Investigation Body for Railway Accidents and Incidents

Summary
Safety Investigation Report
Drifting of 2 empty railcars followed by a lateral collision with a technical train between the Brussels-North and Schaerbeek stations 24 April 2018

May 2019

REPORT VERSION TABLE

Version number	Subject of revision	Date
1.0	First version	10/05/2019

Any use of this restricted report with a different aim than of accident prevention - for example in order to attribute liability - individual or collective blaim in particular - would be a complete distortion of the aims of this report, the methods used to assemble it, the selection of facts collected, the nature of questions posed and the ideas organising it, to which the notion of liability is unknown. The conclusions which could be deduced from this would therefore be abusive in the literal sense of the term. In case of contradiction between certain words and terms, it is necessary to refer to the French version.

Nature of the accident:

Drifting of two empty AM08 "Desiro" railcars, followed by a lateral collision with an empty train.

Type of safety investigation:

Accident with limited investigation.

Date and time of the accident:

Tuesday 24th April 2018 around 11.00am.

Place of the accident:

Brussels-North Station, in the set of tracks on the Schaerbeek side.

Trains:

Train E2178, composed of 2 AM08 "Desiro" railcars (08564 + 08118).
Train E2057, composed of 3 AM08 "Desiro" railcars (08210 + 08051 + 08083)
Train E17907, empty train

Bare facts:

On Tuesday 24 April 2018, at around 11.00am, 2 AM08 railcarss, with no passengers on board, are uncoupled from a train that had arrived a few minutes earlier at Brussels-North station. As the parking brake was not applied on these 2 railcars, they drifted in the set of tracks towards Schaerbeek. There was a minor collision into the side of SNCB/NMBS train E17907, which had no passengers on board, and stopped around 800 metres from the platforms of Brussels-North station.

Victims:

There were no casualties.

Material damages:

While they were drifting, the railcars struck a switch. The train which was hit laterally incurred minor damage.
The incident resulted in delays and train cancellations.

Decision to open an investigation:

The accident occurred on the main track in an important set of tracks and, under slightly different circumstances, could have had more serious consequences.

FINAL REPORT OF THE CHAIN OF EVENTS

On Tuesday, 24 April 2018, the 2 railcars (08564 and 08118) of train E2178 had been in service since approximately 5.00am.
At approximately 8.01am, while train E2178 was scheduled to depart from the unmanned station (PANG in French) Essene-Lombeek on line 50 after a commercial stop, a technical problem occurred with the AM08564 pantograph management system.
As a result of this problem, the pantographs of the 2 railcars of the train lowered (for system safety).

The driver tried to solve the problem by stalling and then restarting the AM08564 and repeatedly attempting to raise the pantograph on the AM08564.
The problem persisted, and the driver of train E2178 declared his train in distress: with no power supply, the train was immobilised.

Behind train E2178, on the same line 50, two trains were blocked between Denderleeuw and Essene-Lombeek:

- Train E7954 (Kortrijk – Brussels-Midi), which sent a distress call shortly thereafter;
- Train E7016 (Aalst – Brussels-Midi).

Traffic Control (Infrabel) and the CTC (SNCB/NMBS) agreed on the resources to be deployed in order to clear the track blocked by the train in distress as quickly as possible: train E2057 was located in Ternat (not far from Essene-Lombeek) and was also composed of AM08 railcars.
This therefore ensured compatibility and coupling was possible via the GF automatic couplers fitted to AM08 railcars.

Train E2057 was cancelled, the passengers of train 2057 disembarked in Ternat and train E2057 was sent to the PANG in Essene-Lombeek.

The railcars of train E2178 needed to be towed (in 'vehicle' mode) to Brussels-North where they were uncoupled from the towing train and then brought by their own propulsion to the Schaerbeek yard.

The staff onboard train E2178 got the passengers to disembark on the platform: once the 2 trains had been coupled, the passengers of train E2178 boarded the 3 railcars of the towing train.
The 2 defective railcars were towed by the 3 railcars to Brussels-North station.

A driver was dispatched on-site to decouple the 2 defective railcars, which were then driven to the Schaerbeek workshops. According to information collected by the IB, he was not informed of the circumstances of the assistance by train E2057.

This driver pressed the door button of the first of the last 2 railcars (i.e. the railcars that were to be taken to Schaerbeek). The fact that there was no power in these railcars meant that the doors did not open.
The driver then went to the last door of the last railcar which had done the towing, boarded the railcar, and started the decoupling in the driver's cab.

