

## 5 SAFETY RECOMMENDATIONS

### 5.1 Clarifying the instructions on GPS positioning in the trackwork permission process

Centralised traffic control did not check that GPS positioning was used before granting a trackwork permission. In the instructions of the Finnish Transport Infrastructure Agency, the use of the GPS positioning feature has not been specified as mandatory for centralised traffic control. The accuracy of GPS positioning is enough to locate the trackwork in the right area on sections of line.

The Safety Investigation Authority recommends that the Finnish Transport and Communications Agency (Traficom) ensure the implementation of the following recommendation:

The Finnish Transport Infrastructure Agency orders the use of GPS positioning to be mandatory in locating trackwork. [2020-S19]

Centralised traffic control must always check the location of the trackwork team with GPS positioning before granting a trackwork permission.

### 5.2 Use of location markers and track elements in the voice communications between centralised traffic control and the trackwork supervisor

The trackwork supervisor did not check the location based on track elements or location markers before going on the track. Neither did the traffic controller use them to confirm the location of trackwork during voice communications.

On sections of line, the location markers and the numbers of electric-railway poles are often the only way to confirm the location. The TURO instructions do not allow their use to state the location. Neither do the instructions require centralised traffic control to use track elements and location markers in confirming the location of trackwork. According to the rail traffic and shunting work safety rules, location markers or track elements must be used to pinpoint the location.

The Safety Investigation Authority recommends that the Finnish Transport and Communications Agency (Traficom) ensure the implementation of the following recommendation:

The Finnish Transport Infrastructure Agency harmonises the location instructions for the railway network so that location markers are used in addition to the track elements in the voice communications between centralised traffic control and the trackwork supervisor, if necessary. [2020-S24]

Using track elements and location markers would make the location of trackwork concrete. If they are not used, the voice communications between centralised traffic control and the trackwork supervisor remain too vague.

### 5.3 Harmonising the maps

The map in the RUMA system does not support the identification of the trackwork site on sections of line in particular. The traffic controllers must use several different information systems and their maps. The systems do not exchange information with each other.

The Safety Investigation Authority recommends that the Finnish Transport and Communications Agency (Traficom) ensure the implementation of the following recommendation:

The Finnish Transport Infrastructure Agency harmonises the maps used for locating trackwork. [2020-S25]

The maps of the information system's platforms should be uniform and sufficiently accurate. They should show landmarks, such as bridges, undercrossings and level crossings.

### 5.4 Competence assurance in the trackwork training of companies

Based on the investigation, there are deficiencies in the training and competence related to locating trackwork. Not all trackwork supervisors know how to take advantage of the features of the RUMA application or understand why using them is necessary. This means that competence assurance in the trackwork training of companies has not been completely successful.

The Safety Investigation Authority recommends that the Finnish Transport and Communications Agency (Traficom) ensure the implementation of the following recommendation:

The Finnish Transport Infrastructure Agency emphasises competence assurance in auditing the training of trackwork companies. [2020-S26]

### 5.5 Measures that have been taken

The Finnish Transport Infrastructure Agency is studying the development of the RUMA system extensively with Finrail Oy.

The Finnish Transport Infrastructure Agency has taken the observations on the accident into account in the track maintenance safety instructions (TURO) that will enter into force on 1 January 2021. The instructions were originally going to enter into force on 1 June 2020, but the implementation had to be delayed due to the coronavirus epidemic. The instructions have developed the procedures of locating trackwork and raised GPS positioning as a requirement that has been described in more detail. In addition, the procedures in accordance with the different stages of trackwork have been grouped into chronological task lists based on the task roles.

In the new version of the TURO instructions, the trackwork supervisor must always ensure that the contact persons of the teams as well as the trackwork machine operators and rolling stock drivers have joined the trackwork in RUMA and are using RUMA to transmit their location before requesting a trackwork permission. In addition, the trackwork supervisor must always check their own location and the location of the contact persons of other teams as well as trackwork machines, both in RUMA and visually. With regard to trackwork machines, the location must also be confirmed by voice communication with the trackwork machine operators.

The Finnish Transport Infrastructure Agency will continue to update the track maintenance safety instructions (TURO) in the autumn of 2020. The update focuses not only on the observations of the accident and the investigation report, but also on identifying again the tasks related to trackwork and their potential for error and error chains, in addition to their human and organisational factors. At the same time, the aim is to find the corrective measures for procedures and technical systems that can be used to prevent errors and their consequences.

The Finnish Transport Infrastructure Agency has taken the accident that occurred into account in the overview of current safety issues delivered to the service providers; it highlights the importance of positioning in starting trackwork. A reminder and examples of practical positioning procedures were delivered as an attachment to the overview of current issues.

The Finnish Transport Infrastructure Agency takes the recommendation on auditing the training of trackwork companies in its in-house control plan. The Finnish Transport Infrastructure Agency has updated the basic and refresher training material for trackwork supervisors based on the observations on the accident, among other things, and the issue is also taken into account in the safety coordinator training.

In addition, the Finnish Transport Infrastructure Agency has identified needs for measures related to the publication and entry into force of instructions and the scheduling of refresher training. The Finnish Transport Infrastructure Agency has not made any decisions on these measures yet.

Finrail Oy has a study in progress on how to harmonise the map and diagram templates of centralised traffic control systems and the other systems that support them.

Finrail Oy is developing a functionality for the RUMA application, in which the application warns the user if their position differs significantly from the trackwork area.

Sweco Oy has decided to implement training in the RUMA application for its trackwork supervisors and pays special attention to the GPS feature of the application as well as locating trackwork.

Attention is also paid to the interaction with centralised traffic control that can help to confirm the location of the trackwork and the people working on it. The training will be held from August to September in 2020.