



STATE COMMISSION ON RAILWAY ACCIDENT INVESTIGATION
Ministry of Interior and Administration

REPORT No. PKBWK 02/202 3

**on the investigation of a railway accident
that occurred on June 20, 2022 at 12:55
at the Regalica junction station,**

Poznań Główny POD - Szczecin Główny railway line No. 351 at km 204.079

area of the infrastructure manager PKP PLK S.A. Railway Line Department in Szczecin

WARSAW, 05.06.2023.

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

Pursuant to Article 28f (3) of the Railway Transportation Act of March 28, 2003, the Commission's proceedings do not determine guilt or liability.

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I. SUMMARY

Type of occurrence: Accident.

Description of occurrence: While driving, the train ROM 88628/9 (POLREGIO Spółka Akcyjna) line Szczecin Główny - Kołobrzeg on track no. 2 from station Szczecin Port Central SPA in the direction of junction post Szczecin Zdroje, at the junction post Regalica in the turnout fouling point no. 3 there was a collision with the maintenance train Rob.1, which was standing at the turnout no. 1.

Date of occurrence: 20.06.2022, 12:55 pm.

Site of occurrence: Railway line no. 351 Poznań Główny POD - Szczecin Główny, Regalica junction post track no. 2, km 204.079, geographical location: 53° 22'30.1 "N, 14° 35'41.5 "E.

Implications of the occurrence: As a result of the occurrence, two rail vehicles were damaged: ROM 88628/9 train operated by a 219M rail bus and maintenance train Rob.1 operated by a WM15P.00/HB-19 motor car.

Causal factor: Preparation of the runway by the train dispatcher on duty, without checking that the runway for the ROM 88628/9 train is properly laid out and that there are no obstacles in the way.

Contributing factors:

- 1) Commencement of the next stage of reconstruction of signaling equipment at the SPA post without restoring the full functionality of the Regalica junction post, i.e. restoring the dependence of the position of switch No. 1 in the minus position for course B2²_w "from SPA on track No. 2 to Szczecin Zdroje on track No. 2", which resulted in the lack of lateral protection for this line.
- 2) Enabled transmission of the enabling signal S10 on the semaphore B2 in absence of lateral protection for course B2²_w "from SPA on track No. 2 to Szczecin Zdroje on track No. 2".
- 3) Stopping train Rob.1 in the switch fouling point 3c/d, where it should not stop, upon the verbal order of the train dispatcher on duty, while entering mainline track No. 2 of railway line 351.
- 4) Organization of the train traffic at Regalica junction post (sub-junction) without exit semaphores being incompatible with current regulations.
- 5) Lack of observation by the train dispatcher of sub-junction Regalica of passing trains from the place designated by technical regulations.
- 6) Carrying out the technical acceptance of the traffic control system and commissioning at the Regalica junction post by the acceptance committee on 03.09.2021 in such a way that the lack of dependence of the B2 semaphore signals on switch position at turnout No. 1 has not been revealed.
- 7) Failure to disclose the lack of dependence of B2 semaphore indications on the position of turnout switch No. 1 during the diagnostic test performed on 11/15/2021.

Systemic factors: The relaxation of the infrastructure manager's internal rules in relation to the provisions of national regulations, which led to the failure to issue authorizations following technical modifications.

Recommendations and their addressees:

- 1) Infrastructure Manager PKP PLK S.A. will ensure the supervision of implementation quality of the Company's investment process and diagnostic process.

- 2) Infrastructure Manager PKP PLK S.A. will strengthen the system of supervision of training and authorization of employees in connection with organizational or technical changes affecting the way they perform their activities.
- 3) Infrastructure Manager PKP PLK S.A. will adapt its internal regulations to the provisions of the Regulation of the Minister of Infrastructure of January 11, 2021 on employees working in positions directly related to the operation and safety of railway traffic and the operation of certain types of railway vehicles (Journal of Laws of 2021, item 101) with regard to authorizations.



Photo 1. View of the vehicles after the occurrence (source: materials provided by the railway commission)



Photo 2. View of the site of the vehicle clash (source: materials provided by the railway commission)



Photo 3. View of the aftermath of the occurrence (source: materials provided by the railway commission)



Photo 4. Marking of the site (source: Spatial Information System)

II. PROCEEDINGS AND ITS CONTEXT

1. Decision to initiate the investigation

Tadeusz Ryś, Chairman of the State Commission on Railway Accident Investigation (hereinafter referred to as the "PKBWK" or the "Commission"), has issued Resolution No. PKBWK.4631.3.2022 of June 29, 2022 on the initiation of investigation on the causes and circumstances of the railway accident that occurred on June 20, 2022 at 12:55 a.m. at the Regalica junction post on track no. 2, km 204.079 of railway line no. 351 Poznań Główny - Szczecin Główny. 351 Poznań Główny - Szczecin Główny. Considering this fact and the provisions of Article 28e paragraph 4 of the Railway Transport Act (Journal of Laws of 2021, item 1984, as amended), hereinafter referred to as the "Railway Transport Act", on July 1, 2022, the incident was reported to the Railway Agency of the European Union and registered in its database under the number PL-10248.

2. Grounds for the decision to initiate the investigation

Basing on the analysis of circumstances of the occurrence, taking into account that the occurrence was an accident which, under slightly different conditions, would have been a serious accident resulting in the cessation of operation of structural subsystems or interoperability components and forming a series of accidents relating to the system as a whole, the Chairman of the PKBWK decided, in accordance with Article 28e (2) of the Railway Transport Act, to initiate the investigation by the Commission's Investigation Team.

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

There were no restrictions that would adversely affect the proceedings during the course of the proceedings.

4. Aggregated description of the technical capabilities of the functions in the team of persons conducting the investigation

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

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

Pursuant to Article 28h, paragraph 2, item 5 of the Railway Transport Act, the Chairman of PKBWK, by letter No. PKBWK.4631.3.1.2022 dated 29.06.2022, obligated the designated persons among the members of the Railway Commission to cooperate with the Investigation Team on a permanent basis and to hand over the documents collected during the investigation.

On 11.07.2022, at the headquarters of the Railway Line Department of PKP Polskie Linie Kolejowe S.A. in Szczecin, a protocol handover of the collected documentation by the railway commission took place.

As part of the investigation, the Chairman of the Commission requested the cooperation of the following entities related to the occurrence under investigation:

- railway infrastructure manager PKP Polskie Linie Kolejowe S.A.
- railway undertaking POLREGIO S.A.
- railway undertaking PKP Energetyka S.A.

In accordance with the provisions of Article 28k of the Railway Transportation Act, the Commission provided the parties involved in the accident with an opportunity to review the investigation and to comment on the draft report.

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

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

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

Throughout the process of determining the causes and circumstances of the accident, the Investigation Team relied on its own knowledge, experience, and findings.

They used their own documentation and documentation collected by the railway commission.

As part of the investigation of the occurrence, the Investigation Team used the following methods, among others:

- Inspection of the scene after the accident,
- Local inspections at the scene,
- Conducting hearings of the train dispatcher, train drivers and train managers, the designer and works manager,
- Analysis of the collected documentation,
- Analysis of the records of the train running parameters recorder,
- Analysis of the recorded image of the train's foreground,
- Analysis of causal factors using the 5 Why method.

The following is a selection of the laws, regulations and internal policies used in the process:

European Union regulations:

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

National regulations:

- 1) Railway Transport Act of March 28, 2003 (i.e., Journal of Laws of 2021, item 1984, as amended),
- 2) Regulation of the Minister of Infrastructure of January 11, 2021, on employees working in positions directly related to the operation and safety of railway traffic and the operation of certain types of railway vehicles (Journal of Laws of 2021, item 101),
- 3) Regulation of the Minister of Infrastructure dated July 18, 2005 on general conditions of railway traffic and signaling (i.e., Journal of Laws of 2015, item 360, as amended),
- 4) Act of July 7, 1994 - Construction Law (i.e., Journal of Laws 2021, item 2351, as amended),
- 5) Regulation of the Minister of Transport and Maritime Economy dated September 10, 1998, on technical conditions to be met by railway structures and their location (Dz. U. No. 151 item 987, as amended).