Once uncoupled, the 2 railcars began to drift without the driver or on-site staff being able to stop them.

The IM agent on the platform immediately reported the incident to the Brussels-North signalling station (block 8).
The Brussels-North signalling station sent an alarm via GSM-R, with a voice message in both languages "*Alarm alarm, stop alle verkeer Brussel-Noord; alarme alarme, stoppez toutes les circulations à Bruxelles-Nord*".
All trains in these zones received the alarm.

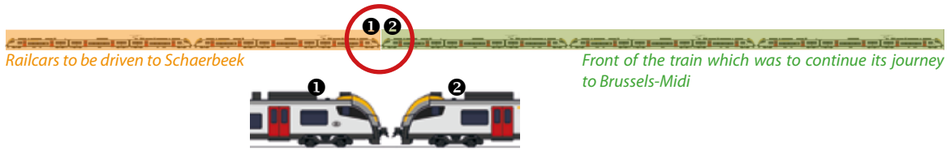
Train E17907, an empty SNCB/NMBS train, was stationary at Brussels-North station at a closed signal, when it received the GSM-R alarm. Immediately after receiving the alarm, the signal in front of train E17907 opened. The driver did not see any obstacles in front of his train or on the adjacent tracks: he started his train with restricted speed.
Other train drivers in the zone followed the same procedure.

The two railcars continued to drift and struck a switch. They then slowly collided into the side of train 17907, causing minor damage.

The drifting railcars came to a standstill around 800 metres from the platforms of Brussels-North.
The driver of train E2232 stopped his train when he received the GSM-R alarm: stationary at the entrance to Brussels-North station, he was able to witness the drifting of the 2 railcars and the lateral collision.
Seeing that the drifting trains had stopped, he secured his train, got off and went to the first of the two drifting railcars.
Using his service key, he activated the switch to restart the battery and start the computer systems. The starting of the computers caused the direct electrically controlled brake to be applied, by supplying power to the solenoids powering the brake cylinders.
The driver who had decoupled the trains joined the driver of the E2232 and they both continued the procedures to immobilise the drifting railcars.

CONCLUSIONS

DIRECT CAUSE



When the driver started the decoupling from the driver's cab ❷, the railcars that were to be driven to Schaerbeek came loose and drifted in the Brussels-North set of tracks towards Schaerbeek.

The fact that the parking brake was not engaged on these two railcars was the direct cause of the uncoupling and drifting.

INDIRECT FACTORS

TRAIN IN DISTRESS

After various attempts to restart his train, the driver of train E2178 sent a distress call in accordance with Traffic Control. The train was stationary at the PANG of Essene-Lombeek.

As a result, two other trains running on line 50 between Denderleeuw and Essene-Lombeek - train E7954 (Kortrijk - Brussels-Midi) and train E7016 (Aalst - Brussels-Midi) - were immobilised.

Only railcar 08564 (at the front) was defective, but it was not possible to change the front railcar (place railcar 08118 at the front) or to turn back towards Denderleeuw (with railcar 08118 at the front) given that the 2 trains E7954 and E7016 were immobilised on line 50.

Traffic Control, in agreement with the CTC, then decided to send another train to evacuate the two railcars to Brussels-North station, from where they could be taken under their own propulsion (railcar 08118 towing railcar 08564 in "vehicle" mode) to Schaerbeek.

Train E2057 was sent to evacuate passengers: it was composed of 3 railcars of the same type AM08, allowing straightforward coupling via the GF automatic couplers fitted to the AM08 railcars.
However, the train was in service: it was decided to cancel the train and disembark passengers at Ternat station. The train was sent to the PANG of Essene-Lombeek.

At Essene-Lombeek, the onboard staff asked passengers to disembark onto the platform, so the coupling could be performed.

COUPLING OF THE TRAINS

When train E2057 arrived, it was coupled with train E2178.
The two railcars were in "vehicle" mode, which meant:

- the mechanical and pneumatic couplings (automatic brake line (CFA in French)) were performed;
- but the electric couplers were not connected between the 2 trains.

The consequences included the following:

- as there was no electrical connection between the 2 trains, the service brake was not operational on the 2 railcars 08564 and 08118;
- the continuity of the automatic brake line (CFA) ensures that the automatic brake is operational: it is applied in the event of emergency braking or in the event of unintentional uncoupling (coupling failure);
- the braking capabilities of the full train are reduced and, in accordance with the rules laid down in the Drivers' Regulations (HLT in French), the speed of the convoy is limited to 80 km/h.

