MINISTRY OF TRANSPORT, CONSTRUCTION AND MARITIME ECONOMY

State Commission for Investigation of Railway Accidents

REPORT No. PKBWK/2/2011

on investigation into Cat. A04 serious accident that occurred on 8 November 2010 at 05.30 hrs in Białystok station in the area of Bł1 executive signal box on track 1a, turnout 7, at 175.170 km of line 006 Zielonka – Kuźnica Białostocka, premises of Infrastructure Manager PKP Polskie Linie Kolejowe S.A. Zakład Linii Kolejowych w Białymstoku

Report adopted by the State Commission for Investigation
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WARSAW, 29 November 2011

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REPORT

Drawn up between 27 November 2010 and 29 November 2011 in the head office of the State Commission for Investigation of Railway Accidents (Państwowa Komisja Badania Wypadków Kolejowych, PKBWK) in the Ministry of Transport, Construction and Maritime Economy in Warsaw in relation to an A04 serious accident consisting in a failure by train 112861 from Płock Trzepowo to Sokółka, driven in double traction with diesel locomotives M62-0689 and TEM2-198, to stop before route semaphore B½ indicating signal Sr-1 'STOP' and a consequent running into the side of train 55272, which occurred on 8 November 2010 at 0530 hrs in Białystok station in the area of Bł1 executive signal box on track 1a, turnout 7, at 175.170 km of railway line 006 Zielonka – Kuźnica Białostocka, premises of Infrastructure Manager PKP Polskie Linie Kolejowe S.A. Zakład Linii Kolejowych w Białymstoku (PKP Polish Railways, or PKP PLK, Railway Facility in Białystok), by the Accident Investigation Team composed as follows:

1) Jan Andrzej Młynarczyk – Head of the Accident Investigation Team, Vice Chair of PKBWK,
2) Andrzej Kusior – temporary member of the Commission,
3) Andrzej Rodzik – temporary member of the Commission,
4) Benedykt Kugielski – temporary member of the Commission.

I. SUMMARY OF THE INVESTIGATION

1. Decision to institute a serious accident investigation, composition of the accident investigation team and description of the course of investigation

The Accident Investigation Team took over the investigation into the accident in question from the company accident commission headed by Ms Lilla Andrejuk, Train Dispatcher with PKP PLK Zakład Linii Kolejowych w Białymstoku. The company accident commission had been appointed by Director of PKP PLK S.A. Zakład Linii Kolejowych w Białymstoku under decision IZESd-732–205/10 dated 15 November 2010.

Between 13 November 2010 and 16 November 2010, the company accident commission prepared 'Serious Accident On-site Inspection Protocol' in relation to the accident consisting in a failure by a railway vehicle to stop before 'Sr1' 'STOP' signal as shown by route semaphore signal B½ that occurred on 8 November 2010 at 0530 hrs in Białystok station on track 1a, turnout 7, in the area of Bł1 signal box. The said company accident commission was composed as follows:

1. Lilla Andrejuk – PKP PLK S.A. Zakład Linii Kolejowych w Białymstoku,
2. Andrzej Jacek Kierman – PKP PLK S.A. Zakład Linii Kolejowych w Białymstoku,
3. Waldemar Wnorowski – PKP PLK S.A. Zakład Linii Kolejowych w Białymstoku,
4. Sławomir Dub – PKP PLK S.A. Zakład Linii Kolejowych w Białymstoku,
5. Bernard Gilewski – PKP PLK S.A. Zakład Linii Kolejowych w Białymstoku,
6. Andrzej Borowski – PKP PLK S.A. Zakład Linii Kolejowych w Białymstoku,
7. Tadeusz Rynkowski – PKP PLK S.A. Zakład Linii Kolejowych w Białymstoku,
8. Mirosław Gąsowski – PKP PLK S.A. Zakład Linii Kolejowych w Białymstoku,
9. Henryk Jaworski – Orlen KolTrans Sp. z o.o.,
10. Roman Lisicki – Orlen KolTrans Sp. z o.o.,
11. Roman Pluciński – Orlen KolTrans Sp. z o.o.,
12. Piotr Pawłowski – Hagans Logistic Sp. z o.o.,
13. Zbigniew Kurkelewicz – Hagans Logistic Sp. z o.o.,
14. Kazimierz Wasilewski – Hagans Logistic Sp. z o.o.,
15. Jan Szatyłowicz – PKP CARGO S.A. CTGW Białystok,

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16. Roman Cimoch – PKP CARGO S.A. CTMI 2 Białystok,
17. Cezary Andruszkiewicz – PKP CARGO S.A. CTTE Białystok,
18. Agnieszka Passon – Orlen KolTrans Sp. z o.o.,

And involved participation of:

1. Tadeusz Ryś – Chair of the State Commission for Investigation of Railway Accidents (PKBWK),
2. Jan Andrzej Młynarczyk – Vice Chair of the State Commission for Investigation of Railway Accidents (PKBWK),
3. Rafał Leśniowski – Secretary, standing member of the State Commission for Investigation of Railway Accidents (PKBWK),

Then, on 22 November 2010, pursuant to § 10 Paragraph 3 of the Ordinance of the Minister of Transport dated 30 April 2007 on serious accidents and incidents on railway lines (Journal of Laws No. 89, Item 593), PKBWK Chair Tadeusz Ryś passed decision No. PKBWK-0780-101/TR/10 in which he appointed PKBWK Vice Chair Jan Andrzej Młynarczyk as the Head of the Accident Investigation Team to operate within PKBWK in order to explain the causes of Cat. A04 serious accident that occurred on 8 November 2010 at 0530 hrs in Białystok station in Bł1 signal box area on track 1a, turnout 7, at 175.170 km of 006 Zielonka – Kuźnica Białostocka railway line. The decision also appointed the Accident Investigation Team in the following composition:

1. Andrzej Kusior – temporary member of the Commission,
2. Andrzej Rodzik – temporary member of the Commission,
3. Benedykt Kugielski – temporary member of the Commission,

The Team's purpose was to continue the investigation into the accident in question.
Pursuant to Article 28h Paragraph 2 Point 3 of the Railway Transport Act of 28 March 2003, the PKBWK Chair obliged the following members of the company accident commission, as listed in Section VIII Point 5 of 'Serious Accident On-site Inspection Protocol' dated 16 November 2010, to cooperate with the Accident Investigation Team under written requests sent to their Employers:

1. Lilla Andrejuk – PKP PLK S.A. IZ Białystok,
2. Andrzej Jacek Kierman – PKP PLK S.A. IZ Białystok,
3. Tadeusz Rynkowski – PKP PLK S.A. ISEZ Białystok
4. Roman Lisicki – Orlen KolTrans Sp. z o.o.,
5. Roman Pluciński – Orlen KolTrans Sp. z o.o.,
6. Roman Cimoch – PKP CARGO S.A. CT Białystok,
7. Cezary Andruszkiewicz – PKP CARGO S.A. CT Białystok.

2. Brief description of the occurrence, time, location and consequences of the serious accident

On 8 November 2010 at 0530 hrs, train 112861 from Płock Trzepowo to Sokółka, driven in double traction with diesel locomotives – leading locomotive M62-0689 and active tail locomotive TEM2-198 – in Białystok station on track 1a at 175.170 km, turnout 7, failed to decelerate after passing warning shield ToB indicating Ot1 and did not stop before route semaphore B½ indicating signal Sr1 'STOP', and subsequently ran into the side of the third wagon, counting from the tail, of train 55272 from Białystok to Warszawa Praga, hauled by active locomotive ET22-1030 with locomotive ET22–1055 dead-hauled at the rear, entering track 2a from track 107 along a correctly positioned driving route to signal Sr3 'Free way with speed limit' indicated on semaphore E^2. Derailed as a result of the collision were: locomotives M62-0689 and TEM2–198, two coal wagons loaded with scrap metal, one empty roofed wagon, twelve tank cars with hazardous material and five TWR (Towary Wysokiego Ryzyka – High Risk Goods) tank cars. As a result of the collision, loc. TEM2–198's fuel tank was ripped open leading to spillage and ignition of the fuel. Two tank cars exploded. The fuel spilt from the locomotive's fuel tank led to expanding the

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source of fire to the other derailed wagons and locomotives, which caught fire and were destroyed. The fire completely destroyed railway infrastructure elements on the accident site (overhead equipment, tracks, turnouts, rail traffic control facilities) and burnt down executive signal box Bł1 together with the related equipment and rail traffic control devices. The head of train 55272 stopped at 175.000 km, the rear of train 112861 stopped at 175.050 km. Train 55272 consisted of an active locomotive ET22-1030, dead-hauled locomotive ET22–1055 and 7 (seven) freight wagons, including two LPG tank cars. Train 112861 consisted of locomotives M62-0689 and TEM2-198 and 32 tank cars, including 12 tank cars with UN1202 diesel oil and 20 tank cars with UN1268 petroleum distillates.

3. Description of the immediate cause of the serious accident and of indirect causes identified in the course of investigation

a) immediate cause:
Train 112861's failure to stop before route semaphore B½ indicating signal Sr1 'Stop'.

b) primary cause:
Failure of train 112861 drivers to observe and react to indications of the warning shield ToB½ indicating Ot1 in reference to route semaphore B½ and to implement braking after passing the warning shield.

c) indirect causes:

1. Turning off of vigilance control devices in train's 112861 tail locomotive TEM2-198.
2. No appropriate reaction from train 55272 driver, during his departure, to the train going in the opposite direction on track '1a', while such reaction could have reduced the consequences of the accident or made it possible to avoid it altogether.
3. No appropriate reaction from the signalman at post Bł11 during entrance of train 112861, which was manifested in his failure to notify the chief train dispatcher of the threat that was posed by train 112861, which did not commence braking as it approached route semaphore B½ signalling Sr1 'STOP'.
4. Earlier dispatch of train 55272 by the chief train dispatcher at Błd post at Białystok station, inconsistent with the inner timetable (Wewnętrzny Rozkład Jazdy, WRJ), resulting in the necessity to stop train 112861 carrying TWR before route semaphore B½ indicating Sr1 'STOP'.

d) systemic causes:
   1. Implementation and execution of the provisions of the Protocol of 18 March 2009 regarding operation of executive signal boxes Bł2, Bł3 and Bł14 at Białystok station by the signalman of executive signal box Bł1, Zakład Linii Kolejowych PKP PLK S.A. w Białymstoku, without relevant changes to the Station Technical Rules (Regulamin Techniczny Stacji, RTS) of Białystok station.
   2. Provision of traction services by Hagans Logistics Sp. z o.o., which does not hold the carrier licence or Safety Certificate, and should not provide services in the area of hiring driving personnel to other carriers, in this case Orlen KolTrans Sp. z o.o. under Agreement no. MP/2/2008 of 18 January 2008.

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4. Identification of contributory factors of the serious accident

1) Tiredness of the driver of leading locomotive M62-0689 after a whole night shift.
2) Disadvantageous positioning of route semaphore B½ with respect to the railway infrastructure by erecting catenary bridges and poles as part of electrification of Białystok station while keeping the semaphore signalling system in place.
3) Change in work organisation at Bł2, Bł3 and Bł14 posts without adapting the rail traffic control devices (sterowanie ruchem kolejowym, srk) for being operated from a single signal box and failure to introduce relevant changes arising from the protocol of 18 March 2009 regarding operation of executive signal boxes Bł2, Bł3 and Bł14 into RTS of Białystok station.

5. Main recommendations and addressees of the recommendations

1) Railway undertaking ORLEN KolTrans Sp. z o.o. and other railway undertakings providing cargo transport services under RID International Regulations shall amend their contracts of employment signed with personnel directly involved in driving railway vehicles by adding a clause that will forbid working for other railway undertakings in order to enforce the statutory working time regulations, particularly daily and weekly working time limits, and ensure observance of regulations regarding working at night and required rest periods.
2) The Railway Department at the Ministry of Transport, Construction and Maritime Economy shall take steps to amend the Railway Transport Act of 28 March 2003 and executive regulations regarding manner of employment of individuals directly involved in rail traffic management and safety or driving railway vehicles solely under contracts of employment.
3) The Commission shall oblige railway undertakings to compile lists of employees licensed to drive railway vehicles which will include the basis of their employment (contract of employment, civil-law contracts) and to submit such lists to the Office for Railway Transport, and to keep such lists up to date.
4) The Office for Railway Transport shall consider whether it is possible to increase the number of inspections on locomotives in service with railway undertakings, in particular with respect to functioning of vigilance control devices in locomotives in double traction.
5) The Office for Railway Transport shall conduct audits of Hagans Logistic Sp. z o.o. and ORLEN KolTrans Sp. z o.o., in particular with respect to meeting the provisions of their rail cargo transport licences and requirements of the Safety Management System,.
6) The Office for Railway Transport shall conduct an audit of Hagans Logistics Sp. z o.o. with respect to cooperation with railway undertakings and compliance with the requirements to be met by railway vehicle drivers.
7) PKP CARGO S.A. shall make efforts to adapt its drivers' working time schedules as may be necessary for starting freight trains.
8) PKP PLK Zakład Linii Kolejowych w Białymstoku shall update the Station Technical Rules (RTS) for Białystok station so that it reflects the current layout of tracks and srk devices. In the said RTS it shall also define in detail the scope of activities to be performed by signal box post personnel, in particular in the case of staffing cuts at individual posts.
9) Licensed Railway Undertakings shall amend their instructions for traction vehicle drivers by adding a clause that will define train driver crew responsibilities in the second locomotive in the case of double traction operations.

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10) PKP PLK shall implement a system as part of which PKP PLK employees will be passing on information on 'TWR' transports from the station of origin to the station of destination, including full cargo type information and 'tracking' obligation.

II. FACTS DIRECTLY RELATED TO THE SERIOUS ACCIDENT

Description of facts on site, including:

1) Identification of the accident

a) Date, exact time and location of the accident (station, line, km of the line, route),

Cat. A04 serious accident that occurred on 8 November 2010 at 0530 hrs in Białystok station in the area of Bł1 executive singnal box on track 1a, turnout 7, at 175.170 km of the 006 railway line Zielonka – Kuźnica Białostocka, premises of Infrastructure Manager PKP Polskie Linie Kolejowe S.A. Zakład Linii Kolejowych w Białymstoku.

b) Description of the accident

On 8 November 2010 at 0530 hrs, train 112861 from Płock Trzepowo to Sokółka, failed to decelerate in Białystok station after passing warning shield ToB indicating Ot1 and did not stop before route semaphore B½ indicating signal Sr1 'STOP', and subsequently ran into the side of the third wagon, counting from the tail, of train 55272 from Białystok to Warszawa Praga entering track 2a from track 107 along a correctly positioned driving route to signal Sr3 'Free way with speed limit' indicated on semaphore E2. Derailed as a result of the collision were: locomotives M62-0689 and TEM2–198, two coal wagons loaded with scrap metal, one empty roofed wagon, twelve tank cars with hazardous material and five tank cars with TWR (Towary Wysokiego Ryzyka – High Risk Goods). Two tank cars exploded. The remaining derailed wagons and locomotives caught fire and were destroyed. The fire damaged overhead equipment, tracks 1a, 2a, 3a and 4a, turnouts 6, 7, 8, 9, 10, 11, 15, 27 and caused fire to and destruction of post Bł1 together with its equipment. The head of train 55272 stopped at 175.000 km, the rear of train 112861 stopped at 175.050 km. Train 55272 consisted of an active locomotive ET22-1030, dead-hauled locomotive ET22–1055 and 7 (seven) freight wagons, including two UN1965 tank cars with LPG. Train 112861 consisted of locomotives M62-0689 and TEM2-198 and 32 tank cars, including 12 tank cars with UN1202 diesel oil and 20 tank cars with UN1268 petroleum distillates.

c) Identification of railway personnel and subcontractors participating in the accident, and of third parties and witnesses

Initials	Title	Work establishment
M.S.	Senior train driver	PKP CARGO S.A. Zakład Podlaski
A.W.	Train driver	Hagans Logistics Sp. z o.o.
K.W.	Train driver	Hagans Logistics Sp. z o.o.
K.L.	Chief train dispatcher Błd	PKP PLK S.A. IZ Białystok
G.P.	Assistant train dispatcher Błd	PKP PLK S.A. IZ Białystok
J.T.	Signaller Bł11	PKP PLK S.A. IZ Białystok
St.S.	Signaller Bł1	PKP PLK S.A. IZ Białystok
M.A.	Signaller Bł1	PKP PLK S.A. IZ Białystok

d) Identification of trains and their compositions, transported loads (particularly hazardous goods), railway vehicles with their series and numbers

Train I specification:
a) train number: 55272; train type: TLGEc, railway undertaking: PKP CARGO S.A.
b) route: Białystok – Warszawa Praga; traction rolling stock series and number: ET22-1030
c) Train timetable speed: 80 km/h, maximum allowed speed along the driving route on the accident site 40 km/h, actual speed 25 km/h.
d) train length in metres: 124.0 m,
e) train composition: locomotive ET22-1030 and locomotive ET22-1055 in cold state and 7 (seven) wagons,
f) total train weight: 453 t,
g) required train braking weight: 220 t,
h) actual train braking weight: 366 t,
i) wagons with brake switched off: none,
j) brake setting: slow (G) – none, fast (R) 7 wagons,
k) last extensive brake testing location: Białystok – st. Postojowa (holding station),
l) rolling stock inspector or another person authorised to test brakes: – M.K. – rolling stock inspector of PKP CARGO S.A. Zakład Podlaski,
ł) last simplified brake testing location: no simplified testing.

PKP CARGO S.A. vehicles comprising train 55272 stopped at 175.000 km on track 2a. Locomotive ET22-1030, PKP CARGO S.A. Zachodniopomorski Zakład Spółki, as the leading locomotive in train 55272 from Białystok to Warszawa Praga. Railworthiness certificate No. CEZO12-58/2010 dated 28 September 2010, valid until 22 May 2013 for mileage of 170,186 km counted from 329,814 km. Vigilance control devices CA (Czuwak Aktywny – dead-man's vigilance device), SHP (Samoczynne Hamowanie Pociągu – automatic train braking system) – operational, sealed. Radiotelephone and 'Radio-Stop' alarm button – operational – plugs secured and sealed. Speed recorder Hasler RT 9 No. L01083 operational; data recorded on tape – legible (tape removed by a member of the commission and handed over to the Police). Head of the leading locomotive marked with Pc1 signal.

Composition of the train:
1) locomotive ET22 – 1055 PKP CARGO S.A. Świętokrzyski Zakład Spółki, as the train's locomotive number 2 hauled cold.
2) freight wagon Zagkks No. 33877917348-7, loaded with gaseous hydrocarbons 23UN- 1965.
3) freight wagon Zagkks No. 33877919641-3, loaded with gaseous hydrocarbons 23UN- 1965.
4) freight wagon Eaos No. 82515345771-8, loaded with steel scrap.
5) freight wagon Eaos No. 82515329450-9, loaded with steel scrap.
6) freight wagon Eaos No. 82515337607-4, loaded with steel scrap – damaged
7) freight wagon Eaos No. 82515499776-1, torn off the train set, overturned – lying on its side, load spilt (baled steel scrap).
8) freight wagon Hbikklls No. 21512371223-8, torn off the train set, overturned – lying on its side and crushed under two empty (no load) tank cars from train 112861.

