switchman, and received an approval from the signaller. The switchman took a portable radio telephone from the command box in order to be in contact with the signaller and, at around 09:00 hrs, left the command box "Jw" together with the automation foreman and the craftsman specialist, taking equipment for clearing turnouts of snow, i.e. a scraper, a brush and a shovel, for himself. They all went together in the switchman's private car to the west side to the road shelter, where the craftsman specialist and the switchman picked up a backpack diesel blower. All three then drove to the area of the closed down Skp building about 400 m away from the shelter, where they parked the car on the roadside and from where they picked up an additional snow brush. The automation foreman and the craftsman specialist stayed next to the Skp building trying to start the blower, as confirmed by the image captured by the camera of passenger train no. 28104 which was passing on track two at 09:30 hrs.

Photograph 2 - An image recorded by the camera on passing train no. 28104 (source: PKP INTERCITY S.A.)

After starting the blower, all three workers made for turnout no. 4 on the intertrack space of tracks 2 and 12. The blower was operated by the specialist craftsman who was blowing snow from the switch section of the turnout, while the switchman was brushing off the channel and setting-up closure. The automation foreman was standing on the side and watching the works at the turnout. Not satisfied with the results, he personally took over the operation of the blower and proceeded to clearing turnouts no. 3 and 2 on track two of snow. Then the automation master with the blower and the specialist craftsman made for turnout no. 1 on track one, and the switchman remained at turnout no. 2 on track two, continuing the cleaning.

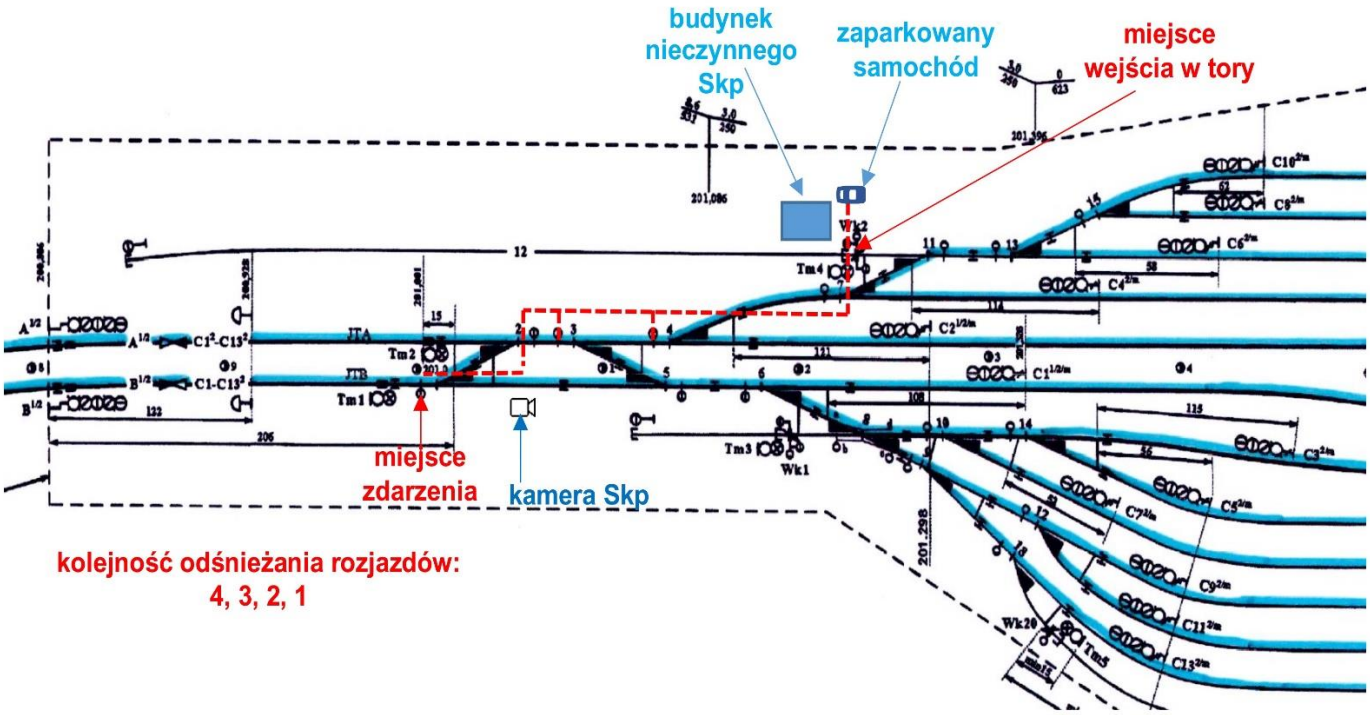


Figure 3 - The point of entry onto the tracks and marked locations of snow clearance work

At 09:56 hrs, passenger train ROM 22401 departed from Minkowice station for Jaszczów station on track no. 1. The signaller at the command box "Jw" gave the permissive aspect for that train on the home signal $B^{1/2}$ because, as he noted in his statement "... *[I] checked the situation in the field, i.e. I looked at the Skp camera image to check where the workers clearing the snow from the turnouts were. In the bottom corner of the Skp screen I saw that the workers were at on the trackside at that time, the on the intertrack space of tracks no. 2 and no. 12 near turnout no. 3. The workers were standing at a safe distance from the entrance track of the passenger train that was about to enter track no. 1, so there was no obstacle to giving the aspect permitting the entry ...".* He then made a public address announcement informing travellers of the arrival of that train and the upcoming timetable changes, and continued his duties which included maintaining technical and traffic documentation in paper and electronic form, as well as carrying out activities associated with the entry of a siding train.

