Rail Accident and Incident Investigation Unit

Summary
Safety Investigation Report
Derailment of 2 tank wagons during a hump shunting operation Antwerpen-Noord fan of sidings - 31/10/2024

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March 2026

REPORT VERSION TABLE

Version number	Subject of revision	Date
1.0	First version	27/03/2026

Any use of this report with a different aim than of accident prevention - for example in order to attribute liability - individual or collective blame 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.

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SUMMARY

On 31 October 2024, twenty-two wagons were to be hump shunted in the Antwerpen-Noord C fan of sidings.

Two of these wagons, each carrying 54450 kg of toluene, were to be parked on shunting track 222 of the C2 fan of sidings.

At around 5.10 p.m., the two wagons rolled down the hump and passed through three retarder sections, as well as several switches, before being directed at a controlled speed towards shunting track 222. The facilities concerned include several measuring and detection devices enabling the automatic system to control the switches and retarders on the tracks.

When the two wagons reached the classification retarder of shunting track 222, they derailed and overturned, partly onto the adjacent track 221.

Source: Infrabel

The tank of the first wagon was damaged and pierced: a large quantity of toluene leaked out. Toluene is a highly flammable liquid and an aromatic hydrocarbon commonly used as a reagent or solvent, particularly in the industrial sector. This substance is harmful and ecotoxic. Following the leak, it was necessary:

- to call in the emergency services and the specialist fire brigade of BASF;
- to remove the contaminated soil and decontaminate it.

In addition to damage to the tank, there was also damage to bogie components (wheels, axle, brakes, suspension), the structure of the wagons and the hooks of both wagons.

Tracks 221 and 222, along with their retarders, sustained significant damage during the accident.

There were no victims.

Due to the damage and pollution caused, this accident was classified as a serious accident, and the Investigation Unit opened an investigation.

Due to the toluene leak and the intervention of the emergency services, the site and the wagons were not accessible, preventing the IU from making their own findings, measurements and checks immediately after the accident. Furthermore, following the essential intervention of the emergency services and the specialist fire brigade of BASF, the condition of some components may have been altered, particularly the retarder of shunting track 222. Some of the uncertainties arising from the situation could not be resolved during the investigation.