Train II specification:
a) train number: 112860/1; train type: TNDSkt, railway undertaking: ORLEN KolTrans Sp. z o.o.
b) route: Płock Trzepowo – Sokółka, traction rolling stock series and number: M62-0689 and TEM2-198
c) Train timetable speed: 60 km/h – in accordance with the inner timetable (WRJ) for Łapy – Białystok section, but 40 km/h at the train's entrance from semaphore B½ into signal box area

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Bł4. 'The actual speed impossible to be determined due to complete destruction of the speed recorders in the blaze' The likely actual speed of approximately 57 km/h was determined on the basis of the time and distance covered from station Łapy and post Bł11, as recorded in traffic management documentation, and the fact that the drive controller on the leading locomotive was set at '12' – i.e. the leading locomotive driver kept his railway vehicle in the 'drive' position.

d) train length in metres: 407 m,
e) train composition: locomotives: M62-0689 and TEM2-198 plus 32 (thirty two) wagons,
f) total train weight: 2290 t
g) required train braking weight: 1214 t,
h) actual train braking weight: 1700 t,
i) wagons with brake switched off: No. 84 5179016843
j) brake setting: slow (G) – 32 wagons.
k) last extensive brake testing location: Płock Rafineria.
l) rolling stock inspector or another person authorised to test brakes: – M.R. – rolling stock inspector with Orlen KolTrans
ł) last simplified brake testing location: no simplified testing.

ORLEN KolTrans Sp. z o.o. vehicles comprising train 112860/1 entering Białystok station on track 1a.

1. **Diesel traction vehicle M62–0689** – property of ORLEN KolTrans Sp. z o.o. (locomotive number one in the train set) – destroyed, at the time of the post-accident inspection it was derailed in the Bł1 area and tilted approximately 10^0 to the right. The locomotive had been driven from the B cab (looking in the direction of the train's travel i.e. towards Sokółka station). Noticeable disruption of the locomotive's body on the left side of the B cab – a large dent with disruption of the left-side wall panel, dented to the inside of the cab together with sheet element of the coal wagon (maroon). No windscreens or side window panes in both cabs. The locomotive's direction controller set in the 'ahead' position, with the drive controller at 12 and locked; driver's main valve Oerlikon in the braking position, with the additional valve in the release position; position of the lighting switches indicating that the front of the train was illuminated with three Pz-1 white lights; the lighting tint switch in the off position – indicating that long beam lights were on; Hasler speedometer indicating zero; main pipe, brake cyliner and main reservoir pipe gauges all indicated zero values.

Switches in the panel on the desk door: first switch from the left, on – locomotive steering, second switch from the left, on – lighting and signalling, third switch, off – fuel pump in locomotive number 2, fourth switch, on – driver's cab heater, fifth switch, off – engine timing, sixth switch, off – fuel pump in locomotive number 1.

The control unit of Pyrylandia radiotelephone type F 747 M, No. 0251/OD, and the Transmitter-Receiver Assembly No. 0151/0 (the second digit or letter illegible) were dismounted under the commission's supervision – both devices were secured by the commission. There were the following documents in the cab: a board book of the self-propelled vehicle, on/off duty logbook, written orders, brake testing sheet, movement report (which serves also as the traction team's work log). The documents flooded with water, possible to be read.

The locomotive's cab A burnt out. All devices and objects in the cab, including speed recorder, comms equipment, indicators and brake valves were obliterated due to the very high temperature of the fire. It was impossible to remove the tape from the recorder, as it got completely burnt.

The commission inspected the vestibule (between cab A and the engine room), where CA and SHP device generators were located. The said devices were found to have intact seals on. Switches on the CA and SHP devices were on, with seals intact.

Engine compartment: diesel engine – missing head covers (melted in the blaze) and inspection covers on the right side of the engine. The right turbocharger completely melted, the left turbocharger partially melted, the supercharger melted on its right side. The motor control – destroyed. The main generator, generator exciter, tachometer generator – destroyed with effects of fire clearly visible.
Electrical cabinet – internal inspection not possible. External inspection shows that the equipment is completely burnt.
The vehicle's undercarriage stuck deeply in the track ballast. The bogies are torn off the locomotive's body. Batteries in the battery box – burnt out.
Fuel tank – the structure was damaged due to fire and mechanical forces. It was not possible to assess the technical condition of the wheel sets and traction motors.
Railworthiness certificate No. 8/OKt/2009 dated 29 April 2009, valid until 29 April 2013 for mileage of 400,000 km counted from 107 km.
2) **Diesel traction vehicle TEM2–198** – property of ORLEN KolTrans Sp. z o.o. (locomotive number 2 in the train set) destroyed, at the time of the post-accident inspection it was derailed and positioned perpendicularly to the track axis in the Bł1 area. The whole structure of the vehicle was found to have been damaged due to high temperature of the fire and forces acting on the vehicle at the moment of impact. All devices and objects in the cab, including speed recorder, comms equipment, indicators and brake valves were obliterated due to the very high temperature the fire. It was impossible to remove the tape from the recorder, as it got completely burnt.
Only some metal fragments of the desk with the speed recorder could be seen, and the recorder itself was completely melted. The speed indicator, which should be located on the left side of the locomotive's rear desk was also completely melted. It is not possible to make any assessment whatsoever of other boxes and vigilance devices, as they were completely destroyed. No transport documentation was found in the vehicle (rail waybills, customs documents, ADT or quality certificates). Due to the extensive damage it is not possible to check and verify positions of the vehicle's control devices. The buffer beam of the leading locomotive M62-0689 stuck in the fuel tank at approximately 90° on the left side of the vehicle's undercarriage section. The above led to the spillage of diesel oil from the fuel tank, which is shown clearly by the state of the ripped panelling of the fuel tank. The vehicle's body panels were burnt out very significantly on both sides, which made access to the machinery in the front compartments not possible (blocked access due to the action of high temperature and mechanical damage). Bogies, wheel sets and traction motors were destroyed very significantly.
Railworthiness certificate No. 34/OKt/2010 dated 6 September 2010, valid until 6 September 2014 for mileage of 400,000 km counted from 000107 km.
The train bound from Płock to Sokółka was composed of 32 tank cars owned by GATX Rail Poland Sp. z o.o. The tank cars were leased by PKN ORLEN SA and carried petroleum products subject to the regulations concerning the international carriage of dangerous goods by rail (RID). The products were property of PKN ORLEN SA.
Composition of the train:

1) tank car 33517973164-9 – containing diesel oil with ID no. 30UN1202, completely destroyed, burnt,
2) tank car 33517860736-2 – containing diesel oil with ID no. 30UN1202, completely destroyed, burnt,
3) tank car 83517858334-9 – containing diesel oil with ID no. 30UN1202, completely destroyed, burnt,
4) tank car 33517852853-5 – containing diesel oil with ID no. 30UN1202, completely destroyed, burnt,
5) tank car 33517983567-3 – containing diesel oil with ID no. 30UN1202, completely destroyed, burnt,

6) tank car 83517860482-2 – containing diesel oil with ID no. 30UN1202, completely destroyed, burnt,
7) tank car 33517855846-6 – containing diesel oil with ID no. 30UN1202, completely destroyed, burnt,
8) tank car 83517981402-4 – containing diesel oil with ID no. 30UN1202, completely destroyed, burnt,
9) tank car 83517858656-5 – containing diesel oil with ID no. 30UN1202, completely destroyed, burnt,
10) tank car 33517952812-0 – containing diesel oil with ID no. 30UN1202, completely destroyed, burnt,
11) tank car 84517901684-3 – containing diesel oil with ID no. 30UN1202, completely destroyed, burnt,
12) tank car 83517862549-6 – containing diesel oil with ID no. 30UN1202, completely destroyed, burnt,
13) tank car 33517901697-7 – containing petroleum distillates with ID no. 33UN1268, completely destroyed, burnt,
14) tank car 33517858525-3 – containing petroleum distillates with ID no. 33UN1268, completely destroyed, burnt,
15) tank car 33517862424-3 – containing petroleum distillates with ID no. 33UN1268, completely destroyed, burnt,
16) tank car 33517850081-5 – containing petroleum distillates with ID no. 33UN1268, completely destroyed, burnt,
17) tank car 83517862212-1 – containing petroleum distillates with ID no. 33UN1268, completely destroyed, burnt,
18) tank car 83517856576-7 – containing petroleum distillates with ID no. 33UN1268, completely destroyed, burnt, (contents pumped out),
19) tank car 33517952327-9 – containing petroleum distillates with ID no. 33UN1268, completely destroyed, burnt, (contents pumped out),
20) tank car 33517952175-2 – containing petroleum distillates with ID no. 33UN1268, partially destroyed, partially burnt – initially scheduled for repair following specialist testing by an authorised unit.
21) tank car 83 51 7858693-8 – ID plates with no. 33 UN 1203 and stickers with no. 3 on both sides of the car, the rail waybill shows ID no. 33 UN 1268, containing petroleum distillates,
22) tank car 33 51 7859754-8 – ID plates with no. 33 UN 1203 and stickers with no. 3 on both sides of the car, the rail waybill shows ID no. 33 UN 1268, containing petroleum distillates,
23) tank car 33 51 7857401-8 – ID plates with no. 33 UN 1294 and stickers with no. 3 on both sides of the car, the rail waybill shows ID no. 33 UN 1268, containing petroleum distillates,
24) tank car 83 51 7857430-6 – ID plates with no. 33 UN 1294 and stickers with no. 3 on both sides of the car, the rail waybill shows ID no. 33 UN 1268, containing petroleum distillates,
25) tank car 83 51 7862366-5 – ID plates with no. 33 UN 1294 and stickers with no. 3 on both sides of the car, the rail waybill shows ID no. 33 UN 1268, containing petroleum distillates,
26) tank car 33 51 7852958-2 – ID plates with no. 33 UN 1203 and stickers with no. 3 on both sides of the car, the rail waybill shows ID no. 33 UN 1268, containing petroleum distillates,
27) tank car 33 51 7859832-2 – ID plates with no. 33 UN 1294 and stickers with no. 3 on both sides of the car, the rail waybill shows ID no. 33 UN 1268, containing petroleum distillates,
28) tank car 33 51 7852169-6 – ID plates with no. 33 UN 1268 and stickers with no. 3 on both sides of the car, the rail waybill shows ID no. 33 UN 1268, containing petroleum distillates,
29) tank car 84 51 7982 982-3 – ID plates with no. 33 UN 1268 and stickers with no. 3 on both sides of the car, the rail waybill shows ID no. 33 UN 1268, containing petroleum distillates,

30) tank car 83 51 7952690-9 – ID plates with no. 33 UN 1203 and stickers with no. 3 on both sides of the car, the rail waybill shows ID no. 33 UN 1268, containing petroleum distillates,
31) tank car 33 51 7881210-3 – ID plates with no. 33 UN 1294 and stickers with no. 3 on both sides of the car, the rail waybill shows ID no. 33 UN 1268, containing petroleum distillates,
32) tank car 84 51 7952013-3 – ID plates with no. 33 UN 1203 and stickers with no. 3 on both sides of the car, the rail waybill shows ID no. 33 UN 1268, containing petroleum distillates,

In the case of the 12 disconnected tank cars, the commission found inconsistencies between the RID code designations and types of products specified in the rail waybills. In accordance with the rail waybill, the tank cars should have borne code designation plates with ID no. 33UN1268. All the disconnected tank cars had the correct designation informing about the hazard posed by the carried materials (number 33) and warning stickers (hazard warning) with number 3. The above inconsistency in the marking applies also to tank car 335179521752. No identification is possible in the case of the tank cars that were completely destroyed. Attached to the records of the formal investigation procedure, Volume 1 pp. 215-278, are 32 railworthiness certificates of the GATX Rail Poland Sp. z o.o. tank cars and, on pp. 93-212 of the same, decisions issued by the Director of the Transport Technical Supervision Authority (Transportowy Dozór Techniczny, TDT) permitting utilisation of individual tank cars following technical inspection by TDT.

11The railworthiness certificates for the 32 tank cars were issued in conflict with the Ordinance of the Minister of Infrastructure of 15 February 2005 regarding reailworthiness certificates for railway vehicles. Moreover, in the case of two of the tank cars, bearing ID no. 33517857401-8 and 33517973164-9, inconsistencies were found regarding the numbers shown on the cars and the numbers recorded in the protocol of inspection of the hazardous material tank cars conducted by TDT, under which the cars were admitted to international rail traffic. The inconsistencies in question resulted from changing the numbers during a revision repair. The exchange code ‘83’ was changed to ‘33’ and the self-checking digit on the former tank car was changed from ‘7’ to ‘8’, the self-checking digit on the latter changed from ‘8’ to ‘9’.

The investigation revealed that in rail waybill no. 9642 for train 112860/1 of Orlen KolTrans Sp. z o.o. the goods designated ‘33UN 1268’, i.e. petroleum distillates (Raw Material for Reforming Processes), were defined as Packing Group I. In accordance with RID, such categorisation requires carriage of goods in L4BN tank cars, whereas the goods in question were carried in L1,5BN tank cars, which belong to RID’s Packing Group II. The above irregularity made it necessary to look into the manner Orlen KolTrans Sp. z o.o. assigns Packing Group categories to goods it carries.

On 25 May 2011 the PKBWK team together with representatives of PKP PLK S. A. Zakład Linii Kolejowych w Białymstoku, the rail infrastructure manager, inspected train 112860/1 of Orlen KolTrans Sp. z o.o. at Racibory station with the intention to examine the documentation and compliance of maintenance and equipment of the locomotives and wagons with applicable regulations, including regulations regarding transport of hazardous materials.

On 26 May 2011 the Chair of PKBWK requested the President of the Management Board of Orlen KolTrans Sp. z o.o. in writing to explain why inappropriate packing (tank cars) had been used.

In his response dated 6 June 2011 the President of the Management Board explained that the ‘Packing Group I’ entry had been caused by an IT system error and had no impact on the transport safety. Since the response from Orlen KolTrans Sp. z o.o. did not satisfy the PKBWK, the latter again requested Orlen KolTrans Sp. z o.o. to furnish explanations formulated in accordance with the terminology provided in Schedule ‘A’ of the regulations concerning the international carriage of dangerous goods by rail (RID). As a result, Orlen KolTrans Sp. z o.o. was forced to conduct additional laboratory analyses of the product carried.

Moreover, on 7 July 2011 Mr S.M., Director of the Forwarding Department at Orlen KolTrans Sp. z o.o., was interviewed in the PKBWK head office regarding how the Packaging Group

categories had been determined for goods carried by Orlen KolTrans Sp. z o.o. on 8 November 2010 and 25 May 2011. The interviewed Director testified that in his interpretation a specific category is determined on the basis of product data sheets, and because terms used in those sheets do not follow the nomenclature provided in the RID regulations (Table 'A' Item 1268, 1-3), the Packing Group category entered for the train on 8 November 2010 was incorrect.

On 26 July 2011 the President of the Management Board of Orlen KolTrans Sp. z o.o. stated in his letter no. DO/B/5290/2011 that, under a laboratory report issued by ORLEN Laboratorium Sp. z o.o. on physical and chemical properties, which are the key parameters for determining the correct packing group and selection of an appropriate packing for the purpose of transporting 'Raw Materials for Reforming Processes' as required by the RID regulations, the said product is categorised in Packing Group II i.e. third item in group UN 1268 in Schedule 'A' to the regulations concerning the international carriage of dangerous goods by rail (RID).

Attached to the letter was ORLEN Laboratorium's Laboratory Report No. LP-3/1152/20011/P/1.

Following the above explanation by the President of the Management Board of Orlen KolTrans Sp. z o.o., the Accident Investigation Team found the Director's clarifications conclusive.

e) Description of the railway infrastructure and signalling system at the accident site – types of tracks, turnouts, srk devices, signalling devices, SHP devices, etc.

Participating in driving routes of trains 112861 and 55272 involved in the accident were signal boxes Bł1, Bł2, Bł3, Bł4, Bł11 and Błd.

Executive signal box Bł1

The room of executive signal box Bł1 – burnt. It was established that the executive signal box was equipped with mechanical key-operated devices with semaphore shape signalling. Railroad switches are set manually, with the state of closed switches transferred through sockets placed in the switch control bench. Based on visual inspection of the condition of the burnt internal rail traffic control devices (description plates burnt and illegible) and on technical documentation of these devices, it was established that the 12th (twelfth) itinerary lever (looking from the left side of the block apparatus) E^2/106, 107, 108 was moved upwards; the lever closes the running route from semaphore E^2 onto track 2a and is an extension of ladder lead $N107^2$. The last itinerary lever (looking from the left side of the block apparatus) k/4, 3, 2, 1 was also in the upward position. The lever closes the running route from semaphore K onto main track 4t leading to station Białystok Starosielce. The above itineraries are not conflicting. It was established that the 8th (eighth) signal lever (looking from the left side of the block apparatus) of semaphore E^2 was set downwards. It was established that the other signal levers i.e. A^1, A^2, B^1, B^2, C^1, C^2, D^2, F^2_L, $F^2_{T,S}$, G^2_L, $G^2_{T,S}$, H, J, K, Tm26, Tz2, Tz3, Tm6, Tm7 are in primary, upward position (not set). The following switch keys could be found in sockets in the switch control bench: 5-; 6a/b+; 4a/b(6c/d)+; 7a/b-; 7c/d-; 8-; 9a/b+; 9c/d-; 10a-; 10b-; 11c/d+; 13+; 27/28+;11a/b+;15-;16a/b-; 16c/d+; 17a/b+; 17c/d-; 18a-; 18b+; 19a+; 19b-; 261a/b/4c/d+.

Block disks in the block apparatus were burnt, with the glass in the windows melted and the paint on block plates charred, which made it impossible to visually read the positioning of the blocks.

57 switch keys were recovered, including 24 keys from sockets in the switch control bench: 5-; 6a/b+; 4a/b(6c/d) +; 7a/b-; 7c/d-; 8-; 9a/b+; 9c/d-; 10a-; 10b-; 11c/d+; 13+; 27/28+; 11a/b+; 15-; 16a/b-; 16c/d+; 17a/b+; 17c/d-; 18a-; 18b+; 19a+; 19b-; 261a/b(4c/d) + with the following registers: A-2pcs; B-2pcs; D-3pcs; E-1pcs; G-1pcs; I-1pcs; K-1pcs; L-2pcs; M-1pcs; O-1pcs; P-1pcs; Q-1pcs; R-1pcs; T-1pcs; U-2pcs; V-2pcs; X-1pcs. The states of the above keys and their positioning agree with the interlocking table of signal box Bł1 for the running route from position 25 i.e. $N106^2$-$N107^2$-$N108^2$/E^2 onto track '2a' from track 106, 107, 108. And 33 spare keys 5-; 7a/b+; 9c/d+; 15-; 19b+; 7a/b-; 4a/b-(6c/d) +; 9a/b-; 11c/d-; 6a/b-; 9a/b+; 19a-; 8+; 11a/b+; 10a-

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; 17c/d-; 10a+; 11c/d+; 16c/d-; 10b-; 8-; 7c/d+; 10b+; 18b-; 17a/b-; 15+; 18a+; 4a/b-(6c/d)-;7c/d-; 6a/b+; 11a/b-; 16a/b+; 17c/d+ with the following registers: A-1pcs; C-1pcs; D-2pcs; E-1pcs; F-3pcs; G-4pcs; H-1pcs; I-1pcs; K-1pcs; L-2pcs; M-1pcs; N-1pcs; O-1pcs; P-3pcs; Q-1pcs; R-1pcs; T-2pcs; U-2pcs; V-1pcs; W-1pcs; X-1pcs; Z-1pcs. The keys were deposited and locked in a box with the Team IV master, and added to the list of deposited keys. There were 13 switch keys in the switches that survived the accident, namely: 261a/b-/4c/d+; 4a/b-/6c/d+; 5+; 13+; 15+; 16a/b+; 16c/d-; 17a/b-; 17c/d+; 18a+; 18b-; 19a-; 19b+, with the following registers: O-1pcs; F-2pcs; B-1pcs; T-2pcs; X-2pcs; N-1pcs; R-1pcs; Z-1pcs; Q-1pcs; G-1pcs. For the purpose of operating the surviving switches 8 keys were deposited with the Team III automation master: 261a/b-/4c/d+; 16a/b-; 16c/d+; 17a/b+; 18a-; 18b+; 19a+; 19b-, with the following registers: O-1pcs; V-1pcs; U-1pcs; Q-1pcs; B-1pcs; L-1pcs; A-1pcs; D-1pcs. The keys shall be placed and sealed in a cabinet at signal box Bł2. For the purpose of controlling the switches on tracks 2 and 4, two switch keys were deposited with the head of the section: 5+; 28/27+ with the following registers: B-2pcs. For the purpose of operating the siding EZ Zakład Wschodni w Białymstoku, two switch keys were placed in the active key table at signal box Błd: 261+/4c/d+; 4a/b+ with the following registers: D-1pcs; T-1pcs. Search of the turnout debris placed on platforms revealed 7 switch keys with the following registers: L-1pcs; W-1pcs; R-1pcs; U-1pcs; P-2pcs; C-1pcs; for the following sockets: 10a+; 11a/b-; 9c/d-; 4a/b-/6c/d-; 10b+; 7c/d+; 27-/28+. Those keys were deposited with the head of the section. During reloading of the turnout debris from the platforms to the yard in ISE Białystok, two further switch keys were found for turnout locks 8+; 11cd- with the following registers G; H. Those keys were deposited with the head of the section. In total, 91 of all 96 switch keys were recovered. Their registers and webs were consistent with the list of keys from post Bł1. 5 switch keys were lost: 6a/b-; 7a/b+; 9a/b-; 9c/d+; 27-/28+ with the following registers: G-1pcs;C-2pcs; F-1pcs; D-1pcs.