Passenger train ROM 22401, running on track no. 1 with a speed of approximately 93 km/h, was approaching the home signal $B^{1/2}$ at Jaszczów station, positioned on the right side of track no. 1, which was transmitting the signal S5*(Next signal (indicates) the aspect Stop*). The train driver, driving on a downslope curve, noticed people working in bright orange clothing, with a cloud of snow floating around them. To warn the working group, who were 345m ahead of him, he gave the Rp1 "Attention" sound signal lasting from 10:05:42 hrs to 10:05:54 hrs.

Seeing no reaction from the workers at turnout no. 1, the train driver continued the Rp1 "Attention" signal and implemented emergency braking at 10:05:46 hrs at the speed of 86.75 km/h.

Photograph 3 - A view of the working group captured by the front camera of SA134-019 (source: POLREGIO S.A.)

The driver maintained emergency braking and was approaching the workers while continuing the "Attention" signal without interruption (from 10:05:54 hrs to 10: 06:02 hrs), but there was no reaction from the workers, who were busy clearing snow from turnout no. 1 on track one on which the train was running. The automation foreman was facing the approaching train with his hood pulled over his head, slightly bent over and standing on the outside of track one, next to the right track rail, blowing snow with a blower at the switch drive. Right next to him, the craftsman specialist, standing in the axis of the turnout facing the approaching train, was sweeping the residual snow and ice from the switch channel with a brush. The third employee, the switchman, was clearing snow from turnout no. 2 on the adjacent track two, at a distance of approximately 70 m behind the workers who were clearing the snow from turnout no. 1, looking in the direction of the train's travel. When the switchman noticed the approaching train, he started waving his arms and shouting to the workers at turnout no. 1, but they did not notice it as they were focused on clearing snow from the turnout. Also, the noise generated by the blower, made them unable to hear the switchman's calls and the sound of the approaching train.

Despite the continuous Rp1 "Attention" signal and emergency braking, the train head hit the tow workers at 10:06:02 hrs at the speed of 30.25 km/h.

As a result of the impact, the worker with the blower was thrown some 5 m in the direction of the train's travel onto the right side of the right track rail, where he remained lying on his back with his head against the electric turnout heating (EOR) transformer box and his left leg at the right track rail. The other worker, who was between the track rails, was hit, knocked over and dragged under the train.

After hitting the workers, the head of the train travelled another 28m and stopped at 10:06:10 hrs.

Photograph 4-A view from the front camera of SA134-019 on the working group just before the accident (source: POLREGIO S.A.)

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.

The occurrence was immediately reported by radio to the Jaszczów station signaller by the driver of train ROM 22401 and the switchman working at junction no. 2. At the same time, the manager of the rail bus and the signaller called the emergency number 112.

Photograph 5 - A view from the front camera of SA134-019 on the third worker, shortly after the occurrence and train stop (source: POLREGIO S.A.)

The third employee clearing snow from the turnouts, i.e. the switchman, went in the direction of the train to the injured.
At that time, also the train manager got off the train. At the scene, they found the injured craftsman specialist lying under the first bogie of the rail vehicle, face down and giving no signs of life. They then both went to

the second casualty, who was lying next to the track and the stopped train. The injured automation foreman was conscious, at which point the switchman took the working blower off his back. They then proceeded with the train manager and one of the passengers to administering first aid to the foreman. A Fire Service unit was the first to arrive at the occurrence site at 10:25 hrs, and they took over the rescue operation, i.e. continued to administer aid to the injured and proceeded to extract the casualty from under the train. A short while later, the Police arrived at 10:30 hrs, followed by the Ambulance Service at 10:40 hrs. The signaller closed line tracks no. 1 and 2 to Minkowice at 10:20 hrs, and the tracks remained closed until 14:42 hrs on 3 December 2023.

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 Lublin

The tasks of the infrastructure manager, hereinafter referred to as "the manager", include operation of rail infrastructure involving inter alia:

- operation of railway traffic;
- provision of railway infrastructure, provision of related services and levying of the related charges,
- maintenance of railway infrastructure by carrying out works to preserve the condition and capacity of the existing railway infrastructure for the safe operation of railway traffic. Ensuring smooth operation of railway in difficult weather conditions requires solid planning and execution of preparatory works, as well as organisational and technical measures to deal with the effects of snowfalls and temperature drops in accordance with the *Instruction on ensuring railway operability in winter* (Ir-17).

In accordance with the provisions of the aforementioned instruction, the infrastructure manager prepared the *Plan for the conduct of winter works in the 2023/2024 season on the premises of the Railway Line Plant in Lublin*, which was approved on 11 October 2023.

Railway carrier POLREGIO S.A. Lublin Plant in Lublin

The railway vehicle designated to carry out the transport task by the railway carrier had a railway vehicle type operation approval certificate and a technical railworthiness certificate. The designated train crew that operated the train held all ratings and qualifications required by law. The train was driven on the basis of a timetable. The technical condition of the railway vehicle involved provided for its safe operation and did not affect the occurrence. The responsibilities of the railway carrier concerning safe driving of a rail vehicle are specified in the internal rules of the infrastructure manager and railway carrier. Based on the analysis of the evidence collected, the Investigation Team did not find any irregularities in the conduct of the driver of train ROM 22401.