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

- 1) Ie-1 (E-1) Signaling Instructions,
- 2) Ie-4 (WTB-E10) Technical guidelines for the construction of railway traffic control devices,
- 3) Ie-5 (E-11) Instruction on the principles of operation and maintenance of railway traffic control devices,

- 4) Ie-6 (WOT-E12) Guidelines for technical acceptance and commissioning of railway traffic control equipment,
- 5) Ie-7 (E-14) Instruction for technical diagnosis and periodic inspection of railway traffic control equipment,
- 6) Ie-10 (E-18) Instruction for the operation of relay traffic control devices,
- 7) Ir-1 Instruction on train operation,
- 8) Ir-8 Instruction on the handling of serious accidents, accidents, and occurrences in rail transport,
- 9) Id-1 (D-1) Technical conditions for maintenance of track superstructure,
- 10) Ik-2 Railway safety inspection manual,
- 11) Ia-5 Instruction on preparation and professional development of PKP Polskie Linie Kolejowe S.A. employees,
- 12) Conditions and rules of acceptance of construction works on railway lines.

Internal instructions of the railway undertaking POLREGIO S.A.

- 1) Pt-2 Instruction for the EMU team,
- 2) Pt-5 Instruction on maintenance of powered railway vehicles.

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

- 1) Et-11 Driver's and train driver's manual,
- 2) Et-17 Train Manager's Manual.

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

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

9. Any interaction with the judicial authorities.

In the case under review, there was no need to cooperate with the judicial authorities.

10. Other information relevant to the ongoing investigation

Based on an analysis of the Construction Law and the decisions of December 1, 2016. GSK 1224/15 and December 1, 2016. II GSK 1233/15, of the Supreme Administrative Court regarding the author's supervision, the author's supervision can be carried out only by the author of the design.

III. DESCRIPTION OF THE OCCURRENCE

1. Occurrence and background information

1.1. Description of the type of occurrence

Occurrence at the Regalica junction post. The occurrence involved the following trains: passenger train ROM 88628/9/9 between Szczecin Główny and Kołobrzeg (rail bus type 219M) owned by railway undertaking POLREGIO S.A. and maintenance train Rob.1 (WM15P.00/HB-19) of PKP Energetyka S.A.

While the ROM 88628/9 train was passing on track 2, it collided sideways in the switch fouling point No. 3 with the maintenance train Rob.1, which was standing on track 1. The end of Rob.1 train was in the turnout fouling point No. 3, occupying the gauge for the moving ROM 88628/9 train.

1.2. Date, exact time, and location of the occurrence

The occurrence took place on 20.06.2022, at 12:55 at the Regalica junction post located on railway line No. 351 Poznań Główny POD - Szczecin Główny, track No. 2, km 204.079, geographical location: 53° 22'30.1 "N, 14° 35'41.5 "E. The junction post is located at the connection point of railway line No. 351 with railway line No. 855 Regalica - Szczecin Port Central SPA.

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

The Regalica junction post is located at km 204.079 of the double-track electrified railway line No. 351 Poznań Główny - Szczecin Główny. Three turnouts are built in the main tracks: ordinary turnouts No. 1 and 2 and double cross turnout No. 3. This post is a branching of line No. 855 Regalica - Szczecin Port Central SPA. The beginning of the line is at km -0.023 at turnout No. 1, which corresponds to kilometer 204.055 of line 351.

Track No. 2 of line No. 855 located in a curve, limiting the visibility of the maintenance train standing at turnout No. 1 in the rolling stock gauge of the passing train.

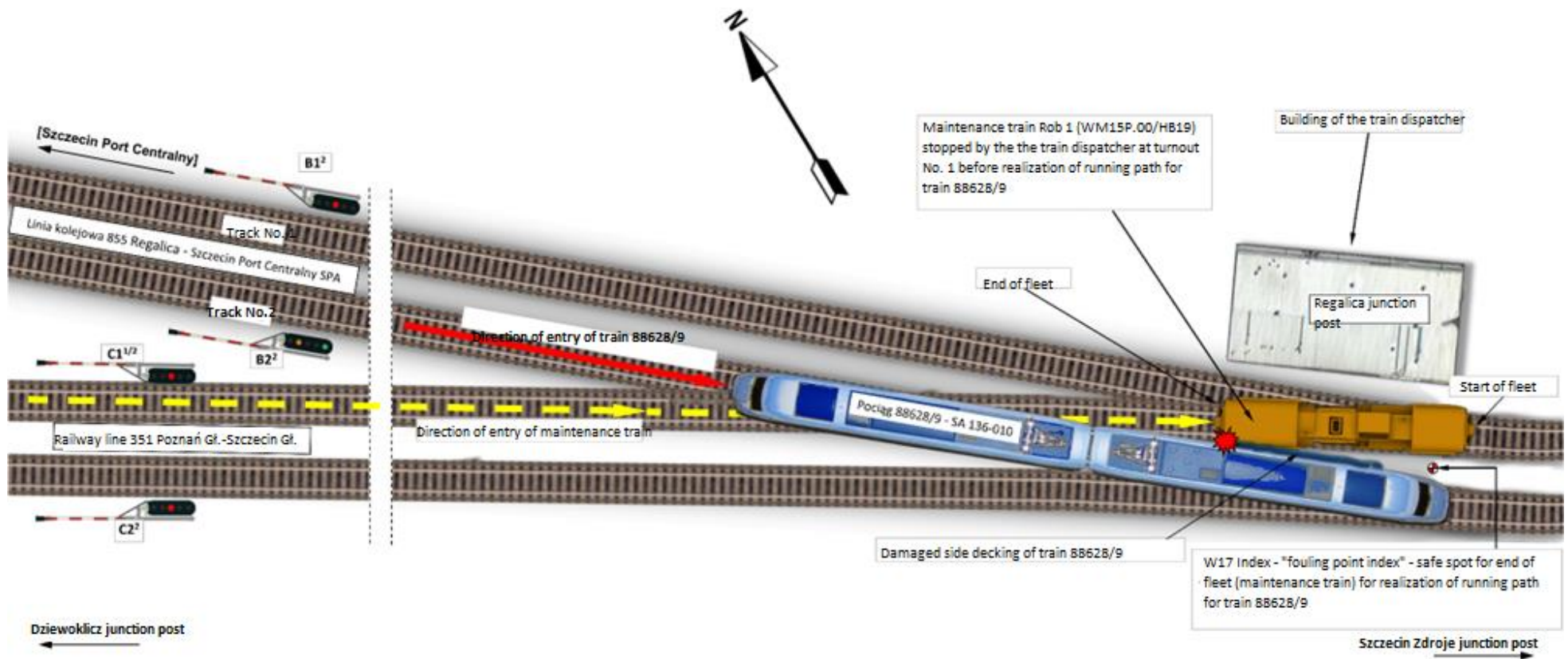
The occurrence took place during daytime, air was clear, no fog, no rain, ambient temperature +15°C.

On the day of the occurrence, the provisions of Regulation No. 47/2020 on temporary operation of traffic during construction works (consolidated text as of 17.03.2022) were in force for the operation of trains on tracks No. 1 and 2 of line No. 855 Regalica - Szczecin Port Central SPA.

On behalf of the Railway Line Department in Szczecin, the maintenance train was carrying out works on route No. 273 on track No. 1 of the Dziewoklicz - Regalica line, according to letter No. IZ18ES.606.302.2022.E6 dated 15.06.2022.

At the time of the collision, no work was being carried out on the railway infrastructure in and around the location.

Figure 1 - Sketch of the accident (opr. PKBWK)



1.4. Deaths, injuries, and damage to property

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

There were no injuries or deaths as a result of the occurrence.

b) Cargo, luggage and other property

There was no damage to the personal belongings and luggage that were carried on the train.

c) Rolling stock, infrastructure and environment

The SA136 series rail bus, type 219M, suffered damage in form of scratches and perforation of the plating of the left side wall, the left door wing of the first door of the first carriage. The right door wing of the first door of the first carriage was destroyed and torn out.

As a result of the collision, on the WM15P.00/HB-19 maintenance train, the left towing hook on the A-cab side was broken off.

There was no damage to the railway infrastructure or environmental pollution.

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

As a result of the occurrence, train traffic was interrupted on the following tracks and routes:

- Route Regalica - Szczecin Zdroje track No. 1 closed from 13:00 to 14:51, track No. 2 closed from 13:05 to 14:16;
- Route Regalica - Dziewoklicz track No. 1 closed from 13:00 to 14:14, track No. 2 from 13:05 to 14:14;
- Route Regalica - Szczecin Port Central SPA track No. 1 closed from 13:00 to 14:55, track No. 2 closed 13:05-14:17.

The occurrence resulted in train delays totaling 3101 minutes.