Executive signal box Bł11

The executive signal box was equipped with mechanical key-operated devices with semaphore shape signalling. Railroad switches are set manually, with the state of closed switches transferred through sockets placed in the switch control bench. It was established that the rail traffic control devices were locked and sealed, with padlocks and seals intact. The Permission Granted block e^2; g^2_{2a}; i; was locked, with the window in the block apparatus white; the block locks the itinerary lever e^2; $^{g2}_{2a}$; i. All signal levers were in primary, upward position (not set). It was attempted to change position of signal lever for warning shield ToB^2 – position change not possible, sublever lock in working order with a red plate in the window. It was attempted to change position of signal lever for warning shield ToB^1 – position change not possible, sublever lock in working order with a red plate in the window.
The commission did not voice reservations regarding the condition of rail traffic control devices in the area of post Bł11. In line with instructions from the officer in charge of the rescue operation, the running route was dissolved to make it possible to haul away the railway vehicles not affected by the fire. The above state of the rail traffic control devices was caused by rescue activities carried out by the National Fire Service. The actual state of the rail traffic control devices determining the running route from semaphore 6G onto main track 2 for train 55272 at the moment of accident could not be described, for on direct orders from the officer in charge of the rescue operation the running route was dissolved to make it possible to haul the railway wagons and tank cars not affected by the fire away from tracks 1a and 2a. A relevant order from the head of the section, notified to and permitted by the commission, was given by telephone to the signalman at signal box Bł11 and recorded in documentation.
The actual state of the automation devices at the time of occurrence was as follows:

1. entrance semaphore 6G set to signal Sr 2 'Free way' for train 55272 from track 2a onto main track 2, the signal lever in downward position,
2. itinerary lever 6g shifted to close the running route from track 2a onto main track 2.
3. unlocked 'Order Received' block On6G (white window).

Executive signal box Bł2

The executive signal box was equipped with mechanical key-operated devices with semaphore shape signalling. It was established that the rail traffic control devices were locked and sealed, with padlocks and seals intact. In the block apparatus, 'Permission Granted' block N105, 106, 107, 108, 109 locked with a white plate in the apparatus's window. The said block locked itinerary lever n106, 107, 108 switched to the right in apparatus P46. It was also established that signal levers Tm11; $M102^2$; $M103^2$; $M104^2$ were in primary, upward position (not set). Inserted in key apparatus P46 were the following switch keys: 32-; 31-; 29-; 26c/d+; 26a/b-; 25+; 24b+; 24a+; 23c/d+; 23a/b+; 22+; 21c/d+; 21a/b+; 20-; and key Tm11 as for running route $N106^2$, $N107^2$, $N108^2$/ E^2. The above was verified on the basis of the interlocking table for signal box Bł2 (item 25, sheet copy no. 5Z). The commission did not voice reservations regarding the condition of rail traffic control devices in the area of post Bł2.

Executive signal box Bł3

The executive signal box was equipped with mechanical key-operated devices with semaphore shape signalling. The railroad switches are locked on the ground by means of pin switch locks. Interlocking is performed in a Z-type wall-mounted key box. The station interlock incomplete. Signal levers are locked with locks. Setting sequence is controlled by means of sublever locks that allow the operator to set a semaphore after the preceding semaphore has been set to signal free way. At the moment of the occurrence, the rail traffic control devices were set back to the primary position following completion of train 55272's exit through Bł3 area. The following switch keys were in the wall-mounted key box: 44-; 42c/d+; 42a/b+; 41+; 50+; 43+ (configuration of the keys as for the running route $N107^2/E^2$ from track 107 onto track 2a, in accordance with the interlocking table for signal box Bł3, item 7). In addition to that, there were the following route-signal keys locked in the wall-mounted key box: $N109^2/D^2$; $N108^2/E^2$; $N107^2/E^2$; $N106^2$/D2; $N106^2/E^2$; $N105^2/D^2$.
All 'Order Received' blocks in the block apparatus were locked (red windows). The blocks were locked with 'order Received' keys $N109^2$; $N108^2$; $N107^2$; $N106^2/E^2$; $N106^2/D^2$; $N105^2$. Signal repeaters for semaphores D, E indicated that the semaphores were set to 'STOP'. Signal levers of the semaphores in primary positions (not set). Sublever locks of signal levers not released (red windows).
The rail traffic control devices were locked, with padlocks and seals intact 'On the ground', semaphores N105, N106, N107, N108, N109 signalled 'STOP'. Turnout switches positioned to 41+; 42a/b+; 42c/d+; 43+; 44-; 50+. The state of the indoor and outdoor devices did not raise any reservations.

Dispatching signal box Błd

The signal box was equipped with manual key-operated devices with shape signalling. The rail traffic control devices were locked and sealed, with padlocks and seals intact. It was established that 'Permission Received' block $n106^2$; $n107^2$; $n108^2$ in the block apparatus was unlocked, with a white plate in the apparatus's window; the block cooperates with the 'Permission Granted' block in signal box Bł2. Also unlocked was 'Permission Received' block e^2; $g^2{}_{2a}$; i; with a white plate in the apparatus's window; the block cooperates with the 'Permission Granted' block in signal box

Bł11 as a means to check whether track 2a is free. Additionally, 'Order Given' block E^2; F^2; G^2; J; is locked; the block cooperates with 'Order Received' block in Bł1. The same block locked itinerary lever $n107^2/e^2$, switched to the left.
The commission did not voice reservations regarding the condition of rail traffic control devices in the area of post Błd.

Ground-based rail traffic control devices

Route semaphore B½, situated at 174.809 km, operated from executive signal box Bł1 was inspected. The investigators checked, standing on the right rail path on the ground level 200 metres away, the visibility of the red light – it is obscured by an overhead line gate, visibility of the red light from 150 m is limited, visibility from 100 m is very good. Basic signal – the arm of the shape semaphore can be seen from each of the distances referred to above. The semaphore arms' actuating mechanism shifted, transmission lines used for moving the semaphore arms are hanging down due to fire-related damage. The upper arm is tilted 5^o from horizontal, the lower arm positioned vertically. There is no SHP point-action device before route semaphore B½.
Technical inspection was conducted also for shape signal semaphore E^2 situated at 175.402 km and operated from executive signal box Bł1. The semaphore shows a dubious signal because its upper arm is positioned upwards at a 25^o angle from horizontal, while its lower arm is tilted 20^o from vertical. The transmission lines damaged in the fire. The semaphore arms' actuating mechanism shifted.

Technical inspection was conducted for entrance semaphore 6B½ and warning shield ToB½ operated from post Bł11. It was established that semaphore 6B½ was in working order and set to signal 'Stop', well visible – the semaphore's illumination in working order. The semaphore is situated to the right of track 1 at 173.720 km. Warning shield ToB½ , referring to route semaphore B½ , is situated to the right of track 1 at 172.718 km. It was established that the warning shield was in working order, positioned to signal Ot1, which means that the semaphore to which it referred to signalled Sr1 'Stop'; well visible, illumination in working order, the green glass panel cracked. The warning shield's location is marked with a W1 marker, which is good condition and well visible.

Furthermore, inspections and checks were conducted for SHP track electromagnet no 1696 of the year 2002. It is positioned to the right of the right rail path of track 1 (looking in the direction of travel) at 173.518 km. The SHP electromagnet's quality factor was also checked with the use of inductometer COB Z5/69 no. 59. The electromagnet was found to be in working order 'Good quality'. In addition, the electromagnet's position relative to the rail was checked.
The upper part of the electromagnet protrudes above the rail head – 42 mm on one side and 43 mm on the other. The distances between the electromagnet's long axis and the rail head side are 265 mm and 255 mm. The distances between bumper rails and rail head sides are respectively 165 mm and 130 mm. No rail joints were found in the vicinity of the electromagnet.
Inspection and check was performed on SHP rail electromagnet ETK98 BA no. 1703 of the year 2002, referring to warning shield To6B and situated to the right of the right rail path on track 1 at 172.518 km. The electromagnet's quality factor was also checked with the use of inductometer COB Z5/69 no. 59. The electromagnet was found to be in working order 'Good quality'. In addition, the electromagnet's position relative to the rail was checked. The upper part of the electromagnet protrudes above the rail head – 41 mm on one side and 42 mm on the other. The distances between the electromagnet's long axis and the rail head side are 260 mm and 258 mm. The distances between bumper rails and rail head sides are respectively 135 mm and 130 mm.

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Recovered were: 57 switch keys, including 24 keys from sockets in the switch control bench: 5-; 6a/b+; 4a/b(6c/d) +; 7a/b-; 7c/d-; 8-; 9a/b+; 9c/d-; 10a-; 10b-; 11c/d+; 13+; 27/28+; 11a/b+; 15-; 16a/b-; 16c/d+; 17a/b+; 17c/d-; 18a-; 18b+; 19a+; 19b-; 261a/b(4c/d) + with the following registers: A-2pcs; B-2pcs; D-3pcs; E-1pcs; G-1pcs; I-1pcs; K-1pcs; L-2pcs; M-1pcs; O-1pcs; P-1pcs; Q-1pcs; R-1pcs; T-1pcs; U-2pcs; V-2pcs; X-1pcs. The states of the above keys and their positioning agree with the interlocking table of signal box Bł1 for the running route from position 25 i.e. $N106^2$-$N107^2$-$N108^2/E^2$ onto track '2a' from tracks 106, 107, 108. And 33 spare keys 5-; 7a/b+; 9c/d+; 15-; 19b+; 7a/b-; 4a/b-(6c/d) +; 9a/b-; 11c/d-; 6a/b-; 9a/b+; 19a-; 8+; 11a/b+; 10a-; 17c/d-; 10a+; 11c/d+; 16c/d-; 10b-; 8-; 7c/d+; 10b+; 18b-; 17a/b-; 15+; 18a+; 4a/b-(6c/d)-;7c/d-; 6a/b+; 11a/b-; 16a/b+; 17c/d+ with the following registers: A-1pcs; C-1pcs; D-2pcs; E-1pcs; F-3pcs; G-4pcs; H-1pcs; I-1pcs; K-1pcs; L-2pcs; M-1pcs; N-1pcs; O-1pcs; P-3pcs; Q-1pcs; R-1pcs; T-2pcs; U-2pcs; V-1pcs; W-1pcs; X-1pcs; Z-1pcs. The keys were deposited and locked in a box Team IV, and added to the list of deposited keys. There were 13 switch keys in the switches that survived the accident, namely: 261a/b-/4c/d+; 4a/b-/6c/d+; 5+; 13+; 15+; 16a/b+; 16c/d-; 17a/b-; 17c/d+; 18a+; 18b-; 19a-; 19b+, with the following registers:
O-1pcs; F-2pcs; B-1pcs; T-2pcs; X-2pcs; N-1pcs; R-1pcs; Z-1pcs; Q-1pcs; G-1pcs. For the purpose of operating the surviving switches 8 keys were deposited with the Team III automation master: 261a/b-/4c/d+; 16a/b-; 16c/d+; 17a/b+; 18a-; 18b+; 19a+; 19b-, with the following registers: O-1pcs; V-1pcs; U-1pcs; Q-1pcs; B-1pcs; L-1pcs; A-1pcs; D-1pcs. The keys shall be placed and sealed in a cabinet at signal box Bł2.
For the purpose of controlling the switches on tracks 2 and 4, two switch keys were deposited with the head of the section: 5+; 28/27+ with the following registers: B-2pcs. For the purpose of operating the siding EZ Zakład Wschodni w Białymstoku, two switch keys were placed in the active key table at signal box Błd: 261+/4c/d+; 4a/b+ with the following registers: D-1pcs; T-1pcs. Search of the turnout debris placed on platforms revealed 7 switch keys with the following registers: L-1pcs; W-1pcs; R-1pcs; U-1pcs; P-2pcs; C-1pcs; for the following sockets: 10a+; 11a/b-; 9c/d-; 4a/b-/6c/d-; 10b+; 7c/d+; 27-/28+.

Those keys were deposited with the head of the section. During reloading of the turnout debris from the platforms to the yard in ISE Białystok, two further switch keys were found for turnout locks 8+; 11cd- with the following registers G; H. Those keys were deposited with the head of the section. In total, 91 of all 96 switch keys were recovered. Their registers and webs were consistent with the list of keys from post Bł1. 5 switch keys were lost: 6a/b-; 7a/b+; 9a/b-; 9c/d+; 27-/28+ with the following registers: G-1pcs; C-2pcs; F-1pcs; D-1pcs.

The area of executive signal box Bł1 had the following superstructure elements:

a) Rails

- no. 1a, 1t, 2a, 2t, 3a, 3t, 4t, 23a, 33a, S-49 type continuous welded rails dated 1974/75, INBK7d prestressed concrete sleepers dated 1973/74; K type fixation, ballast: crushed stone 30cm.

b) Turnouts

- Rkpd no. 4 superstructure – S-49, crossing angle1:9, radius of curvature on the diverging direction 190 m, wooden switch sleepers, crushed stone ballast,
- Rkpd no. 6 superstructure – S-49, crossing angle1:9, radius of curvature on the diverging direction 190 m, wooden switch sleepers, crushed stone ballast.
- Rkpd no. 7 superstructure – S-49, crossing angle1:9, radius of curvature on the diverging direction 190 m, wooden switch sleepers, crushed stone ballast.
- Rkpd no. 9 superstructure – S-49, crossing angle1:9, radius of curvature on the diverging direction 190 m, wooden switch sleepers, crushed stone ballast.

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- Rkpd no. 11 superstructure – S-49, crossing angle1:9, radius of curvature on the diverging direction 190 m, wooden switch sleepers, crushed stone ballast.
- Rkpd no. 16 superstructure – S-49, crossing angle1:9, radius of curvature on the diverging direction 190 m, wooden switch sleepers, crushed stone ballast.
- Rkpd no. 17 superstructure – S-49, crossing angle1:9, radius of curvature on the diverging direction 190 m, wooden switch sleepers, crushed stone ballast.
- Rkpj no. 10 superstructure – S-49, crossing angle 1:9, radius of curvature on the diverging direction 190 m, wooden switch sleepers, crushed stone ballast.
- Rkpj no. 18 superstructure – S-49, crossing angle 1:9, radius of curvature on the diverging direction 190 m, wooden switch sleepers, crushed stone ballast.
- Rkpj no. 19 superstructure – S-49, crossing angle 1:9, radius of curvature on the diverging direction 190 m, wooden switch sleepers, crushed stone ballast,
- Rz no. 5 superstructure – S-49, crossing angle 1:9, radius of curvature on the diverging direction – left 300 m, wooden switch sleepers, crushed stone ballast,.
- Rz no. 8 superstructure – S-49, crossing angle 1:9, radius of curvature on the diverging direction – left 300 m, wooden switch sleepers, crushed stone ballast.
- Rz no. 13 superstructure – S-49, crossing angle 1:9, radius of curvature on the diverging direction – right 190 m, wooden switch sleepers, crushed stone ballast.
- Rz no. 15 superstructure – S-49, crossing angle 1:9, radius of curvature on the diverging direction – right 300 m, wooden switch sleepers, crushed stone ballast.
- Rz no. 27 superstructure – S-49, crossing angle 1:9, radius of curvature on the diverging direction – right 300 m, wooden switch sleepers, crushed stone ballast.
- Rz no. 28 superstructure – S-49, crossing angle 1:9, radius of curvature on the diverging direction – left 300 m, wooden switch sleepers, crushed stone ballast.

c) Inter-turnout inserts

- insert between turnouts 4 and 28, length 100 m (track 4), superstructure – S-49 rails, INBK-7 prestressed concrete sleepers, crushed stone ballast
- insert between turnouts 5 and 6, length 8 m (track 2), superstructure – S-49 rails, wooden sleepers, crushed stone ballast
- insert between turnouts 6 and 27, length 16 m (track 2), superstructure – S-49 rails, wooden sleepers, crushed stone ballast
- insert between turnouts 7 and 9, length 8 m (track 1), superstructure – S-49 rails, wooden sleepers, crushed stone ballast
- insert between turnouts 8 and 10, length 13 m (track 3), superstructure – S-49 rails, wooden sleepers, crushed stone ballast
- insert between turnouts 10 and 11, length 8 m (track 3), superstructure – S-49 rails, wooden sleepers, crushed stone ballast
- insert between turnouts 4 and 6, length 9 m, superstructure – S-49 rails, wooden sleepers, crushed stone ballast.
- insert between turnouts 27 and 28, length 10 m, superstructure – S-49 rails, wooden sleepers, crushed stone ballast
- insert between turnouts 5 and 7, length 11 m, superstructure – S-49 rails, wooden sleepers, crushed stone ballast
- insert between turnouts 6 and 9, length 11 m, superstructure – S-49 rails, wooden sleepers, crushed stone ballast
- insert between turnouts 7 and 10, length 11 m, superstructure – S-49 rails, wooden sleepers, crushed stone ballast

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- insert between turnouts 9 and 11, length 11 m, superstructure – S-49 rails, wooden sleepers, crushed stone ballast
- insert between turnouts 8 and 16, length 97 m, superstructure – S-49 rails, wooden sleepers, crushed stone ballast
- insert between turnouts 10 and 15, length 60 m, superstructure – S-49 rails, wooden sleepers, crushed stone ballast
- insert between turnouts 11 and 17, length 59 m, superstructure – S-49 rails, wooden sleepers, crushed stone ballast.