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

Railway carrier POLREGIO S.A., which provides the rolling stock, is responsible for its serviceability, technical condition and compliance with the vehicle maintenance process.

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

Not applicable.

1.4. National safety authorities or the European Union Agency for Railways

No factors influencing the occurrence were identified on the side of the national safety authority.

1.5. Notified bodies, designated bodies or risk assessment bodies

Not applicable.

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

Based on the evidence material gathered in the case, the Investigation Team did not identify any factors on the side of the certification body of the railway carrier that would have impact on the occurrence.

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

Not applicable.

2. Rolling stock and technical installations

Powered railway vehicle

A description of selected parameters of rail bus SA134-019 recorded from the moment of entering Jaszczów station until the moment of stopping after the incident.
Rail bus SA134-019 owned by POLREGIO S.A. Lublin Plan in Lublin is equipped by the manufacturer with an electronic system for recording running parameters:
manufacturer of the recorder: ATM PP Sp. z o.o.,
type of the recorder: ATM-RP4.
The Investigation Team holds certificates to analyse the records of the ATM-RP4 recorder manufactured by ATM PP Sp. z o. o. Selected driving parameters recorded on the device immediately before the occurrence were analysed with the support of the FDS10 software version 10.1.10.

The diagram below shows the following driving parameters of train ROM 22401 operated by vehicle SA134-019:
analogue signals:

- time,
- speed,
- distance,
- pressure in the main line,
- pressure in the brake cylinders,

digital signals:

- activation of the vigilance device - cabin B,
- reset of the automatic train stop in cabin A or B,
- activation of the automatic train stop - cabin B,
- activation of the siren (cabin A or B),
- functioning of the left-hand white headlight,
- functioning of the right-hand white headlight,
- pressure in main line 1,
- pressure in main line 2,
- position of the BR adjuster,
- position of the BE adjuster.

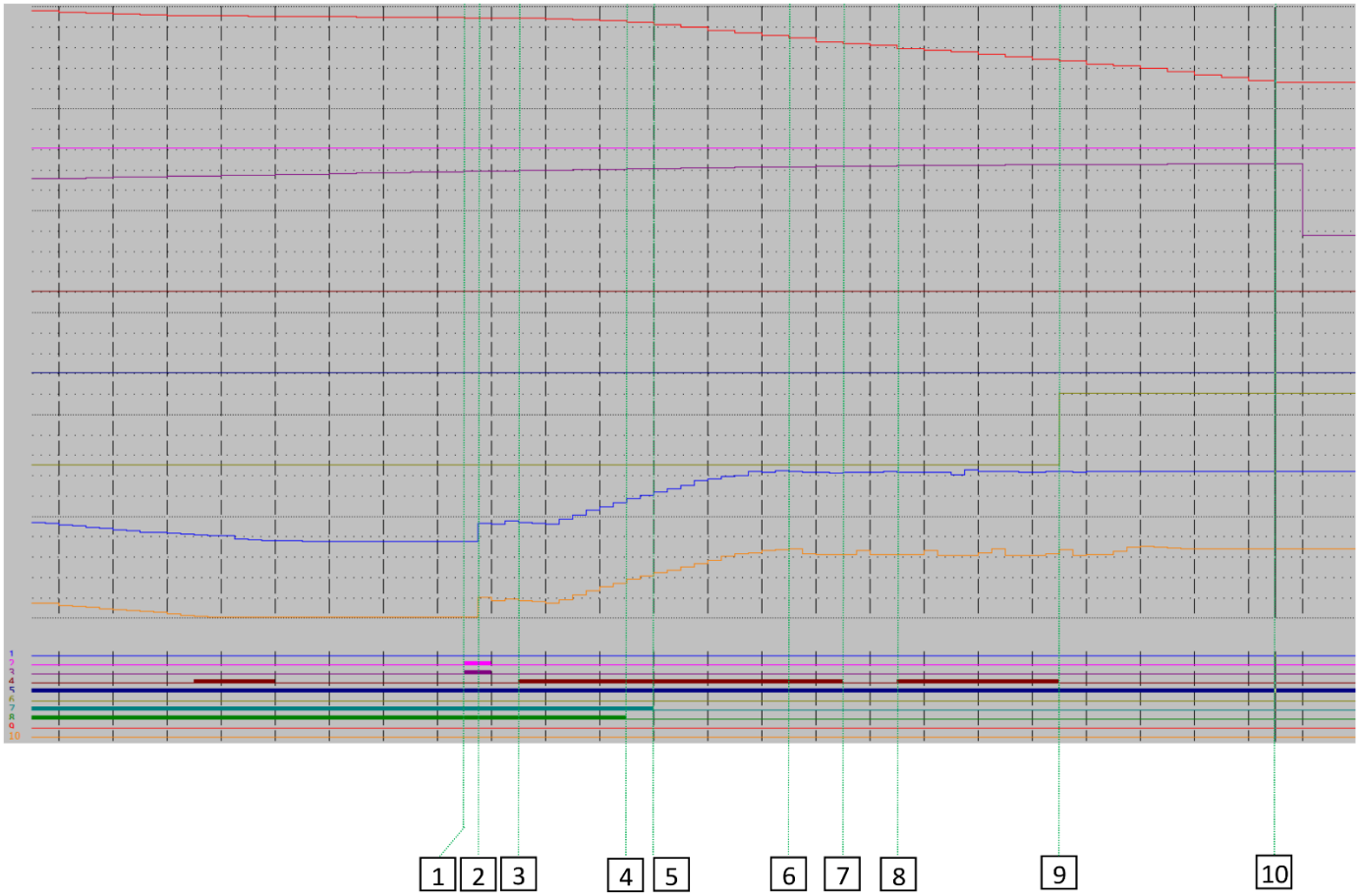
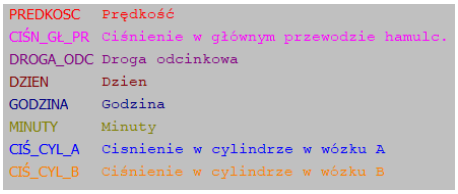


