



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

REPORT No. PKBWK 01/2024

**on the investigation of a railway accident
that occurred on 19 January 2023 at 18:37 hrs
on the Szczecin Podjuchy – Szczecin Port Centralny SPA route,
km 349.520 of track no. 1, railway line no. 273 Wrocław Główny – Szczecin Główny,
the area of infrastructure manager PKP PLK S.A. Railway Line Plant in Szczecin**

WARSAW, 16 January 2024

<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 the provisions of *Commission Implementing Regulation (EU) 2020/572 of 24 April 2020 on the reporting structure to be used for railway accidents and incidents investigation report*
(OJ L 132 of 27 April 2020)

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I. SUMMARY

Type of occurrence: Accident.

A description of the occurrence: A train collision, a train running into another train.

Moving train LTE 785009 (locomotive alone) operated by railway carrier CTL Logistics Sp. z o.o. from Rzepin to Szczecin Port Centralny SPB12 ran into the last wagon of freight train TME 684013 operated by railway carrier POL-MIEDŹ TRANS Sp. z o.o. from Głogów Wróblin to Reclaw which was stationary before an entrance semaphore B to the Szczecin Port Centralny SPA station.

Date and time of the occurrence: 19 January 2023, 18:37 hrs.

Place of the occurrence: Railway line no. 273 Wrocław Główny – Szczecin Główny, single-track route Szczecin Podjuchy – Szczecin Port Centralny SPA, km 349.520, geographical coordinates: 53°22'17.4"N 14°35'13.6"E.

Consequences of the occurrence: As a result of the occurrence, the locomotive E182-055-4 of train LTE 785009 operated by railway carrier CTL Logistics Sp. z o.o. and last wagon no. 8451 5944675- 4 (loaded with stone) of train TME 684013 operated by railway carrier POL-COPPER TRANS Sp. z o.o. were damaged.

Causal factor: Dispatching train LTE 785009 (locomotive alone) from the Szczecin Podjuchy station to the Szczecin Port Centralny SPA station on a single-track route occupied by train TME 684013, which in consequence led to train LTE 785009 running into the rear of train TME 684013.
(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)

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) Telephone confirmation of the arrival of train TME 684013 by the signaller at the Szczecin Port Centralny SPA train signalling point to the signaller at the Szczecin Podjuchy train signalling point, without verifying whether the train concerned entered the Szczecin Port Centralny station.
- 2) Telephone clearance by the signaller at the Szczecin Port Centralny SPA train signalling point for the signaller at the Szczecin Podjuchy train signalling point to dispatch train LTE 785009 from the Szczecin Podjuchy station when the route was occupied by train TME 684013.
- 3) Non-compliance with the content of telephone signalling messages in accordance with the templates provided in Supplement 2 to "Instruction on operating rail traffic Ir-1" when managing traffic on the basis of train signalling by telephone.
- 4) Failure by the signaller at the SPA point to establish contact despite being called twice by the driver of train TME 684013 after the change of the train communication channel and after that train stopped before the entrance semaphore B to SPA indicating the "Stop" signal.
- 5) Conversations unrelated to the operation of rail traffic with persons in the SPA traffic operation post building, leading to decreased concentration on the part of the signaller at the Szczecin Port Centralny SPA train signalling point.

- 6) Limited ability of the driver of train LTE 785009 to notice the Pc 5 train end signal (day) of a stationary train TME 684013 due to hours of darkness, position of the track curve and illumination of the construction site and lights of vehicles working at the construction site adjacent to the plain track.
- Systemic factor:** None.
- Recommendations and their addressees:**
- 1) Infrastructure manager PKP PLK S.A. shall, within the framework of its periodic and additional training and courses for signallers, place particular emphasis on the prescribed use of telephone signalling messages when managing traffic on the basis of train signalling by telephone, as prescribed in Instruction Ir-1.
 - 2) Infrastructure manager PKP PLK S.A. shall extend particular supervision to workers directly involved in rail traffic management (traffic officers, point operators) with less than two years of employment.
 - 3) Infrastructure manager PKP PLK S.A. shall enhance actions concerning periodic replays of recorded conversations from traffic operation posts, in particular under restriction in force (signalling by telephone, issuing orders and reporting readiness of routes).
 - 4) Infrastructure manager PKP PLK S.A. shall introduce permanent supervision of the correct use of telephone signalling messages when managing traffic on the basis of train signalling by telephone, in accordance with templates contained in Instruction Ir-1.
 - 5) Infrastructure manager PKP PLK S.A. shall verify the presence, in the railway network under its management, of the W28 "Radio channel indicators" at the locations of change of the prescribed train radio communication channel.
 - 6) In order to ensure good visibility of the return reflection from Pc 5 signal disks (day) on curves, the railway carriers shall implement the obligation to use Pc 5 signal disks "Marking of the end of a train or another rail vehicle" in accordance with the technical requirements laid down in Part II of Instruction Ie-102 "Technical requirements for indicators and signal discs" on freight trains operating on railway lines managed by PKP Polskie Linie Kolejowe S.A.
 - 7) Railway carrier CTL Logistics Sp. z o.o. shall ensure supervision of the correct setting of the real time in traction vehicle recorders.
 - 8) The infrastructure managers shall procure that works contractors eliminate visibility of sources of light illuminating their construction sites in the area of active railway tracks which dazzle drivers of rail vehicles.

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on the Szczecin Podjuchy – Szczecin Port Centralny SPA route,
w km 349.520 of track no. 1, railway line no. 273 Wrocław Główny – Szczecin Główny



Photograph 1. A view of the occurrence site (source: the railway commission)



Photograph 2. A view of the effects of the occurrence (source: the railway commission)

II. THE INVESTIGATION AND ITS CONTEXT

1. The decision to establish an investigation

Chairman of the State Commission on Rail Accident Investigation (hereinafter referred to as "PKBWK" or "the Commission") Tadeusz Ryś issued decision no. PKBWK.590.3.2023 of 27 January 2023 on establishing an investigation to explain the causes and circumstances of a rail accident on 19 January 2023 at 18:37 hrs on the Szczecin Podjuchy – Szczecin Port Centralny SPA route, track no. 1, km 349.520 of railway line no. 273 Wrocław Główny - Szczecin Główny. Taking into consideration the provisions of Article 28e(4) of the Act on rail transport (Journal of Laws of 2021, item 1984, as amended), hereinafter referred to as "the Rail Transport Act", the occurrence was reported on 30 January 2023 to the European Union Railway Agency and was registered in the EURA's database under number PL-10366.

2. The motivation to the decision to establish an investigation

Based on an analysis of the circumstances of the occurrence, considering that it was an accident which under slightly different conditions would have been a serious accident disrupting the functioning of structural subsystems or interoperability constituents, and that it represents a series of accidents concerning the system as a whole, in accordance with Article 28e(3)(2) of the Rail Transport Act, the Chairman of PKBWK decided to establish an investigation to be conducted by the Commission's Investigation Team.

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

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 knowledge and competencies regarding the investigation concerned.

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

In accordance with Article 28h(2)(5) of the Rail Transport Act, the Chairman of PKBWK obliged the designated members of the railway commission to cooperate with the Investigation Team on a permanent basis under a written request PKBWK.590.3.1.2023 of 30 January 2023 addressed to their employers, and to hand over the accumulated documents of the investigation.

