



Summary of the Safety Investigation Report

COLLISION OF A PASSENGER TRAIN WITH AN EXCAVATOR

DUFFEL - 14 JUNE 2012



On 14 June 2012 at 14:47 on platform I of track A on line 25, the Benelux train E9233, Brussels Midi/Zuid - Amsterdam Central Station, collided with the arm of an excavator which was working in the vicinity of the used track.

The impact caused the arm of the excavator to swing 270° and, in its movement, hit an assistant of the excavator operator, who then deceased at the scene.

The excavator operator suffered an injured foot and was transferred in a state of shock to the nearest hospital in Duffel.

The accident took place at the railway infrastructure project renovating, amongst others, the bridges over the Nete and the platforms at Duffel. The infrastructure project extends over a period of several years.

Pallets of paving stones which were stacked on platform I of Duffel station needed to be moved. The pallets were stacked in two rows at the end of the platform on the Antwerp side. The work consisted of splitting up the pallets in order to facilitate the paving work on platform I (direction Antwerp). The work was planned for the weekend of 23 and 24 June.

The method planned by the site management was to move the pallets with an excavator using lifting straps. In this case, an assistant needs to help with the handling of the load and give various instructions to the excavator operator. With this method the site managers considered that the arm of the excavator would not enter the structure gauge (area of the track where no obstacle is allowed) and that it was therefore not necessary to put a track warning system in place (Minimel) with a TSR (temporary speed restriction) or to take the track out of service.

The moving of the pallets was not signalled beforehand to the infrastructure manager's supervising official. A verbal briefing of the technique was given in the morning to the excavator operator and an assistant. However, another assistant than initially foreseen was ultimately sent to accompany the excavator operator. Possibly, this other assistant was not informed of the method chosen by the site managers.



The workers considered that the pallets were unstable, and that a fork-lifting system would be more efficient and give better support to the pallets being moved.

The site manager was present on the site but could not be present when the pallets were being moved. The workers did not inform him of the altered method.

The excavator operator did not have a good view of the position of the arm in relation to the structure gauge, nor did he have a good view of the possible arrival of trains on track A.

The arm of the excavator obscured the assistant's view of any approaching

trains but the assistant retained visual contact with the excavator operator.

Two reconstructions of the movement of the pallets have been carried out at the scene of the accident in the presence of the different parties, one with the use of lifting straps and the other with a fork-lift system. When using the fork-lift system, the arm of the excavator moved into the structure gauge. The assistant had to position himself behind the arm of the excavator to be able to see the excavator operator, which means that he then had no view of any trains arriving on track A.

During the movement of the pallets with the lifting straps, the assistant had no view of the excavator operator, nor of the trains arriving on track A, when placing the straps under the pallets. During this activity, they moved within the safety distance (1.5m, distance measured from the outer side of the closest rail, in which no obstacle may be found). What is more, to place the straps under the pallets, the assistant had to use a tool (an iron rod).

It was noted during the reconstruction that the arm of the excavator did not enter the structure gauge, however the iron bar held by the assistant did. This risk had not been considered.

The workers, the assistant and the excavator operator, were both responsible for carrying out work as sub-contractors on the Duffel work site. They had not always been present on this site and were sometimes called to work on other sites. They received, amongst others:

- general safety information applicable on the work site of the main contractor, but the general training of the workers was more limited than the one received by the main contractor's own staff.
- the rules for the use of excavators close to tracks in service are incorporated in a few basic concepts and are incorporated in the safety instructions for this work site.

The differences between the protection systems installed on the different tracks were not explicitly made clear to the assistant and the excavator operator.

The assistant sent with the excavator operator had carried out work earlier in the morning with a mini-excavator on the middle platform 2/3. On the two adjacent tracks there was an automatic track warning system (Minimel) in operation and incoming trains were announced with sirens and flashing lights.

Shortly before the accident, according to the witness statements collected and the EBP images (electronic signal box), the Minimel went off twice during the passage of trains. It is possible that the assistant thought that the Minimel was also in operation on track A to protect the working area.

Consultation takes place at different hierarchical levels via site meetings, meetings of the coordination structure with the different parties to promote safe working. However, not all the sub-contractors are always represented at these different meetings.

The workers of the sub-contractors are sent out to different sites. In view of the ever-changing circumstances (dangers and safeguards), it is however crucial to inform them regularly, clearly and precisely of the safety issues on the site.