Figure 4 - Diagram of the SA134-019 driving parameters



analogue parameters

discrete parameters (0 or 1)

Train ROM 22401 was driven from control cab "B" of rail vehicle SA134-019.

1 - 10:05:38 hrs, V=94.25km/h, pressure in the brake cylinders in bogies A and B = 0.02MPa,
2 - 10:05:40 hrs, V=93.75km/h, pressure in the brake cylinders in bogie A = 0.11MPa, in bogie = B 0.12MPa, passing over ATS of the home signal $B^{1/2}$, implementation of the braking procedure, i.e. 397m from the accident site,
3 - 10:05:42 hrs, V=93.00km/h, pressure in the brake cylinders in bogie A = 0.11MPa, in bogie B = 0.10MPa, siren activated after covering 52m from the ATS, 345m to occurrence site,
4 - 10:05:45, V=89.00 km/h, pressure in the brake cylinders in bogie A = 0.2MPa, in bogie B = 0.18MPa, pressure drop in main line 2 recorded (a discrete parameter),
5 - 10:05:46 hrs, V=86.75 km/h, pressure in the brake cylinders in bogie A = 0.24MPa, in bogie B = 0.22MPa, pressure drop recorded in main line 1, air release from the main line indicating the application of emergency braking, i.e. 246 m from the accident site,

6 - 10:05:51 hrs, V=67.75 km/h, pressure in the brake cylinders in bogie A = 0.35MPa, in bogie B = 0.34MPa, maximum pressure in brake cylinders A and B reached; 141 m to the occurrence site,
7 - 10:05:54 hrs, V=56.25 km/h, the siren sound ceased,
8 - 10:05:56 hrs, V=49.25 km/h, the siren sounded again; 64 m to the occurrence site,
9 - 10:06:02 hrs, V=30.25 km/h, the siren sound ceased; the accident site,
10 - 10:06:10 hrs, V=0 km/h, the train stopped; 28 m from the occurrence site.

The emergency braking distance was 274 m, including 246 m to the place where the workers were hit plus 28 m after the impact.
The analogue parameter "Pressure in the main line" and the digital parameters: "functioning of the right-hand white headlight" and "position of the adjuster" not recorded throughout the range of the recorded data.

3. Human factors

3.1. Human and individual characteristics

Employer POLREGIO S.A., Lublin Plant in Lublin, provided the train driver operating the rail bus with the required rest time before starting work. The occurrence took place in his second hour of work. The worker had the required qualifications and valid medical certificates, as well as several years of experience as a train driver.
The workers clearing snow from the turnouts - i.e. the automation foreman and the craftsman specialist - had many years of work experience and the required qualifications and authorisations, and had occupational medicine certificates allowing them to carry out works on the tracks without contraindications. They were assigned to the snow clearing work under the *Plan for the conduct of winter works in the 2023/2024 season on the premises of the Railway Line Plant in Lublin* and according to the work schedule.
The workers at the technical post "Jw" - i.e. the signaller and the switchman - also had many years of work experience and were qualified for their positions.

3.2. Job factors

The workers carrying out works on active tracks that involved de-snowing and de-icing of turnout sections were performing those activities in difficult weather conditions. They wore protective winter clothing, and the automation foreman had a hood pulled over his head. When clearing snow, they used a backpack diesel blower which raised clouds of snow, restricting their visibility, and which was a source of noise in excess of 100 dB, making it impossible for them to hear the sound of an approaching train and the driver's continuous Rp1 "Attention" signal. Although the said equipment had been assigned to the work position, no training or workplace instruction had been provided as regard the operation of the diesel blower.
The workers had not established any rules for communicating and alerting between them. The radio was held by the switchman, who was located at turnout no. 2 some 70 m away from the two workers using a snow blower to clear snow from turnout no. 1.

3.3. Organisational factors and assignments

The instruction on ensuring railway operability in winter (Ir-17) sets out safe rules for carrying out maintenance works on active tracks in winter, including as regards securing the work site, alerting rules and the equipment that may be used for snow clearing. The instruction requires the infrastructure manager to develop guidelines for the preparation and maintenance of railway during the winter period. In accordance with the said instruction, the *Plan for the conduct of winter works in the 2023/2024 season on the premises of the Railway Line Plant in Lublin* was developed and approved, and authorised the use of backpack diesel blowers on the premises of the Plant, in conflict of the instruction and without any risk assessment regarding the use of this type of equipment. Furthermore, no rules were established for the safe use of this type of equipment in winter conditions. In the operating manual, the manufacturer of the device recommends that it should be used in accordance with its intended purpose. The manual warns also that "*the use of the equipment*

for purposes other than intended can lead to serious injuries or death to persons or damage to property" due to the blast force.