The 2 defective railcars were then towed by the 3 railcars to Brussels-North station.

STAFF FOR THE DECOUPLING

A driver was dispatched by the CTC to the platforms in Brussels North, to decouple the two trains.
This was a different driver to:

- the one who was driving train E2178 when it sent a distress call at Essene-Lombeek, and
- the one who brought all 5 railcars to Brussels-North station.

According to information collected by the IB, this driver sent to Brussels-North was not informed of the situation, i.e. that 2 of the 5 railcars were in "vehicle" mode.

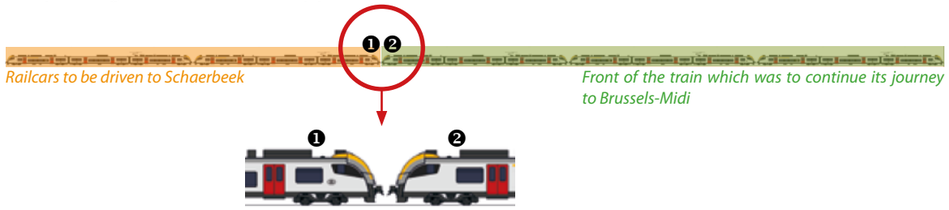
Regarding HLT regulations:

- Two drivers were present on the platforms of Brussels-North to perform the decoupling: the driver sent by the CTC and the driver who brought the 5 railcars to Brussels-North;
- The two drivers did not consult each other, as specified in the HTL V 08-2 (Annex II);
- During a decoupling procedure, the parking brakes should have been applied to the whole train when the train composed of 5 railcars arrived at the Brussels-North platform. It was not checked whether the parking brakes were applied before the decoupling.

The decoupling procedure stipulated in the SNCB/NMBS regulations (HLT) was not correctly applied.

ERGONOMICS FOR THE DECOUPLING

To perform the decoupling, the driver sent to Brussels-North tried to board the first of the towed railcars (❶): he pressed the door button, but as there was no power supply on these railcars, the doors did not open.
This did not catch his attention.
He did not notice either that the parking brake indicators on the side of the railcar were green: the parking brakes were not applied.



The driver then went to the last door of the last railcar (❷) of the towing train, and entered the driver's cab.

The TDD screen in the driver's cab displayed an image like this one:

Image from a reconstruction.

In this image:
• the white area represents the railcar in which the driver is located (❷ on the previous diagram);

• the dotted lines indicate that one or more railcars are coupled in "vehicle" mode.

This characteristic display did not sufficiently draw the driver's attention to the fact that the 2 towed railcars were in "vehicle" mode.

On the control panel, a parking brake indicator light was on, but as there were no electrical connections between the towing railcars and the towed railcars, this indicator only provided information on the status of the parking brakes of the 3 towing railcars (❷ on the diagram and shown in white on the TDD screen).
This last element did not help the driver realise that the railcars that were to be brought to Schaerbeek did not have their brakes on.

The driver then started the decoupling.

DRIFTING

Once the decoupling had been started, the 2 railcars drifted towards Schaerbeek.

The fact that there was no power supply on both railcars 08118 and 08564 meant that the ETCS system was deactivated, on which the anti-drifting system depends.

Neither of the two safety features, provided by both the parking brake and the automatic braking generated by the anti-drifting system, was operational at the time of decoupling, and could not stop the drifting.

MITIGATION - FOLLOW-UP OF THE GSM-R ALARM

The IM agent on the platform immediately reported the incident to the Brussels-North signalling station. The Brussels-North signalling station sent an alarm via the GSM-R system, with a voice message in both languages "*Alarm alarm, stop alle verkeer Brussel-Noord; alarme alarme, stoppez toutes les circulations à Bruxelles-Nord*".

All trains in these zones received the alarm. Immediately after receiving the alarm, the signal in front of train E17907 opened.
The driver did not see any obstacles in front of his train or on the adjacent tracks : he started his train with restricted speed. Other train drivers in the zone adopted the same procedure.

During its route, train E17907 sustained a minor lateral collision by the drifting railcars, with no serious consequences (minor damage to rolling stock).

According to the HLT, an alarm call received by the driver stipulates that the train must stop, or proceed with restricted speed, depending on the nature of the danger.

**The voice message communicated during the GSM-R alarm ordered all traffic in Brussels-North to stop.
In such cases, drivers should have no margin for interpretation.**

Following the measures taken by SNCB/NMBS (see Chapter 5 of the report), the IB does not issue any recommendations.

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