Power facilities within the area of Bł1:
Before the occurrence, tracks 1a, 1t, 2a, 2t, 3a, 3t had YzC120-2C traction network suspended over them, while other tracks i.e. 4t, 23a, 33a, 606, 607 and rail crossovers had C95-C type traction network. In the area of executive signal box Bł-1 there were power supply units complete with OKZ disconnectors and electric electrical actuators – OKZ110 'Borsukówka' at location 175-8 at 175.054 km, OKZ80 'station disconnector 2' at location 175-14 at 175.156 km on gate support, network disconnector no. 118 at location 175-14 at 175.156 km on the other support of the same gate, network disconnector no. 201 at location 175-16 at 175.202 km on a support of the next gate.
The third gate was at 175.246 km location 175-18.
Single supporting structures were used for suspending the traction network above track 606 in the area of turnout 13 and for suspension and anchorage of rail crossovers.
Non-traction power supply – 25 type ŻN10 external lighting poles with fixtures i.e. lighting fixtures – 25 pcs, boxes on poles and connection line of approximately 750 linear metres of YAKY 4x25 mm^2 cable.

f) Means of radio and telephone communications used on site

Communications devices installed in executive signal box Błd:
Cable communications:
-KTE 101 telephone exchange, in working order, last inspection in October 2010, provided for security, train and emergency communications in the following configuration:
-button no. 1 security Łapy,
-button no. 2 security Białystok Fabryczny,
-button no. 3 security Białystok Starosielce,
-button no. 4 emergency Łapy,
-button no. 5 emergency K. L.e,
-button no. 6 train Łapy,
-button no. 7 train Białystok Fabryczny,
-button no. 8 train Białystok Starosielce,
-button no. 9 train K. L.e,
-button no. 10 train Wasilków,
-KTE 201 telephone exchange, in working order, last inspection in October 2010, provided for station communications in the following configuration:
-button no. 1 – to executive signal boxes Bł1, Bł4, Bł11,
-button no. 2 – to executive signal boxes Bł1, Bł2, Bł3, Bł5,
-button no. 3 – to executive signal boxes Bł4, Bł6, Bł7, Bł8,
-button no. 4 – to Cargo inspectors,
-button no. 5 – to executive signal box Bł11,
-MB 6 telephone exchange, in working order, last inspection in October 2010, provided for station communications in the following configuration:
-button no. 1 – to executive signal boxes Bł4, Bł5, Bł6, Bł.,
-button no. 2 – to executive signal boxes Bł1, Bł8,

-2 general service telephone sets (current nomenclature: public links), phone number (085) 673 3318 (fax) (085) 673 1318, in working order, last inspection in October 2010
-IP selector,
-fixed link with public address system (announcing trains),
- IRYS 707 F recorder, in working order, provided for recording of telephone calls from KTE 101 phone exchange, last inspection in September 2010 conducted by company Przedsiębiorstwo Handlowo Usługowe INN Marek Korzunowicz under agreement 13/209/001/00/11025750/10/I/O dated 16 February 2010.
Wireless communications:
-KRP 10 radiotelephone hub, in working order, provided for communications in train, road and maintenance network, antenna on a mast mounted on the roof of the Błd signal box building, last inspection in October 2010, offering the following channels:

- -train channel 4 – line 6,
- -train channel 5 – line 38, 32
- -train channel 7 – line 37,
- -emergency channel,
- -road channel,
- -maintenance channel,

- FM 3206 radiotelephone, in working order, providing for station shunting communications within station Białystok, last inspection in October 2010,
- IRYS 707 F recorder, in working order, provided for recording of radiotelephone calls from the hub, last inspection in September 2010 conducted by company Przedsiębiorstwo Handlowo Usługowe INN Marek Korzunowicz under agreement 13/209/001/00/11025750/10/I/O dated 16 February 2010.

The communications equipment is inspected by employees of railway telecommunications services in accordance with the schedule drawn up under Agreement no. A/09/01B/001/00/0025/09 dated 27 February 2009 for provision of telecommunications equipment maintenance services to PKP PLK S.A. by Telekomunikacja Kolejowa Spółka z o.o. in the years 2009-2012.

The communications equipment installed in executive signal box Bł1 prior to the accident (as listed in the recovered technical documentation):
Cable communications:
-MB 10 telephone exchange, in working order, last inspection in October 2010, provided for traffic communications between posts in the area of station Białystok, battery operated
-a general service telephone set (current nomenclature: public link), phone number (085) 673 1615, in working order, last inspection in October 2010

Wireless communications:

-FM 3001 radiotelephone for the station shunting communications, in working order, provided for the station shunting communications, antenna on a mast mounted on the roof of the Bł1 signal box, last inspection in October 2010
The communications equipment is inspected by employees of railway telecommunications services in accordance with the schedule drawn up under Agreement no. A/09/01B/001/00/0025/09 dated 27 February 2009 for provision of telecommunications equipment maintenance services to PKP PLK S.A. by Telekomunikacja Kolejowa Spółka z o.o. in the years 2009-2012.

g) Works in progress at the accident site and in its neighbourhood

no works in progress.

h) Initiation of post-accident procedures and their subsequent stages

Full name initials and title of the notifying person	Time of notification	Notified unit	Full name initials of the receiving person
M.S. Train driver	0530 hrs	Train dispatcher Błd	K.L.
K.L. Chief train dispatcher Błd	0532 hrs	Dispatcher IZ Białystok	J.W.
Dispatcher J.W.	0533 hrs	Provincial Office, Podlaskie Province	G.M.
Dispatcher J.W.	0533 hrs	Fire Service, Police, Medical Emergency Service	S.T.

Full name and title of the notifying person, time of notification	Notified unit	Full name of the receiving person	Date and time of arrival at the scene	Completion of work
Dispatcher IZ – 0533 hrs	Police	Duty Officer	0538 hrs - 0541 hrs	1400 hrs
J.W. – 0533 hrs	Provincial Office, Podlaskie Province	G.M.		
J.W. – 0533 hrs	Fire Service, Police, Emergency Medical Service	Duty Officer	0538 hrs - 0541 hrs	1400 hrs
Occurrence reported 9 November 2010	In accordance with the Ordinance, sent as per distribution list to all parties concerned.			

i) Description of rescue operations carried out by specialised units of railway and public rescue services, the Police and medical services; sequence of rescue operation stages

Rescue operation started on	8 November 2010	time	0530 hrs

completed on	11 November 2010	time	1400 hrs

Institutions notified:

National Fire Service
Police
Emergency Medical Service
Prosecutor's Office
State Commission for Investigation of Railway Accidents
National Labour Inspectorate
Provincial Environmental Protection Inspectorate
Municipal Police
Military Police
Provincial Office, Podlaskie Province
Orlen KolTrans
PKP CARGO S.A. Podlaski Zakład Spółki (Podlaskie Division)
PKP Energetyka S.A. Zakład Wschodni (Eastern Division)
Przewozy Regionalne Sp. z o.o. Podlaski Zakład Przewozów Regionalnych (Podlaskie Division)

Description of actions undertaken at the scene, manpower and resources committed:

On 9 November 2010, after the accident scene had been handed over by rescue services, the crew of the Special Technical Rescue Train Unit (Specjalny Pociąg Ratownictwa Technicznego, SPRT) of PKP PLK S.A. Zakład Linii Kolejowych w Warszawie (railway crane EDK1000/4, Technical Support Vehicle, SM42 locomotive) and the crew of Technical Rescue Train Unit (Pociąg Ratownictwa Technicznego, PRT) of PKP PLK S.A. Zakład Linii Kolejowych w Białymstoku commenced a site clearing operation to remove the damaged rolling stock. Upon removing the scrap that scattered from the derailed freight wagons, the crews went on to repair work to restore traffic in station Białystok.
The following companies were involved in rebuilding the destroyed railway infrastructure (crews and equipment):

1. PKP PLK S.A. Zakład Linii Kolejowych w Białymstoku: Operations Section in Białystok, Hajnówka, Suwałki (motorised trolleys, Fadroma loader, motor vehicles).
2. PKP PLK S.A. Zakład Linii Kolejowych w Warszawie – the Special Technical Rescue Train Unit.
3. Pomorskie Przedsiębiorstwo Mechaniczno Torowe Sp. z. o.o. Gdańsk (road-rail vehicles, rail tamper, vibration roller).
4. PKP Energetyka S.A. Zakład Wschodni w Białymstoku (Maintenance Trains).
5. TK Telekom Spółka z o.o. Region Robót Telekomunikacyjnych Warszawa (telecommunications works)

Work performed:

1. Removal of railway vehicles from the rail gauge of tracks 2a and 4a.
2. Removal of two tank cars from track 1a.
3. Demolition of damaged railway elements in the accident area i.e.: demolition of tracks 1a, 2a, 3a, 4a; demolition of destroyed steel sections and switch sleepers at turnouts.
4. Scooping out destroyed crushed stone ballast in places scheduled for laying the tracks for the rebuilt track layout.
5. Construction work related to repair of the superstructure in tracks 1a, 2a, 3a and 4a along a 497 m track section.

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6. Auxiliary work – geodetic measurements, surveys of density and load-bearing capacity of the trackbed under tracks 1a, 2a, 3a, 4a and intertrack space, crushed stone profiling in the repaired tracks and intertrack spaces.
7. Temporary support structures for the traction network at tracks 1a, 2a and 4a.
8. Suspending electrical grid on the earlier raised poles, service launch of tracks 2a and 4a with electric power traction – limited speed traffic.
9. Suspending electrical grid over track 1a and service launch of that track – limited speed traffic.
10. Rebuilding the cable grid for the local and long distance telephone lines damaged as a result of the accident (work done by TK Telekom Region Robót Telekomunikacyjnych Warszawa).
11. Dismantling the semaphore transmission lines, isolating the signal box area Bł1 from the station interlocking system.

Decisions made and people in charge of making them:
Pursuant to §2 Paragraphs 19 and 21 of Appendix 2 to the Accord regarding protection of critical infrastructure in PKP Group companies and cooperation between PKP Group companies, amended under Annexe No. 1 of 23 February 2009 and Annexe No. 2 of 29 September 2009, and pursuant to §34 Paragraph 4 Subparagraph 5 of the rules & regulations of providing access to train routes and their utilisation by licensed carriers in the framework of 2009/2010 timetable, the following decision were made:

Decision No. 23/2010 issued by the Chair of the Crisis Management Team in PKP Group on 8 November 2010 regarding appointing specific members and commencement of work of the Regional Crisis Management Team in Warsaw in relation to the occurrence of a serious railway accident at station Białystok; the team was composed as follows:

- Head of the Rail Traffic Management Agency of the Warsaw Company – Chair of the Team,
- Regional Commanding Officer of the Railway Protection Guard (Straż Ochrony Kolei, SOK) in Siedlce – Vice Chair.

Team members:

- Director of PKP Polskie Linie Kolejowe, Zakład Linii Kolejowych w Białymstoku,
- Head of Traffic Control Division in Zakład Centralny PKP Intercity S.A.,
- Director of PKP CARGO S.A. Zakład Podlaski,
- Director of Podlaski Zakład Przewozów Regionalnych Sp. z o.o. w Białymstoku,
- Director of Przewozy Lotos Kolej Sp. z o.o.,
- Deputy Director Technical and Commercial Operations in PKP Energetyka S.A. Zakład Wschodni.

The Regional Crisis Management Team operated from the headquarters of the Rail Traffic Control Division (Ekspozytura Zarządzania Ruchem Kolejowym) at 74 Targowa Street, Warsaw.
Pursuant to Resolution No. 162 adopted by the Management Board of PKP Polskie Linie Kolejowe S.A. on 4 May 2009 regarding implementation of 'Principles of organisation and operation of PKP Polskie Linie Kolejowe S.A. in crisis situations', the following decision was made:
Decision no. 6/2010 by Director of Zakład Linii Kolejowych w Białymstoku dated 8 November 2010 regarding appointing and commencement of work of the Company Crisis Management Team in Białystok in relation to the occurrence of a serious railway accident at station Białystok; the team was composed as follows:

- Deputy Director Service in PKP Polskie Linie Kolejowe S.A. Zakład Linii Kolejowych w Białymstoku – Chair of the Team,

- Deputy Regional Commanding Officer of the Railway Protection Guard (SOK) in Siedlce.

Team members:

- Officer Commanding SOK Outpost Białystok,
- Deputy Director for Service in PKP CARGO S.A. Podlaski Zakład Spółki w Białymstoku,
- Deputy Head of the Transport and Service Section in Białystok, PKP Intercity S.A. Zakład Centralny w Warszawie:,
- Deputy Director of Przewozy Regionalne Sp. z o.o., Podlaski Zakład Przewozów Regionalnych w Białymstoku,
- Head of the Transport Department in Podlaski Zakład Przewozów Regionalnych w Białymstoku,
- Head of the Service Provision Department in PKP Energetyka S.A. Zakład Wschodni w Białymstoku,
- Deputy Director Coordination and Supervision in TK TELEKSOM Sp. z o.o. Region Robot Telekomunikacyjnych w Warszawie (Telecommunication Service Region in Warsaw),
- Deputy Head of the Service Section in PKP Polskie Linie Kolejowe S.A. Zakład Linii Kolejowych w Białymstoku,
- Independent Officer for Information Security, Defence and Crisis Matters in PKP Polskie Linie Kolejowe S.A. Zakład Linii Kolejowych w Białymstoku,
- Director of the Civil Planning and Protection Unit in the Security and Crisis Management Department of the Podlaskie Provincial Office in Białystok.

The Company Crisis Management Team operated from the headquarters of Zakład Linii Kolejowych w Białymstoku at 58 Kopernika Street, Białystok.
The Company Crisis Management Team in Białystok cooperated closely with the Regional Crisis Management Team in Warsaw.
The fact of appointing the Company Crisis Management Team Zakład Linii Kolejowych w Białymstoku was reported to: the Provincial Police Commander, the Municipal Commander of Police, the Provincial Commanding Officer of the Fire Service, Crisis Management Centre of the Provincial Office, Municipal Crisis Management Centre in Białystok.

The scope of responsibilities of the Company Crisis Management Team appointed in Zakład Linii Kolejowych w Białymstoku included:

- establishing cooperation with crisis management system agencies relevant for the Team's area of operations,
- cooperation with units conducting the rescue operation,
- monitoring of and compiling updates on developments of the situation related to the accident in question and forwarding the updates to the Regional Crisis Management Team in Warsaw and the Crisis Management Centre in the Podlaskie Provincial Office in Białystok,
- elimination of the consequences of the occurrence,
- unblocking and restoration of traffic,
- development of 'The Regulations for temporary rail traffic management in relation to the accident that occurred on 8 November 2010 in station Białystok' and 'The Regulations for temporary rail traffic management in station Białystok following opening of tracks 1a, 2a, 4t',
- securing the accident scene,
- ensuring travellers' safety.

Pursuant to the Ordinance of the Minister of Transport of 30 April 2007 regarding serious accidents, accidents and incidents on railway lines (Journal of Laws No. 89, Item 593), the Company Accident Commission was appointed to investigate the circumstances and causes of the occurrence and to develop relevant preventive conclusions. The Commission promptly commenced operations at the accident scene.

The Commission was composed of representatives of Zakład Linii Kolejowych w Białymstoku, PKP CARGO S.A. Podlaski Zakład Spółki w Białymstoku and Orlen KolTrans Płock.

The Regional Crisis Management Team in Warsaw and the Company Crisis Management Team in PKP PLK S.A. Zakład Linii Kolejowych w Białymstoku commenced work on 8 November 2010 and concluded it on 15 November 2010 at 1500 hrs.

The two Crisis Management Teams in question concluded their work under the following decisions:

Decision No. 25/2010 by the Chairman of the Crisis Management Team in PKP Group dated 15 November 2010 regarding conclusion of work of the Regional Crisis Management Team in Warsaw in view of cessation of threats resulting from the serious railway accident in station Białystok.

Decision No. 8/2010 by the Director of Zakład Linii Kolejowych w Białymstoku dated 15 November 2010 regarding conclusion of work of the Company Crisis Management Team in Zakład Linii Kolejowych w Białymstoku in view of cessation of threats resulting from the serious railway accident in station Białystok.

2) Fatalities, injuries and losses:

a) Passengers, third parties, railway staff, including subcontractors, injured in the accident

Casualty Toll	Fatalities	Seriously injured	Injured
a) passengers	none	none	none
b) staff, including subcontractors	none	none	2 persons – train drivers
c) railway crossing users	none	none	none
d) persons unauthorised to stay on railway premises	none	none	none
e) other	none	none	1 person – a fireman

b) Losses to freight, passenger luggage and other property

Train 112861 carried the following load:

- Diesel oil ekodisel ultra F, net quantity: 581,300 kg, weight 582,087 kg,
- Raw material for reforming processes, weight 1,015,350 kg,

There were 20 tank cars with the following load in the fire zone at the occurrence time:

- Diesel oil ekodisel ultra F, net quantity: 581,300 kg, weight 582,087 kg,
- Raw material for reforming processes, weight 401,550 kg

The following load was pumped out of partially burnt tank cars at the scene:

- Raw material for reforming processes, weight 124,220 kg
- Hydrocarbon mixture, quantity 75,300 kg

Other property destroyed/burnt included staff private and protective clothing and personal belongings left in lockers in executive signal box Bł1 and in traction vehicles of train 112861.

c) Destruction of or damage to railway vehicles, railway infrastructure, environment etc.

Diesel traction vehicle M62–0689 – property of ORLEN KolTrans Sp. z o.o. (locomotive number one in the train set) – destroyed.
Noticeable disruption of the locomotive's body on the left side of B cab – a large dent with disruption of the left-side wall panel, dented to the inside of the cab together with sheet element of the coal wagon (maroon). No windscreens or side window panes in both cabs. All devices and objects in the cab, including speed recorder, comms equipment, indicators and brake valves were obliterated due to the very high temperature of the fire. It was impossible to remove the tape from the recorder, as it got completely burnt. External inspection shows that the equipment is completely burnt. The vehicle's undercarriage stuck deeply in the track ballast. The bogies torn off the locomotive's body. Batteries in the battery box – burnt out. Fuel tank – the structure was damaged due to fire and mechanical forces. It was not possible to assess the technical condition of the wheel sets and traction motors.
Diesel traction vehicle M2–198 – property of ORLEN KolTrans Sp. z o.o. (locomotive number two in the train set) – destroyed.

The whole structure of the vehicle was damaged due to the high temperature of the fire and forces acting on the vehicle at the moment of impact. All devices and objects in the cab, including speed recorder, comms equipment, indicators and brake valves were obliterated due to the very high temperature of the fire. It was impossible to remove the tape from the recorder, as it got completely burnt. Due to the extensive damage it was not possible to check and verify positions of the vehicle's control devices. The vehicle's body panels were burnt out very significantly, which made access to the machinery in the front compartments not possible (blocked access due to the action of high temperature and mechanical damage). Bogies, wheel sets and traction motors were destroyed very significantly. As a result of the action of mechanical forces and fire, it is not possible to assess whether or not any of the locomotive's elements is fit for further use (recovery).
Tank cars in train 112861 were damaged as follows:

1) tank car 33517973164-9 – completely destroyed, burnt,
2) tank car 33517860736-2 – completely destroyed, burnt,
3) tank car 83517858334-9 – completely destroyed, burnt,
4) tank car 33517852853-5 – completely destroyed, burnt,
5) tank car 33517983567-3 – completely destroyed, burnt,
6) wagon 83517860482-2 –completely destroyed, burnt,
7) tank car 33517855846-6 – completely destroyed, burnt,
8) tank car 83517981402-4 – completely destroyed, burnt,
9) tank car 83517858656-5 – completely destroyed, burnt,
10) tank car 33517952812-0 – completely destroyed, burnt,
11) tank car 84517901684-3 – completely destroyed, burnt,
12) tank car 83517862549-6 – completely destroyed, burnt,
13) tank car 33517901697-7 – completely destroyed, burnt,
14) tank car 33517858525-3 – completely destroyed, burnt,
15) tank car 33517862424-3 – completely destroyed, burnt,
16) tank car 33517850081-5 – completely destroyed, burnt,
17) tank car 83517862212-1 – completely destroyed, burnt,
18) tank car 83517856576-7 – completely destroyed, burnt,
19) tank car 33517952327-9 – completely destroyed, burnt,
20) tank car 33517952175-2 – partially destroyed, partially burnt – initially scheduled for repair following specialist testing by an authorised unit.

Wagons in train 55272 were damaged as follows:

1) freight wagon Eaos no. 82515337607-4, damaged.
2) freight wagon Eaos no. 82515499776-1, torn off the train set, overturned – lying on its side
3) freight wagon Hbikklls No. 21512371223-8, torn off the train set, overturned – lying on its side and crushed under two tank cars from train 112861.

In the area of the derailed wagons, the superstructure of the head of the turnout in the Bł1 switch area Bł1, including:

1) ordinary switches S-49, 1:9, R-300 on wooden switch sleepers – no. 8, no. 15 and no. 27 – three pcs.
2) double slip switches S-49, 1:9, R-190 on wooden switch sleepers – no. 6, no. 7, no. 9, no. 10 and no. 11 – 5 pcs.
3) the superstructure of the damaged tracks and inserts – S-49 type rails on wooden sleepers, Type K intermediate fixing (footing bolts and screws) along a total of 432 linear metres of track.
4) crushed stone ballast along the whole section of the turnout head.