Chapter 4 The number of persons for winter works of the *Plan for the conduct of winter works in the 2023/2024 season on the premises of the Railway Line Plant in Lublin* provided that 5 workers, including 2 supervision personnel, should be employed on a work shift in Phase II at Jaszczów station. On the day of the occurrence, there were three workers employed at the station employed as part of the winter operation. Of those persons, supervision was exercised by the automation foreman named in Chapter 3 of the aforementioned *Plan*, who was responsible for assigning the tasks and organising the work and was not allowed to perform any other activities, let alone take over the operation of the blower.

Points 17 and 18 of Section 16 of the Technical Regulations of Jaszczów station "Assignment of activities to workers" for the position of the signaller provides a detailed description of how the signaller should work when the switchman is in the station tracks. Furthermore, Section 51 "Health and safety at work" of the Regulations provides for how the signaller should alert groups of workers who are carrying out their activities on the station tracks. The provisions of the aforementioned Sections require that the workers should be alerted by, inter alia, radio telephone to each train or shunting movement, and that such a message should be acknowledged, which the signaller failed to do. Before giving the signal aspect permitting train ROM 22401 to enter the station, the signaller used only the view from the end-of-train determination camera on the screen and considered that the workers were at a safe distance. Furthermore, the signaller did not inform the train driver of the work party clearing snow from the tracks and turnouts.

Photograph 6 - The diesel blower on the equipped list for the Jaszczów station shelter which was in use on the day of the occurrence (source: PKBWK).

3.4. Environmental factors

The occurrence took place in the winter period after a snowfall. The group of workers were at work at turnout no. 1, the first home turnout at Jaszczów station from the direction of the oncoming train. The equipment used for clearing snow from the turnouts included, among other things, a diesel blower which is characterised by a high noise level and high blowing force, throwing up clouds of snow. The situation impaired the ability to properly observe and hear the approaching train. Also the train driver, because of the snow clouds raised by the blower, had difficulties seeing the group of workers when he was approaching them. In addition, the field of vision was restricted by driving on a right-hand curve with a radius of R=903. Furthermore, the train's braking distance may also have been affected by the prevailing weather conditions (snow and icing).

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

If a change is considered significant within the meaning of Procedure SMS/MMS-PR-03 and the aforementioned Regulation, a Technical and Operational Risk Assessment is carried out in accordance with Procedure *Technical and Operational Risk Assessment SMS/MMS-PR-02.* The purpose of that procedure is to set out the rules for carrying out risk assessments, including the analysis and valuation of risks within the Safety Management System (SMS) or the Maintenance Management System (MMS), and the related compliance requirements.

During the planning and implementation phase, before the change is accepted or the safety assessment report is submitted, the infrastructure manager shall either establish a hazard record(s) or, where such record(s) already exist, shall update them. The hazard record tracks the progress in monitoring the risks associated with the identified hazards. Once the system is accepted and operational, the hazard record shall be further maintained by the infrastructure manager or railway undertaking responsible for operating the system as an integral part of its safety management system.
The hazard record covers all hazards and all related safety measures and assumptions regarding the system that were identified during the risk assessment process. The record clearly identifies the source of the hazards and selected risk acceptance rules, as well as the entity or entities responsible for overseeing each hazard.

The infrastructure manager's internal regulation setting out the rules for organising and carrying out winter maintenance of the railway infrastructure is the *Instruction on ensuring railway operability in winter (Ir-17).* According to the provisions of the Instruction, manual cleaning of tracks and turnouts shall be carried out with, inter alia:
1) shovels for removing snow and crushed ice;
2) bars for crushing ice;
3) scrapers for detaching ice;
4) brooms for removing snow;
5) brushes for switches (also used for cleaning grooves at level crossings and foot crossings).
The following machines should be used to clear snow from tracks and turnouts, depending on the thickness of the snow cover:

1) Blade ploughs which remove snowdrifts up to 1.5 m high from the track to the trackside, either to one or both sides;
2) snow removal units (so-called snowblowers) which collect snow from the track up to 0.9 m thick directly onto wagons equipped with conveyor belts;
3) blade and rotor snowblowers which remove up to 1.0m of snow from the tracks;
4) motor trolleys fitted with blade attachments to clear snow up to 0.5m from the track;
5) brush shovellers and motor trolleys fitted with brush attachments to remove snow up to 0.3m thick from turnouts and station tracks;
6) hydraulic trolleys fitted with cutter and blade attachments that remove snow up to 1.0m thick (cutter) and 0.5m (blade) from tracks;
7) technical rescue trains fitted with snow cutter attachments that remove snow up to 1.0m thick from tracks;
8) technical rescue road-rail vehicles fitted with snow cutter attachments that remove snow up to 1.0m thick from tracks.
In addition, the Instruction provides that:
- Workers involved in winter works should be trained according to the scope of their work assignments, and:
1) the work supervisor, prior to commencing snow clearance work, is obliged in each case to provide on-site instructions, including as regards personal division of work, sequence of tasks, health and safety requirements for individual activities;
2) where tools, equipment or mechanised snow clearing machines are used, the workers should be familiarised with the rules for their use, the manufacturer's recommendations and operating instructions, as well as the corresponding OHS instructions.
- The work supervisor must be equipped with a radio certified for use in the Company's network, the correct operation of which must be checked prior to the commencement of works.
According to the provisions of the aforementioned instruction, where more than two persons are working on active tracks, the work supervisor is obliged to deploy signal men. The Investigation Team found the absence of a signal man as a factor contributing to the occurrence.

