6 CONCLUSIONS

The causes for the events studied in the theme investigation are presented in the conclusions. A cause means the various factors in the background of the events and the direct and indirect circumstances affecting them.

1. Established work methods, rushing things and leaving things unchecked are behind most shunting accidents and incidents. The external timetable pressures on shunting work often increase the sense of urgency and can easily lead to making assumptions and working recklessly. In shunting work, the workers are responsible for their own safety, which emphasizes the importance of keeping a lookout. This is often neglected, however.

   Conclusion: Rushed work and assumptions decrease the safety of shunting work and can lead to neglecting to keep a lookout or check the actual state of things.

2. Training in the use of new systems and regulations is increasingly conducted online. This leaves the verification of competence partly at the responsibility of the student.

   Conclusion: Self-direction, the requirements of planning your own studies, and the assimilation of information and verification of competence are emphasized in online training.

3. The rather poor general lighting of railway yards and the weak lights of the locomotives used for shunting work hinder keeping a lookout during shunting operations.

   Conclusion: Not enough attention has been paid to the lighting of railway yards and rolling stock. Obsolete lights should be updated to new energy-efficient technologies.

4. The poor visibility and ambiguity of track signs causes hazards during shunting work, especially in darkness or otherwise poor visibility. The situation is exacerbated by poor lighting.

   Conclusion: The visibility of track signs needed during shunting work is poor, especially in artificial light, so their colors can be confused with each other.

5. Shunting personnel often consider it pointless to report safety deviations, since corrective measures are not taken and feedback is not given. This is particularly the case in multi-operator environments, in which the division of responsibilities between companies often creates a barrier to the implementation of corrective measures.

   Conclusion: Deviation reports will only be filed if they are processed quickly, feedback is given and corrective measures are implemented. The boundaries between operators should not prevent the correction of shortcomings in safety.

6. The effects of changes made to track devices, signs or work methods on the safety of shunting is rarely identified in risk assessments. The needs of shunting operations are often different from those of other user groups. In a multi-operator environment, changes implemented by one operator often have an impact on others as well.

   Conclusion: It is crucial to take all operators and user groups, as well as the mutual effects of the changes on each other, into account when making changes.

7. Shunting instructions are fragmentary and partly conflicting in the areas of different infrastructure managers and between operators. This problem is exacerbated in a multi-operator environment. There are general instructions, local instructions and operator-specific instructions for shunting. There is currently no systematic process for ensuring the compatibility of these instructions.

   Conclusion: Shunting instructions and the supervision of their compatibility are currently not sufficient in a multi-operator environment.

8. The lack of standardized communications and use of local terms and expressions causes accidents and incidents in shunting operations. For example, similar callsigns combined with a lack of local knowledge can make the situation worse. The prevailing operational and communications culture can increase the threshold for asking for advice and making sure of things. The guidelines for standardized communications do not address uncertain situations.

   Conclusion: Standardized communications and a culture of asking questions have been neglected in the railway industry. They are vital for safety, especially in uncertain situations. Old practices die hard.

9. There are currently several railway information systems, which do not exchange information. In addition, most data is entered into the systems manually, which increases the possibility of error. There is also room for improvement in the usability of the systems, especially in field conditions. For example, finding local instructions and locating the section of track to which they apply is difficult.

   Conclusion: Not enough attention has been paid to the compatibility and usability of railway information systems. Technical regulations to ensure the compatibility of systems are insufficient in the industry.

10. The interfaces between class 1 and 2 traffic control areas have proven to be dangerous for shunting work. The risk is emphasized if access to a class 1 area from a class 2 area using an incorrect route is not monitored or prevented by technical means. It is regrettably often due to simple chance that serious accidents are avoided. The decision made in 2016 to remove Stop signs has made the situation worse.

    Conclusion: Traffic control is largely organized according to the needs of train traffic, and shunting work is viewed as a support function. This can lead to overlooking the safety aspects of shunting.

11. Shunting accidents often cause only minor costs and impact on other railway traffic. Nevertheless, hundreds of such incidents occur every year.

    Conclusion: The annual financial impact of shunting accidents is significant because of the large number of annual incidents.

12. Shunting accidents or incidents often have an indirect effect on traffic in a large area. In such cases, everyone in the area should be notified of the incidents as quickly as possible. Railway emergency calls are a good means of achieving this, but they are seldom used.

    Conclusion: The threshold for making railway emergency calls is still too high.