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

The Investigation Team identified the following individuals and entities associated with the occurrence:

- The train dispatcher on duty at Regalica junction post - employee of the infrastructure manager PKP PLK S.A.,
- Train driver driving train ROM 88628/9 - employee of railway undertaking POLREGIO S.A.,
- ROM 88628/9 train manager - employee of railway undertaking POLREGIO S.A.,
- Train driver Rob.1 - employee of railway undertaking PKP Energetyka S.A.,
- Train manager Rob.1 - an employee of the railway carrier PKP Energetyka S.A.,
- designer of signaling devices - employee of Biuro Projektów Kolejowych S.A. in Lublin, not performing the function of author's supervision, lack of his involvement in this function due to the fact that the investor did not inform him about the process of changing the stages of the construction sequence, which was incompatible with the provisions of Procedure SMS-PW-09 "Safe design of railway infrastructure and principles of cooperation with designers",
- works managers of srk sector - employees of KOMBUD S.A. Radom,
- construction manager - employee of TORPOL S.A. in Poznań,
- acceptance commission - employees of PKP PLK S.A.,
- Investment supervision inspector of BBF Sp. z o. o. in Poznań,
- The contractor for the works - TORPOL S.A., together with subcontractors - Zakłady Automatyki "KOMBUD" S.A. in Radom, Trans-Tel Sp. z o. o. in Pobiedziska and JAKS Sp. z o. o. in Szczecin,
- Automation diagnostic team - employees of PKP PLK S.A.

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

POLREGIO S.A.

Passenger train ROM 88628/9 was compiled from a SA136-010-series rail bus operated by railway undertaking POLREGIO S.A. Zachodniopomorski Zakład w Szczecinie.

The vehicle had a technical railworthiness certificate for a railway vehicle - rail bus type 219M, year of construction 2010, serial number A631BNA010 219M 010, issued by PESA Bydgoszcz S.A. based on the permission to operate the type of railway vehicle No. T/2011/0845, railway vehicle identification PL-PREG EVN 95 51 2 820 096-6; 95 51 2 820 097-4; 95 51 2 820 098-2.

Certificate of technical railworthiness issued on 04.06.2019 in Inowrocław and valid until 28.12.2026 or for a mileage of 1,200,000 km calculated from the odometer of 111 km. The mileage at the time of the occurrence was 473,455 km. The P2 inspection was performed on 5/20/2022 with a mileage of 460,451 km. The P1 service interval was performed on 06/19/2022 with a mileage of 473134 km.

Data on train ROM 88628/9 based on the List of railway vehicles in the train (R-7) dated 20.06.2022 and the Brake Test Card:

– train length	56 m
– total weight of the train	123 tons
– percentage of braking mass required	105 %
– braking mass required	130 tons
– actual braking mass	212 tons

PKP ENERGETYKA S.A.

The Rob.1 maintenance train was created from a WM 15P.00/HB-19 maintenance train operated by PKP Energetyka S.A.

The vehicle has Certificate No. EGWT/02/2020 ex. A of technical railworthiness of the railway vehicle - maintenance train of type WM 15P.00/HB-19, year of construction 2013, manufactured by ZPS Sp. z o.o. Stargard Szczeciński, issued based on the permission to operate the type of railway vehicle No. T/2010/0177, railway vehicle identification PL-PKPE 92 51 9 431 067-9. The technical railworthiness certificate was issued on 02.03.2020 in Dąbrowa Górnicza and valid until 01.03.2026 or for a mileage of 300,000 km calculated from the odometer reading of 85,154 km. The mileage at the time of the occurrence was 191,916 km. The P2 inspection was performed on 06/06/2022 with a mileage of 191,272 km. The P1 inspection was performed on 06/20/2022.

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

1) Track surface:

Type rails	-	60E1
Railway sleepers	-	prestressed concrete of PS94 type
Attachment type	-	SB4 type
Type of ballast	-	gravel
Turnout No. 1	-	ordinary right, R300, 1:9, 60E1
Turnout No. 3	-	double cross, R190, 1:9, UIC60

Turnouts from 2014, on hardwood sub-switches, breakstone ballast.

2) Railway traffic control (SRK) devices:

At the Regalica junction post, E-type relay equipment with a cubic control panel was built, year of construction 1967, Siemens S700K switchgear drives - 3 units, EEA4 - 1 unit, year of construction 2019. Track and turnout control is implemented based on classic track and turnout unoccupancy control circuits. Light entry semaphores are installed at the post.

Automatic line interlocking of type Eac, three-way multi-passage on tracks No. 1 and 2 of the Regalica - Szczecin Zdroje line.

Semi-automatic signal box of type Eap with unoccupied track control on tracks 1 and 2 of the Regalica - Dziwów line.

C type semi-automatic signal box on tracks 1 and 2 of the Regalica - Szczecin Port Central SPA line.

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

Design assumptions:

Reconstruction of traffic control devices on the Regalica subjunction was implemented in 3 stages within the following scope:

- Replacement of semaphores C1 and C2 with a change in their location,
- addition of ISpC1 and ISpC2 repeater signals,
- Replacement of B1 and B2 semaphores with a change in their location,
- Replacement of ISpB1, IISpB1, IIISpB1, ISPB2, IISpB2, and IIISpB2 repeater signals with a change in their location,
- Changing the location of isolated connectors at semaphores B1, B2, C1 and C2,
- Adaptation and expansion of the cable network,
- Reconstruction of the cubic control panel.

In the first stage, the track 1 to the station Szczecin Port Central SPA was closed, which made it necessary to close the switch No. 1 in the positive (+) position on the subjunction Regalica, and in order to allow the train to run on the permissive signal on semaphore B2, according to the design documentation, bridges were built to override the dependency of switch No. 1 in the course b^{2/2w}.

For this documentation, sheets of signal circuits S1a, S2 and S3 with designed temporary connections (among other bridges) were made, without annotating the significance of the change, method, and term of their making as well as their applicability. A temporary dependency table was designed for switch key No. 1 with excluded runs that did not contain such comments.

After the completion of stage 1, skipping stage 2, work began on the first part of stage 3, which provided for the commissioning of track 1 to Szczecin Port Central SPA station after its completion. The signal circuit diagrams prepared for the first part of stage 3 included, among other things, the removal of the built-in bridges on the contacts of 2PKn relays, thus restoring the dependency of switch No. 1 in the b^{2/2w} train path.

Investment implementation:

- On the day of the occurrence, the provisions of the Regulation on temporary traffic management during the execution of works No. 47/2020 (consolidated text dated 17.03.2022) were in force regarding the operation of trains on tracks No. 1 and 2 of line No. 855 Regalica - Szczecin Port Central SPA. The works were carried out as part of the "Improvement of rail access to the seaports in Szczecin and Świnoujście" project.

- The Contractor, for the duration of the works in various stages and in accordance with the detailed design on the Regalica subjunction, closed for protective reasons the switch of turnout No. 1 in positive (+) position for the route b^{2/2} and b^{2/1} with a switch lock by deactivating the control by installing bridges, and deposited the key in the Szczecin Operations Section (copy in Part II E-1758 dated 05.11.2020). The changes in the signaling equipment were specified in the detailed design for the reconstruction of the signaling equipment and consisted, among other things, in installation of bridges on the contacts of relay 2Pkn1(-) minus (contact no. 17 ÷ 18 and contact no. 19 ÷ 20), which in the signal relay circuit SB2 bypassed the dependence of the turnout switch no. 1 in the (-) minus position as essential. The purpose of these modifications was to enable the transmission of the enabling signal on the B2 semaphore in the absence of a lateral protection for the b^{2/2} section "from SPA station on track No 2 to Szczecin Zdroje subjunction on track No 2" during the closure of track No 1 of Regalica subjunction - Szczecin Central Port SPA line.

With the above notation made in the book E-1758 about the adaptation of the SRK devices for carrying out train traffic on track no. 2 of route Regalica - Szczecin Port Central SPA and closing with lock Uzz1 the switch of turnout no. 1 in positive (+) position, the train dispatchers of Regalica subjunction were acquainted to against signature, except for the train dispatcher on duty on the day of the occurrence.

- In the book E-1758 dated 05.09.2021 it is recorded that the lock Uzz1 was dismantled and the order of operation of the point No. 1 was restored, which was one of the elements of the third stage of the project. In this stage the

track No. 1 of line Regalica - Szczecin Port Central SPA No. 855 was put into operation. According to the project documentation and signal circuit diagrams S1a, S2 and S3, the dependency of switch No. 1 should be restored by removing the bridges on the contacts of relays 2PKn-, which was not done.