On 15 February 2023, the documentation accumulated by the railway commission was officially handed over in the registered office of the Railway Line Plant of PKP Polskie Linie Kolejowe S.A. in Szczecin.

Within the framework of the investigation, the Chairman of the Commission requested cooperation from the entities involved with the occurrence under investigation, i.e. from:

- the infrastructure manager – PKP Polskie Linie Kolejowe S.A.,
- the railway carrier – POL-MIEDŹ TRANS Sp. z o.o.,
- the railway carrier – CTL Logistics Sp. z o.o.

In accordance with Article 28k of the Act of 28 March 2003 on rail transport, the Commission shall enable the participants, witnesses and other parties concerned and involved in the accident to know the conduct of the investigation and view the draft report in order to submit their opinions, information or any comments regarding the report. Opinions submitted by the entities concerned were analysed at a meeting of the Commission held on 16 January 2024.

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

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

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

Throughout the process aimed at explaining the causes and circumstances of the occurrence, the investigation Team relied on their own knowledge, experience and established findings.

The documentation gathered by the railway commission and the Investigation Team was used.

Within the framework of the investigation, the Investigation Team applied *inter alia* the following methods:

- an inspection of the occurrence site after the accident,
- on-site verifications at the occurrence site,
- interviews with the signallers, train drivers and other workers,
- an analysis of the documentation submitted by the rail infrastructure manager and railway carriers,
- an analysis of the contents of the train event data recorders,
- an analysis of the recorded imagery of the train's driving foreground,
- an analysis of the recorded conversations between the train signalling points,
- an analysis of the recorded radio correspondence.

Below is a list of selected legal acts, rules and internal instructions used during the investigation:

European Union rules:

- 1) Regulation (EU) No. 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), and the related Act of 10 May 2018 on the protection of personal data (Journal of Laws of 2018, item 1000, 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, p. 10).
- 3) Directive (EU) 2016/798 of the European Parliament and of the Council of 11 May 2016 on railway safety (OJ L 138, 26.05.2016, p. 102, as amended).

National rules:

- 1) Act of 28 March 2003 on rail transport (consolidated text: Journal of Laws of 2021, item 1984, as amended),
- 2) Act of 26 June 1974 on the Labour Code (consolidated text: Journal of Laws of 2022, item 1510, as amended),
- 3) Regulation of the Minister of Infrastructure of 11 January 2021 on personnel employed on positions related directly to the conduct and safety of rail traffic and to driving of specific types of rail vehicles (Journal of Laws of 2021, item 101, as amended),

- 4) Regulation of the Minister of Infrastructure of 18 July 2005 on general conditions for rail traffic and signalling (consolidated text: Journal of Laws of 2015, item 360, as amended),
- 5) Regulation of the Minister of Infrastructure and Construction of 16 March 2016 on serious accidents, accidents and incidents in rail transport (Journal of Laws of 2016, item 369).

Internal instructions and regulations of rail infrastructure manager PKP PLK S.A.

- 1) Ir-1 Instruction on operating rail traffic,
- 2) Ir-2 (R-7) Instruction for signal box personnel,
- 3) Ir-5 Instruction for using railway radio communication devices,
- 4) Ir-8 Instruction on the handling of serious accidents, accidents and incidents in rail transport,
- 5) Ie-1(E-1) Instruction on signalling operations,
- 6) Ie-5 (E-11) Instruction on the rules of operating and conducting works on rail traffic control devices,
- 7) Ie-7 (E-14) Instruction on technical diagnostics and periodic inspections of rail traffic control devices,
- 8) Ie-10 (E-18) Instruction on operation of relay rail traffic control devices,
- 9) Ie-102 Technical requirements for indicators and signal discs,
- 10) Ik-2 Instruction on inspections concerning rail traffic safety,
- 11) Ia-5 Instruction on professional preparation and development of workers of PKP Polskie Linie Kolejowe S.A.,
- 12) Technical Rules for the Szczecin Port Centralny SPA traffic operation post,
- 13) Technical Rules for the Szczecin Podjuchy traffic operation post,
- 14) Work rules for workers of PKP Polskie Linie Kolejowe S.A. – Railway Line Plant in Szczecin,
- 15) Collective Labour Agreement for workers of "PKP Polskie Linie Kolejowe Spółka Akcyjna".

Internal instructions of railway carrier POL-MIEDŹ TRANS Sp. z o.o.

- 1) Train Driver Instruction TKt-1.

Internal instructions of railway carrier CTL Logistics Sp. z o.o.

- 1) CTL 1 Instruction on the work and responsibilities of a traction vehicle driver,
- 2) CTL 3 Instruction on the maintenance of traction vehicles.

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

The Investigation Team was unable to determine the appropriateness of long-term operation of rail traffic on the basis of telephone train signalling because the "Book of inspections of rail traffic control devices..." from the Szczecin Podjuchy point, kept for the period 21 September 2022 and 9 January 2023, was not made available.

9. Any interaction with the judicial authorities.

The case under investigation did not require any interaction with the judicial authorities.

10. Other information relevant in the context of the investigation

None.

III. A DESCRIPTION OF THE OCCURRENCE

1. The occurrence and background information

1.1. The description of the occurrence type

A train collision, i.e. train LTE 785009 (an E182-055-4 locomotive alone) operated by railway carrier CTL Logistics Sp. z o.o. from Rzepin to Szczecin Port Centralny SPB182 ran into the last wagon of freight train TME 684013 operated by railway carrier POL-MIEDŹ TRANS Sp. z o.o. from Głogów Wróblin to Reclaw which was stationary before an entrance semaphore B to the Szczecin Port Centralny SPA station indicating the S1 "Stop" signal.

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

The occurrence took place on 19 January 2023 at 18:37 hrs on the Szczecin Podjuchy – Szczecin Port Centralny SPA route, railway line no. 273 Wrocław Główny– Szczecin Główny, track no. 1, km 349.520, geographical location: 53°22'17.4"N 14°35'13.6"E.

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 in hours of darkness, overcast, poor visibility, ambient temperature was -2°C. An electrified single track route.

The geometrical layout of the Szczecin Podjuchy – Szczecin Port Centralny SPA route:

- from km 348.788 to km 348.934 the track is in curve with the radius of R=300 m,
- from km 348.934 to km 349.254 the track is straight,
- from km 349.254 to km 349.622 the track is in curve with the radius of R=753 m (the occurrence site is at km 349.520),
- from km 349.622 to km 350.355 the track is straight.

Near the plain track, to its left, there is a woodland, and to the right there were works in progress as part of the project "*Conversion of bridges to ensure minimum clearance*" on the railway bridge at km 349.140 of railway line no. 273 (Szczecin Podjuchy). The scope of the works included *inter alia* construction of a new railway bridge over the Regalica River and conversion of the infrastructure at the Szczecin Podjuchy station and on the Szczecin Podjuchy – Szczecin Port Centralny SPA route.