4.2. The safety management system of the involved railway undertaking(s) and infrastructure manager(s) including the basic elements stated in Article 9(3) of Directive (EU) 2016/798 and any EU legal implementing acts

According to the aforementioned Directive, the infrastructure manager should apply, inter alia, procedures and methods for identifying risks, carrying out risk evaluation and implementing risk-control measures whenever a change of operating conditions or the introduction of new material imposes new risks on the infrastructure or the man-machine-organisation interface. In the opinion of the Investigation Team, authorising the equipment, i.e. backpack diesel blowers, for clearing turnouts of snow use in conflict with its intended purpose under the Pan *for the conduct of winter works in the 2023/2024 season on the premises of the Railway Line Plant in Lublin*, should have been preceded by a risk assessment. The application of this procedure would lead to the development of rules either for the safe use or prohibition of use of this equipment.

4.3. The management system of the entity/entities in charge of maintenance and maintenance workshops including the functions stated in the Article 14(3) and Annex III of Directive (EU) 2016/798 and any subsequent implementing acts

Not applicable.

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

No factors influencing the occurrence were identified on the side of the national safety authority.

4.5. The authorisations, certificates and assessment reports granted by the Agency, the National Safety Authorities or other conformity assessment bodies

Not applicable.

5. Previous occurrences of a similar character

The Investigation Team analysed accidents which occurred under circumstances similar as on railway line no. 7.

A brief description of the occurrences and their consequences.

1. An accident that occurred on 19 July 2012 at 08:57 hrs on the Sokołowo Wrzesińskie - Podstolice route on track no. 2, km 254.550 of line no. 3 Warszawa Zachodnia - Kunowice, the area of the infrastructure manager PKP PLK S.A. Railway Line Plant in Poznań.
   On 19 July 2012 at 08:57 hrs, train no. 71010 travelling from Frankfurt Oder to Warsaw Wschodnia ran into workers who were carrying out works on active track no. 2. As a result of the collision, two workers - employees of the work subcontractor - died on the spot. The workers wore clothing required by OHS rules. The head of the train stopped at km 254.080, i.e. 470 m past the point of impact.
   The railway commission determined the following causes of the occurrence:
   a) direct - collision of the head of the train with a group of workers carrying out work on a screwing machine at an active track,
   b) primary - non-compliance with applicable regulations and instructions as regards workplace organisation, direct supervision of workers, alerting workers to oncoming rolling stock, shielding the workplace in accordance with Instruction Ie-1,
   c) indirect - lack of qualifications of the works supervisor to carry out his duties, lack of qualifications of the workers to carry out the duties of signal men, lack of qualifications of the workers to operate the screwing machine that was in use during the works, use of equipment without an operating manual and technical/operational documentation,
   d) systemic - failure to verify the qualifications of the workers who were about to commence work on railway grounds.
2. An accident that occurred on 30 August 2019 at 23:32 hrs at Grodzisk Mazowiecki station on track no. 2, km 28.939 of line no. 1, the area of the infrastructure manager PKP PLK, Railway Line Plant in Warsaw.
   On 30 August 2019, rail grinding works were being carrying out at Grodzisk Mazowiecki station on track no. 1, line no. 1. The works were being carried out on a closed track. The workers were carrying out works involving uninstallation and re-installation of the ATS equipment and axle counters in the track. The works were being carried out in accordance with the temporary rules for the operation of train traffic during rail grinding on line no. 1 on the section Warszawa Zachodnia - Radziwiłłów Mazowiecki. After the grinding was completed, the grinding train stopped ahead of turnout no. 2 to lift the grinding unit. At that time, the workers proceeded to installing the ATS device in track 1 at km 28.939. In front of the grinding train, which was heading in the direction of the command box Grodzisk Mazowiecki, the employees left track no. 1 (not on the previously agreed intertrack space) and entered active track no. 2, on which train no. 6110 Wrocław Główny - Warszawa Wschodnia was travelling, after which two workers of the Operations Section Warszawa Centralna were run into. The head of the train stopped at km 28.601.
   The railway commission determined the following causes of the occurrence:
   a) direct - the presence of the workers in active track no. 2 during the passage of fast train no. 6110, in conflict with the previously discussed rules of performing uninstallation and re-installation trackside equipment,
   b) primary - unauthorised entry of the workers onto active station track no. 2, instead of the indicated intertrack space between track no. 1 and track no. 11; a condition indicating the consumption of ethyl alcohol by one of workers.
   c) indirect - failure by the workers to take special care; failure to observe the rules of movement in the area of active tracks.
3. A Cat. A35 serious accident that occurred on 28 October 2019 at 12:55 hrs on the Paczyna - Toszek route, track no. 1, at km 48.180, railway line no. 132 Bytom - Wrocław Główny, the area of PKP Polskie Linie Kolejowe S.A., Railway Line Plant in Tarnowskie Góry.
   On 28 October 2019, train MPE 16111 of PKP INTERCITY S.A. travelling from Warszawa Grochów to Wrocław Główny, driven by THE EP07-1056 locomotive on track no. 1 on the Paczyna - Toszek route,

line 132 Bytom - Wrocław Główny, at km 48.180, fatally hit the operator of an MD 07 geodetic tamping machine owned by PNUIK Kraków.