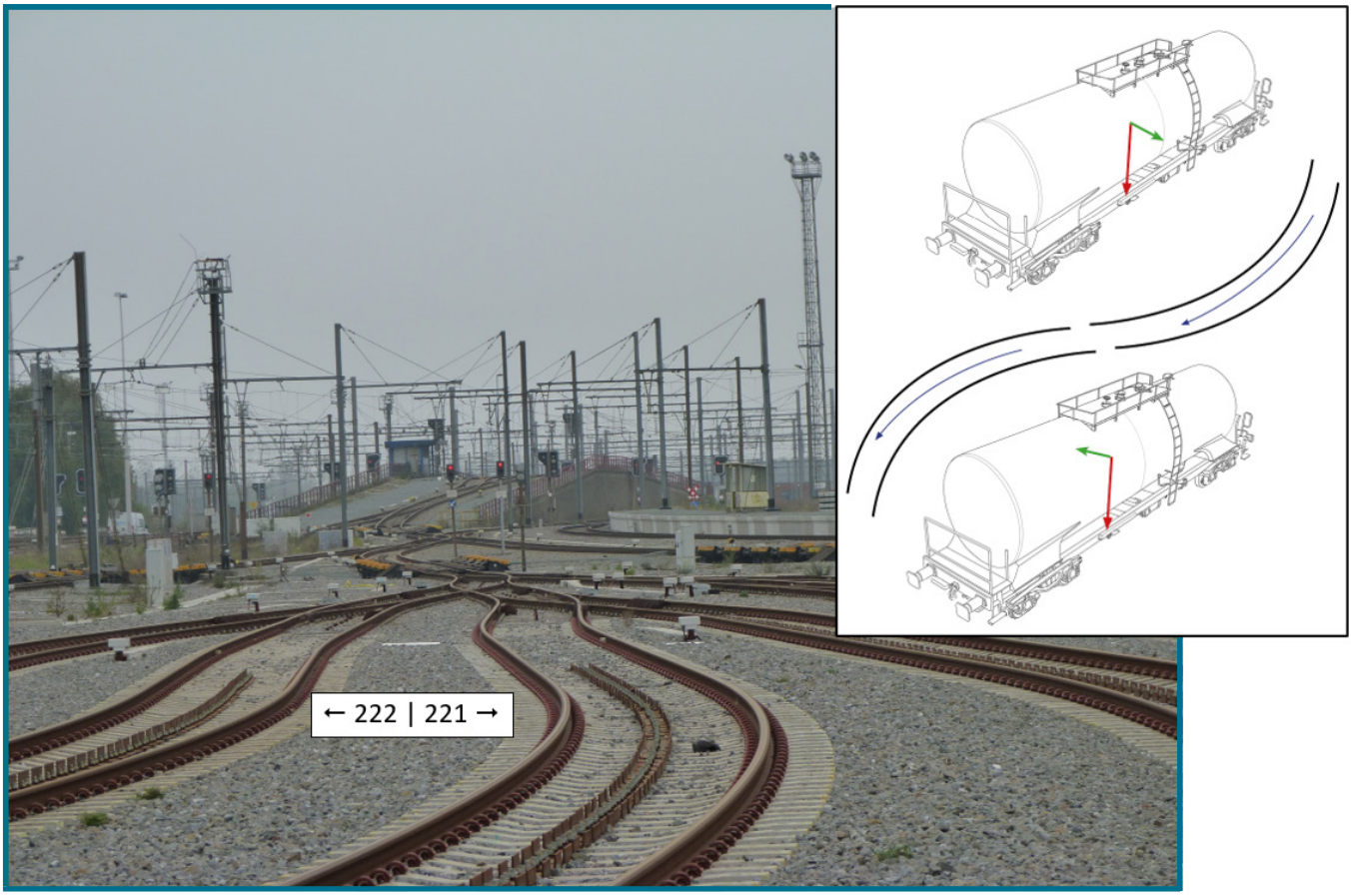
The IU assumes that the most likely sequence of events was as follows: the two wagons rolled down the hump, passed through several switches and retarders, and travelled at a controlled speed along track 222; at the level of the classification retarder of track 222, the first wagon derailed, overturned and dragged the second wagon with it.

The reasons for the derailment of the first wagon could not be established with certainty: none of the factors considered separately (the layout of track 222, the classification retarder of the shunting track, the characteristics of the wagons) can explain the derailment.

In an attempt to understand the derailment, various measurements, reconstructions and tests were therefore carried out during the investigation.

The IU assumes that the derailment of the first wagon is due to a combination of factors: the speed of the wagons after the main retarder, combined with the layout of track 222, may have generated forces acting on the wagons; the right-hand wheel of the first axle of the leading wagon is believed to have mounted on the classification retarder brake bar, the position of which was found during the investigation to be abnormal.

The investigation revealed that the bolts securing the classification retarder brake bar were loose: this may have caused the bar to move into an abnormal position following braking while the preceding wagons were passing.



During the investigation, the infrastructure manager took improvement measures. At the close of the investigation, these measures are extended and planned, while others are identified, implemented or planned:

1. Functional tests and modification of the "basic parameters" of the automatic shunting installation of the C fans of sidings ;
2. Check and adjustment of the "user parameters" of the automatic shunting installation of the B fans of sidings ;
3. Close monitoring of the maintenance and technical condition of the automatic shunting installation at Antwerpen-Noord ;
4. Functional tests and measures for putting shunting track 222 back into service ;
5. Close monitoring of all incidents and anomalies during automatic shunting at Antwerpen-Noord by the I-CBE.14 investigation team ;
6. Installation of a CCTV network at Antwerpen-Noord to visually assess the dynamic behaviour of wagons and cuts.

In view of the measures taken by Infrabel, the Investigation Unit does not issue any recommendation.

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