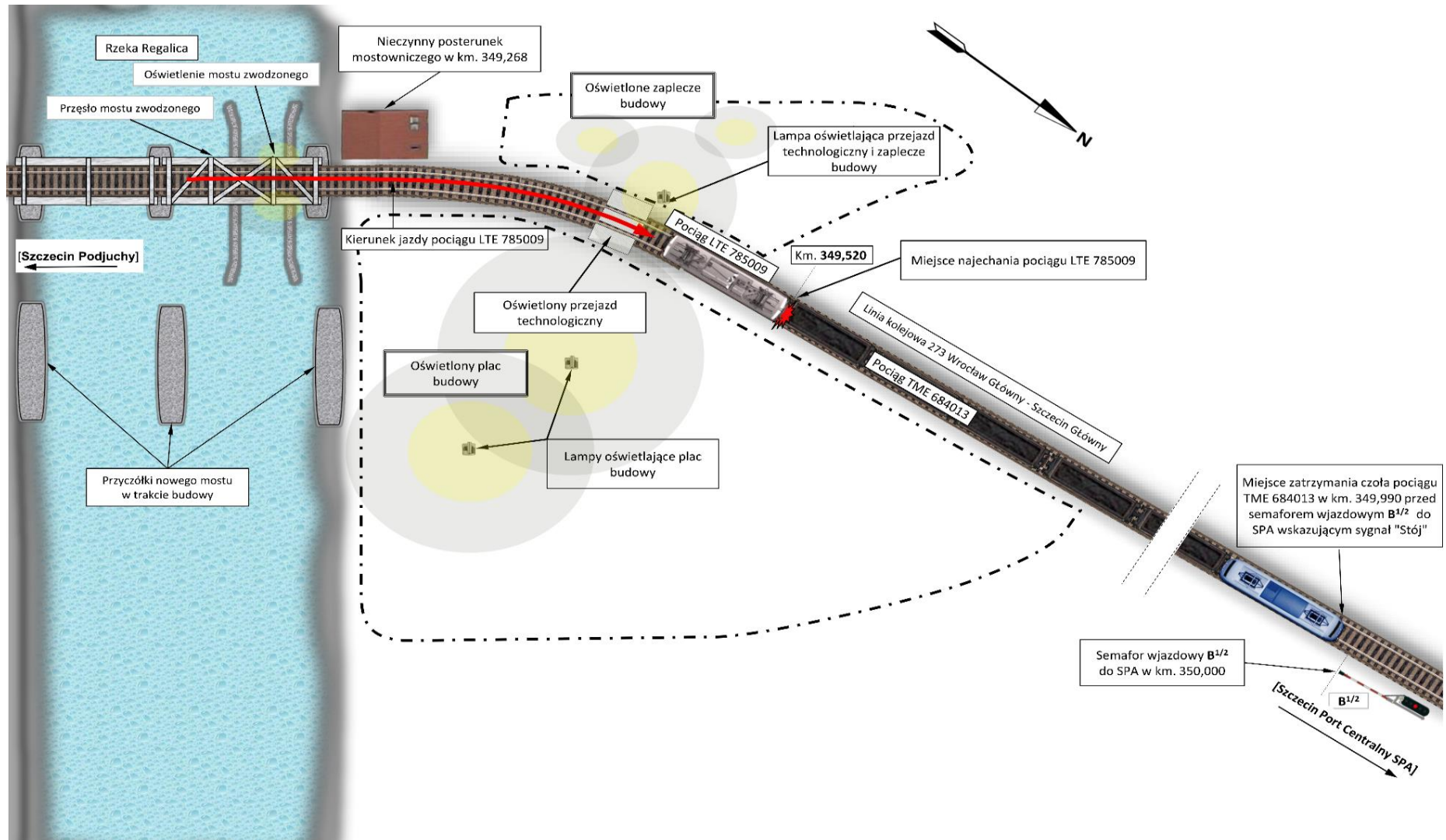
A view of the railway route and the adjacent construction site is show in Photograph 3.



Photograph 3. A general view of the route and the site of the occurrence as seen from the driver cabin in daylight on 19 January 2023. Visible is the construction site whose illumination at nighttime hindered observation of the route by the driver of the rail vehicle (materials of the railway commission).

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



1.4. Deaths, injuries and material damage

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

No person was injured in the occurrence.

b) cargo, luggage and other property

No damage to items or cargo carried in the train occurred.

c) rolling stock, infrastructure and the environment

As a result of train LTE 785009 running into the last wagon of train TME 684013, the E182 055-4 locomotive was damaged. Damaged were *inter alia* the head wall of Cabin A (the central part at the headlights was indented to the inside of the vehicle), both buffer devices, the draw device, the skin of the front beam, bogie pivots and steps on the head of the cabin together with their mounting.

The damage to the Eamos 84 51 5944 675 4 wagon of train TME 684013 included both buffer devices (the left buffer was knocked into the wagon), the solebar, the end sill, the draw device. Furthermore, there was damage to the lower part of the head wall and a section of the left side wall connected directly with the head wall. Additionally, the shunting step and its mounting were damaged.

There was no damage to the rail infrastructure or pollution of the natural environment.

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

The occurrence caused disruption to train traffic on the Szczecin Podjuchy - Szczecin Port Centralny SPA route from 18:40 hrs to 00:50 hrs on 20 January 2023.

As a result of the disruption caused train delays by 1561 minutes, and replacement bus service was provided:

- carrier POLREGIO S.A. for trains: 80573, 88547, 78507, 87508, 88526, 88562 on the Szczecin Podjuchy - Szczecin Główny - Szczecin Podjuchy section
- carrier PKP INTERCITY S.A. for train 3805 on the Szczecin Podjuchy - Szczecin Główny section and for train 81170 for passengers travelling via Kostrzyn, Rzepin, Zbąszynek.

Train 81170 operated by PKP INTERCITY S.A. on the Szczecin Główny - Warszawa Gdańska route was detoured via Krzyż on line 351.

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

The Investigation Team identified the following persons directly involved in the occurrence:

- the signaller at the Szczecin Port Centralny SPA train signalling point – a worker of infrastructure manager PKP PLK S.A.
- the signaller at the Szczecin Podjuchy train signalling point – a worker of infrastructure manager PKP PLK S.A.
- the driver of train TME 684013 - a worker of railway carrier POL-MIEDŹ TRANS Sp. z o.o.
- the driver of train LTE 785009 - a worker of railway carrier CTL Logistics Sp. z o.o.

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

Pol-Miedź Trans Sp. z o.o.

Train TME 684013 operated by carrier POL-MIEDŹ TRANS Sp. z o.o. on the route Głogów Wróblin – Reclaw was formed of a 111Ed-009 locomotive and 34 loaded coal wagons. Locomotive no. EVN PL-RCF 91 51 5170 079-5 has "*Release to service and notice of return to operation*" no. 600255 of 24 November 2022. All wagons of train TME 684013 had valid maintenance certificates.

The last wagon of train TME 674013 had train end signals used on German railways, as shown in Photograph 4.



Photograph 4. The train end signal used on train TME 684013 (next to it is a non-reflective sheet of white paper for comparison)

Train set details – from the brake test sheet:

– length of the train	470 m
– total mass of the train	2753 tonnes
– total mass of the set	2673 tonnes
– required braked mass percentage	47%
– required braked mass	1256 tonnes
– actual braked mass percentage	64%
– actual braked mass	1710 tonnes

CTL LOGISTICS Sp. z o.o.