Damaged traction network between 174.950 km and 175.300 over tracks 1a, 2a, 3a, 4a, 23a, 33a, 606, 607. Three supporting gate structures complete with suspensions were damaged (2 gates supporting 7 suspensions, 1 gate supporting 6 suspensions) along with 4 single supporting structures with suspensions and 15 grid suspensions, 2 OKZ power supply units with wiring, 3 ONS control boxes located on the traction network's support structures. A total of approximately 3 km of YzC 120-2c traction network and 2 km of C95–C traction network were destroyed

Five outdoor lighting poles with fixtures were destroyed in the area of Bł1.

Indoor rail traffic control devices – completely destroyed, burnt. Outdoor rail traffic control devices in the accident area – destroyed. Other outdoor rail traffic automation devices – partially damaged. Signalling devices switched off and invalidated.

Summary of losses incurred as a result of the serious accident

	Extent and nature of damage and destruction	Estimated replacement value
Railroad superstructure	Double slip switch – 4 pcs, single slip switch – 1 pcs, ordinary switch – 3 pcs, inter-turnout inserts – 432 linear metres completely destroyed.	PLN 4,800,000.00
rail traffic control devices	Executive signal box Bł1 together with indoor rail traffic control devices – completely burnt down. Outdoor rail traffic control devices in the Bł1 signal box area – partially destroyed.	PLN 6,400,000.00
Traction network	Destroyed were: approximately 3 km of Yzc120-2C traction network and 2 km of C95–C traction network, 3 gate support structures, 5 outdoor lighting poles with fixtures	PLN 450,000.00
traction vehicles	Destroyed: locos M62-0689, and TEM2-198	 PLN 2,234,200.00, PLN 1,500,000.00
PR Białystok	Backup transport Lost profit	PLN 31,398.06 PLN 27,015.00
freight wagons CARGO S.A.	3 wagons	351,736.80
freight wagons	19 wagons	PLN 8,100,000.00

GATX Rail Poland		
Environment	Remediation programme	PLN 6,000,000.00
TK TELEKOM Sp. z o.o.	Installations and devices	PLN 149,095.52
PKP Energetyka SA	Traction disconnector control devices	PLN 130,000.00
Total:		**PLN 30,173,445.38**

3) External conditions

a) Weather conditions

Time of day	night	Cloud coverage	moderate
Precipitation	light drizzle	Temperature	+4°C
Visibility	good	Audibility	good
Other phenomena	none		

b) Other external conditions which might have contributed to the accident (damage caused by mining operations, flood, etc.)

None.

III. DESCRIPTION OF RECORDS, EXAMINATIONS AND INTERVIEWS

1. Railway traffic safety management system, with reference to the serious accident, including:

1) Manner and organisation of giving and following orders

The investigators analysed the provisions of the Station Technical Rules for station Białystok in force since 15 October 1999, Copy 'Z', and 'The protocol drawn up in the Service Section in Białystok on 18 March 2009 regarding operation of executive signal boxes Bł2, Bł3 and Bł14 in station Białystok by the signalman in executive signal box Bł1'.
19 amendments were introduced to the Rules referred to above, as evidenced in the index of amendments and revisions, Record 81.
Amendment no. 19 Record 40 – there is inconsistency in the provisions regarding valid date of this amendment, i.e. accepting trains with hazardous loads and special shipments,
Amendment 16 Record 5 regarding the list of the station's technical posts:

- executive signal box Bł1 staffing: signalman no. 1, signalman no. 2,
- executive signal box Bł2 staffing: 1 signalman, when staffing suspended – signalman no. 2 of Bł1,
- executive signal box Bł3 staffing: operation from Bł2 or signalman no. 2 of Bł1. Inconsistencies with Record 42, i.e. distribution of staff activities at those posts:
  - with respect to signal box Bł1, the passage presents activities and responsibilities of the signalman and switch man, and in the absence of the switch man – his activities are performed by the signalman of that post,

– with respect to signal box Bł2, the passage presents activities of the signalman and states that in the case the staffing of post Bł3 is suspended, the responsibilities of the Bł3 signalman are taken over by the signalman of Bł2 (point 13, p. 497) 'for trains leaving from tracks 105-109, the signalman sets the running route, locks it with the itinerary lever and blocks the 'Permission Granted' from signal box Bł2, locks it and then goes to signal box Bł3 to set and lock the running route from there and send the permission signal to the semaphore'.

– signal box Bł3 operation from Bł2. There are provisions regarding suspension of operations of the switch man no. 1 and switch man no. 2 (who were employed for shunting and operation of the hump marshalling yard, which ceased operations after a tunnel under the PKP tracks was built in 2004) at that post, with their responsibilities taken over by the switch man from Bł2.

The above provisions show that the work on signal box posts Bł1, Bł2 and Bł3 was organised without applicable amendments to the RTS, i.e.:

a) responsibilities of the signalman at post Bł1 are performed by a single person in his/her signal area; these responsibilities include: setting running routes, observation from the signal box window of trains entering/leaving his/her signal area, operation of the station interlocking system, keeping a book of running routes and other documents (points 1- 12; p. 493);
b) staffing at that post includes also a switch man, whose responsibilities include maintenance, cleaning and operation of turnouts in his/her area (points 1-6, p. 495). However, no responsibilities are listed for signalman no. 2,
c) provisions from Record 5 cause that posts Bł2 and Bł3 are not staffed,
d) with such organisation of work, with the staffing of posts Bł2 and Bł3 suspended, it is not possible to observe trains leaving the group of tracks from no. 105 to no. 109 in signal area Bł2, as set forth in Records 31 and 33 of the Station Technical Regulations.

On 8 November 2010 train 55272 was dispatched from track 107 in conflict with the provisions of Record 40 of the RTS regarding accepting and dispatching trains carrying hazardous goods and special shipments. Train 112861 is not shown in an extract from the station timetable at signal box Błd, although it had been recorded in internal timetable books. In parallel to that, the commission established that prior to the accident there had occurred the following deviations from the timetable: dispatching train 55272 before the time set in the timetable without substantiation or approval from the line dispatcher, repeated delays of train 112861, trains carrying high risk goods (TWR) were dispatched from station Białystok from tracks not intended for those types operations (according to the RTS of station Białystok, Record 40). With post staffing suspended, it is not possible to fully enforce these provisions of the RTS. Books of running routes (R-142) should be kept in full scope for posts Bł2 and Bł3 due to incomplete station interlocking i.e. the absence of the block for compulsory return of order, as a result of which the staff exchanged instructions and reports regarding setting running routes between dispatching signal box Błd and executive signal boxes Bł2 and Bł3 by telephone. Since signal boxes Bł1 and Bł11 are equipped with full station interlocking with blocks for compulsory return of order, they did not require any restrictions. On the accident day, documentation from posts Bł2 and Bł3 was at post Bł1, which prevented recording of ongoing reports and orders given in those signal areas regarding setting of running routes, giving permission signals or time of entry and time of exit of a train. The above extended the time needed to set the running routes for trains.

Relevant work documents presented (lists of presence at posts Bł1, Bł2 and Bł3) revealed that post Bł2 was staffed from post Bł1 in August and October 2010, while in September 2010 the staffing of post Bł2 was maintained between 1000 hrs and 1800 hrs. Changing working hours and staffing of the posts hindered appropriate organisation of work at those posts.

With such organisation of work, it was impossible to enforce the provisions of the RTS and provisions set forth in 'The Protocol (...)' of 18 March 2009. The amendments introduced under the Protocol were not incorporated in the RTS. In the shape presented above, the Station Technical Regulations (RTS) for station Białystok prevented proper performance of responsibilities by the staff at posts Bł1, Bł2 and Bł3, in whose areas the entry of train 112861 and exit of train 55272 was controlled.

2) Requirements regarding railway personnel and enforcement of those requirements (working time, professional qualifications, health requirements, etc.)

a) Train dispatcher – K.L. – PKP PLK S.A. Zakład Linii Kolejowych w Białymstoku, born on 24 March 1970; employed as train dispatcher since 7 November 1996 following a successfully passed qualifying exam; authorisation exam did apply at the time; periodic exam on 30 August 2010; last periodic briefing on 10 February 2010; last periodic health check on 24 September 2008. Employed in accordance with the work plan. The accident occurred in the 10th hour of work.

b) Train dispatcher – G.P. – PKP PLK S.A. Zakład Linii Kolejowych w Białymstoku, born on 9 June 1963; employed as train dispatcher since 20 December 1982 following a successfully passed qualifying exam; authorisation exam Błd on 25 April 1996; periodic exam on 2 September 2010; last periodic briefing on 8 February 2010; last periodic health check on 9 July 2010. Employed in accordance with the work plan. The accident occurred in the 10th hour of work.

c) Signal Woman – J.T. – PKP PLK S.A. Zakład Linii Kolejowych w Białymstoku, born on 18 November 1972; employed as signal woman since 17 June 2003 following a successfully passed qualifying exam; authorisation exam Bł11 on 4 July 2005; periodic exam on 2 September 2010; last periodic briefing on 25 June 2010; last periodic health check on 10 June 2009. Employed in accordance with the work plan. The accident occurred in the 10th hour of work.

d) Signalman – S.S. – PKP PLK S.A. Zakład Linii Kolejowych w Białymstoku, born on 4 April 1960; employed as signalman since 8 April 1992 following a successfully passed qualifying exam; authorisation exam Bł1 on 6 July 2006; periodic exam on 1 September 2010; last periodic briefing on 14 October 2010; last periodic health check on 24 February 2010. Employed in accordance with the work plan. The accident occurred in the 10th hour of work.

e) Signalman – A.M. **–** PKP PLK S.A. Zakład Linii Kolejowych w Białymstoku, born on 3 June 1971; employed as signalman since 18 August 1989 following a successfully passed qualifying exam; authorisation exam Bł1 on 17 November 1989; periodic exam on 31 August 2010; last periodic briefing on 22 June 2010; last periodic health check on 13 May 2010. Employed in accordance with the work plan. The accident occurred in the 10th hour of work.

f) Train Driver – M.S. of PKP CARGO S.A. Zakład Mazowiecko- Podlaski, driving train 55272 bound from Białystok to Warszawa Praga; born on 28 May 1955; appointed as train driver on 12 February 1991; licence to drive electric traction vehicles No. A019183 issued on 19 July 2007; qualifying exam on 12 February 1991; periodic exam on 18 March 2010; the Train Driver M.S. was not obliged to pass an authorisation exam; route knowledge card in 2010 – last travel on the Białystok-Warsaw route on 12 October 2010, the card was not signed by the holder; periodic health check valid until 3 November 2011; last periodic briefing on 7 October 2010; the accident occurred in the 1st hour of work. Employed in accordance with the work plan.

g) Train Driver – K.W. of Hagans Logistics Sp. z o.o., born on 21 January 1976 in Bydgoszcz, qualifying exams for the position of:
- rolling stock inspector – 14 July 2008,
- shunter – 23 August 2008,
- driver of diesel traction vehicles – 15 May 2009,
- shunting master – 15 September 2010.

No authorisation exam regarding operation of M62 and TEM2 locomotives; driving licence no. HL 26/2009; periodic exam – no need for taking; route knowledge card – no card – last travel on route Kutno–Sokółka on 3 November 2010. His last periodic health check was conducted on 2 June 2010 and during that check it was established that he had had his last psychological examinations on 3 October 2007 and 5 June 2008 i.e. prior to him taking his qualifying exams for the position of rolling stock inspector and shunter – for the position of a driver. No document was furnished to certify he is psychologically fit to do his current job. Last periodic briefing on 29 October 2010. No documents certifying that he familiarised himself with the station technical regulations for station Białystok. The accident occurred in the 10th hour of work. Employed to meet the needs of the hiring party.
On 1 July 2010 Mr K.W. and Hagans Logistics Sp. z o.o. signed an agreement no. 157 for the provision of traction services. The fact is, however, that the company does not hold a carrier licence and should not offer outsourcing of traction employees. The company Orlen KolTrans Sp. z o.o. was misled, as the employees providing traction operation were not in fact employed by the business with which Orlen KolTrans Sp. z o.o. entered into agreement no. MP/2/2008 dated 18 January 2008 – i.e. Hagans Logistic Sp. z o.o.

h) Train Driver – A.W. of Hagans Logistics Sp. z o.o., born on 8 October 1974 in Toruń, qualifying exams for the position of:
- assistant to a driver of diesel traction vehicles – 30 April 2004,
- shunting master – 15 July 2005,
- rolling stock inspector – 15 July 2005,
- driver of diesel traction vehicles – 23 June 2006,
- driver of electric traction vehicles – 15 November 2009,
- authorisation exam regarding operation of M62 and TEM2 locomotives – 30 October 2006.

Driving licence no. HL35/2006, periodic exam – passed in June 2010. No route knowledge card; last travel on Kutno–Sokółka route on 26 October 2010; last periodic health check on 4 November 2010; psychological examination on 9 November 2007, last periodic briefing on 29 October 2010. No documents certifying that he familiarised himself with the station technical regulations for station Białystok. The accident occurred in the 10th hour of work. Employed to meet the needs of the hiring party.
On 1 July 2010 Mr A.W. and Hagans Logistics Sp. z o.o. signed an agreement no. 154 for the provision of traction services. The fact is, however, that the company does not hold a carrier licence and should not offer outsourcing of traction employees. The company Orlen KolTrans Sp. z o.o. was misled, as the employees providing traction operation were not in fact employed by the business with which Orlen KolTrans Sp. z o.o. entered into agreement no. MP/2/2008 dated 18 January 2008 – i.e. Hagans Logistic Sp. z o.o.

3) Ad-hoc and periodic internal audit procedures and their findings (internal safety audit)

No documentation of Hagans Logistic Sp. z o.o. and Hagans Logistics Sp. z o.o. evidencing that the train drivers underwent any ad-hoc checks.

The audit of the performance of train drivers K.W. and A.W. was based on their job sheets and tachometer tapes reaching back to 1 month before the occurrence and revealed that the said documentation had not been controlled and showed a number of irregularities, namely:

- exceeding the statutory working time limit i.e. more than 12 hours in the vehicle,
- non-compliance with the obligatory 12-hour rest period between jobs,
- switching off the vigilance devices in the locomotives,
- inconsistent working time data in job sheets tachometer tapes.

The train drivers' job sheets were validated after each completed job by a dispatcher in Hagans Logistic Sp. z o.o., who was an employee of the company that employed the drivers. The dispatcher validated the sheets despite numerous irregularities therein.
The drivers participated in periodic briefings and held documents issued by Hagans Logistic Sp. z o.o., with which they had no agreements for the provision of traction services.

Train driver M.S. participated in periodic briefings, underwent checks during training and checking driving. Planning and actual performance of working shift no. 77, which applied to driving train 55272, showed irregularities consisting in employing train drivers by dispatchers before their job sheets and timetables were updated.
Train dispatchers and signalmen at station Białystok underwent ad hoc checks during the day and at night in accordance with the provisions of point 4 of the Programme for the Improvement of Rail Traffic Safety in PKP Polskie Linie Kolejowe Zakład Linii Kolejowych w Białymstoku in the year 2010. They participated in periodic briefings in accordance with the briefing plan in force at Zakład Linii Kolejowych PKP PLK S.A. w Białymstoku in the year 2010.
All employees of PKP PLK S.A. Zakład Linii Kolejowych w Białymstoku meet the employment requirements applicable to the positions they hold.
Reports on audits conducted at PKP PLK S.A. Zakład Linii Kolejowych w Białymstoku in the second half of 2010 by the Warsaw Branch of the Office for Railway Transport (Urząd Transportu Kolejowego) (between 9 and 13 August 2010 and between 12 and 15 October 2010) did not show any irregularities.
Reports from inspection tours of railway line 006 Zielonka-Kuźnica Białostocka conducted in the second half of 2010 by the Office for Control and Internal Audit of PKP PLK S.A. (on 19 July 2010 and 22 July 2010) did not show any irregularities. The audits and checks did not cover the issues that had an impact on the occurrence.
The Station Technical Regulations of station Białystok – no relevant amendments regarding scopes of responsibilities and division into signal areas were introduced after withdrawing the staff from post Bł2, Bł3 and Bł14.

4) Responsibilities regarding cooperation between the various organisations that took part in the accident

During dispatch planning at 1025 hrs a dispatcher in Orlen KolTrans forwarded data to a dispatcher in PKP PLK S.A. regarding an intention to carry high risk goods in train 112861 (21 tank cars with the code UN1203). The data was subsequently entered into the SEPE and SWDR systems. This information is inconsistent with facts because, according to the rail waybills regarding goods carried in the train and the list of wagons in the train set furnished by the carrier, it transpires that no UN1203 goods were on that train. The train carried goods coded as UN1268, which in fact are high risk goods, but the number of tank cars with high risk goods declared by the carrier (21 tank cars) was different – the train had 20 tank cars with such goods.
Pursuant to §17 Paragraph 7 if Instruction Ir-16 regarding steps to be taken with respect to carriage of hazardous goods by rail, the dispatcher in Orlen KolTrans notified the dispatcher in

PKP PLK S.A. on the plans to dispatch tank cars with high risk goods. The train driver notified the train dispatcher at the departure station of the carriage of high risk goods by sending message R-7 which contained actual information about the goods carried.
The dispatcher in PKP CARGO S.A. sent the dispatcher in PKP PLK S.A. the data on train 55272 that reflected the actual state of facts, i.e. 2 tank cars with UN1965 high risk goods.

2. Guidelines and regulations with relevance to the accident, including:

1) Rules and regulations in force in the EU and in Poland
European Union Directive 49/2005 on safety on the Community's railways and amending Directive 2001/14/EC on the allocation of railway infrastructure capacity and the levying of charges for the use of railway infrastructure and safety certification.

The Act of 28 March 2003 on railway transport and related executive regulations. (RID) The Regulations on the International Carriage of Hazardous Goods by Rail

2) Internal regulations in force at railway undertakings
Infrastructure Manager – PKP PLK S.A.

- Ir-8(R-3) – Instruction on steps to be taken with respect to serious accidents, accidents, incidents and operational difficulties on railway lines,
- Ir-1(R-1) – Instruction on managing train traffic operations,
- Ir-3(R-9) – Instruction on drawing up technical regulations,
- Ir-2(R-7) – Instruction for the personnel manning technical traffic posts,
- Ir-16 – Instruction on steps to be taken with respect to carriage of hazardous goods by rail,
- Ie-1(E-1) – Signalling instruction,
- WTB-E10 – Guidelines for construction of traffic management control devices in the railway undertaking PKP
- Station Technical Regulations for Station Białystok in force since 15 October 1999,
- 'The protocol drawn up in the Service Section in Białystok on 18 March 2009 regarding operation of executive signal boxes Bł2, Bł3 and Bł14 in station Białystok by the signalman in executive signal box Bł1'.

ORLEN KolTrans Sp. z o.o.
Train Driver Instruction – (OKTt-2 ORLEN KolTrans)

PKP CARGO SA
Train Driver Instruction – CT-1

3. Summary of interviews (personal data protected under the Act of 29 August 1997 on personal data protection – Journal of Laws of 2002, No. 101, item 926, as amended):

1) Railway staff and subcontractors' staff

Mr A.W., driver of locomotive M62-0689, Hagans Logistics Sp. z o.o., was interviewed on 9 November 2010. He briefly described the movements of train 112861 from the moment of taking over at Kutno station up to the moment of the occurrence. He testified that he had seen the Białystok station entrance semaphore $6B^{1}/_{2}$ set to signal free way and the warning shield $ToB^{1}/_{2}$ signalling Ot1 with reference to route semaphore B½ set to signal 'Stop'. He said he had started braking. He then continued to drive ahead as he noticed a green light showing through from just where the semaphore was located. At the moment of the occurrence he fell to the floor of his

vehicle. Mr A.W. was asked 13 additional questions aimed at obtaining a more detailed picture of the situation before the accident that he described in his interview. Explanations and answers provided by A.W. are inconsistent with the Commission's findings.
Mr K.W., driver of locomotive TEM2-198, Hagans Logistics Sp. z o.o., was interviewed on 9 November 2010. He said that the CA and SHP vigilance devices had been switched off and sealed. The train documentation was in the train. He briefly described the movements of train 112861 from station Kutno up to the site of the occurrence. He said that he had seen a single green light displayed on the warning shield for the Białystok station entrance semaphore, upon which he discontinued pushing. He estimated the speed of his train to be around 60 km/h.

