R2017-01 Runaway of **a** maintenance machine in Ylivieska, Finland, on 28 June 2017

At 7.07 in the morning of 28 June 2017, a self-powered track maintenance machine used for track tamping began moving of its own accord from the western double-track work site located to the south of Ylivieska. The machine trailed a turnout leading from the work site to a track section used by traffic, and rolled north on a track used by traffic for a distance of one kilometre, coming to a halt on track 1 of the Ylivieska station. Only moments before, the track section had been used by a freight train heading south. Passenger trains were on their way to the Ylivieska station from both south and north. The trains were supposed to pass each other in Ylivieska.

In the evening of 27 June, the maintenance machine had been used for track tamping at the western double-track work site located to the south of the Ylivieska station. The crew of the machine stopped work after two o'clock in the night and moved the machine to the crossover between the eastern track used by traffic and the western double-track under construction, and left it standing there. The unu-sual location was chosen to make work easier. The driver, who acted as the crew chief, contacted the Kokkola–Ylivieska traffic control and reported that the machine had been left standing on the crossover and that it would not affect rail traffic.

The Ylivieska–lisalmi traffic controller, under whose control the Ylivieska station also was, saw the centralised traffic control system showing the tracks become occupied to the south of the Ylivieska station. Because there was not supposed to be traffic in that area, the traffic controller called the engine driver of a passenger train waiting at the Ylivieska station and asked whether the driver could see any traffic on the track. The engine driver saw a lightless maintenance machine slowly rolling down the southern hill and coming to a halt on track 1 of the station. At the request of the traffic controller, the engine driver approached the machine and noticed that the parking brake of the machine was disengaged. The engine driver engaged the parking brake and ensured that the machine will stay in place by placing stop blocks in front of the wheels of the machine.

While rolling, the maintenance machine had occupied the track section to the south of the Ylivieska station, due to which the signal located further to the south had changed to the *stop* state. Due to this, the passenger train approaching from the south had to stop at the signal.

During the incident, the point machine was damaged. The damage totalled EUR 25,000. The incident caused three passenger trains to be delayed, with the IC train en route from Oulu to Helsinki delayed the most, 2.5 hours.

The maintenance machine started rolling after its pneumatic brakes released, because the parking brake had not been engaged. Furthermore, stop blocks intended to secure the machine in place had not been used. There was no clear distribution of critical duties for the machine, and critical operations – such as engaging the parking break – were not verified when leaving the machine standing. In addition, the linkage of the machine's brake system was worn and poorly adjusted. These deficiencies had not been detected during the traffic worthiness inspection and safety inspection conducted on the machine one month earlier.

The location chosen for the machine to be left standing in was in conflict with the traffic safety plan of the work site in question. The crew of the machine did not have the knowledge required to intervene in the matter, because their induction had not included a review of the traffic safety plan. The general instructions in the field do not pay attention to locations where rolling stock may be left standing or how it should be secured in place.

The contractor who owns the machine did not have its own safety management system for trackwork. The Finnish Transport Agency's safety management system for trackwork had been specified to apply on the work site. The contractor's operations had not been audited by the Finnish Transport Agency, although deficiencies had previously been detected in the operations of said contractor, for example during investigation R2013-02 of the Safety Investigation Authority. The monitoring of trackwork safety issues on a practical level was found to be insufficient.

The traffic control did not have access to an up-to-date track diagram of the place of incident. For this reason, the traffic controller did not realise they should have intervened in the machine left standing on the crossover. The lack of documentation also slowed down clearing up the incident, because the centralised traffic control had no knowledge of theturnouts added to the track section used by traffic. The turnouts added to the track section used by traffic had not been connected to the centralised traffic control system; only their straight-running rails had been connected to be a part of the monitored track section.

In order to avoid similar incidents in the future, the Safety Investigation Authority recommends that the Finnish Transport Safety Agency (Trafi) ensure the implementation of the following new recommendations:

- 1. Already at the competitive tendering phase for the project, the Finnish Transport Agency should require each main contractor participating in track projects to have its own safety management system that takes the special characteristics of the companies and work sites into consideration, and include monitoring of the realisation of these systems as part of its auditing process.
- 2. The Finnish Transport Agency should add instructions to the safety instructions of track maintenance (TURO) and the rail traffic and shunting work safety rules (Jt) on the locations where rolling stock may be left standing and the required procedures to secure it in place.
- 3. The Finnish Transport Agency should update Part 6, Safety devices, of the Railway Engineering Guidelines (RATO) so that the section of a turnout that sees traffic installed on a track section used by traffic must always be connected to the track circuit of the railway safety system as its own element and connected to the centralised traffic control monitoring immediately when technically possible.
- 4. The Finnish Transport Safety Agency should specify in more detail the checks required during a traffic worthiness inspection as well as the qualification and independence criteria for the party conducting the inspection.

In addition, the Safety Investigation Authority reiterates the recommendation issued during investigation R2013-02:

The Finnish Transport Agency will increase the field monitoring of trackwork safety regulations by allocating appropriate resources for such work. [R2013-02/S346]