An E182 055-4 series (EVN 91 51 3 150 668 4) locomotive driving as train LTE 785009 on the Rzepin - Szczecin Port Centralny SPA route. Release to service no. 06/01/23/REMKOL/182-055 was issued on 19 January 2023 after a P2 maintenance check. The locomotive has "Release to service and notice of return to operation" no. 02/2023/182-055 issued on 19 January 2023.

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

- 1) Track:

Rail type	– 60E1 - year 2010
Sleepers	– prestressed concrete, PS94 type - year 2010
Attachment type	– SB type
Ballast type	– 35 cm gravel
Maximum permitted train speed en route	– passenger 110 km/h – freight 70 km/h

Level curve radius at the occurrence site – 753 m from km 349.254 to km 349.622
Rail inclination at the occurrence site – 7.1 ‰ along the length of 300 m from km 349.400 to km 349.700

2) Rail traffic control devices:

Block system – Single-ended (manual) Type C block system, bi-directional, without plain track occupancy detection, installed before 2014.
Station devices at Szczecin Podjuchy – mechanical, centralised with the light signalling system
Station devices at Szczecin Port Centralny SPA – computer rail traffic control devices, Local Control Station (Polish: *Miejscowe Stanowisko Obsługi*, MSO) equipped with a MOR-1.1 computer control panel
Signalling system – lights

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

None.

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 19 January 2023, rail traffic on the Szczecin Podjuchy - Szczecin Port Centralny SPA route was operated on the basis of telephone train signalling.

Telephone train signalling on the plain track from the Szczecin Podjuchy station to Szczecin Port Centralny SPA station was introduced on 28 November 2022 at 09:31 hrs by a signaller at the Szczecin Podjuchy station at the request of the technical acceptance commission. The request was recorded in the book of inspections of rail traffic control devices by the technical acceptance commission and forwarded to the signaller on 28 November 2022 at 08:20 hrs before commencing the check of rail traffic control devices and point machines. On 29 November 2022 at 14:30 hrs, the acceptance commission completed the check of the devices, finding they were operational and ready to clear for service. Furthermore, the commission upheld the earlier restrictions which remained in force by the day of the accident (nearly two months, as mentioned in Point 8, Chapter II of this report).

On the day of the occurrence, departures of trains from the Szczecin Podjuchy station in the direction of the Szczecin Port Centralny station were based on clearance signals on semaphores. The block system devices operated correctly and were operated in addition to operation of traffic on the basis train signalling.

On 19 January 2023 at 18:23 hrs, the signaller at the Szczecin Podjuchy station's Sj point telephoned the signaller at the Szczecin Port Centralny station's SPA point, announcing the time of departure of train no. 484017 at 18:12 hrs, and the SPA signaller acknowledged its arrival at 18:20 hrs. That train was dispatched on the basis of telephone train signalling backed by auxiliary operation of serviceable block system.

During that telephone conversation, the Sj signaller announced another train, no. 684013, in the direction of SPA point. After that announcement, a discussion ensued between the signallers concerning the route of that train because the signaller at the SPA point said during the conversation that he could not see train no. 684013 in "the system". After a short discussion, the SPA signaller said: "It is Pol-Miedź, isn't it? OK, OK, good to go".

After receiving telephone clearance at 18:24 hrs to dispatch the train, and with the clearance block after the previous train no. 484017 still unblocked, the signaller at the Szczecin Podjuchy station's Sj point dispatched train TME 684013 at 18:28 hrs on the clearance signal shown by the P semaphore on the plain track in the direction of the Szczecin Port Centralny station and blocked the initial block, while at the SPA point the SPA's track layout diagram displayed information about a train on route in the form of a red arrow. While continuing driving on the route, the driver of train TME 684013 called the SPA point at 18:29 hrs on the radio to check communication after changing the radio channel in accordance with the timetable from R5 to R6, but he did not receive any response from the signaller. After several seconds, the driver of train TME 684013 called the SPA point on the radio again to report that he was ahead of the entrance semaphore, but he did not receive any response from the signaller either. Train TME 684013 stopped before at the entrance semaphore B, which was showing the signal Stop, and waited for entry to the Szczecin Port Centralny SPA station. At the same time, train CD Cargo TME 884051 was entering from the Regalica junction on track 15. Train TME 884051 passed through the SPA control area at 18:35 hrs.

At 18:34 hrs, the signaller at the Szczecin Podjuchy station's Sj point telephoned the signaller at the Szczecin Port Centralny station's SPA point and reported the departure time of train TME 684013 – 18:28 hrs, which had been already on route and waiting for entry to the the SPA area.

The signaller at the SPA point replied: *"hold up, I've messed up here, 4840... we've already noted that down"*

The signaller at the Szczecin Podjuchy station's Sj point: *"684013, and in that 484017 it was 12 and 20"*

The signaller at the SPA point: *"Hold up, I've messed up here, OK OK, from remark, when did it depart from you?"*

The signaller at the Szczecin Podjuchy station's Sj point: *"28",*

The signaller at the SPA point: *"It arrived to me at 33",*

The signaller at the Szczecin Podjuchy station's Sj point: *"33 and that funny loner 785009",*

The signaller at the SPA point: *"785009, aha it is up CTL, OK good to go",*

The conversation ended at that.

At 18:35 hrs, the signaller at the Szczecin Podjuchy station's Sj point telephoned the SPA point signaller again said: *"You haven't returned the block on that previous one" - (about train 684013 waiting for entry to SPA – as established by PKBWK),*

The signaller at the SPA point: *"What, what?"*

The signaller at the Szczecin Podjuchy station's Sj point: *"You haven't given the block on the previous one, and now you will not return it to me, or will you?"*

The signaller at the SPA point: *"No, I won't. I can see as if something is travelling from you."*

The signaller at the Szczecin Podjuchy station's Sj point: *"Good, good".*

At 18:38 hrs, the signaller at the SPA point telephoned the Szczecin Podjuchy station's Sj point and asked: *"R....., what do you want me to return to you. You have announced me train 684012, haven't you?"*

The signaller at the Szczecin Podjuchy station's Sj point: *"Sze, sze, yep."*

The signaller at the SPA point: *"You have announced now, and it has now departed from you and is heading to me, yes?"*

The signaller at the Szczecin Podjuchy station's Sj point: *"785009 departed at 18..."*

The signaller at the SPA point: *"And that 684012?"*

The signaller at the Szczecin Podjuchy station's Sj point: *"Hasn't it arrived?"*

The signaller at the SPA point: *"But 778, hold up 'cause I've messed up here."*

The signaller at the Szczecin Podjuchy station's Sj point: *"So has that 684013 entered, or not?"*

The signaller at the SPA point: *"No, it hasn't."*

The signaller at the Szczecin Podjuchy station's Sj point: *"No?"*

The signaller at the SPA point: *"No no, wait 684012, where is it then?" And has that lone one departed from you yet?"*

The signaller at the Szczecin Podjuchy station's Sj point: *"Yes."*

The signaller at the SPA point: *"785009?"*

The signaller at the Szczecin Podjuchy station's Sj point: *"Yes."*

The signaller at the SPA point: *"Look, I've lost a train somewhere then, ha ha ha."*

The signaller at the Szczecin Podjuchy station's Sj point: *"Has it or hasn't it entered to you?"*

