4 CONCLUSIONS

4.1 Statements

1. A majority of the wrong routings occurred when the traffic controller was forming a route manually. In many cases, the automated system could have been used.
2. Traffic controllers do not take maximum advantage of the automated system's functions or features.
3. Routes have been formed manually, because the traffic controllers believe that this makes traffic run smoother and facilitates their work, and because they distrust the automation systems.
4. On occasion, traffic controllers find that the automation systems make their work slow and restrictive.
5. Higher rail traffic speeds require modifications to the interlocking systems. Insufficient attention has been paid to this within the remote control system. Trains need to slow down or even stop at signals until the signal indicates that driving ahead is permitted.
6. The manual creation of routes has led to errors, cases of forgetting and errors of judgement.
7. In many cases, such errors only resulted in minor traffic disruptions, as the engine driver noticed the faulty position of a switch or signal.
8. A passenger train being directed onto a track with no platform easily creates a dangerous situation as passengers attempt to board the train, and there is not always time to make an announcement to the passengers or warn other traffic.
9. In some sections of the rail network, the part of the automation system dealing with train numbers is not in use, despite the technology itself being in place.
10. The systems used for traffic control have been in an almost constant state of change, which has affected the users of the systems.
11. Several different systems are in use and are subject to continuous and numerous changes. There is insufficient time to train personnel in the use of new or modified systems before the deployment of these systems.
12. The safety management system of the Safety Investigation Authority has not been comprehensively updated for five years, despite the fact that the operating environment and organisations have changed. On several occasions, the Transport Safety Agency has detected shortcomings in the quality control of the Finnish Transport Agency's service providers.
13. The roles of the Finnish Transport Agency and Finrail as purchasers of control services and as service providers are partly unclear. This hampers collaboration in the development of traffic control systems.
14. During the investigation, the Rail Traffic Control Manual in effect at that time was a confidential document. The confidentiality makes the utilisation of the manual more difficult. The *Rail Traffic Control Manual* contains information that is useful in the training of instructors who train engine drivers and those responsible for trackwork, contributing to the safety of traffic and making it run more smoothly.
15. The regulations and instructions in effect are not always identical to those actually used.
16. At some traffic control points, small, unclear or erroneous display symbols, or a lack of symbols designating passenger platforms, hamper the work of traffic controllers.
17. Several different traffic control systems may be in use at one traffic control point. This hampers the work of traffic controllers as they move between control tables, or work at several tables simultaneously.

18. Traffic controllers feel that they have insufficient say in the planning of new traffic systems and development of old ones.
19. It is impossible for the traffic controllers to verify the correctness of the route on their displays in cases where some of the switches are not monitored.
20. Traffic has not always been initiated in accordance with the inspection instructions after maintenance or repairs of a switch or an interlocking. Traffic controllers are unable to confirm the position of a switch solely from their displays.
21. Traffic controllers do not submit a deviation report for all wrong routings.
22. No clear and uniform system exists for reporting on wrong routings that covers all parties: the rail traffic operator, the owner of the rail network and the safety authority.
23. Finrail Oy classifies some wrong routings as quality deviations. However, a wrong route classified as a quality deviation may cause a dangerous situation for passengers if a passenger train is directed onto a track with no platform.
24. Trackwork causes traffic controllers to have to remember many operations. The problem is exacerbated by the large variety of trackwork operators and the resulting diversity of communications.
25. Communication between traffic controllers at the borders of control areas is partially deficient. For example, changes in the arrival order of trains were not always reported to the receiving traffic controller in situations where the train number was not automatically transmitted.
26. The instructions for cancelling a departure signal on tracks controlled via radio signals, issued as a voice communication based on a flash message, are difficult to find in the system's extensive operating instructions.
27. Changes made to the automatic traffic control functions in connection with train schedule changes include a lot of routine operations and opportunities for error. Errors resulting from this reduce trust in the functioning of the automation.
28. An *emergency stop* message cannot be relayed via the engine radio at border crossing points for international traffic. Nor is there a common hand signal.