



Summary  
Safety Investigation Report  
Near-collision between an empty passenger train and  
another passenger train  
Denderleeuw - 11/07/2023

## REPORT VERSION TABLE

Version number	Subject of revision	Date
1.0	First version	24/10/2024

*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 Dutch version.*



# SUMMARY

On 11 July 2023, at around 8:30 p.m., a near-collision between an empty passenger train and another passenger train takes place near Denderleeuw station. There were no victims, but as a result, train services on line 89 were interrupted for more than six hours.

After the initial findings on site and an exchange meeting with the parties involved, the RAIU decides to open a safety investigation into this significant accident.

From the technical investigation, no failures can be identified in either the railway infrastructure or the rolling stock.

An empty SNCB/NMBS passenger train E1590 is at platform 9 of Denderleeuw station. The train is composed of two type 08 'Desiro' rail cars. One of the two rail cars must be parked at the Denderleeuw fan of sidings. To this end, after uncoupling, the first rail car must run to a dead-end track where the front is switched (i.e. change of direction of travel). The journey can then be continued to the track of the fan of sidings.

After the uncoupling of the two rail cars, the train driver is given permission through the signalling at around 8:16 p.m. to shunt to the dead-end track.

On the dead-end track there is a signal used to allow the return journey for the shunting movement. The distance between this signal and the end of the dead-end track is 375 metres. This distance is sufficiently long to receive the rail car (80 metres). The train driver is not obliged to drive to the end of the dead-end track to switch front.

The end of the dead-end track is indicated by a buffer stop with a marker board that must be visually observed by the train driver. From the moment the distance between a buffer stop and the front of a train is less than 200 metres, the train driver must limit the speed to a maximum of 20 km/h. On the day of the accident, the train driver is driving at a speed of about 28 km/h until he reaches the end of the dead-end track and hits the buffer stop. As a result, the train derails with the first bogie over a distance of 17 metres in the direction of the adjacent track A of line 89 which is parallel to the dead-end track. Consequently, the train encroaches on the clearance gauge of this track. The collision also causes part of the buffer stop to land on track A of line 89.



Another SNCB/NMBS passenger train (E5141 running from Schaerbeek to Kortrijk) is at platform 5 of Denderleeuw station. At around 8.27 p.m., this passenger train is given permission to depart through the signalling. The train leaves the station and runs on the main track towards Burst station.

About one kilometre in advance of Denderleeuw station, at the level of the derailed train, the passenger train hits a piece of the buffer stop after which the train driver brings the passenger train to a standstill. The passenger train passes right next to the derailed train; both trains are only a few centimetres apart.

The near-collision by passenger train E5141 is caused by the encroachment of the empty passenger train EM1590 on the clearance gauge of track A of line 89.

The empty passenger train (EM1590) collides with the buffer stop at a speed of about 28 km/h. At the end of dead-end track 091, there is no more track and the train derails in the direction of the clearance gauge of the adjacent track A of the line 89.

The first contributing factor is that due to the lack of attention to the shunting movement, the train driver does not see the buffer stop with marker board at the end of the dead-end track 091, causing him to neither slow down nor brake.

The RAIU does not make a recommendation.

In response to the near-collision between passenger trains E5141 and EM1590, the railway undertaking SNCB/NMBS is, on the one hand, taking actions to remind and raise awareness among train drivers about the importance of vigilance in the driver's cab and the prevention of distractions from external elements.

According to the RAIU investigation, the driver of the empty passenger train (EM1590) was not in a telephone call at the time of the collision with the buffer stop.

An additional observation is that during interviews with several train drivers, occasional use of mobile phones was repeatedly mentioned as a source of distraction or loss of concentration: by answering a call or reading a text message during a break, a train driver's thoughts about it can lead to distraction.

Train drivers receive training and various instructions regarding the use of mobile phones: in the driver's cab, mobile phones (and more extensively private multimedia devices) must be switched off and stowed away.

**The RAIU recommends the DRSI to verify the measures taken and controls implemented with regard to the use of private multimedia devices within railway undertakings.**



The two trains are only a few centimetres apart.

The priority means of communication between the train driver and the signal box is the GSM-R, which must always be switched on. Other possible means are considered as backup means of communication. The transmission of a GSM-R alarm is a group call that addresses all GSM-R devices in service that are within the call zone.

The second contributing factor is that after the collision with the buffer stop and the derailment of the empty passenger train EM1590, the train driver does not transmit a GSM-R alarm, but uses his service mobile phone.

In the absence of a GSM-R alarm, it is not immediately obvious to the signal box that there is a serious situation and no immediate safety measures are taken.

For the empty passenger train colliding with the buffer stop, no problems are observed regarding braking nor GSM-R.

Specifically during the investigation, the practical operation of a GSM-R alarm is also investigated, including when a driver's cab is taken out of service. In such a situation, it is still possible to use GSM-R. The actions for this purpose are listed in the train driver's manual.

Regulations have been developed within both the infrastructure manager Infrabel and the railway undertaking SNCB/NMBS to immediately inform each other of situations that compromise the safety, performance and/or availability of both the railway network and the rolling stock.

The driver of the empty passenger train EM1590 does not start his call with the message "Alarm Alarm". Consequently, it is not immediately obvious to the signal box that there is a serious situation requiring immediate safety measures.

The third contributing factor is that the standardised safety communication as provided for in the procedures is not applied between the train driver and the traffic controller.

An accident requires the application of immediate safety and alarm measures to limit the consequences of the accident. Priority is given to urgently stopping train traffic. This includes closing the controlled stop signals which give access to the scene of the accident.

The fourth contributing factor is the non-application of permanent coverage of the track (section) by the signal box as provided for in the procedures.

The RAIU does not make a recommendation for these last three contributing factors. The railway undertaking SNCB/NMBS is taking actions to remind and raise awareness among train drivers about correctly transmitting alarm calls, conducting correct safety communication and correctly implementing the immediate safety measures in case of an accident. The infrastructure manager Infrabel is taking actions to raise awareness among traffic controllers. Through e-learning modules, Infrabel wants to guarantee a good approach among signal box staff to sending and managing alarm calls. Role-playing cases are being developed as part of continuous training on safety communication. A poster clarifying the basic principles of good communication will also be developed and distributed.

The systemic factor is that there was no certainty regarding the operation of the GSM-R of the passenger train after the accident.

Training of train drivers is in accordance with national and European provisions, with theoretical and practical training being provided regarding the operation of the GSM-R and the transmission of a GSM-R alarm.

The functionalities and operation of the GSM-R in the driver's cab are always the same.

When the driver's cab is taken out of service, GSM-R can be switched on via the emergency control as provided for in the train driver's manual.

**The RAIU recommends the DRSI to verify the measures taken and controls implemented with regard to the use of GSM-R within railway undertakings.**



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