He did not see any other signals right up to the moment of the accident. Mr K.W. was asked 8 additional questions aimed at obtaining more details regarding his explanations. His answers and explanations corroborate the facts established by the Commission about the switched off vigilance devices and failure to observe indications on trackside signalling devices.

Mr M.S., driver of locomotive ET 22-1030, Podlaski Zakład Spółki CARGO S.A., interviewed on 8 November 2010. He briefly described the situation relating to starting his work and taking over the train 55272. He described the actions related to starting the train and departure from track 107 in station Białystok. In the Bł1 area he noticed a train approaching on full beam headlights from the opposite direction. As prompted by the electrical traction indicators, he switched to 'non-electric drive' and passed the train approaching from the opposite direction on the adjacent track. He then felt a jolt of the train, upon which he implemented braking and reported the accident to the train dispatcher at station Białystok on his radiotelephone. Mr M.S. was asked 11 additional questions aimed at obtaining more details regarding his explanations. His answers and facts provided in the interview are inconsistent with the Commission's findings.

Individuals G.Ż., M.U. and G.P., working as crossing keepers on the Łapy-Białystok route on the day of the accident, interviewed on 19 November 2010. The information they provided during the interviews as well as their answers to additional, fine-tuning questions are consistent with the Commission's findings regarding the course of events before the accident.

Ms K.O., senior train dispatcher at block post Baciuty, interviewed on 19 November 2010. She briefly described her assumption of shift duty and her work on the day of the accident. She did not confirm the allegations that the train driver of train 112861 raised the Baciuty post on the radiotelephone. She had information that train 112861 had been carrying high risk goods. As train 112861 was passing by, she noticed that interior lights in both locomotives were switched off. She handled the [traffic control] devices according to the rules and updated her documentation. She recorded the fact of the train's high risk load in the R-147. At around 0527 hrs block PoA , informing about train 112861's approach to station Białystok, unlocked. She then heard about the accident on the radiotelephone. Ms K.O. was asked 9 questions to make the interview more precise. Her answers and explanations corroborate the Commission's findings.

Mr St.S., signalman no. 1 in Bł1, was not interviewed due to long-term disease, but he gave his explanations to representatives of the Police and Prosecutor's Office on the day of the accident.

Mr M.A., signalman no. 2 in Bł1, interviewed on 10 November 2010. He briefly described the situation related to starting his work and taking over duties at the post on the day of the accident. He then briefly characterised the traffic situation in areas Bł2 and Bł3, which he operated, and discussed the train movements and shunting operations prior to the accident. He listed all activities related to handling of srk devices in areas Bł2 and Bł3 related to the preparation of the

running route for train 55272. He characterised the train exiting from track 107 and explained his actions from the moment of exit until the moment of the accident. Mr M.A. was asked 13 additional questions. Mr M.A. was interviewed additionally on 16 December 2010, when he was asked 4 questions regarding keeping and storing documentation.
Interviews held with Mr M.A. and his answers corroborate the Commission's findings regarding the course of events and irregularities in keeping the documentation for areas Bł2 and Bł3.

Ms J.T., signal woman in Bł11, interviewed on 17 November 2010. She briefly described the events related to her taking over of the night shift duty prior to the accident. She presented the traffic situation and discussed the manner of documentation keeping at the post. She confirmed the facts related to comms check and lighting of the signalling devices and did not voice any reservations in that respect. At around 0517 hrs a passenger train travelled through her signal box area from the direction of Baciuty. The signal woman described all activities related to her handling of rail traffic control devices and documenting train movements from the direction of Baciuty. She explained the manner of ordering the running routes for scheduled trains and trains that travel according to their individual timetables. She said that the train dispatcher, after raising post Bł1, Bł11, gave the order to prepare a running route first for the train departing in the direction of Baciuty and then for the train approaching from the direction of Baciuty. The order was given in one telephone dispatch with the sequence of actions prioritised. She operated the rail traffic control devices and set permission signals on semaphore 6B½ for train 112861 and on semaphore 6G for train 55272 as ordered, and recorded those actions in the documentation. While approaching to commence observation of the entry of train 112861, she noticed that route semaphore B½ indicated Sr1 'STOP'. The head of the train was illuminated with three white lights. On passing the signal and clearing points she handled the rail traffic devices and did not see any irregularities in the passing stock, but she did notice that there were no signs of braking by the driver of train 112861. She explained how the ToB warning shield was handled. She said that when she wanted to leave to commence observation of train 55272, she noticed a fire in the Bł1 area, which she reported to the train dispatcher via a phone exchange. The train dispatcher already knew about the occurrence. She also informed about a break in communications and end of her work. Ms J.T. was asked 19 additional questions. The signal woman's answers and explanations corroborate the course of events established by the Commission.

Ms E.B., signal woman in Bł4, interviewed on 12 November 2010. She briefly summarised her taking over of shift duties and subsequent course of work prior to the accident, including the traffic situation and manner of documentation keeping. At around 0400 hrs 2 locomotives for the train passed and entered track 107. After that, until the moment of the accident, there were no trains or shunting. At around 0530 hrs she heard a loud bang and saw a fire in the Bł1 area. She notified the train dispatcher by telephone and left the signal box room. She saw the traction network going down. She then set off to the dispatching signal box following instructions from SOK officers. Ms E.B. was asked 23 additional questions. Her answers and explanations corroborate with the Commission's findings.

Mr K.L., chief train dispatcher at station Białystok, interviewed on 11 November 2010. He informed about his taking over of duties at dispatching signal box Błd. He discussed his responsibilities regarding handling of rail traffic control devices and keeping the relevant traffic documentation. He informed about defects and problems in controlling rail traffic, and presented the traffic situation at station Białystok. He informed about the manner of ordering running routes with executive signal boxes that report to him. He explained how messages are exchanged between employees participating in rail traffic control at the executive signal boxes and the dispatching signal box.

He discussed rail traffic restrictions and reasons for imposing them. He briefly summarised preparations of train 55272 for departures, starting from the moment of positioning on track 107 until the departure and collision with train 112861. He specified messages with which he informed the signalmen participating in train movements about preparation of running routes for trains, and messages he received from his subordinates about readiness of those running routes.
He recorded the individual running routes in the documentation. At around 0520 hrs the driver of train 55272 reported ready to depart. It was a short train set carrying high risk goods standing on track 107. At the same time, he received a message from the assistant train dispatcher about the departure of train 112861 with high risk goods from Baciuty. He ordered running routes in a single telephone dispatch first for train 55272 from track 107 and then for train 112861 onto track 25 in areas Bł1, Bł11, Bł4. It was around 0521 hrs. He handled the rail traffic control devices and recorded it in the documentation. He did not agree an earlier departure of the train with high risk goods with the dispatcher. He explained how the rail traffic devices are handled at signal boxes Bł2 and Bł3, particularly the inter-relations resulting from the sequence of setting the semaphores. He explained that with the permission signal sent to semaphore E^2 it is not possible to indicate the same on semaphore B½, for these are conflicting routes in the Bł1 area. Train 112861 had its entrance prepared onto track 1a to semaphore B½, which indicated 'STOP'. He was informed by the rail traffic control devices about the movement of train 112861 though area Bł11 and of the train 55272 through areas Bł3, Bł2. At around 0530 hrs he heard the driver of train 55272 on the radiotelephone screaming that 'the private bloke must have passed the semaphore and hit me on the side'. He then noticed a fire glow in the distance in the Bł1 area. He took immediate steps and started notifying by phone relevant rescue and emergency services of the occurrence. He passed the information also to the dispatchers. In the case of train 55272, the running route in the area of signal boxes Bł2 and Bł3 was controlled on the basis of monitoring of the rail traffic control devices without using telephone dispatches. He was breathalysed by his superiors (negative result) and then by Police officers (also negative). Mr K.L. was asked 16 additional questions aimed at obtaining more details regarding his explanations. Mr K.L. was invited to an additional interview on 5 January 2011, when he was asked 8 additional questions. The interviews and incomplete answers confirmed the facts established by the Commission and included in the Report.

Ms G.P., assistant train dispatcher at signal box Błd, station Białystok, interviewed on 17 November 2010 and 5 January 2011. At the first interview, she discussed her taking over of the shift duty at dispatching signal box Błd on 7 November 2010 and actions she took during her shift. She then answered 14 questions about, among other things, information on the type of train 112861, reasons for the earlier departure of train 55272, operation of the station interlocking/block system, notifying the crossing keepers of the departure of train 55272, organisation of traffic in signal box areas Bł11, Bł1 and Bł4 and her knowledge of the train timetable deposited at the Błd post. She confirmed deployment of train 55272 with high risk goods on track 107, which is not designated by the regulations to support exits of trains of this type. She testified that after she had been breathalysed (result 0.00 mg/litre) by the traffic engineering station master M.G. and deputy section head, she went home. During the interview she said that because she had been under stress and could not sleep, she had two glasses of cognac at around 1000 hrs and went to sleep. This led to an alcohol test done by the Police at the Police station at 1501 hrs. Her answers were consistent with the Commission's finding included in the Report.

Mr M.K., rolling stock inspector at PKP CARGO S.A., interviewed on 5 January 2011 in relation to the event that happened on 8 November 2010**.** He discussed the course of action he took during his shift. Then he answered 4 questions about the brake testing on train 55272, filling in the relevant brake testing sheet, the name of the train driver with whom he conducted the testing. His answers were consistent with the Commission's finding included in the Report.

Mr G.B., traffic engineering instructor at IZ Białystok, interviewed on 4 January 2011 about the manner of operating executive signal boxes Bł2, Bł3 and Bł14 by the signalman at signal box Bł1 in relation to the Protocol dated 18 March 2009 in reference to the accident that occurred on 8 November 2010 in the conditions of altered organisation of work at signal box Bł1. He gave a detailed explanation of the cause for the reorganisation introduced under the Protocol dated 18 March 2009 and then answered three questions about keeping the traffic and technical documentation for posts Bł2 and Bł3 (which had been deposited at post Bł1), ordering the signalman to prepare the running route at posts Bł2 and Bł3, and the scope of activities of the two signalmen, possibility for the staff at technical posts to perform the obligations regarding train entries/exits. His answers were consistent with the Commission's findings included in the Report, i.e. he confirmed that it was impossible to handle train entries and exits in the said signal box areas in accordance with the provisions of the Station Technical Regulations and findings in the Protocol dated 18 March 2009.

Ms L.A., traffic engineering controller IZ Białystok, interviewed on 5 January 2011 in her capacity of the Chair of the company commission investigating the event that occurred at station Białystok on 8 November 2010, regarding actions she had taken in relation to testing the sobriety of the employees involved in the accident. While conducting the above-said investigation, at around 0800 hrs she was informed by Mr A.B., a member of the commission, and A.J.K. that the staff of dispatching signal box Błd had been breathalysed and were sober. While at the accident scene, she personally ordered signalmen St.S. and M.A. to go to the signal box Błd in order to have their sobriety tested by the Police. She obtained information about the state of sobriety of train dispatcher G.P. after she had received protocols from the Prosecutor's Office on 14 December 2010. She promptly notified, by telephone, the Chair of the PKBWK of the negative result of the sobriety test. Her answers were consistent with the Commission's finding included in the Report.

Mr J.Ch. – Automation Master at ISE Białystok. During his interview on 12 November 2010, he said he had learnt about the occurrence at station Białystok from television and went on to describing the actions he took when he came to work. Then he answered 8 questions regarding, among other things, types of defects in the rail traffic control devices between 18 June 2010 and the date of the occurrence, defects related to the functioning of the shape route semaphore B½, replacement of light bulbs in electrical lighting on that semaphore, the possibility to send a permission signal to semaphore E^2 after locking the semaphore (permission granted) B½ on track 25 without train entry; he gave a detailed description of the defect in semaphore $B^{1/2}$ of 16 September 2010 recorded in the E1758 documentation. His explanations were consistent with the Commission's findings included in the Report.

2) Other witnesses

There were no witnesses.

4. Functioning of the rail traffic structures and facilities and railway vehicles:

1) Signalling, traffic control and security systems, including recordings from automatic data recorders

Station Białystok is equipped with mechanical key-operated rail traffic control devices with shape signalling. Executive signal boxes Bł1 and Bł11 are equipped with block apparatuses

with mechanical interlocking boxes, where the obligatory permission and order clearance is done through Pzz and Pzn blocks cooperating with interlocking mechanisms. Executive signal boxes Bł2, Bł4, Bł6, Bł7, Bł8, Bł12, Bł14 are equipped with P46 apparatuses. Signal boxes Bł3, Bł5 and Bł13 are equipped with block apparatuses and wall-mounted key boxes of 'Z' type. Dispatching signal box Błd is equipped with coupled P46 apparatuses cooperating with all the executive signal boxes. The obligatory permission and order clearance is done electrically from the side of dispatching signal box Błd through continuous current flappers placed above order blocks. As a result of the above situation, ordering of and reporting on preparation of running routes between dispatching signal box and the executive signal boxes, except for Bł1 and Bł11, had to be done by telephone. Turnouts within the entire station area were switched manually. Switches were locked with bolt and pin locks.
To ensure safety, the station's devices had additional sublever interlockings for the sequence of setting the semaphores. The above required from the staff to operate all the traffic control devices separately for each train pass. The rail traffic control devices were in working order and operational, and their condition was in line with the technical documentation. The rail traffic control system used at the Białystok station does not provide for recording actions taken by the operators.
The documentation gathered in the course of the investigation includes reports from diagnostic checks of the rail traffic control devices, reports from checks of visibility of signals and reports from checks of the automatic train braking system devices – all drawn up by qualified personnel holding applicable building licences. The reports confirmed the efficiency of the rail traffic control devices.
The visibility of markers and signals from locomotives ET22-1030 and M62-689 was very good, while from locomotive TEM2-198 it was good from the right side due to vehicle's design. The Commission established the above on the basis of two site inspections and a test run in a rolling stock on the Łapy–Białystok route at night.

2) Railway infrastructure

The remaining railway infrastructure i.e.: the rail superstructure and power systems were also diagnosed by qualified personnel holding appropriate qualifications and building licences. The necessary measurements and functional tests, both of the superstructure and the traction network, were done and officially handed over to the manager or recorded in appropriate documentation. The infrastructure related to the accident was in working order.

3) Communications equipment

Cable communications:

- an MB 10 telephone exchange, in working order, last inspection in October 2010, provided traffic communications between posts in the area of station Białystok, battery operated,
- a general service telephone set (current nomenclature: public link), phone number (085) 673 1615, in working order, last inspection in October 2010

Wireless communications:

- an FM 3001 radiotelephone for the station shunting communications, in working order, provided the station shunting communications, antenna on a mast mounted on the roof of the Bł1 signal box, last inspection in October 2010.

The communications equipment is inspected by employees of railway telecommunications services in accordance with the schedule drawn up under Agreement no. A/09/01B/001/00/0025/09 dated 27 February 2009 for the provision of telecommunications equipment maintenance services to PKP PLK S.A. by Telekomunikacja Kolejowa Spółka z o.o. in the years 2009-2012.

a) the investigators recovered data from the telephone call recorder on a 'Koliber' train radiotelephone, manipulator number KM 01-0922009, radiotelephone number K T 01-0922009, at station Wasilków. Analysis of the said data revealed calls made between the train dispatcher at Błd (K.L.) and the train driver M.S.
0522 hrs – readiness of train 55272 report, the report received by the train dispatcher, a full 'analysis' of the train communicated by the train driver to train dispatcher K.L.
0523 hrs – train driver M.S. gave the numbers of the locomotives in train 55272 and dispatcher K.L. gave another number, under which the report was recorded.
0527 hrs – information about the fire and full recording of calls between the train drivers and the dispatcher.
0536 hrs – voices of the train drivers were recorded.
0539 hrs – further recording of the calls between the dispatcher and the train drivers.

4) Railway vehicles, including automatic data recorder entries

Locomotive ET22-1030 – equipped with a 'RADMOR- 3036' radiotelephone and a Hasler-Bern RT9 speedometer-recorder saving operating parameters on a tape within the recording range from 0 to 150 km/h. The locomotive's technical condition was good and the vehicle had a valid railworthiness certificate. All devices installed in the locomotive were in working ordere and functioned properly. Locomotive M62-0689 – equipped with a PYRYLANDIA radiotelephone, manipulator no. F747M,SN:251/OD and a Hasler-Bern RT9 speedometer-recorder (destroyed, unrecoverable). The locomotive's technical condition was good and the vehicle had a valid railworthiness certificate. Locomotive TEM2-198 – equipped with a PYRYLANDIA radiotelephone and a Hasler-Bern RT9 speedometer-recorder (destroyed, numbers could not be recovered). The locomotive's technical condition was good and the vehicle had a valid railworthiness certificate.
The content of the calls related to the accident was recreated on the basis of accounts given by the employees. The train communications radiotelephones at station Białystok, locomotives ET22-1030, were in working order. No calls made via train radios from locomotives M62–0689 and TEM2- 198 were recorded, but the event log from the F747M,SN:251/OD radiotelephone's manipulator on leading locomotive M62-689 was recovered.

A commission hearing of calls recorded on the 'KOLIBER' radiotelephone at station Wasilków between 0510 hrs and 0600 hrs was conducted; the recording included calls made at station Białystok in relation to the occurrence.
Recordings on automatic data recorders:

- Entries from the data recorder in locomotive ET22-1030 of train 55272 PKP CARGO SA (data recorder Hasler Bern RT9 no. L01083, a speed recorder tape with speed range 0 km/h – 150 km/h) were recovered.
- Entries on the speed recorder tape: inactivity of the locomotive together with recorded braking from 0450 hrs to 0520 hrs; start-up of the locomotive, cab B, at 0525 hrs causing a speed increase to 23 km/h; movement with the drive inactivated from 0525 hrs to 0526 hrs. Reactivation of the drive, speed up to 30 km/h and at 0526 hrs the drive is again inactivated, with speed down to 22 km/h; at 0527 hrs
- reactivation of the drive and speed up to 25km/h, and at that speed – the pressure drop in the main pipe (braking) and stop at 0527 hrs.
- The RADMOR-3066 device installed in the locomotive does not provide for recording phone calls. The train driver did not use the 'Radio-Stop' function.
- The data recorders installed in locomotives M62-0689 and TEM2-198 were not recovered due to complete destruction in the fire of the rail vehicles.

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- data from the PYRYLANDIA phone call recorder (manipulator no. F747M,SN:251/OD) installed in locomotive M62-0689 was recovered.

Analysis of the recorded data revealed that a prolonged interruption of power supply caused a loss of synchronisation of the RTC internal clock. Reenergising caused a switch in dates and recording of events from 1 January 1996 0000 hrs. From that date on, there is a full record of events covering the last 18 days prior to the moment of the accident. On the day of the occurrence – full event log for the device offering information on connecting/disconnecting the calls, reception of sounds and comms on specific frequencies (channels). No record of a 'RADIO-STOP' test. At 0533 hrs the hand set was taken off the hook and post-accident sending started. The previous signal-send was at 0458 hrs (recording at 1725 hrs).