The signaller at the SPA point: *"Well, no no, really. Know what? That CD has entered to me, and that 684012 - what could happen to it?"*

The signaller at the Szczecin Podjuchy station's Sj point: *"684013 was from me".*

The signaller at the SPA point: *"What time did it depart from you?"*

The signaller at the Szczecin Podjuchy station's Sj point: *"At 28."*

The signaller at the SPA point: *"What time is it now?"*

The signaller at the Szczecin Podjuchy station's Sj point: *"39."*

The signaller at the SPA point: *"So it hasn't arrived to me, 684012, it is standing at the semaphore here."*

The signaller at the Szczecin Podjuchy station's Sj point: *"Oh, sweet Jesus",*

The signaller at the SPA point: *"Yep".*

It transpires from the above conversations between the signallers that after receiving acknowledgement of the arrival of train 684013 to SPA, the signaller at the Szczecin Podjuchy station's Sj point at 18:34 hrs requested clearance to dispatch train LTE 785009. After receiving telephone clearance at 18:35 hrs to dispatch lone locomotive LTE 785009, the signaller at the Szczecin Podjuchy station's Sj point displayed a replacement signal on entrance semaphore B. Train LTE 785009 was dispatched at 18:37 hrs to the plain track Szczecin Podjuchy - Szczecin Port Centralny SPA occupied by train TME 684013 (although the block devices indicated that the route was occupied).

After clearing the drawbridge, the driver of train LTE 785009 raised the pantograph and continued driving with the speed of 43 km/h. While passing the construction site situated along the track, and illuminated by lamps that limited his field of vision, in his headlights he saw dim reflections of train end signals. He immediately initiated emergency braking, but the locomotive did not stop, and at 18:37 hrs it ran at the speed of 43 km/h into the end of train TME 684013, stationary at the B semaphore and waiting for entry to the SPA area.

After speaking to the signaller at the Szczecin Port Centralny SPA point and learning that he had dispatched train no. 785009 on an occupied route, the signaller at the Szczecin Podjuchy station used the "Radiostop" button on the radio in the signal box - channel R5. The transmission of the signal was recorded on the recorder at 18:38 hrs. The signal did not cause any train to stop (there was no train within the range of the radio). Train no. 785009 did not receive the signal because it had already switched to channel R6 as per timetable. The signal was sent after train no. 785009 ran into the end of stationary train no. 684012. The signaller decided to use "Radiostop" without knowing the location of the dispatched train in order to prevent accident.

To ensure anonymisation required under the GDPR, the transcript uses the name of the job without indicating the actual sex of the persons involved.

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

After the occurrence took place, at 18:39 hrs the driver of train LTE 785009 called the SPA signaller: *"SPA to 785009 alone".*

The call was received by a worker who was taking the signaller night shift in the SPA signal box. That signaller asked with surprise: *"So 785009 is travelling from Podjuchy now. Yes?"*

In response, the driver of train LTE 785009 answered: *"It's no longer going. It's stationary on that freighter's a...se"*.

Then the SPA signaller was called by the driver of train TME 684013 waiting for entrance: *"SPA to 684013"*.

In response, the SPA signaller from the day shift replied: *"I'm signalling entrance then"*.

The driver of train LTE 785009 made sure whether he had been read by SPA: *"SPA, did you read me?"*. In response, he heard: *"Yes, I did"*.

After receiving that answer, the driver of train LTE 785009 reported: *"I've smashed the locomotive on that freighter's a...se"*, to which the SPA signaller replied: *"OK, so we are not signalling entrance then"*.

After receiving information about the occurrence from the driver of train LTE 785009, the SPA signaller notified: the Szczecin Podjuchy station signaller at 18:41 hrs, the plant dispatcher at 18:42 hrs, and the line dispatcher at 18:43 hrs.

The plain track was closed at 18:41 hrs and train traffic was stopped. A rescue train UNIROLLER from Stargard was dispatched to clear the effects of the accident; departure at 19:50 hrs, arrival on site at 20:50 hrs. Permission to commence clearing the effects of the occurrence was issued by the commission at 21:00 hrs. Train TME 684013 entered SPA on track 15 at 21:31 hrs (the last wagon remained on route), and was cleared by the commission to continue travel at 01:16 hrs on 20 January 2023. A PKP CARGO SM42-758 locomotive and a CTL Logistics SM42-2291 locomotive were requested to tow the damaged rolling stock away. Departure of the locomotive to tow the damaged rolling stock, as rescue train Rat-2, on the closed track at 22:12 hrs. The damaged locomotive and wagon were removed from the route at 00:27 hrs on 20 January 2023. The plain track was checked and cleared for scheduled speeds. The track was opened at 00:50 hrs on 20 January 2023. The damaged locomotive and wagon were moved to track no. 2 of the Szczecin Port Centralny SPB - Szczecin Port Centralny SPC route to be uncoupled. The vehicles were uncoupled at 02:10 hrs. In order to clear plain track no. 2, the damaged locomotive and wagon were moved to track no. 609 at the Szczecin Port Centralny at 02:47 hrs.

IV. ANALYSIS OF THE OCCURRENCE

1. Roles and responsibilities

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

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

The primary business of PKP PLK S.A. includes:

- operation of rail traffic and administration of railway lines, as well as maintenance of railway lines in the condition that ensures safe and efficient carriage of persons and objects, regularity and safety of rail traffic, fire protection, and protection of the environment and property in the railway area;
- provision of rail infrastructure to applicants and carriers in accordance with applicable procedures on setting of charges and publication of unit rates.

The manager responsibilities concerning safe operation of rail traffic are set forth in the Instruction on operating rail traffic Ir-1, Instruction on signalling operations Ie-1 (E-1) and the Technical rules for traffic operation posts.

On 19 January 2023, rail traffic on the Szczecin Podjuchy - Szczecin Port Centralny SPA route was operated on the basis of telephone train signalling.

Telephone train signalling on the plain track from the Szczecin Podjuchy station to Szczecin Port Centralny SPA station was introduced on 28 November 2022 at 09:31 hrs by a signaller at the Szczecin Podjuchy station at the request of the technical acceptance commission. The request was recorded in the book of inspections of rail traffic control devices by the technical acceptance commission and forwarded to the signaller on 28 November 2022 at 08:20 hrs before commencing the check of rail traffic control devices and point machines. On 29 November 2022 at 14:30 hrs, the acceptance commission completed the check of the devices, finding they were operational and ready to clear for service. Furthermore, the commission upheld the earlier restrictions which remained in force by the day of the accident.

On the day of the occurrence, departures of trains from the Szczecin Podjuchy station in the direction of the Szczecin Port Centralny station were based on clearance signals on semaphores. The block system devices operated correctly and were operated in addition to operation of traffic on the basis train signalling.