Train MPE 16111 passed Pyskowice station at 12:49 hrs at the speed of 100 km/h. At 12:51 hrs, the train passed Paczyna station junction post and continued its travel at the scheduled speed of 120 km/h. After passing the W6a indicators relating to level crossings located in the path of this train, the driver gave the sound signal "Attention". As established during interviews with the train driver, when the train was approximately 700 metres from the tamping machine working on track no. 2, the train driver noticed the machine and again gave the signal "Attention". At a distance of approx. 400 m from the tamping machine, the train driver noticed people working on track no. 2 and a worker in the intertrack space between the tamping machine and track no. 1 relative to the approaching train. He gave the signal "Attention" again, and then heard the sound of a collision on the left side of the locomotive. He initiated train emergency braking immediately. The train stopped after travelling approx. 770 m. The train driver reported the occurrence and suspected collision with a person to the signaller at Toszek station.

The PKBWK Investigation Team identified the following causes of the occurrence:

direct - train MPE 16111 fatally hitting a track tamping machine operator who was in the intertrack space within the gauge of active track no. 1 during tamping work on track no. 2

primary - entry of the tamping machine operator into the intertrack space between closed track no. 2 and active track no. 1, and his presence within the gauge of track no. 1 during tamping of track no. 2,

indirect -

a) absence of site manager or work supervisor required by the building law at the worksite,

b) lack of "Regulations on temporary operation of traffic during the execution of works",

c) failure to take special care and observe OHS rules during execution of track works by the injured person,

d) inappropriate organisation of the tamping work on track no. 2 on the Paczyna - Toszek route, consisting in the lack of cooperation between the work supervisor and the signaller at Toszek and Paczyna stations,

e) failure to secure the worksite for continuous tamping of the track with a heavy tamping machine, i.e. failure to appoint a signal man, which was in conflict with the provisions of § 63 (6.17) of the "Technical conditions for the maintenance of railway superstructure Id-1 (D1)",

f) lack of train speed limit to 100 km/h on active line track no. 1 at the site of the track works on closed track no. 2. (§ 3 of Id-18 "Guidelines for securing sites of works carried out on a closed track during the operation of railway traffic on an active track at a speed V≥100km/h,

systemic - lack of provisions in the instruction on operating railway traffic (Ir-1) requiring that train drivers must be informed by signallers of works in progress on an adjacent track.

4. An incident that occurred on 5 January 2024 at 14.40 hrs on the Świebodzin - Toporów route, track no. 1, km 425.400, line no. 3 Warszawa Zachodnia - Kunowice, the area of the infrastructure manager PKP PLK S.A. Railway Line Plant in Zielona Góra.

   On 5 January 2024, a trackman and two fitters of Operations Section in Zbąszynek were conducting preparatory works for the repair of a rail buckling (they were carrying the tools and equipment necessary to secure the rail from their car and arranging them on the trackbed). The trackman agreed with the signaller at Toporów station that the rail repair works would start during a break in train traffic, after passenger and fast trains passed, and had radio communication with the signaller. Seeing a train in advance, the trackman called for the fitters to get off the track and himself moved to the embankment by track no. 1. One of the fitters, seeing the steep embankment, turned around to see if any tools had been left on the track and decided to get off the track to the side of track 2, which was closed to traffic. At that time, the driver of train 70326 leaving Toporów station on track 1 towards Świebodzin noticed a worker in the track directly in front of the train - the train driver implemented emergency braking. He reported the occurrence to the signaller at Toporów station and to the dispatcher. After making sure that there was no obstruction, the driver continued the travel.

   The railway commission determined the following causes of the occurrence:

   a) direct - sudden braking of the train in front of the workers on the tracks, no casualties,

   b) primary - failure by the worker to comply with the instructions given by the trackman in charge of the works; failure to observe OHS rules during works on an active track,

c) indirect - failure to designate a signal man to alert the persons working on the tracks.