5. Railway traffic operation documentation, including:

1) Measures taken by railway staff with a view to traffic control and signalling

Technical and traffic documentation from the following posts was secured:

a) Błd – Traffic logbook R146, turnout inspection logbook D-831, book of running routes R142, telephone logbook R138 (2 pcs), record of inspections of the rail traffic control devices (at railway crossing) * and of restrictions imposed/lifted E1758, copy of a record card for 'ready to depart' reports from trains at station Białystok.
b) Bł11 – Record of inspections of the rail traffic control devices (at railway crossing) * and of restrictions imposed/lifted E1758 (2 pcs), book of running routes R142, telephone logbook R138,
c) Bł8 – Book of running routes R142,
d) Bł4 – Book of running routes R142, telephone logbook R138, turnout inspection logbook D-831, record of inspections of the rail traffic control devices (at railway crossing) * and of restrictions imposed/lifted E1758,
e) Bł3 – record of inspections of the rail traffic control devices (at railway crossing) * and of restrictions imposed/lifted E1758,
f) Bł1 – record of inspections of the rail traffic control devices (at railway crossing) * and of restrictions imposed/lifted E1758,
g) Block post 'Baciuty' – Telephone logbook R138, Block post traffic logbook R147,
h) Crossing post 154.675 km, Łapy – Telephone logbook R138 and crossing keeper's work logbook R49,
i) Crossing post 156.256 km, Uhowo – Telephone logbook R138 and crossing keeper's work logbook R49,
j) Crossing post 169.010 km, Niewodnica – Telephone logbook R138 and crossing keeper's work logbook R49,
k) Dispatching signal box Łapy – Traffic logbook R146, telephone logbook R138.
l) Station Technical Regulations for station Białystok- 'Z' copy,
m) self-propelled vehicle logbook – loco. M62-0689.
n) On/Off duty logbook for diesel locomotive M62-0689,

Analysis of the documentation revealed that:

a) The Station Technical Regulations for station Białystok does not include provisions set forth in the Protocol dated 18 March 2009 regarding operation of executive signal boxes Bł1, Bł3 and Bł14 in station Białystok by the signalman in executive signal box Bł1.
b) Organisation of work at posts Bł1, Bł2 and Bł3 was volatile (August, October and November 2010 – post Bł1 staffed and operating Bł2, Bł3 and Bł14, while in September 2010 – 24h staffing of post Bł1 and staffing of post Bł2 from 1000 hrs to 1800 hrs),

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which was against the provisions of the Station Technical Rules for station Białystok (the posts were staffed depending on operating and personnel requirements) and the provisions set forth in the Protocol dated 18 March 2009 regarding changes in organisation of work depending on the volume of rail traffic.

c) It was tolerated that the documentation from posts Bł2 and Bł3 (Books of running routes R142) could be left at post Bł1, which made it impossible to update it, thus preventing entering running route preparation reports and orders for preparation of running routes in areas Bł2 and Bł3.
d) Trains carrying high risk goods were frequently dispatched from station Białystok from tracks not earmarked for that purpose in the Station Technical Regulations for station Białystok (Record 40).
e) Frequent dispatching of train 55272 before the time set in the timetable without substantiation or approval from the line dispatcher.
f) 'Frequent delays of train 112861'.

Analysis of documentation from traffic posts at station Białystok and manner of keeping it

The book of running routes R-142 was kept on 8 November 2010 by train dispatcher Błd Mr K.L. for train 112861 in full scope, which is evidenced by the following entries: 'Prepare entry – Section 1 train 112861; Section 2 from: (acronym of the neighbouring announcement post) BC; Section 3 to track 25, Entry prepared (track free) – Section 4 in area 1, 4, 11, Section 5 0520 hrs, Section 6 give permission signal on entry semaphore 0521 hrs, Section 7 train entered 0528 hrs, Section 8 'Comments' accident at Bł1 TWR 0530 hrs it is an example that unconfirmed entries were recorded i.e. unsupported by reports from signal employees participating in preparation of running routes. Records regarding train 55272 – exit from track 107 to post Baciuty: 'Prepare exit – Section 1 train 55272, Section 2 from: (acronym of the neighbouring announcement post) BC, Section 3 from track 107, Exit prepared (track free) – Section 4 in area 1, 2, 3, 11, Section 5 0520 hrs, Section 6 give permission signal on exit semaphore 0521 hrs, Section 7 train exited 0525 hrs, Section 8 'Comments' accident at Bł1 TWR 0530 hrs – these are also unreliable entries.
In signal box areas Bł2 and Bł3 ordering and reporting preparation of running routes is done by telephone due to incomplete station interlocking (no obligatory clearance of permission and order). It is necessary to keep the R-142 book in full scope. The documentation kept by the train dispatcher reveals that he gave orders to prepare two (conflicting) running routes in a single telephone dispatch and prematurely recorded train 112861's entry onto track 25. In the light of restrictions in force at the time, his sending a single telephone dispatch with orders to prepare two (conflicting) running routes for trains 112861 and 55272 was against the provisions of Instruction Ir-1 §38, §40, §41 paras. 16 and 17, §48 para. 7.
Running routes for trains 112861 and 55272 were conflicting, with the difference in area Bł1. Prevention of simultaneous setting of those running routes was ensured by mechanical rail traffic control devices with the full station interlocking through Pzn blocks at signal box Bł1. The running routes for trains 55272 and 112861 are mutually exclusive in area Bł1 through a contrary positioning of switches no. 5, 7, 15, 17. Full scope keeping of the R-142 book was not required there. On 8 November 2010 train 55272 was dispatched from track 107 in conflict with the provisions of Record 40 of the RTS regarding accepting and dispatching trains carrying hazardous goods and special shipments.
Train dispatcher K.L. dispatched train 55272 outside the internal timetable – 15 minutes before the scheduled departure. Since the train was carrying a high risk load, he should have consulted the unscheduled departure with the line dispatcher and entered the numerical code of order, if approved by the line dispatcher, in the R–138 logbook. Mr K.L. breached the provisions of §17

para. 7 points 4, 6 and 7 of Instruction Ir–16, and §50 para. 1 points 1 and 4, para. 4 of Instruction Ir–1.
Ms G.P., assistant train dispatcher at signal box Błd, who was involved in the process of organising the work at the station, on 8 November 2010, while on duty as an assistant train dispatcher, incorrectly filled in the R-146 traffic logbook for train 112861 by inserting the train's entry onto track 25/1a (Section 3) at 0528 hrs (Section 6), which was not the case. The train only partially entered track 1a. Moreover, she failed to take steps to prevent deployment of the wagons with high risk goods from the cargo station onto track 107, which was not earmarked in the Station Technical Regulation for rolling stock carrying such goods. The incorrect filling in Section 3 regarding the train entry onto track 25 and confirmation of train 112861's arrival by filling in Section 6 with the time of arrival at 0528 hrs is in conflict with the provisions of § 36 para. 7 points 3 and 5 of Instruction Ir–1. Her approval of the deployment of a train carrying high risk goods on track 107, not meant for shipments of that type, is in conflict with the provisions of Record 40 of the Station Technical Regulations.
The process of receiving train 112861 and dispatching train 55272 involved the staff of posts Bł1 and Bł11.
Ms J.T., on duty as a signal woman at post Bł11, recoded that train 112861 entered from post Baciuty onto track 1a at 0528 hrs (an entry about high risk goods in the comments section). She was observing the entry of the train standing in front of the signal box building, as prescribed by the Regulations, and after the train passed the signal and clearing points, she returned to the post and confirmed the train's arrival in Baciuty by operating the line block i.e. block Ko6B, and then the station block i.e. she locked the order given block $6B^1$ thus confirming the train's entry without making sure that it was indeed an entry, not a passage, of such a long train in her signal area. She failed to react to the fact that a 406 m long train with 32 wagons had not implemented braking.
Although she knew about the Sr1 signal on the semaphore B½ 859 m away from post Bł11, she failed to take steps to mitigate the threat. She contravened § 44 para. 1 of Instruction Ir–1.
The Commission established that Mr M.A., the signalman no. 2 in signal box Bł1, did not send a telephone report on preparing the running route to the train dispatcher in signal box Błd. The signalman no. 2 did not receive orders from the train dispatcher for signal areas Bł2, Bł3, but he had been executing orders from signalman no. 1 from Bł1, filling in documentation from posts Bł2, Bł3 based on the R142 book from Bł1. Thus he would fill in the train's entry/exit times after he returned to signal box Bł1, populating the data on the basis of the R142 from signal box Bł1. The R142 books from posts Bł2 and Bł3 were held at post Bł1. In the light of restrictions in force at the time, the essential condition for proper preparation of a running route at Bł2, Bł3 was first an order from the train dispatcher Błd and then a report from the signalman in areas Bł2, Bł3, which, in the absence of the documentation in Bł2, Bł3, was not observed. The manner of keeping the train entry/exit documentation is in conflict with the provisions of § 38 and § 48 paras. 1, 4, 7 of Instruction Ir-1.
During the accident, the rail traffic documentation held at post Bł1 burnt. Mr St.S., the signalman no. 1, would give the signalman no. 2 orders to prepare running routes in the area of posts Bł2 and Bł3, which is in conflict with the provisions of §38 para. 4 of Instruction Ir-1. He would permit to keep the documentation from posts Bł2 and Bł3 at post Bł1 although he knew about the restriction in force, which is in conflict with the provisions of § 38 and § 48 of Instruction Ir-1.
Analysis of the traffic and technical documentation kept by the train dispatcher at the Baciuty block post shows that data in the R147 logbook is consistent with the train entry/exit records in the book of running routes R-142 of the Białystok station. The fact that there is no record of train 112861's entry into station Białystok in the R147 logbook is a result of the communication failure after the accident.

Analysis of performance of Płock Trzepowo–Sokółka trains in September and October 2010 hauled by Orlen KolTrans locomotives manned by Hagans Logistics train drivers revealed the following irregularities:

1. Dispatching the train from the station of departure with a 2 hour deviation from the inner timetable.
2. Marking the load carried in the wagons inconsistently with the RID provisions.
3. Frequent switching off of the vigilance devices (SHP and CA) in locomotive no. 2 in double traction mode, which was established on the basis of records on the speed recorder tapes.
4. Exceeding the statutory working limit by the train drivers, i.e. 12 hours in the vehicle while driving.
5. Failure to observe the obligatory rest time of at least 12 hours at the reversing station Sokółka.
6. Discrepancies in working time data documented in job sheets and locomotive speed recorder tapes.
7. Failure to perform 'Radio-Stop' tests in the traction vehicles.
8. Cases of failure to perform test braking on the trains.
9. Frequent cases of dividing the exceeded working time in two 'train work sheets'.

Analysis of the performance of train 55272 hauled by locomotive ET22-1030 of PKP CARGO SA and started up from station Białystok on 8 November 2010 revealed the following irregularities:

- Deployment of the train driver to drive the train before time slot set forth in the work timetable and the company dispatcher's failure to document that fact.
- Updating the vehicle's documentation (the self-propelled vehicle's logbook, Mt507) with work start times that were inconsistent with the timetable and editing the entries.
- The train driver designated to drive the train reported 'ready to depart' to the chief train dispatcher at station Białystok before the work start time indicated in the Mt-514a job sheet.
- Lack of a comment regarding the time of the extensive brake testing.

2) Exchange of voice messages in relation to the accident, including recorder documentation

Data media with voice communications recorded on the IRYS 707F device, including train/post voice communications from the KTE 101 exchange, were secured by the District prosecutor's Office in Białystok.

On 10 November 2010 a commission hearing was conducted for calls recorded on 8 November between 0510 hrs and 0600 hrs on the 'KOLIBER' radiotelephone installed at station Wasilków (manipulator no. KM 01-0922009, radiotelephone no. KT 01-0922009). An official report was drawn up to document the hearing.

On 12 February 2011 the Accident Investigation Team conducted another hearing of the recorded calls and drawn up a supplementary report to include details not included in the report of 10 November 2010.

3) Measures taken to protect and secure the site of the serious accident

The fire fighting action started at 0540 hrs on 8 November 2010. At the same time, the Fire Service cordoned off the scene. Due to the extensive area to be covered, the security action was supported by officers of the Railway Protection Guard (SOK), Municipal Police and Police. On extinguishing the fire at 1400 hrs on 11 November 2010, the Fire Service handed over the scene to

the Head of the Operations Section in Białystok. Thereupon, securing the scene was the responsibility of SOK officers and the operation continued until the tracks were cleared and traffic on tracks 2, 4, 1, 3 resumed, i.e. by 1840 hrs on 16 November 2010.

6. Work organisation on the site and at the time of the accident:

1) Work times of the personnel involved in the accident

The accident occurred in the 10th hour of work of the train drivers in train 112860, in the 10th hour of work of the train dispatchers at post Błd and signalmen at posts Bł1 and Bł11 of station Białystok, and in the 1st hour of work of the train driver in train 55272.

Full name initials	Title	Work establishment	Workstart time and date	Hours of rest before work start
M.S.	Senior train driver	PKP CARGO S.A. Zakład Podlaski	08/11/2010 0525 hrs	177 hours
A.W.	Train driver	Hagans Logistics Sp. z o.o.	07/11/2010 2015 hrs	9 days (since 28/10/2010)
K.W.	Train driver	Hagans Logistics Sp. z o.o.	07/11/2010 2015 hrs	3 days (since 04/11/2010)
K L.	Chief train dispatcher Błd	PKP PLK S.A. - IZ Białystok	07/11/2010 2000 hrs.	24 hours
G.P.	Assistant train dispatcher Błd	PKP PLK S.A. – IZ Białystok	07/11/2010 2000 hrs	36 hours
J.T.	Signaller Bł11	PKP PLK S.A. – IZ Białystok	07/11/2010 2000 hrs	24 hours
St.S.	Signaller Bł1	PKP PLK S.A. – IZ Białystok	07/11/2010 2000 hrs	24 hours
M.A.	Signaller Bł1	PKP PLK S.A. – IZ Białystok	07/11/2010 2000 hrs	24 hours

2) Psychophysical condition of the railway personnel actively involved in the occurrence

Based on entries made in the R138 logbook, it was established that the following individuals had been examined by their superiors for alcohol content with an alcometer at 0800 hrs on 8 November 2010:
1) K.L. – train dispatcher at dispatching signal box Błd,
2) G.P. – train dispatcher at dispatching signal box Błd,
The test returned 0.00 mg/litre results.

On 8 November 2010 the Police breathalysed the following employees:
1) A.W. – with Alcosensor IV (no. 070508) at 0727 hrs and Alcometr A2.0 at 1222 hrs – result 0.00mg/l,

2) K.W. – with Alcosensor 570 at 0727 hrs and Alcometr A2.0 at 1311 hrs – result 0.00mg/l,
3) M.S. – with Alcosensor at 1032 hrs, result 0.00mg/l,
4) S.S. – with Alcometr A2.0 at 1031 hrs, result 0.00mg/l,
5) M.A. – with Alcometr A2.0 at 1035 hrs, result 0.00mg/l,
6) K.L. – with Alcometr A2.0 at 1141 hrs, result 0.00mg/l,
7) G.P. – with Alcometr A2.0 at 1501 hrs, result 0.14mg/l,

Ms J.T., a signal woman at Bł11, who was involved in the accident, was not tested for alcohol content.

3) Environmental and ergonomic conditions of workstations of the railway personnel in a causal relationship with the accident

The dispatch of train 55272 from station Białystok before the time assigned in the internal timetable (WRJ) might have been influenced by an earlier preparation of the running route for shunting movements of the locomotives approaching the train and an intention to eliminate duplicated and time consuming actions of the signalman no. 2 from signal box Bł1 involving preparation of running routes for trains 112861 and 55272.

IV. ANALYSIS AND CONCLUSIONS

1. Reference to previous accidents that occurred under similar circumstances

No previous occurrences of this nature.

2. Description of the sequence of events in connection with the serious accident under investigation

At station Płock-Rafineria, railway undertaking ORLEN KolTrans failed to properly mark the wagons to indicate the load they actually carried. It left old markings used for identifying the materials carried earlier – some of the identification plates indicated UN1294 (Toluen). As a result, it was not possible to properly identify the substances carried in the tank cars and use appropriate means during the fire fighting action. The railway undertaking failed to observe the provisions of Chapter 1.4 Clause 1.4.2.2.1 f) of the Regulations on the International Carriage of Hazardous Goods by Rail (RID). On 7 November 2010 at 1720 hrs train TNGSkt no. 112860/1 departed from station Płock Rafineria as train no. M-18 and arrived at station Płock Trzepowo at 1730 hrs. It departed from station Płock Trzepowo at 1730 hrs thus deviating from the internal timetable (WRJ), which set the departure for 1530 hrs. At station Płock Trzepowo the railway undertaking furnished the station's train dispatcher with an R-7 form – A list of wagons in the train set with specification of goods carried (12 tank cars marked RID 30/1202 and 20 tank cars marked RID 33/1268).

The train dispatcher at station Płock Trzepowo issued a written order 'O' (a computer printout) no. 956 with information that the train had wagons with high risk goods. Under the provisions of the Station Technical Regulations for station Płock Trzepowo, the train dispatcher should have notified the line dispatcher of the train's readiness for departure and should have specified the train's parameters, the number of wagons with high risk goods and their RID markings, which was not documented and represents a breach of the provisions of § 17 para. 7 points 4, 5, 6 and 7 of Instruction Ir-16 PKP PLK S.A. and the provisions of the Station Technical Regulations for station Płock Trzepowo Record 80 para. 5 point 1.

Written orders 'O' (computer printouts) issued at stations Kutno and Skierniewice did not have any information about carriage of high risk goods. No written order 'O' was issued at station Tłuszcz, despite a note in the RRJ (yearly timetable) about the issue of R-307, which is

in conflict with the provisions of § 58 para. 4 of Instruction Ir-1. At station Kutno at 2015 hrs on 7 November 2010, the traction crew was replaced, A.W. and K.W. assumed their duties as train drivers and K.W. switched off the vigilance devices in locomotive TEM2-198. Such behaviour is in conflict with the provisions of § 13 para. 5 point 15 and § 17 para. 13 of the Train Driver Instruction (OKTt-2 ORLEN KolTrans).

At station Tłuszcz, the train drivers disregarded signal s1 'STOP' on semaphore N-20, then the train reached signal box 'Tła', where they collected a written order R-306 to disregard that semaphore. It is in conflict with the provisions of § 57 para. 5 point 1 of Instruction Ir-1

At the entry of train 112861 into station Białystok at entrance semaphore 6B½ , which signalled 'Free way' Sr 2, there was warning shield ToB½ preceded by marker W1 indicating 'Ot 1', which informed the train drivers that semaphore B½ signalled Sr1 'STOP'. In that situation, the train driver was under obligation to adjust the speed so that the train could definitely stop before the 'STOP' signal. Train 112861's failure to stop before Sr1 STOP' on route semaphore B½ led to its unauthorised entry into signal box area Bł1 without decelerating and collision with train 55272 bound from Białystok to Warszawa Praga then exiting track 107 onto track 2a at station Białystok.

The driver of leading locomotive M62-0689 contravened the provisions of §63 para. 1 point 3a and para. 7 of Instruction Ir-1 and §17 para. 9 of the Train Driver Instruction (OKTt-2 ORLEN KolTrans).

Since train 112861 was operated in a double traction mode, the train driver in locomotive no. 2 (TEM2-198), seeing visible signal Ot1 on warning shield ToB½ and signal Sr1 'STOP' on semaphore B½ , and seeing the imminent danger, should have taken appropriate steps to prevent the accident i.e. he should have implemented emergency braking without waiting for the driver in locomotive no. 1 to react. Failure of the driver of locomotive TEM2-198 to react to the inappropriate behaviour of the driver of the leading locomotive (M62-0689) is in conflict with the provisions of §63 para. 1 point 3a and para. 7, § 64 para. 3 of Instruction Ir-1 and § 17 paras. 9 and 13 of the Train Driver Instruction (OKTt-2 ORLEN KolTrans).