- During the partial technical acceptance on 03.09.2021, which conditioned the commissioning of the traffic control devices, the lack of dependence of the indications of B2 semaphore on the position of the switch of turnout No. 1 in negative (-) position, which constitutes the lateral protection of the $b^{2/2}_w$ track, was not revealed. The material scope of the technical acceptance on Regalica subjunction included, among others, the installation and commissioning of railway signals No. B1, IspB1, IspB1 and IIsB1, the correctness of installation of these signals, as well as the verification of correctness of the signal indication. The commissioning of these signals, together with the commissioning of track no. 1 of line Regalica subjunction - Szczecin Port Central SPA, included the restoration of the dependency of switch no. 1 (i.e., removal of bridges from the contacts of the relay 2PKn1-). The Acceptance Commission, in its Protocol No. K1/SPA/26/08/2021/A dated 03/09/2021, based on the tests and inspections carried out, declared that the works performed were in accordance with the design documentation and that *"the equipment has been checked for proper operation and is ready for commissioning"*.

2. Fact-based account of events

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

On the day of the occurrence, the train traffic on tracks No. 1 and 2 of line Regalica - Szczecin Port Central SPA was based on telephone train announcements introduced as part of the ongoing investment. However, further in the direction of Szczecin Zdroje station, on the double-track Regalica - Szczecin Zdroje line, the basis for traffic management was an automatic line block. At 09:55, the maintenance train ZUM 889048 between Szczecin Główny and Szczecin Dąbie left the Szczecin Port Central SPA station. The train was received at the Regalica level crossing at the S10 acceptance signal given by the B2 entry semaphore and stopped at the Jta2 section, located on track 2 of railway line no. 351 in the direction of Szczecin Zdroje level crossing at 10:01 a.m. by order of the dispatcher.

The individual timetable of this train did not provide for a stop at Regalica subjunction.

In accordance with the Notice on the Order of Track(s) Closure No. IZ18ES.606.302.2022.E6 dated 15.06.2022 for Szczecin node, in agreement with the line dispatcher, the Regalica subjunction train dispatcher closed track no. 1 of line Regalica - Działkowicz at 10:02 a.m. and on the basis of the written order "S" dispatched the maintenance train as a work train Rob.1 in order to eliminate faults and replace track connections after the track works with the condition of returning to Regalica subjunction.

The closure with disconnection of the catenary was carried out in operational (emergency) mode. After the work was finished, the train Rob.1 returned in direction of Regalica subjunction and stopped in front of the entrance semaphore C1 with the signal "Stop". The train dispatcher of Regalica subjunction informed the driver of the route planned for train Rob.1 and used the substitute signal Sz on the C1 entry semaphore. After leaving the isolated section of the 3ab/cd switch, the Rob.1 train was stopped by radio on verbal command *"Stop. You can now. Stop"*, given by the train dispatcher on duty at 12:50. The front of the train was at km 204.056 of track 1, railway line 351, and its end in the fouling point of turnout No. 3, despite indications of its unoccupancy by train. The train dispatcher on duty did not check whether train Rob.1 had passed the signal point and then the running point or had released the fouling point of switch No 3c/d. The train dispatcher stopped the train at a place where it should not have been stopped. In such a state of occupancy of the fouling point of switch no. 3c/d and position (-) of switch no. 1 (running protection), at 12:53 the passenger train ROM 88628/9 of line Szczecin Główny - Kolobrzeg operated by RU POLREGIO S.A. was released from station Szczecin Port Central SPA on track no. 2 of railway line 855 Regalica - Szczecin Port Central SPA in direction of Regalica subjunction. The train dispatcher of Regalica subjunction prepared the route for this train from track no. 2 of subjunction line Regalica - Szczecin Port Central SPA in direction of Szczecin Zdroje subjunction on track no. 2 of line no. 351 Poznań Główny - Szczecin Główny as follows:

- Shifted the switch of turnout No. 2 to minus (-) position - according to the dependency table,
- Shifted the switch of turnout No. 3ab to minus (-) position - according to the dependency table,
- Shifted the switch of turnout No. 3cd to minus (-) position - according to the dependency table,

- **did not reposition the switch of turnout No. 1 and left it in plus (+) - position contrary to the dependency table, and should have repositioned it in minus (-) position protectively, omitting to perform this action.**

The train dispatcher on duty, without making sure that there was no obstacle in front of train ROM 88628/9, gave the permissive signal S10 on semaphore B2 (*"Drive at a speed not exceeding 40 km/h, then at the maximum permitted speed"*).

The passenger train ROM 88628/9, after passing the entrance semaphore B2, running on track 2, entered the setting circle of Regalica subjunction. The driver of train ROM 88628/9, approaching Regalica subjunction, noticed that a maintenance train was standing in gauge of track 1. As he approached, he noticed that the maintenance train was in the switch fouling point that the train he was driving was about to cross. He immediately applied the brakes at 37.25 mph. In area of turnover No. 3c/d crossing, a collision occurred with a side impact between the passenger train ROM 88628/9 and the standing maintenance train Rob.1. The front end of the passenger train stopped at km 204.079 after having travelled 63 m after emergency braking.

2.2. The sequence of events from the occurrence of the event to the conclusion of the emergency response, including: measures taken to protect and secure the scene; efforts of rescue and emergency services

As a result of the incident, the rail cars did not derail and none of the passengers or employees of the passenger and work trains were injured.

The driver of train ROM 88628/9 radioed the train dispatcher on duty at Regalica. The train dispatcher on duty at 13:00 informed the line and operational dispatcher as well as the immediate superiors. The impossibility of passing through Regalica subjunction made it necessary to close line tracks 1 and 2 adjacent to the post from 13:05. The consequences of the occurrence did not require an emergency intervention with the services.

After the initial inspection of SA136-010, the train arrived at Szczecin Dąbie station at 13:58. with a speed limit of 20 km/h. Train traffic in area of the occurrence was restored on both tracks at 14:55.

IV. OCCURRENCE ANALYSIS

1. Roles and responsibilities

1.1. Railway companies or infrastructure managers

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

In particular, the primary task of the railway infrastructure manager is the safe operation of railway traffic. The manager's responsibilities for safe operation of railway traffic are defined by *Instruction Ir-1 - on the operation of train traffic, Ie-1(E-1) – Instruction on signaling*, and *Technical Regulations of the Regalica subjunction*.

In accordance with the provisions of Regulation of the Minister of Infrastructure of July 18, 2005, on the general conditions for railway traffic and signaling, the S10 signal and the substitute signal, given on the C1 and B2 entry semaphore, in this case directed the movement of the maintenance train to the next block signal.

Regalica junction post is a signaling station located at the junction of lines and has only entry semaphores. At such posts, stopping and changing the direction of trains is not organized. If, for technical and operational reasons, it is necessary to stop a train at a junction post, the Ir-1 instruction specifies the rules of conduct in such cases, which have not been observed.

To ensure safe operation of rail traffic during the ongoing investment, the manager, in addition to the applicable internal regulations, developed detailed rules for the operation of train traffic contained in the regulations for the temporary operation of traffic during the execution of works: - for the operation of train traffic on tracks No. 1 and 2 of line No. 855 Regalica - Szczecin Port Central SPA, the provisions of the regulations for the temporary operation of traffic during the execution of works No. 47/2020, including annexes, were in force (consolidated text as of 17.03.2022 in accordance with the recommendation of PKBWK).

- The closure of track no. 1 of line Regalica - Dziewoklicz with disconnection of the overhead line was granted on an operational (emergency) basis on the basis of the Notice on Order of Track(s) Closure No. IZ18ES.606.302.2022.E6 dated 15.06.2022 for the Szczecin node.

As part of the supervision of the operation of SRK devices, in order to ensure the established safety of train traffic in 2020 and 2021, in accordance with the Construction Act and internal regulations, the diagnostic team conducted inspections of structure maintenance in terms of checking its technical condition and suitability for use, as well as diagnostic tests on Regalica subjunction.

The manager, as part of his supervision, conducted diagnostic tests that did not reveal any irregularities.

Infrastructure renewal and port development included:

- Agreement between PKP PLK S.A. and Zarząd Portów Morskich Szczecin i Świnoujście S.A. and TORPOL S.A. in Poznań on "Preparation of detailed designs and execution of construction works at the Central Port Station in Szczecin - Task 1 within the Project: "Improvement of railway access to the seaports in Szczecin and Świnoujście",
- Agreement between PKP PLK S.A. and the consortium of BBF Sp. z o.o. in Poznań (Leader) and SAFAGE S.A.S France for "Preparation of project documentation together with author's supervision within the framework of the project "Improvement of railway access to seaports in Szczecin and Świnoujście", in which the consortium assumed author's supervision duties.