On analysing the documentation gathered and listening to recorded conversations, the Investigation Team identified irregularities in the conduct of the signallers at Szczecin Podjuchy and Szczecin Port Centralny SPA points concerning operation of train traffic on route. The irregularities in the signallers' work included:

- 1) Failure of the signaller at the Szczecin Port Centralny SPA train signalling point to check where train TME 684013 was after dispatching it from the Szczecin Podjuchy station and telephone acknowledgement to the signaller at the Szczecin Podjuchy station that the train had arrived, even though the train had not entered the Szczecin Port Centralny station.
- 2) Telephone clearance by the signaller at the Szczecin Port Centralny SPA train signalling point for the signaller at the Szczecin Podjuchy station to dispatch train LTE 785009 from the Szczecin Podjuchy station when the route was occupied.
- 3) Failure of the signaller at the SPA point to respond to calls made by the driver of train TME 684013 after the train had stopped at the entrance semaphore B to SPA.
- 4) Non-compliance with telephone signalling messages in accordance with the templates provided in Supplement 2 to "Instruction on operating rail traffic Ir-1" when managing traffic at the time when train signalling by telephone is in force.

The above irregularities were considered by the Investigation Team as factors contributing to the occurrence.

The train radio communication channel changes between the Szczecin Podjuchy and Szczecin Port Centralny SPA stations. The location of the change was not marked in the field with the indicator W28

"Radio channel change indicator". The information about the channel change is available only in timetables. The absence of the W28 indicator did not have any direct impact on the occurrence.

Railway carrier POL-MIEDŹ TRANS Sp. z o.o.

The rail vehicle designated to carry out a transport task by the railway carrier had a rail vehicle type operation approval certificate and a valid notice of return to operation. The designated train crew that operated the train held all ratings and qualifications requirement by law. The train was driven on the basis of a timetable. The railway carrier responsibilities regarding safe operation of a rail vehicle are set forth in the following infrastructure manager instructions: Instruction on operating rail traffic Ir-1, Instruction on signalling operations Ie-1 (E-1), and the railway carrier's internal instruction - Train driver instruction TKt-1.

Based on an analysis of the material gathered in the case, the Investigation Team did not find any irregularities in the conduct of the train crew during operation of the train or after the occurrence.

The train was marked by retro-reflective Pc-5 train end signals used by German railways (DB). The dimensions of the said Pc-5 train end signals differ from the dimensions specified in "Technical requirements for indicators and signal discs Ie-102" established by infrastructure manager PKP PLK S.A.

Railway carrier CTL Logistics Sp. z o.o.

The rail vehicle designated to carry out the task by the railway carrier had a rail vehicle type operation approval certificate and a valid notice of return to operation. The designated train crew that operated the train held all ratings and qualifications requirement by law.

The railway carrier responsibilities regarding safe operation of a rail vehicle are set forth in the following infrastructure manager instructions: Instruction on operating rail traffic Ir-1, Instruction on signalling operations Ie-1 (E-1), and the railway carrier's internal instruction - The instruction on the work and responsibilities of a traction vehicle driver.

The locomotive did not have any drive front recording devices.

The Investigation Team did not find any irregularities in the conduct of the train crew during operation of the train or after the occurrence.

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

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

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

The President of the Rail Transport Office (Polish: *Urząd Transportu Kolejowego*, UTK) supervises the safety of rail traffic. In 2021 - 2022 inspections were conducted on the premises of the Railway Line Plan in Szczecin concerning mainly maintenance of the rail infrastructure and safety at level crossings. As regards operation of rail traffic, there was one inspection which encompassed the command boxes at the Koszalin and Kołobrzeg stations. Based on the evidence gathered, the Investigation Team did not establish any relation between the national safety authority and the occurrence under investigation.

1.4. Notified bodies, designated bodies or risk assessment bodies

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

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

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

1.6. 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

Based on the evidence gathered, the Investigation Team did not establish any relation between any other person or entity and the occurrence under investigation.

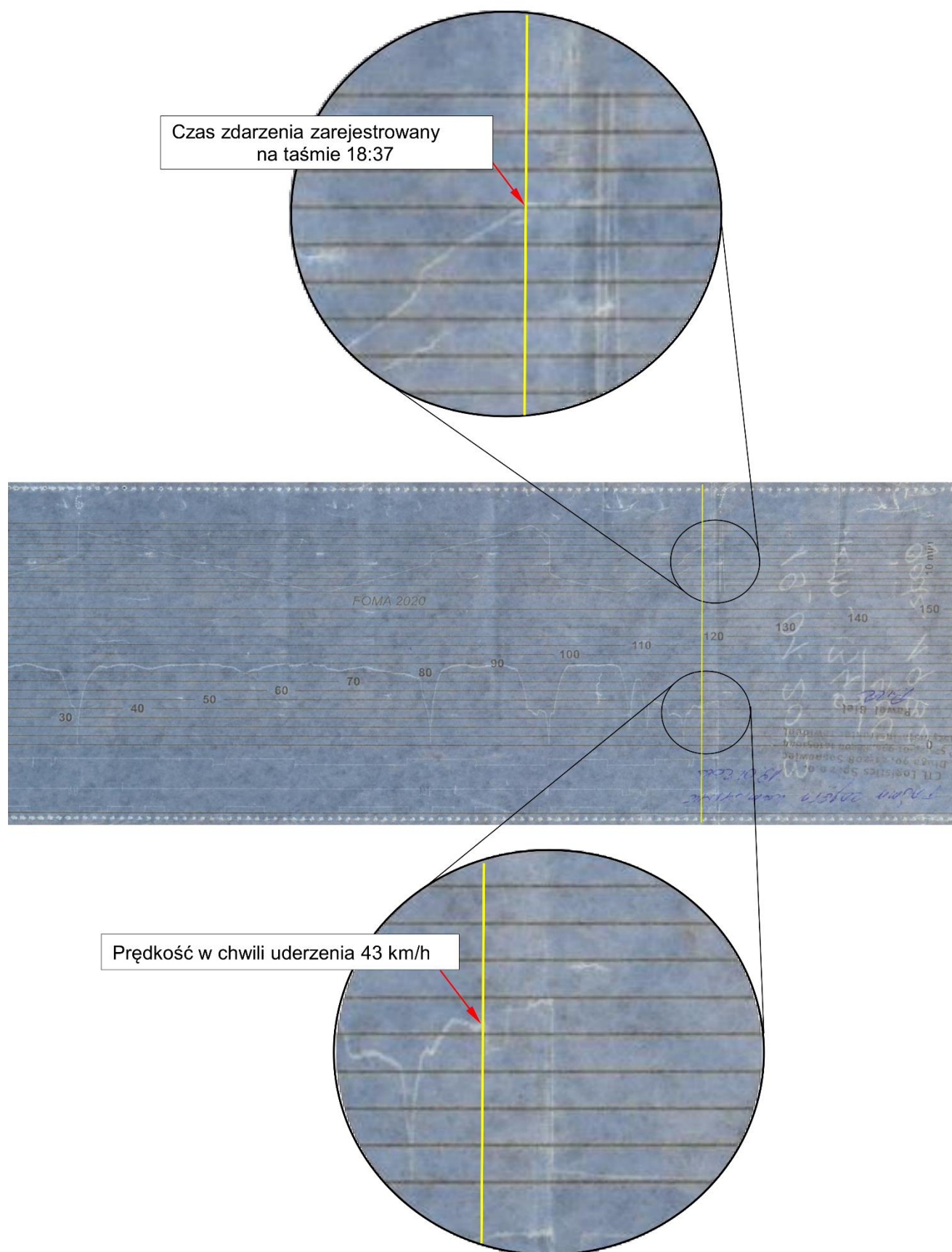
2. Rolling stock and technical installations

E182 locomotive no. 055-4 is equipped by the manufacturer with Hasler Bern RT 9 train event data recording system no. 26795.