Mr M.S. was the senior train driver in train 55272 bound from Białystok to Warszawa Praga, which departed at 0525 hrs in conflict with the internal timetable (WRJ) (0540 hrs),an employee of Podlaski Zakład Spółki PKP CARGO SA, he had reported for work at 0435 hrs to dispatcher M.S., where he was tested for alcohol content – the result was 0.00. He then collected his job sheet MT-514A and walked to station Białystok Towarowa to take over locomotive ET22-1030 from train driver Z.W. The take over took place at around 0520 on track 107, while, in accordance with his job sheet MT-514A, he should have started work at 0525 hrs, which indicates a discrepancy between work planning and execution. The fact that the time of take over of railway vehicle ET22-1030 was corrected from 0530 hrs to 0520 hrs (job sheet MT-514A shows the take over time 0525 hrs) is another example of discrepancies between the train driver's actual actions and actions recorded in the documentation. The recorded radiotelephone communications from Wasilkowo reveal that the train driver reported 'ready for departure' at 0522 hrs, upon which he was contacted by the train dispatcher who informed him that he (the train dispatcher) would order preparation of the running route.

At 0525 hrs he started up the train, illuminated the locomotive, noticed the 'Free way with speed limit' signal on semaphore N107[2], sounded the attention signal, moved off and started to roll. Beyond post Bł2 he past route semaphore E[2], which indicated 'Free way with speed limit', and started entering main track 2a. When passing post Bł1, he noticed a train travelling on full beam headlights. He tinted his headlights but was blinded by the full beam headlights of the train approaching from the opposite direction. Meanwhile, he passed the head of that train, which was

approaching from the direction of Warsaw. A moment later, he felt a violent jolt and saw the traction network sway. He applied emergency braking and stopped the train. He then reported the occurrence to chief train dispatcher Błd on his radiotelephone.

While driving train 55272, senior train driver M.S. failed to take steps to prevent the accident or mitigate its effects. Although he was aware of the Białystol station's technical conditions and noticed the lack of reaction from the driver of the train travelling on track 1a (i.e. no change in headlight intensity, short distance to turnout 7 – conflicting for their routes), he failed to take steps to stop or slow down train 112861. He contravened the provisions of § 12 para. 2 point 2, § 19 para. 1 and § 63 para 4 of Instruction CT – 1, and also § 63 para. 4 of Instruction Ir-1.

The traffic management is presented in Chapter III Point 5.

3. The Commission's findings on the course of the serious accident based on the facts

On 8 November 2010 at 0530 hrs, at station Białystok in signal box area Bł1, train 112861 bound from Płock Trzepowo to Sokółka continued its travel and failed to implement braking after passing signal 'STOP' on route semaphore B½, and subsequently caused a collision with the third wagon of train 55272 (counting from the tail end) bound from Białystok to Warszawa Praga, which was exiting from track 107 in area Bł3 in accordance with signal Sr3 'Free way with speed limit' indicated on semaphore $N107^2$ through areas Bł2 and Bł1 onto track 2a along a correctly positioned running route towards signal Sr3 'Free way with speed limit' indicated on semaphore E^2 in area Bł1. The occurrence, which took place on double slip switch no. 7, caused derailing of locomotives M62-0689 and TEM2–198, two coal wagons loaded with scrap metal, one empty roofed wagon, twelve tank cars with hazardous material and five tank cars with high risk goods. Two tank cars exploded. Locomotive TEM2–198's fuel tank was ripped open leading to spillage and ignition of the fuel. The fuel spilt from the locomotive's fuel tank led to expanding the source of fire to the other derailed wagons and locomotives, which caught fire and were destroyed. The fire damaged overhead traction equipment, tracks 1a, 2a, 3a and 4a, turnouts 6, 7, 8, 9, 10, 11, 15, 27 together with rail traffic control devices used for locking and positioning those turnouts, and caused fire to and destruction of the Bł1 executive signal post building together with its equipment and indoor devices for rail traffic control, cable and wireless communications, and power supply equipment used for facilitating rail traffic control. The head of train 55272 stopped at 175.000 km, the rear of train 112861 stopped at 175.050 km. Train 55272 consisted of active locomotive ET22-1030, dead-hauled locomotive ET22–1055 and 7 (seven) freight wagons, including two tank cars with LPG. Train 112861 consisted of locomotives M62-0689 and TEM2-198 and 32 tank cars, including 12 tank cars with UN1202 diesel oil and 20 tank cars with UN1268 petroleum distillates. Actions taken after the accident were aimed at extinguishing the fire, clearing the debris, reconstructing the essential traffic infrastructure and investigating the causes and circumstances of the occurrence.

4. Analysis of the facts to establish conclusions regarding the causes of the accident and operations of the rescue services

In the course of analysis of the documentation gathered regarding the serious accident, the commission established what follows:

a) The driver of locomotive M62-0689 leading the train 112861 bound from Płock Trzepowo to Sokółka failed to properly observe the running route, as a result of which he passed route semaphore B½ at station Białystok, which indicated signal 'S-1' 'STOP', and ran into the side of train 55272 causing a collision of the two trains and a subsequent ignition of fuel from TEM2–198's tank, which in turn set the wagons on fire.
b) The driver of locomotive TEM2–198, number 2 in the train set (running in the so-called double traction mode) also failed to watch the running route and, moreover, operated the

locomotive with disabled vigilance devices designed to stop the train should the driver lose vigilance.

c) The train dispatcher at dispatching signal box Błd at station Białystok dispatched train 55272 earlier than indicated in the timetable and, moreover, from a track that was not meant for dispatching trains carrying high risk goods.

5. Identification of the immediate causes of the accident, including factors related to actions taken by individuals involved in rail traffic operations and maintenance of railway vehicles or equipment, as well as of indirect causes related to competencies, procedures and maintenance services, and of systemic causes related to legal and other regulatory constraints and to operation of the safety management system.

a) **Immediate cause**:

Failure of train 112861 to stop before route semaphore B½ indicating Sr1 'Stop', which is in conflict with the provisions of § 63 para. 1 point 3a and para. 7 of Instruction Ir-1 and §17 para. 9 of the Train Driver Instruction (OKTt-2 ORLEN KolTrans).

b) **Primary cause**:

The train drivers in train 112861 failed to observe and react to indications of warning shield ToB½ indicating Ot1 in reference to route semaphore B½ and to implement braking after passing the warning shield, which is in conflict with the provisions of § 63 para. 1 point 3a and para. 7 and § 64 para. 3 of Instruction Ir-1 and § 17 paras. 9 and 13 of the Train Driver Instruction (OKTt-2 ORLEN KolTrans).

c) **Indirect causes**:

1. Turning off of vigilance control devices in train 112861's tail locomotive TEM2-198, which is in conflict with the provisions of § 17 para. 13 of the Train Driver Instruction (OKTt-2 ORLEN KolTrans.
2. No appropriate reaction from train 55272 driver, during his departure, to the train going in the opposite direction on track '1a', while such reaction could have reduced the consequences of the accident or made it possible to avoid it altogether. It is in conflict with the provisions of § 12 para. 2 point 2, § 19 para. 1 and § 63 para 4 of Instruction CT–1, and also § 63 para. 4 of Instruction Ir-1.
3. No appropriate reaction from the signalman at post Bł11 during entrance of train 112861, which was manifested in his failure to notify the chief train dispatcher of the threat that was posed by train 112861, which did not commence braking as it approached route semaphore B½ signalling Sr1 'STOP', which is in conflict with the provisions of § 44 para. 1 of Instruction Ir–1.
4. Earlier dispatch of train 55272, by the chief train dispatcher at the Błd post at Białystok station, inconsistent with the inner timetable (WRJ), resulting in the necessity to stop train 112861 carrying high risk goods before route semaphore B½ indicating Sr1 'STOP', which is in conflict with the provisions of §17 para. 7 points 4, 6 and 7 of Instruction Ir–16, and §50 para. 1 points 1 and 4, para. 4 of Instruction Ir–1.

d) **Systemic causes**:

1. Implementation and execution of the provisions of the Protocol of 18 March 2009 regarding operation of executive signal boxes Bł2, Bł3 and Bł14 at station Białystok by the signalman of executive signal box Bł1, Zakład Linii Kolejowych PKP PLK S.A. w Białymstoku, without relevant changes to the Station Technical Regulations (Regulamin Techniczny Stacji, RTS) for station Białystok, which is in conflict with the provisions of § 38 para. 7 of Instruction Ir–1 (R-1), and § 2 paras. 1-2 and § 7 of Instruction Ir-3 (R-9).
2. Provision of traction services by Hagans Logistics Sp. z o.o., which does not hold the carrier licence or Safety Certificate, and should not provide services in the area of outsourcing driving personnel to other carriers (railway undertakings), in this case Orlen KolTrans Sp. z o.o. under Agreement no. MP/2/2008 of 18 January 2008, which is in conflict with Chapter 4 Article 19 and Chapter 8 Article 43 of the Rail Transport Act of 28 March 2003.

6. Identification of other irregularities revealed in the course of investigation but irrelevant to the conclusions regarding the accident

1) Departure of train 112860/1 from station Płock Trzepowo two hours after the time allocated in the internal timetable (WRJ).
2) Inappropriate marking of the wagons carrying high risk goods, which did not reflect the goods that were actually carried.
3) Failure of PKP PLK S.A. employees to report the carriage of high risk goods in train 112860/1, despite the fact that the carrier delivered a list of wagons in the train set with specification of goods carried (R7) at station Płock Trzepowo.
4) Failure to issue a computer printout of the R-307 written order at station Tłuszcz, although it was obligatory under the internal timetable (WRJ).
5) The drivers of train 112860/1 disregarded signal S1 'STOP' on semaphore N-20 at station Tłuszcz, then continued to signal box 'Tła', where a member of the post's staff gave them a written order R-306 to disregard that semaphore.
6) Frequent switching off of the vigilance devices in locomotive no. 2 in Orlen KolTrans trains on routes Płock Trzepowo – Sokółka and Sokółka – Płock Trzepowo.
7) Frequent omissions of test braking in Orlen KolTrans trains on routes Płock Trzepowo – Sokółka and Sokółka – Płock Trzepowo after traction crew changeovers and on exiting station Sokółka.
8) Exceeding the statutory working time limits by train drivers in Orlen KolTrans trains.
9) Dispatching train 55272 from station Białystok with wagons carrying high risk goods from track 107, which is not designated in the Station Technical Regulations as a track for handling high risk goods shipments.
10) Inappropriate manner of issuing orders and documenting those orders in the traffic and technical documentation at station Białystok when handling the entry of train 112860/1 and exit of train 55272 at posts Błd, Bł1, Bł2, Bł3 and Bł4.
11) Failure to keep traffic and technical documentation at posts Bł2 and Bł3 of station Białystok when handling the exit of train 55272.
12) Leaving the books of running routes R142 from posts Bł2 and Bł3 at post Bł1, which made it impossible to keep them correctly updated in the case of telephone route of ordering and reporting on running routes.
13) Introducing alternating traffic at station Białystok in the area of the executive signal boxes, i.e. implementation of the provisions of the Protocol of 18 March 2009 or the Station Technical Regulations for station Białystok.

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14) Failure to include train 112860/1 in the Białystok station's train timetable.
15) Frequent dispatching of train 55272 from station Białystok before the time set in the timetable without notifying or obtaining approval from the line dispatcher
16) Entries in the working time documentation of the traction crew in train 55272 were inconsistent with facts (both in the planning and performance phases at Podlaski Zakład Spółki PKP CARGO S.A.)
17) Some of the employees involved in the occurrence were not tested for alcohol content by a relevant agency immediately after the occurrence.
18) Failure of Hagans Logistics Sp. z o.o. to observe the provisions arising from the Ordinance of the Minister of Infrastructure of 16 August 2004 (Journal of Laws 04.212.2152).
19) No documents to certify that the train drivers employed by Hagans Logistics Sp. z o.o. knew the route.
20) Failure of Hagans Logistics Sp. z o.o. to appropriately organise and document authorisation exams for positions related to rail traffic safety.
21) Based on reports on audits conducted in the second half of 2010 by the Warsaw Branch of the Office for Railway Transport (on 9-13 August 2010 and 12-15 October 2010), it was established that none of the auditors examined the matter of the reorganisation of operations in signal box areas Bł1, Bł2, Bł3 and Bł14. Furthermore, the audits did not analyse the matter of handling trains carrying high risk goods at station Białystok i.e. on tracks not designated fort that purpose in the Station Technical Regulations.
22) Based on reports from test runs on railway route 006 Zielonka Kuźnica Białostocka, conducted in the second half of 2010 by the Office for Control and Internal Audit of PKP PLK S.A. (on 19 July 2010 and 22 July 2010), it was established that also in that case none of the auditors examined the matter of reorganisation of operations in signal box areas Bł1, Bł2, Bł3 and Bł14.
23) The railworthiness certificates for the 32 tank cars were issued in conflict with the Ordinance of the Minister of Infrastructure of 15 February 2005 regarding railworthiness certificates for railway vehicles.
24) In the case of 2 tank cars, bearing ID no. 33517857401-8 and 33517973164-9, inconsistencies were found regarding the numbers shown on the cars and the numbers recorded in the protocol of inspection of the hazardous material tank cars conducted by the Transport Technical Supervision (TDT),

V. DESCRIPTION OF PREVENTIVE MEASURES

Presentation of steps that have been or will be taken to prevent further occurrences of this kind, based on the established immediate causes of the occurrence.

Steps taken by PKBWK following the Cat. A04 serious accident on 8 November 2010 at station Białystok included, but were not limited to:

1) On 28 January 2011 the PKBWK Accident Investigation Team sent a written request no. PKBWK-076-27/BK/2011 to ORLEN KolTrans to hand over documents related to operation of trains 112861 from Płock Trzepowo to Sokółka, including speed recorder tapes and train drivers' job sheets, for analysis of functioning of the train's vigilance devices, compliance with the timetable speed limits and train drivers' working time requirements.
2) In his letter of 7 February 2011 no. PKBWK-076-33/JAM/11, the Chair of the PKBWK Team informed Mr Jerzy Wojtkowiak, Director of Zakład Linii Kolejowych PKP PLK S.A., that the investigation had revealed irregularities in the performance of the personnel at traffic control posts at station Białystok.

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3) In his letter of 7 February 2011 no. PKBWK-076-34/JAM/11, the Chair of PKBWK Team informed the Director of Mazowiecko-Podlaski Zakład Spółki PKP CARGO S.A. about irregularities in the performance of the train driver M.S.
4) On 9 March 2011, Mr Tadeusz Ryś, the Chair of PKBWK, arranged a meeting between PKBWK and representatives of Orlen KolTrans at the head office of Orlen KolTrans in Płock to discuss steps to be taken to improve the [rail traffic] safety following the Cat. A04 serious accident on 8 November 2010 at station Białystok. The minutes of the meeting [are marked] PKBWK/03/2011 of 26 March 2011.
5) On 25 May 2011, the PKBWK Team and representatives of the Białystok Rail Infrastructure Manager inspected Orlen KolTrans train no. 112021 bound from Płock Trzepowo to Sokółka. The inspection covered the waybills and equipment of the locomotives and wagons in terms of compliance with the regulations on the carriage of hazardous goods.
6) On 26 May 2011, Mr Tadeusz Ryś, the chair of the PKBWK Team, sent a written request no. PKBWK-076-27/BK/2011 to ORLEN KolTrans to explain why inappropriate packing (tank cars) had been used i.e. inconsistencies between the actual packing group used, the data in the waybill and the RID regulations.
7) Documents presented by Hagans Logistics Sp. z o.o during an inspection of the company by PKBWK on 3 February 2011 revealed that the company employed individuals from other rail companies of PKP Group and from outside the Group as train drivers. This gives rise to a suspicion that some of those people may perform their duties as train drivers or assistant train drivers in their mother companies and then, without observing the statutory rest requirement, work for another carrier, also in Hagans Logistics.
8) On 9 February 2011, the Chair of PKBWK sent a written request no. PKBWK-076-27/BK/2011 to the President of the Management Board of Hagans Logistics Sp. z o.o. to furnish a specification of work performed over a specified period of time by train drivers from various companies referred to in the attached list. Furthermore, the Chair of PKBWK sent similar requests to the Presidents of the following companies:
   a) PKP Intercity S.A.
   b) Koleje Mazowieckie,
   c) PKP CARGO SA,
   d) Przewozy Regionalne,
   e) DB Schenker Rail Polska S.A.

The findings confirmed that some train drivers had been employed with disregard of the statutory rest requirement.

VI. RECOMMENDED PREVENTIVE MEASURES TO AVOID OR MITIGATE SUCH ACCIDENTS IN THE FUTURE

1. Railway undertaking ORLEN KolTrans Sp. z o.o. and other railway undertakings providing cargo transport services under RID International Regulations shall amend their contracts of employment signed with personnel directly involved in driving railway vehicles by adding a clause that will forbid working for other railway undertakings in order to enforce the statutory working time regulations, particularly daily and weekly working time limits, and ensure observance of regulations regarding working at night and required rest periods.
2. The Railway Department at the Ministry of Transport, Construction and Maritime Economy shall take steps to amend the Railway Transport Act of 28 March 2003 and executive regulations regarding manner of employment of individuals directly involved in rail traffic management and safety or driving railway vehicles solely under contracts of employment.
3. The Commission shall oblige railway undertakings to compile lists of employees licensed to drive railway vehicles complete with the manner of their employment (contract of

employment, civil-law contracts) and to submit such lists to the Office for Railway Transport, and to keep such lists up to date.

4. The Office for Railway Transport shall consider whether it is possible to increase the number of inspections on locomotives in service with railway undertakings, in particular with respect to functioning of vigilance control devices in locomotives in double traction.
5. The Office for Railway Transport shall conduct audits of Hagans Logistic Sp. z o.o. and ORLEN KolTrans Sp. z o.o., in particular with respect to meeting the provisions of their rail cargo transport licences and requirements of the Safety Management System,
6. The Office for Railway Transport shall conduct an audit of Hagans Logistics Sp. z o.o. with respect to cooperation with railway undertakings and compliance with the requirements to be met by railway vehicle drivers,
7. PKP CARGO S.A. shall make efforts to adapt its drivers' working time schedules as may be necessary for starting freight trains.
8. PKP PLK Zakład Linii Kolejowych w Białymstoku shall update the Station Technical Rules (RTS) for Białystok station so that it reflects the current layout of tracks and srk devices. In the said RTS it shall also define in detail the scope of activities to be performed by signal box post personnel, in particular in the case of staffing cuts at individual posts.
9. Licensed Railway Undertakings shall amend their instructions for traction vehicle drivers by adding a clause that will define train driver crew responsibilities in the second locomotive in the case of double traction operations.
10. PKP PLK shall implement a system as part of which PKP PLK employees will be passing on information on 'TWR' transports from the station of origin to the station of destination, including full cargo type information and 'tracking' obligation.

VII. COMMENTS

The extended deadline for the completion of the investigation (statutory 12 months) by the Accident Investigation Team was caused by the following:

1) a large number of interviews required,
2) additional investigative actions required with respect to entities involved in the transport process (carrier, provider of traction services, sender),
3) necessary analyses of a number of documents related to working time, employment and qualifications of train drivers employed by:
   a) Hagans Logistics,
   b) Hagans Logistic,
   c) PKP Intercity S.A.,
   d) Koleje Mazowieckie,
   e) PKP CARGO SA,
   f) Przewozy Regionalne,
   g) DB Schenker Rail Polska S.A.
4) additional consultation with the petroleum products lab in Płock required to analyse the chemical composition of products used by Orlen Koltrans for carriage; the lab analysed also the chemical composition of the high risk load carried in order to confirm the correct packing group.
5) a detailed analysis of significant number of comments submitted by the interested entities and the Office for Railway Transport that the Accident Investigation Team had to deal with.

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SIGNATURES OF MEMBERS OF THE ACCIDENT INVESTIGATION TEAM:
TEAM LEADERS:

1……
Jan Andrzej Młynarczyk

MEMBERS:

2……	3……	4.....
Andrzej Kusior	**Andrzej Rodzik ……**	**Benedykt Kugielski**