V. CONCLUSIONS

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

The analysis of the material gathered shows, among other things, that:
The occurrence involved a railway vehicle colliding with two workers who were clearing turnouts of snow, one of whom was using a backpack diesel blower.
In order to ensure the railway's operability in winter, the Infrastructure manager prepared the *Plan for the conduct of winter works in the 2023/2024 season on the premises of the Railway Line Plant in Lublin*, which was approved on 11 October 2023. The *Plan*, in Appendix No. 4 Point 6.2 "*Machines, vehicles and mechanised equipment used for snow clearing works*" permits the use of backpack diesel blowers for snow clearance. The manager did not carry out a risk assessment and did not develop rules for safe use of the blower on tracks, which the Investigation Team has found to be a systemic factor.
The backpack diesel blower used during the works raised clouds of snow, restricting the work group's visibility, and was a source of considerable noise in excess of 100 dB, which made it impossible for the workers to hear the approaching train or the continuous Rp1 "Attention" signal given by the train driver.
The automation foreman supervising a group of workers had not established rules for mutual communication and alerting. When going out into the field, they had one radio with them, in view of which the group of workers should not have split up, and one of the workers should have been designated by the team leader as a signal man to alert them to approaching trains and shunting rolling stock and maintain contact with the signaller. The supervisor allowed the group to split up and all three worked at different locations without any safeguarding.
The failure to develop an effective system of mutual communication during snow clearance from turnouts with a backpack diesel blower that produced high-intensity noise was also identified by the Investigation Team as a systemic factor contributing to the occurrence.
The signaller at Jaszczów station acknowledged and permitted snow clearance from turnouts by signing the corresponding entry in the D-831 logbook. According to the said entry and the provisions of the station's technical regulations, the signaller was required to notify the workers by radio of approaching trains. The signaller did not notify the workers of the entry of train ROM 22401 and gave the permissive signal aspect for the train to enter from line track no. 1 onto station track one. Before giving the permissive signal aspect for the train, he considered that the workers were at a safe distance based on what he saw on the end-of-train determination screen. Between the time the signal aspect was given and the time the train arrived, the group moved and two workers started clearing snow from turnout no. 1. Information about those the workers clearing snow from the turnouts was not provided by the signaller to the driver of train ROM 22401. Due to the rising snow cloud, the train driver had an obstructed view of the group of workers working on turnout no. 1 in his travel path. In addition, his field of vision was restricted by driving on a right-hand curve with a radius of R=903. The technical condition of the railway vehicle involved provided for its safe operation and did not affect the occurrence. Based on the analysis of the evidence collected, the Investigation Team did not find any irregularities in the conduct of the driver of train ROM 22401.

The Investigation Team identified the following as contributing factors:

1. Inappropriate organisation of work involving a lack of communication and coordination of activities, scope and method of work between the workers clearing turnouts of snow.
2. The automation foreman operating the blower, instead of carrying out supervision, to which he was obligated under the "*Plan for the conduct of winter works in the 2023/2024 season on the premises of the Railway Line Plant in Lublin*".
3. Failure to appoint a signal man to cover the workers clearing turnouts of snow.
4. Failure by the signaller to alert the workers at the turnouts to incoming train ROM 22401.

5. Failure of the Jaszczów station signaller to alert the driver of train ROM 22401 to workers clearing snow of turnouts.

2. Measures taken since the occurrence

The railway commission requested that the signaller on duty on the day of the occurrence should be removed from duties.
The OHS Commission of PKP PLK S.A., Railway Line Plant in Lublin, conducted an investigation of the circumstances and causes of the accident at work, concluded with reports no. 003/2023 (approved on 4 July 2024) and no. 004/2023 (approved on 5 July 2024).

3. Additional comments

In the course of the investigation and examination of the circumstances of the accident, the Team additionally identified the following irregularities:

1) Lack of time synchronisation in the video recorder on rail bus SA134-019 with real time.
2) Lack of recording of main air line pressure parameters, position of the adjuster and operation of the right-hand white headlight in ATM-RP4 recorder installed in rail vehicle SA134-019.
3) Staffing for Phase II of *the winter 2023/2024 operation* at Jaszczów station was inconsistent with the *Plan for the conduct of winter works in the 2023/2024 season on the premises of the Railway Line Plant in Lublin*.

VI. SAFETY RECOMMENDATIONS

1. PKP PLK S.A. shall carry out a risk assessment regarding the use of backpack blowers for snow clearing work.
2. PKP PLK S.A. shall promptly develop and communicate to its subordinate organisational units that use backpack blowers for works on or at railway tracks, a set of requirements concerning safety conditions at work with this type of equipment, and shall enhance supervision of compliance with those requirements.
3. PKP PLK S.A. Railway Line Plant in Lublin shall reposition the end-of-train determination (Skp) camera so that it covers the signal site and, at the same time, turnouts no. 1 and no. 2 at Jaszczów station.
4. Operators of powered railway vehicles shall carry out internal checks on the correctness of recording of train driving parameters by the electronic data recorders installed in railway vehicles in operation.
5. POLREGIO S.A. shall review the front-view cameras installed in railway vehicles in operation for image clarity and time synchronisation.

STATE COMMISSION ON RAILWAY ACCIDENT INVESTIGATION
CHAIRMAN

.....
Tadeusz Ryś

List of entities and acronyms that appear in Report No. PKBWK 3/2025

Item	Symbol (acronym)	Explanation
1	*2*	*3*
1.	EUAR	European Union Agency for Railways
2.	PKBWK	State Commission on Railway Accident Investigation (Polish: Państwowa Komisja Badania Wypadków Kolejowych)
3.	UTK	Office of Rail Transport (Polish: Urząd Transportu Kolejowego)
4.	PKP PLK S.A.	Infrastructure manager
5.	PKP PLK S.A. IZ Lublin	Railway Line Plant in Lublin
6	POLREGIO S.A.	Railway carrier
7.	Skp	End-of-train determination (Polish: stwierdzenie końca pociągu)
8.	SHP	Automatic train stop
9	EOR	Electric turnout heating (Polish: elektryczne ogrzewanie rozjazdów)

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