Railway undertaking POLREGIO S.A. Zachodniopomorski Zakład w Szczecinie

The railway undertaking designated a railway vehicle with a certificate of permission to operate the type of railway vehicle and a valid certificate of technical railworthiness of the vehicle to perform the transportation task. The designated train crew operating the train had all authorizations and qualifications required by law. The train was operated according to a timetable.

Obligations of railway undertakings in safe driving are specified in the infrastructure manager's instruction Ir-1 - On train operation, Ie-1(E-1) - Instruction on signaling, and the railway manager's internal instruction Pt-2 - Instruction for the EMU team. Based on the analysis of the collected material, the Investigation Team did not find any irregularities in the conduct of the train crew during train operation, as well as after the occurrence.

Railway undertaking PKP Energetyka S.A.

The railway company designated a railway vehicle for the task, which had a certificate of permission to operate the type of railway vehicle and a valid certificate of technical railworthiness of the railway vehicle. The designated train crew operating the train possessed all the authorizations and qualifications required by law.

The Investigation Team found that the train crew of train Rob.1 did not fulfill its duties in dealing with safety in the event of a train stopping on a line track where it should not have stopped.

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

- POLREGIO S.A. is responsible for the maintenance of railway vehicles. The company is responsible for the maintenance of P1 and P2 levels (according to the Maintenance System Documentation - DSU), while the other maintenance levels (P3, P4) included in the DSU are carried out by external entities. The maintenance checks indicated in the DSU are carried out according to the cycles specified in the documentation.
- PKP Energetyka S.A. is responsible for the maintenance of rolling stock. PKP Energetyka S.A. is responsible for the maintenance of railway rolling stock. The company carries out the maintenance of P1, P2 and P3 levels (according to the Documentation of the Maintenance System - DSU), while the other maintenance levels (P4, P5) are performed by external companies. Based on the collected research material, the Investigation Team found no connection between the way the rail vehicles are maintained and the occurrence.

1.3. Rolling stock manufacturers or other suppliers of railway products

Based on the collected research material, the Investigation Team did not find any connection between the rolling stock manufacturers and the service providers.

1.4. National safety authorities or the European Union Railway Agency

The President of the Office of Rail Transport (UTK) supervises rail traffic safety. The Investigation Team, based on the collected research material, found no connection between the national safety authority and the investigated occurrence.

1.5. Notified bodies, designated bodies or risk assessment authorities

The Investigation Team did not find a link to the accident from the notified bodies and risk assessment authorities based on the investigation material collected.

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

The Investigation Team, based on the collected research material, did not find a link between the railway operator's certification body and the investigated occurrence.

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

The investigative team identified the following individuals and entities associated with the occurrence: Designer, company exercising Author's Supervision, Construction Manager, Works Manager, Acceptance Committee, Diagnostician.

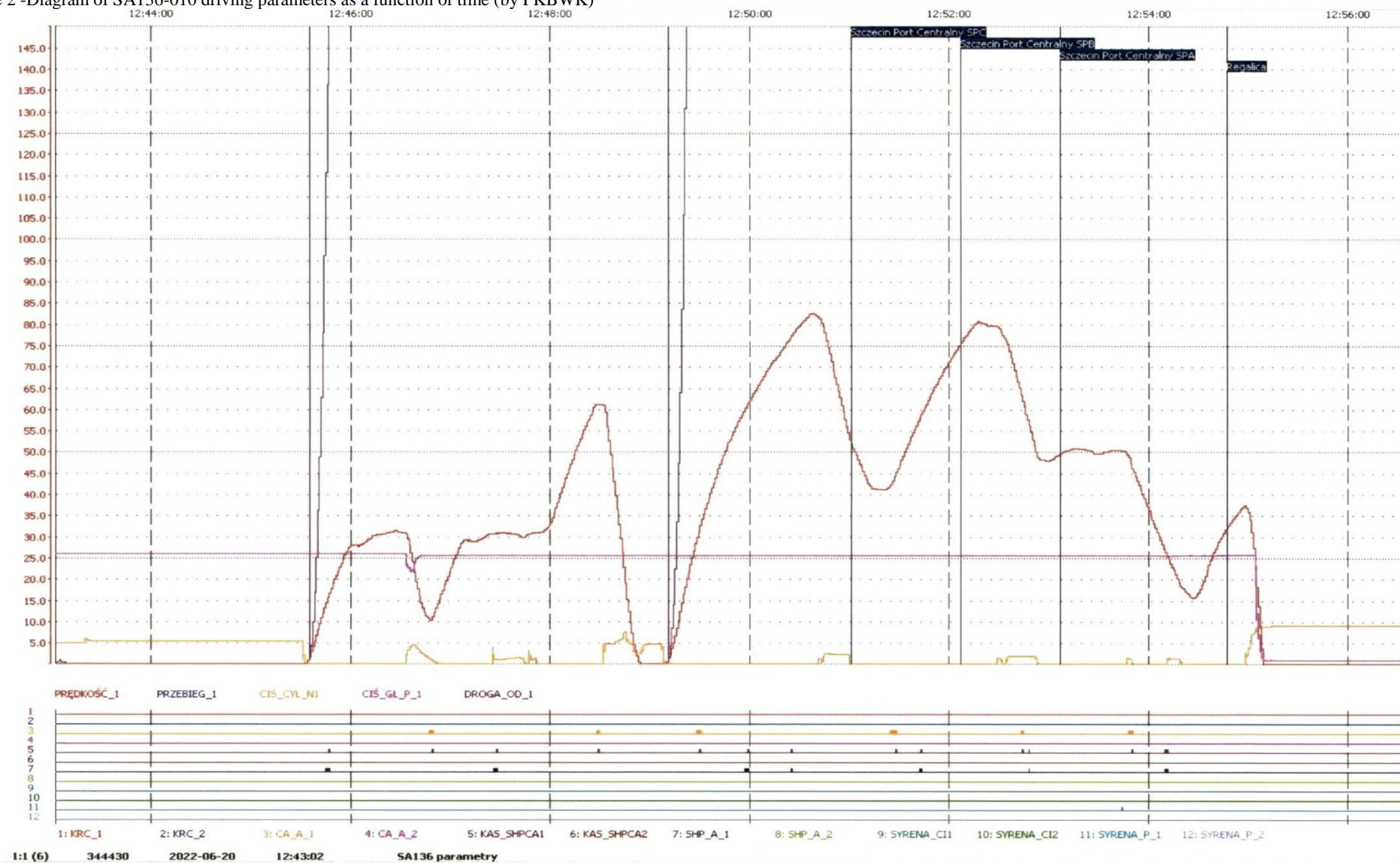
2. Rolling stock and technical installations

Railway vehicles:

The SA136-010 drive series rail vehicle is equipped by the manufacturer with the ATM RP4H electronic driving parameter recording system, serial no. 0080/11, as well as a system for recording the foreground image and voice from inside the vehicle.

The Investigation Team analyzed selected parameters of the train ROM 88628/9, recorded in the electronic data recorder, to study the train's driving characteristics up to the moment of the occurrence. The driving parameters of the train on section from Szczecin Central Station to the moment of stopping at Regalica junction post are shown in the diagram below with a description.

Figure 2 -Diagram of SA136-010 driving parameters as a function of time (by PKBWK)



The parameters of the ROM 88628/9/9 train recorded from 12:45:34 to 12:55 were analyzed.

- 12:45:34 start of the train at the departure station Szczecin Główny, increase of speed to 30 km/h and performing control braking, reducing the speed to 10 km/h,
- 12:48:53 train stop at Szczecin Port Central station,
- 12:49:10 train departure from Szczecin Port Central station to 12:50:38 train speed increase to about 82 km/h,
- 12:50:38 service braking and reduction of running speed to about 41 km/h - before the entrance semaphore to Szczecin Port Central SPB traffic post, then from 12:51:22 to 12:52:17 increase in running speed to about 80 km/h,
- From 12:52:17 to 12:52:28 driving without power consumption, slow decrease in running speed,
- From 12:52:29 service braking - in front of the entrance semaphore to traffic post Szczecin Port Central SPA, decrease in running speed to about 50 km/h, driving at this speed until 12:53:46,
- from 12:53:46 service braking and reducing running speed to about 15 km/h due to the absence of the signal allowing entry on semaphore B2 to Regalica subjunction,
- as of 12:54:25 a.m., increase in running speed from 15 km/h to about 37 km/h,
- 12:54:58 at a speed of about 37.25 km/h a sudden increase in air pressure in brake cylinders to 3.44 bar,
- 12:55:04 a sudden drop in air pressure in the main line and a further slight increase in air pressure in the brake cylinders to 3.50 bar - indicating the implementation of emergency braking,
- 12:55:09 a.m. Train stopping on the track at km 204.079 of line 351, having traveled a braking distance of about 63 meters.