The vehicle did not have a system for recording its driving forward imagery or voices inside the vehicle.

The Investigation Team analysed selected train event data recorded by the data recorder to investigate the train driving characteristics immediately prior to the occurrence. The rail vehicle driving parameters on the section from the Szczecin Podjuchy station and the moment of the occurrence, i.e. running into the last wagon of train no. TME 684013 are shown in the tape scan with a description below.

The time recorded on the tape is inconsistent with the actual time – it is shifted by 12 hours.



Photograph 5. A scan of the speedometer tape from the E182 - 055 loc. (prepared by PKBWK)

Recorded on the tape were the following driving parameters of train LTE 785009:

1. speed,
2. driving and stopping time,
3. pressure in the brake cylinders,
4. use of the automatic train stop and active vigilance cancel button,
5. movement with power intake,
6. control from Cabin A.

At 18:35 hrs, following a short stop at the Szczecin Podjuchy station, there was started to the speed of around 36 km/h and then to the speed of around 42-43 km/h. After a brief speed reduction to 38 km/h, there was a speed increase to 43 km/h, and a sudden speed decrease to 0 km.h at 18:37 hrs.

3. Human factors

3.1. Human and individual characteristics

The occurrence took place 20 minutes before the end of the working shift of the signallers at the SPA and S_j points. The scope of responsibilities before the end of the working shift is greater because apart from operating traffic actions must be taken to handover the documentation. The increased scope of responsibilities and arrival of the replacement could have led to decreased concentration as regards activities relating to operation of rail traffic.

As shown by an analysis of the evidence gathered, the SPA control area was being transited by freight train CD Cargo no. 884051 from the direction of the Regalica junction at 18:35 hrs, followed by passenger train no. 88843 at 18:45 hrs. The transit of the freight train prevented entry of train no. 684013 travelling from the Szczecin Podjuchy station. Such a situation had an impact on the errors made by the signaller at the SPA point in carrying out the job duties, which in consequence led to the accident.

Dispatching a train on an occupied plain track, the signaller at the Szczecin Podjuchy station did not comply with the provisions of §22(7)(e), (f) of Instruction Ir-1.

The short work experience on the job was an additional circumstance: the signaller at the SPA traffic operation post - 16 months, and the signaller at the Szczecin Podjuchy station - 7 months.

A sobriety check of the signallers and the driver of train LTE 785009 did not show alcohol content in exhaled air.

Based on an analysis of the material gathered in the case, the Investigation Team did not find any irregularities in the conduct of the train crews during operation of the trains or after the occurrence.

3.2. Job factors

The Investigation Team did not raise any reservations regarding job factors relating to the signallers and traction vehicle drivers.

3.3 Organisational factors and assignments

As it transpires from the evidence material collected by the Investigation Team, the infrastructure manager and railway carriers had ensured that their personnel involved in the occurrence had the legally required rest time. The workers held all ratings and authorisations required by the applicable law and instructions for actions performed on the job concerned. The employer provided them with all necessary instructions and regulations ensuring safe performance of their jobs.

The investigation Team established that telephone train signalling had been in force on the Szczecin Podjuchy – Szczecin Port Centralny SPA route, despite correct functioning of the Type C single-ended (manual) bidirectional block system without plain track occupancy detection from 28 November 2022 until the day of the accident.

Telephone train signalling was introduced due to replacement of point machines at switches no. 43a/b, 43c/d and 48 at the Szczecin Podjuchy station and operations on replacement signals at those switches. Following

the completion of the works, on 29 November 2022 at 14:30 hrs the acceptance commission established that the devices were fit for service, the required seals had been affixed, and that operations at switches 43 and 48 could be conducted on clearing signals, but the earlier restriction were left in force.

The continued validity of telephone train signalling on the Szczecin Podjuchy – Szczecin Port Centralny SPA route for nearly 2 months after the causes for its introduction had ceased, with the correctly functioning block devices, caused that the signallers at the Szczecin Podjuchy and Szczecin Port Centralny SPA stations ignored the correct indication of the block system.

3.4. Environmental factors

The occurrence took place at nighttime, with overcast sky and temperature of some -2° C. In the area of the place of the occurrence, to the right of the plain track, there were intensive works in progress related to the "Conversion of bridges to ensure minimum clearance" project.

The investigation Team considered that restricted ability to monitor the route on the part of the driver of the CTL Logistics E182-055 locomotive was a contributing factor due to the curve of the track and illumination of the construction site adjacent to the plain track which caused dazzling after clearing the bridge and reduced visibility of reflective signals of the end of the rain on the track. The train end signals used are shown in Photograph 4.

The Pc-5 train end signal disks affixed to the last wagon of train TME 674013 did not meet the requirements laid down in "Technical requirements for indicators and signal disks Ie-102".



Photograph 6. A general view of the route immediately after clearing the bridge over the Regalicą River (a frame from the footage recorded by the rear right mirror camera of the locomotive of train TME 684013)



Photograph 7. A view from around 100 m ahead of the occurrence site (a frame from the footage recorded by the rear mirror camera of the locomotive in train TME 684013)

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

The Investigation Team did not identify any other factors.

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

The Investigation Team did not identify any systemic factors that had impact on the occurrence concerned. No feedback or control mechanisms, including risk and safety management or the monitoring process, did not have impact on the occurrence.

5. Previous occurrences of a similar character

As part of the investigation, the Investigation Team analysed selected occurrences that took place in similar circumstances in 2016 - 2021.

- 1) On 24 November 2017 at 06:48 hrs, on the Warlubie – Laskowice Pomorskie route, the rear of train no. 512022 travelling from Gdynia Port to Stara Wieś and led by an 181-088 electric locomotive operated by carrier LOTOS Kolej Sp. z o.o., stationary under an entrance semaphore W^{1/2} at the Laskowice Pomorskie station, was run into by train no. 564000 travelling from Chruściel to Wróblin Głogowski and led by an E483-201 locomotive operated by carrier POL-MIEDŹ TRANS Sp. z o.o. which did not stop under the last block semaphore of automatic multi-block system no. 4250P with the W18 indicator. The collision resulted in damage to the E181-088 locomotive (flat spots due to the push over following the collision) and inactive 111Ed-003 series locomotive included in the set of train no. 564000 (damaged absorbers).
- 2) On 30 July 2019, train APM 88247 operated by Spółka Przewozy Regionalne Sp. z o. o. on the Szczecinek - Szczecin Główny route was dispatched from the Złocieniec station at 16:53 hrs in the direction of the Jankowo Pomorskie station under a written order "S" from station track no. 2 which did not have an exit semaphore. The point operator incorrectly prepared the train route by routing it on plain

track no. 2 instead no. 1. Train APM 88247 entered on track no. 2 instead no. 1 of the Złocieniec – Jankowo Pomorskie route in the direction opposite to the principal direction. At 17:02 hrs, train ZXS 889252 operated by ZRK - DOM Sp. z o. o. in Poznań on the Szczecin Dąbie – Złocieniec route was dispatched from the Jankowo Pomorskie station on the same track (plain track no. 2) under a written order "S". The trains continued driving on the same track in opposite directions until 17:07 hrs when the driver of train APM 88247 used "Radiostop" and the trains stopped around 600 metres from each other.

