4 CONCLUSIONS

4.1 Statements

1. VR Track was assigned the planning of a switch change as the main contractor. SGM was selected as a subconsultant for taking soil samples.
2. SGM ordered a cable marking at the Uimaharju switch V311 for drilling for soil samples.
3. The intention was to mark the cables with the trackwork permission required for the drilling. This plan was not transmitted to the cable markers.
4. SGM sent the cable marking request to VR Track by e-mail. The cable marking request form was not used.
5. VR Track forwarded the e-mail further to the Kaivulupa.fi service. After a preliminary assessment, kaivulupa.fi sent a marking request to Cinia, because the area may also contain Cinia's cables. From Cinia, the request was forwarded on to Empower.
6. Kaivulupa.fi delivered an incompletely filled cable marking request form to Cinia, and Cinia sent it to Empower's work management.
7. Based on the maps of Kaivulupa.fi, it is impossible to determine if the work could be done outside the trackwork hazard zone.
8. The cable markers went to the worksite near the switch V311 half an hour before the planned start time of the trackwork permission.
9. Cable marking is often carried out without protective measures.
10. The cable markers had already started the work before the trackwork supervisor arrived at the site. The trackwork supervisor did not interrupt the work, and an initial meeting was not held.
11. The cable marker from Empower worked on the left side of the tracks in relation to the train's direction of travel, and the trackwork supervisor moved to the right side of the tracks together with the other cable marker.
12. The train left the Uimaharju station and accelerated to the speed of 59 km/h before reaching the switch V311. The engine driver noticed the people in the vicinity of the tracks, believed that the train had been noticed, and did not blow the whistle.
13. The person marking cables on the left side of the tracks moved towards the tracks when the train was at close range, and was knocked down by the train, sustaining serious injuries.
14. The injured person did not use all of the protective equipment required. Using a helmet could have resulted in less serious injury.

4.2 Causes of the accident

The immediate cause of the accident was that a person working on the tracks without protective measures failed to notice the approaching train and moved too close to the rails when the train arrived.

The root cause was the cable marker's attention being focused on the cable detector. In addition, the current weather conditions and the train being quiet made the train more difficult to notice.

The root causes are related to faulty work practices in cable marking in particular. Cable marking is not seen as actual trackwork, and it is often carried out without protective measures. This had an effect on starting the work before receiving a trackwork permission. In addition, the information about the intention to mark the cables with a trackwork permission had not been transmitted to the cable markers. This was affected in return by the cable marking form not being filled out at the order stage and by the form remaining incomplete when it was finally filled out. The form does not clearly require any comments on the protective measures to be taken, either. It is difficult to determine the need for protective measures in advance, because the maps available cannot be used to evaluate the need to move within the trackwork hazard zone. The company marking the cables had not paid attention to the faulty practices, and higher management had not addressed them, either.

The distance between organisations and the many links in the contract chain have blurred the responsibilities and weakened the flow of information.