SUMMARY

COLLISION OF PASSENGER CARS WITH A RAIL BARRIER AND EVENTUALLY THE WALL OF AN OFFICE BUILDING AT THE HELSINKI CENTRAL RAILWAY STATION, FINLAND, ON 4 JANUARY 2010

At 8:28am on Monday, 4 January 2010, four passenger cars that had become separated from a train collided with a rail barrier at the end of the track at the Helsinki Central Railway Station at a speed of approximately 35 km/h. The front end of the double-decker coach that was the first in the train was pushed onto the damaged rail barrier and then the concrete buffer stop at the end of the track, eventually hitting the wall of the office building at the end of the track. The car broke the wall and came to a stop partially inside the building. Pushed by a locomotive, the train was being shunted to its departure track at the Helsinki station from the Ilmala depot, 4.5 kilometres away. The security officers at the station managed to evacuate the people from the platform before the collision.

Of the three people in the cars during the collision, one was slightly injured. Having collided first with the rail barrier and then the wall of the office building, the double-decker coach was so badly damaged that it had to be scrapped. The second, third, and fourth cars in the train suffered minor damage. In the fifth car, a 1,500-volt cable and a UIC cable were broken, and a brake conduit came loose. The other cars were undamaged. The rail barrier at the end of the track was completely crushed, and the concrete buffer stop behind it suffered minor fractures in the corners. The horizontal end beam to which the contact wires are attached was torn off. The office building suffered substantial material damage. The load-bearing primary frame of the building did not suffer significant damage, but the hollow-core slabs were fractured, and they also moved slightly. A meeting room in the impact area on the second floor of the building was completely destroyed, and the street-level entrance suffered substantial damage. Additionally, the building maintenance and safety-technology-related systems in the immediate vicinity of the impact area were damaged. The total costs of the damage amounted to € 825 000.

The accident was caused by the coupling loop coming loose from the hook during the pushing movement. This caused the train to break into two, and the automatic air brakes engaged once the brake conduit had come off. The conductor released the brakes of the cars to get the train moving. He did not realise that the train had broken into two. The coupling loop come loose because, as the car buffers compressed, the coupling loop, which had frozen solid, rose off the hook. The situation was aggravated by the fact that the screw coupling had not been tightened properly. Seeing the coupling loop was difficult because of poor lighting and the ice and snow in the space between the cars. The train in question had last been de-iced nine days previously, and there was a lot of snow on the bogies and between the cars. Additionally, the water coming from the outlet pipe of the sink in the WC of the car behind the restaurant coach had increased the formation of ice in this space.

In order to avoid similar accidents in the future, the Accident Investigation Commission recommends the following:

- Unambiguous instructions concerning the tightening of the screw coupling in various car types should be drawn up.
- To ensure that the cars remain stationary while the brakes are released by 'milking'[1], instructions on the use of the handbrake should be drawn up.

[1] 'Milking' here refers to the release of the brakes by means of the handle of the decoupling valve.

- Training in the use of device, which are important for safety reason, should be organised for restaurant car personnel also.

The Investigation Commission further recommends that a preparedness plan for exceptional circumstances should be drawn up for traffic control.

The Investigation Commission considers the following measures, already taken or in the process of being carried out good and support them:

- To the Helsinki rail depot in Ilmala has been provided a glycol de-icing system to prevent the formation of ice and the accumulation of snow on the structures under the passenger cars.
- New rail barriers have been installed on tracks 13 and 14 at the Helsinki station. The rail barriers are capable of stopping even a heavy train travelling at 35 km/h without the deceleration posing a risk to any passengers in the cars. All tracks at the Helsinki station will be equipped with similar rail barriers.
- The arrival tracks in Helsinki are equipped with ATP[2]-balises[3], which reduce the speed of an arriving train to 20 km/h.
- The Finnish Transport Agency has had emergency stops installed on the tracks that lead from the Ilmala depot to the Helsinki Central Railway Station. In an exceptional situation, a train can be stopped with this equipment.

Additionally, the Investigation Commission would like to issue a reminder that cars and spaces between cars in particular should be de-iced often enough to allow the requisite inspections to be performed. Car inspectors should be reminded that if , because of ice, a space between cars cannot be inspected, the car should always be referred for de-icing.

[2] ATP = Automatic Train Protection.
[3] A balise is a ATP track device which sends its message to ATP device of the locomotive.