The image recording of the vehicle's foreground video recording system confirmed the above findings of the DVR data analysis.

Srk devices

The condition of the traffic control devices on the day of the occurrence (based on the Railway Commission's site inspection report).

(a) at the traffic post:

Switch no. 1 in positive (+) position - indicates occupancy; switch no. 2 in negative (-) position - indicates occupancy; switches no. 3ab and 3cd in negative (-) position - indicates occupancy; restricted track from semaphore B2 to track 2 in direction to Szczecin Zdroje subjunction; sbl signal box on track 2 in direction of Szczecin Zdroje subjunction; sbl interlocking on track 1 set from the direction to Szczecin Zdroje subjunction; Eap signal box on track 1 and 2 to Dziewoklicz subjunction in neutral state; C-type interlocking to Szczecin Port Central SPA station on track no. 1 permission block unlocked (white colored slot), end block locked (white colored slot), start block unlocked (white colored slot); on track no. 2 permission block locked (red colored slot), end block unlocked (red colored slot), start block unlocked (white colored slot); repeaters of semaphores A1, A2, B1, B2, C1, C2 indicate signal S1 "Stop".

(b) on the ground:

Rz 1 position plus (+) - occupied (maintenance train Rob.1); Rz 2 position minus (-) - occupied, train 88628/9; Rkpd 3ab/3cd in position minus (-) - occupied, train 88628/9; semaphores A1, A2, B1, B2, C1, C2 indicate signal S1 "Stop".

(c) internal equipment:

Relay room door closed; relays Jz1, Jz2, Jz3 de-energized; relay Kn1+ energized; relay Kn2/3cd- energized; relay Kn3ab- energized; relay Ub2 de-energized.

After the occurrence, the Railway Commission inspected the equipment in the relay room and found bridging of contacts 17-18 and 19-20 of relay 2 Pkn1-.

The Investigation Team found out that the bridge connection was used for the reconstruction of track no.

1 of line Regalica subjunction - Szczecin Port Central SPA in order to eliminate the dependence of the run from SPA on track 2 to Szczecin Zdroje on track 2 on the position of switch No. 1 (during the works the switch was permanently closed with lock UZZ1 in positive (+) position) and to enable the display of the enabling signal on semaphore B2. After the repair track No. 1 was put into operation on 05.09.2021. When track No. 1 was put into operation, the dependency was not restored, only the switch permanent lock was removed. Traffic on both tracks on route Regalica subjunction - Szczecin Central Port SPA was carried out

with bridges installed (no dependence on the position of switch no. 1 in the negative (-) position, which protects the run from SPA on track 2 to Szczecin Zdroje on track 2). This type of traffic was operated until the day of the accident (for 288 days).

3. Human factors

3.1. Human and individual characteristics

The investigation revealed that the train dispatcher on duty stopped the train at a location where he should not have stopped it. In addition, the train dispatcher on duty:

- Failed to restore the devices to its basic condition after the passage of train Rob.1,
- Failed to check the route for the passenger train, i.e., failed to ensure that there were no obstacles in the route for train No. ROM 88628/9.

The train crew of maintenance train Rob.1 stopped this train without ensuring that the stoppage do not endanger the safety of railway traffic.

3.2. Job-related factors

The Investigation Team raised no objections to the factors related to the position of the train dispatcher and the EMU driver.

3.3. Organizational factors and tasks

According to § 42(2) of the Regulation of the Minister of Infrastructure of January 11, 2021 on employees in positions directly related to the operation and safety of railway traffic and the operation of certain types of railway vehicles (Journal of Laws of 2021, item 101) and safety of railway traffic and the operation of certain types of railway vehicles (Journal of Laws of 2021, item 101), *the authorization shall be carried out: and in item 3 "in the case of introduction of organizational or technical changes affecting the manner of performance of activities in a given railway position."*

In the course of the works, there were significant changes in the traffic organization, which affected the way of performing activities at the train dispatcher post, i.e.: changes in the dependency table on Regalica subjunction in terms of performing activities. After these changes, the Infrastructure Manager did not issue any authorizations to the operating personnel.

The relaxation of the infrastructure manager's internal rules in relation to the provisions of the national regulations, which led to the failure to carry out authorizations after technical changes, was identified by the Investigation Team as a systemic factor.

3.4. Environmental factors

The event took place during daylight hours, with cloudy sky, occasional rainfall, temperature around +15° C. No work was carried out around Regalica subjunction. Environmental factors did not influence the event.

3.5. Any other factors relevant to the investigation

The Investigation Team's analysis showed that there was no flow of necessary information between the investor, the construction manager, the project engineer and the designer regarding significant changes affecting railway safety during the project. The lack of such communication led to the permanent cancellation of the dependency of switch no. 1 in the SRK devices after the completion of the investment phase on Regalica subjunction, and this procedure was inconsistent with the findings of the SMS-PW-09 procedure.

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

Conditions for an appropriate regulatory framework

4.1. Processes, methods, content and results of risk assessment and monitoring activities carried out by any of the involved parties: railway companies, infrastructure managers, entities in charge of maintenance, maintenance workshops, other maintenance providers,

manufacturers and other entities, as well as the independent assessment reports referred to in Article 6 of Implementing Regulation (EU) No. 402/2013

From 10 to 16 November 2021, a diagnostic test was carried out on Regalica subjunction by a diagnostician. As can be seen from the diagnostic test protocol No. IZATA5/87/11/2021, the mileage was checked in items Nos. 1, 2 and 3 of the dependency table. When checking the dependencies for the runs in positions 2 and 3, irregularities in the dependency of these runs should be revealed (turnover No. 1 for these runs should be dependent in the protective minus (-) position).

The above-mentioned investigation of the diagnostic team did not reveal the abrogated dependence of semaphore B2 indications on the position of switch No. 1. The above was considered by the Investigation Team as a contributing factor.

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

Railway infrastructure manager PKP Polskie Linie Kolejowe S.A.

The Safety Management System (SMS) at PKP Polskie Linie Kolejowe S.A., was introduced by Resolution No. 30/2011 of January 24, 2011 on the adoption of an order introducing the Safety Management System at PKP Polskie Linie Kolejowe S.A.. A summary of selected SMS elements in force at PKP PLK S.A. is presented in the table below.

Table 1 - Summary of selected SMS elements used by PKP PLK S.A related to the occurrence

No.	Symbol/ Procedure no.	Name of document / procedure
Main process		
1.	SMS-PG-01	Provision of railway infrastructure and operation of railway traffic
Supporting process procedures		
2.	SMS-PW-01	Maintenance of the railway line in technical and organizational efficiency
	SMS/MMS-PR-02	Technical and operational risk assessment
	SMS/MMS-PR-03	Change management
	SMS/MMS-PD-05	Corrective and preventive actions
3.	SMS/MMS-PW-03	Dealing with railway occurrences
4.	SMS-PW-04	Conducting rail accident recovery operations
5.		Risk register
6.	SMS-PW-09	Safe design of railway infrastructure and principles of cooperation with designers
7.	SMS-PW-11	Cooperation with investment contractors

The Risk register maintained by the Infrastructure Manager contains a risk with the content "Triggering of SRK devices to allow the issue of an authorization signal with an improperly arranged runway".

Procedure SMS-PW-09 Safe design of railway infrastructure and principles of cooperation with designers specifies:

§1 - *The purpose of the procedure is to determine the requirements for the design of railway infrastructure within the framework of the Company's investment activities (including the construction of new infrastructure), as well as the principles of cooperation at each stage of the design process.*

§2 - *The procedure applies to all organizational units of the Company, in particular to the Investment Execution Center, the Investment Execution Center Regions (regions) and the Railway Line Departments,*

whose scope of activity, as defined in the organizational regulations, includes the task of providing the documentation necessary for the preparation and implementation of the investment process.

§8 Author's supervision and as-built design

(1) Upon approval of the design and commencement of construction, the Contracting Authority shall implement the provisions of the Contract Terms on the Author's Supervision, at the same time notifying the Designer of his obligations under the relevant provisions of the Contract with the Contractor and the Contract with the Engineer (the Construction Supervisor), if provided for in the Construction Contract.

