# 1 CONCLUSIONS

The conclusions include the causes of the accident or incident. A cause means the various factors behind the incident and the direct and indirect circumstances affecting it.

1. After several repaired metros had been transferred on the track as special transport, the risks of the locally made decisions in the transports were typically no longer assessed before a transport. The risk assessment had been made at an earlier planning stage. As the special transports continued, people started to consider the exceptional solutions used in the transports as normal.

   ***Conclusion:*** *Each special transport and its special solutions should be inspected separately. This ensures the safety of each transport and prevents trends that threaten safety.*

2. Special arrangements and decisions made locally at the last minute are typical of special transports. This makes it difficult for the supervisory authority to supervise the safety of installations in special train transports. Similarly, the self-monitoring by railway operators is typically more focused on normal traffic than special transports. The special arrangements required by special transports can easily fall completely outside the scope of supervision.

   ***Conclusion:*** *Railway operators should consciously also try to focus their self-monitoring on the installation work and local solutions in special transports.*

3. The implementation of special transports and the equipment used in them, such as towing adapters, have not always been handled as critical to safety in rail traffic.

   ***Conclusion:*** *The equipment used for special transports should be identified as early as possible so that there would be enough time to carry out sufficient maintenance measures on them. The special transport equipment should be included in the maintenance programme.*

4. The train broke in two, because the towing adapter and the metro coupling malfunctioned at the same time. After the train broke up, the brakes of the measurement carriage did not function as planned due to the implementation of the temporary brake pipe, which caused the collision and derailment.

   ***Conclusion:*** *A train breaking up is a known risk in rail traffic. The break is not assumed to cause an accident, because in a normal situation, the brake arrangements will ensure that the parts of the train will come to a safe and controlled stop. This risk should be taken into account in special transports, however.*

5. It would have been possible to install the brake pipe of the train involved in the accident in accordance with the regulations, in which case the brake system could have functioned correctly. Different kinds of devices and arrangements by different employees are used in special transport arrangements. In that case, the hazards resulting from the combination of different factors may not necessarily be understood.

   ***Conclusion:*** *As far as possible, the arrangements of special transports should be implemented in accordance the regulations that guide safe operation.*