- 3) On 9 March 2020 at 04:15 hrs, at the Szymankowo station, a WMB10-182 motor bogie (work train 1) travelling from closed plain track no. 2 to the Szymankowo station ignored a "P" entrance semaphore showing the signal S1 "Stop". At the same time, train LTE 555122 (an E186-261 locomotive, carrier HSL Polska Sp. z o. o.) travelling from Gdynia Port GPA to Malbork was driving on plain track no. 1 Tczew – Szymankowo in the same direction; that train's route was set up from that plain route to track no. 2 at the Szymankowo station. After train LTE 555122 passed an entrance semaphore "O" showing the signal "S6 - route clear, driving at the speed of up to 100 km/h...", it continued driving on a track linking track no. 1 with track no. 2 and ran into (with the speed of 76.7 km/h) the WMB10-182 motor bogie from Railway Line Plant PKP PLK S.A. in Gdynia, which had stopped at switch no. 26 on its route. Two persons were killed as a result of the collision: the driver of the motor bogie and a surface fitter travelling with him, and the WMB10-182 motor bogie was destroyed; the E186-261 electric locomotive and rail infrastructure elements were also damaged.
- 4) On 31 May 2021 at 03:32 hrs, on plain track no. 1 of the Otłoczyn – Aleksandrów Kujawski route, train TME no. 824002/3 travelling from Szczecin Stołczyn to Dorohusk, operated by carrier PKP CARGO S.A. and led by an ET22- 1147 locomotive, experienced difficulties in driving on the Otłoczyn - Aleksandrów Kujawski route. A TEM2-240 locomotive operated by carrier Rail Poland Sp. z o.o. was dispatcher to assist as train no. Rob4. At km 92.818 the TEM2-240 locomotive ran into the last wagon of train TME no. 824002/3, as a result of which one bogie of the wagon was derailed and the wagon jammed against the penultimate wagon.

V. CONCLUSIONS

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

Found as the causal factor of the occurrence was dispatching train LTE 785009 (locomotive alone) from the Szczecin Podjuchy station to the Szczecin Port Centralny SPA station on a single-track route occupied by train TME 684013, which in consequence led to train LTE 785009 running into the rear of train TME 684013.

The Investigation Team considered that the contributing factors should include:

- Telephone confirmation of the arrival of train TME 684013 by the signaller at the Szczecin Port Centralny SPA train signalling point to the signaller at the Szczecin Podjuchy train signalling point, without verifying whether the train concerned entered the Szczecin Port Centralny station.
- Telephone clearance by the signaller at the Szczecin Port Centralny SPA train signalling point for the signaller at the Szczecin Podjuchy train signalling point to dispatch train LTE 785009 from the Szczecin Podjuchy station when the route was occupied by train TME 684013.
- Non-compliance with the content of telephone signalling messages in accordance with the templates provided in Supplement 2 to "Instruction on operating rail traffic Ir-1" when managing traffic on the basis of train signalling by telephone.
- Failure by the signaller at the SPA point to establish contact despite being called twice by the driver of train TME 684013 after the change of the train communication channel and after that train stopped before the entrance semaphore B to SPA indicating the "Stop" signal.
- Conversations unrelated to the operation of rail traffic with persons in the SPA traffic operation station building, leading to decreased concentration on the part of the signaller at the Szczecin Port Centralny SPA train signalling point.
- Limited ability of the driver of train LTE 785009 to notice the Pc 5 train end signal (day) of a stationary train TME 684013 due to hours of darkness, position of the track curve and illumination of the construction site and lights of vehicles working at the construction site adjacent to the plain track.

2. Measures taken since the occurrence

None.

3. Additional comments

The Investigation Team found that the rail accident site inspection report had been drawn up by the railway commission after 4 days since the day of the accident, i.e. on 23 January 2023, without any participation of representatives of the railway carriers although the latter had been present at the site of the occurrence. In the rail accident site inspection report, the representatives were only identified as persons designated for further work of the railway commission by the Director of the Railway Line Plant in Szczecin (as provided in Paragraph X(1) of the report). The foregoing is in conflict with the provisions of §8 of the Regulation of the Minister of Infrastructure and Construction of 16 March 2016 on serious accidents, accidents and incidents in rail transport (Journal of Laws of 2016, item 369). The Investigation Team considered that to be an irregularity.

VI. SAFETY RECOMMENDATIONS

- 1) Infrastructure manager PKP PLK S.A. shall, within the framework of its periodic and additional training and courses for signallers, place particular emphasis on the prescribed use of telephone signalling messages provided while managing traffic on the basis of train signalling by telephone, as prescribed in Instruction Ir-1.
- 2) Infrastructure manager PKP PLK S.A. shall extend particular supervision to workers directly involved in rail traffic management (signallers, point operators) with less than two years of employment.
- 3) Infrastructure manager PKP PLK S.A. shall enhance actions concerning periodic replays of recorded conversations from traffic operation stations, in particular under restriction in force (signalling by telephone, issuing orders and reporting readiness of routes).
- 4) Infrastructure manager PKP PLK S.A. shall introduce permanent supervision of the correct use of telephone signalling messages when managing traffic on the basis of train signalling by telephone, in accordance with templates contained in Instruction Ir-1.
- 5) Infrastructure manager PKP PLK S.A. shall verify the presence, in the railway network under its management, of the W28 "Radio channel indicators" at the locations of change of the prescribed train radio communication channel.
- 6) In order to ensure good visibility of the return reflection from Pc 5 signal disks (day) on curves, the railway carriers shall implement the obligation to use Pc 5 signal disks "Marking of the end of a train or another rail vehicle" in accordance with the technical requirements laid down in Part II of Instruction Ie-102 "Technical requirements for indicators and signal discs" on freight trains operating on railway lines managed by PKP Polskie Linie Kolejowe S.A.
- 7) Railway carrier CTL Logistics Sp. z o.o. shall ensure supervision of the correct setting of the real time in traction vehicle recorders.
- 8) The infrastructure managers shall procure that works contractors eliminate visibility of sources of light illuminating their construction sites in the area of active railway tracks which dazzle drivers of rail vehicles.

CHAIRMAN
OF THE STATE COMMISSION ON RAIL ACCIDENT INVESTIGATION

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Tadeusz Ryś

List of acronyms used in Report No. **PKBWK 01/2024**

#	Symbol (acronym)	Explanation
1	2	3
1.	EUAR	European Union Agency for Railways
2.	MSWiA	Ministry of the Interior and Administration (Polish: <i>Ministerstwo Spraw Wewnętrznych i Administracji</i>)
3.	UTK	Office of Rail Transport (Polish: <i>Urząd Transportu Kolejowego</i>)
4.	PKBWK	State Commission on Railway Accident Investigation (Polish: <i>Państwowa Komisja Badania Wypadków Kolejowych</i>)
5.	IZ	PKP PLK S.A. – Railway Line Plant (Polish: <i>Zakład Linii Kolejowych</i>)
6.	IZDD	PKP PLK S.A. – company dispatcher (Polish: <i>dyspozytor zakładowy</i>)
7.	GDPR	Regulation (EU) No. 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)