(2) The designer shall perform the tasks covered by the author's supervision and, in the event of the need to make significant changes to the project (as defined by the Construction Code), shall follow the rules established at the stage of the project's implementation (§6) and its approval (§7).

(3) The designer shall prepare the as-built design in accordance with the terms of the contract or a separate agreement with the owner and submit it to the owner.

Despite inclusion of the aforementioned provisions in the procedure, the investor did not comply with their provisions.

Railway undertaking POLREGIO S.A.

The Safety Management System (SMS) at POLREGIO S.A., was introduced by Resolution No. 312/2020 of September 23, 2020 on the adoption of the Order introducing the Safety Management System Issue III at POLREGIO S.A. Summary of selected SMS elements used at POLREGIO S.A.

Table 2 - Summary of selected elements of SMS POLREGIO sp. z o. o. related to the occurrence

No.	Document no.	Name of document / procedure
1.	01	Transportation process
SUBSYSTEMS OF THE SECURITY MANAGEMENT SYSTEM		
2.	11	Purchase and maintenance of railway vehicles
3.	21	Competency management in positions: 1. directly related to the operation and safety of railway traffic and the driver and operator of railway vehicles, 2. indirectly related to the operation and safety of railway traffic.
4.		Register of risks and hazards
5.		Security improvement program for 2022

As a result of the analysis of the SMS documentation of POLREGIO S.A. in relation to the circumstances, course and consequences of the occurrence, the Investigation Team did not raise any objections to the functioning of the SMS with regard to the implementation of the transport process, the management of the employees' competencies, the employees' familiarity with the SMS system, the handling of rail transport hazards, the availability of up-to-date versions of individual procedures. The company keeps a register of risks and identified risks.

Railway undertaking PKP Energetyka S.A.

As a result of the analysis of the SMS documentation of PKP Energetyka S.A. in comparison with the circumstances, course and consequences of the occurrence, the Investigation Team did not raise any objections to the functioning of the SMS in terms of implementation of the transport process, management of employee competencies, employee familiarity with the SMS system, handling of rail transport hazards, availability of up-to-date versions of individual procedures. The company keeps a register of risks and identified hazards.

Table 3 -Summary of selected SMS elements used at PKP Energetyka S.A. relevant to the occurrence

No.	Symbol/ Procedure no.	Name of document / procedure
Main process		
1.	SMS-01	Implementation of the transportation process
Supporting process procedures		
2.	SMS-14	Carrying out maintenance of powered railway vehicles
3.	SMS-10	Safety assessment
4.	SMS - 02	Change management
5.	SMS - 09	Dealing with a railway hazard or occurrences
6.	SMS - 04	Risk register - risk assessment
7.		Security improvement program for 2022

4.3. Management system of the entity(ies) in charge of maintenance and maintenance workshops, taking into account the functions set forth in Article 14(3) of and Annex III to Directive (EU) 2016/798 and any subsequent implementing acts

Not applicable.

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

The President of UTK in 2019 - 2022 carried out two inspections within the scope of operation of the Railway Line Department in Szczecin, including the safety of ongoing works on railway lines. These inspections did not include the investment task carried out within the framework of the project "Improvement of Railway Access to Seaports in Szczecin and Świnoujście", i.e. the area that included the site.

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

Railway infrastructure manager: PKP Polskie Linie Kolejowe S.A. holds:

Security Authorization:

- EU number PL2120210000,
- release date 26.02.2021,
- expiration date 01/03/2026,
- Type of infrastructure; normal-track (99.2%), broad-track (0.8%).

Size of managed infrastructure:

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

Railway undertaking: POLREGIO S.A.:

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

Railway undertaking: PKP Energetyka S.A. has:

1) Safety Certificate - Part A:

- EU numberPL1120190005,
- release date26.03.2019,

- expiration date09.04.2024,
- type of transportation freight without transport of dangerous goods,
- volume of transportless than 500 million ton-kilometer per year,
- company size ... large.

The Part A safety certificate covers railway sidings operated by PKP Energetyka S.A.

2) Safety Certificate - Part B:

- EU number PL1220200003,
- release date21.01.2020,
- expiration date09.02.2025,
- type of transportation..... freight without transport of dangerous goods,
- lines served: PKP Polskie Linie Kolejowe S.A.; PMT Linie Kolejowe sp. z o. o.; PKP Szybka Kolej Miejska w Trójmieście sp. z o. o.; "Kopalnia Pisku KOLTARNIA - Linie Kolejowe" sp. z o.o.; Jastrzębska Spółka Kolejowa sp. z o.o.; CTL Maczki Bór S.A.; Infra Silesia S.A.; CARGOTOR sp. z o.o.; "Euroterminal Sławków" sp. z o.o.

4.6. Other systemic factors

The Investigation Team considered as a systemic factor of the occurrence the relaxation of the infrastructure manager's internal regulations in relation to the provisions of the national regulations, which led to the failure to carry out authorization after technical changes. The infrastructure manager introduced in its internal regulations and safety management system relaxed approval requirements in relation to the provisions of the Regulation of the Minister of Infrastructure of January 11, 2021 on employees working in positions directly related to the operation and safety of railway traffic and the operation of certain types of railway vehicles (Journal of Laws of 2021, item 101).

Instruction Ia-5: "§ 28.5(3) and § 28.7(9), *the manager is required to carry out authorization in the event of organizational or technical changes that have a **significant** impact on the way the activities of a given position are performed at the workplace, including a change in the dependency system of signaling devices and the introduction of universal locks into service. Carrying out of the authorization should be recorded in part V of the register of exams for the positions of train dispatcher, switchman, automation officer and track master.*"

On the other hand, the regulation states: "§ 42 1. *As a condition for allowing employees to perform activities in a particular railway position, they must obtain authorization carried out by the employer.*

2 *Authorization is carried out:*

- 1) *before being allowed to carry out activities independently on a particular railway post;*
- 2) *in the event of a change in the place of work, type of railway vehicle, or when the interruption of work in a railway post lasted more than 6 months;*
- 3) *in the event of organizational or technical changes affecting the way activities are carried out at a particular railway post.*"

5. Previous events of a similar nature

The Investigation Team analyzed accidents that occurred under similar circumstances between 2019 and 2021 as part of its investigation.

A brief description of the events and their consequences.

1. Railway incident occurred on February 5, 2021 at 09:37 at Gogolin station in track no. 6, at km 22,400 of railway line No. 136 Kędzierzyn Koźle - Opole Groszowice, area of infrastructure manager PKP PLK S.A. Railway Line Department in Opole.

On 05.02.2021 at 09:37 the train 844000 entered the station Gogolin on the permissive signal on semaphore Z^{1/2} on a restricted track, carrying out a run Z²₆. The train was running on an improperly prepared route. The improperly set switch of turnout No. 42 (not independent in the run) directed to turnout No. 39ab and then to the non-electrified turnout No. 8 instead of the main auxiliary track No. 6. Having noticed the improperly prepared route, the driver applied the emergency brake and lowered the pantographs. The front of train no. 844000 stopped behind the switch of turnout no. 39ab on track no. 8 at km 22.455.

The factors that contributed to the occurrence of the aforementioned occurrence were the failure to comply with the provisions of the internal regulations of the infrastructure manager and railway operator regarding the organization of train traffic in the station and on the line, as well as failure to comply with the procedures for the acceptance of traffic control equipment and its commissioning, and the improper supervision of the designer.

2. Railway incident of category C 41 occurred on July 30, 2019 at 16:53 at Złocieniec station, track No. 2, at km 114.131, railway line No. 210 Chojnice - Runowo Pomorskie, area of infrastructure manager PKP Polskie Linie Kolejowe S.A. Railway Line Department in Szczecin.

On July 30, 2019, at 16:53, the train APM 88247 from Złocieniec station was dispatched on the basis of a written order "S" from the station track No. 2, which does not have an exit semaphore, in direction of Jankowo Pomorskie station. The signalman incorrectly prepared the route of the train, instead of track no. 1, he prepared the route on track no. 2. The train APM 88247 left on track no. 2 instead of track no. 1 of line Złocieniec - Jankowo Pomorskie in the opposite direction to the main line. At 17:02 from Jankowo Pomorskie station, train ZXS 889252 was dispatched on the same track (track no. 2), based on written order "S". The trains continued on the same track in opposite directions until 17:07. At this time the driver of train APM 88247 made a "radio stop" and the fronts of the trains stopped at a distance of about 600 meters from each other.

3. Serious accident of category A 13 occurred on March 9, 2020 at 04:15 at Szymankowo station, track No. 2, at km 287.360 of railway line No. 9 Warszawa Wschodnia Osobowa - Gdańsk Główny, area of infrastructure manager PKP Polskie Linie Kolejowe S.A. Railway Line Department in Gdynia.

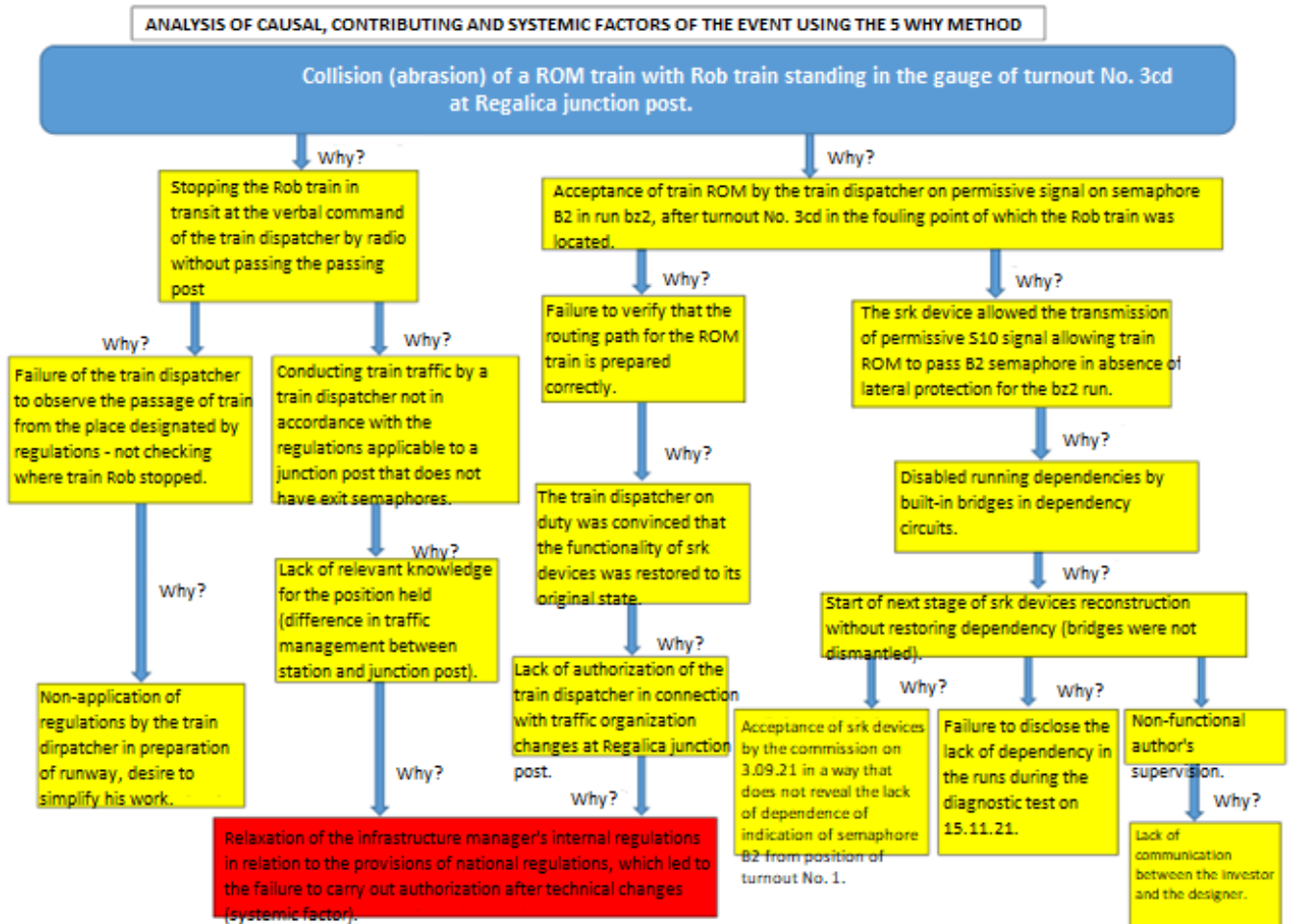
On 09.03.2020, at about 04:15, the motor bogie WMB10-182 (work train Rob.1), while moving from the closed track no. 2 to station Szymankowo, bypassed the entrance semaphore "P" transmitting the signal S1 "Stop". At the same time, on track no. 1 Tczew - Szymankowo in the same direction, train LTE 555122 was running, which had a route from this mainline track to track no. 2 of Szymankowo station. The route of this train included, among others, turnout 26. After the train LTE 555122 passed the entrance semaphore "O", which transmitted the signal "S6 - free road, running at a speed not exceeding 100 km/h...", the train, continuing on the track connecting track No. 1 with track No. 2, at a speed of 76.7 km/h, collided with the motor bogie WMB10-182, which had stopped at turnout No. 26, located in the running track of this train. As a result of the collision two people were killed: the driver of the motor bogie and the track fitter driving with him, the motor bogie WMB10-182 was destroyed, the electric locomotive E186-261 and elements of the railway infrastructure were also damaged.

In the incidents described in points 2 and 3, the factors contributing to the occurrences were non-compliance with the provisions of the internal regulations of the Infrastructure Manager and Railway Operator regarding the organization of train traffic in the station and on the line.

V. CONCLUSIONS

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

The Investigating Team found that during the run of train ROM 88628/9 (POLREGIO Joint Stock Company) Szczecin Główny - Kołobrzeg line (rail bus type 219M) on track no 2 from station Szczecin Port Central SPA (line 855) via Regalica junction post at the permissive signal on semaphore B2, in direction of the junction post Szczecin Zdroje (on line 351) at turnout no 3, there was a collision with a maintenance train Rob.1, which was standing at turnout no. 1 in the fouling point of switch no. 3. The signal allowing the passage of this train on the semaphore was displayed with an improperly laid route (missing protective path and missing fouling point). The display of the signal was possible only due to the dependence of the point No. 1. This exclusion remained from the previous stage of work.



2. Measures taken since the occurrence

There was no need to make recommendations.

3. Additional notes

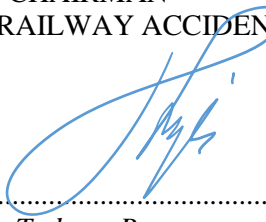
There is no correspondence between the route descriptions in the Technical Regulations, i.e., Appendix 5 to Plot 39, and the Dependency Table and Schematic Plan.

VI. SAFETY RECOMMENDATIONS

Recommendations resulting from the investigation:

- 1) The Infrastructure Manager PKP PLK S.A. will ensure the supervision of the quality of the implementation of the Company's investment process and diagnostic process.
- 2) The Infrastructure Manager PKP PLK S.A. will strengthen the system of supervision of training and authorization of employees in connection with organizational or technical changes affecting the way they perform their activities.
- 3) The Infrastructure Manager PKP PLK S.A. will adapt its internal regulations to the provisions of the Ordinance of the Minister of Infrastructure of January 11, 2021 on employees working in positions directly related to the operation and safety of rail transport and the operation of certain types of rolling stock (Journal of Laws of 2021, item 101) with respect to the following authorizations.

CHAIRMAN
STATE COMMISSION ON RAILWAY ACCIDENT INVESTIGATION



.....
Tadeusz Rys

List of abbreviations appearing in the contents of Report **No. PKBWK 02/2023**

No.	Symbol (abbreviation)	Explanation
<i>1</i>	<i>2</i>	<i>3</i>
1.	EUAR	European Union Agency for Railways
2.	MSWiA	Ministry of the Interior and Administration
3.	UTK	Office of Rail Transport
4.	PKBWK	State Commission on Railway Accidents Investigation
5.	IZ	PKP PLK S.A. - Railway Lines Department
6.	IZDD	PKP PLK S.A. – Department dispatcher
7.	podg	Junction post

Definitions of selected terms used in the Report:

"Causal Factor" means any act, omission, event, or condition, or combination thereof, which, if corrected, eliminated, or avoided, would more likely than not have prevented the Event,

"Contributing Factor" means any act, omission, event or condition that influences the occurrence of an Event by increasing its likelihood, accelerating its consequences over time or increasing the severity of its consequences, but the elimination of which would not have prevented the Event,

"Systemic factor" means any causal or contributing factor of an organizational, managerial, social or regulatory nature that may influence similar and related events in the future, taking into account in particular the conditions of the regulatory framework, the design and implementation of the safety management system, personnel qualifications, procedures and maintenance.