

## SUMMARY IN ENGLISH

After the arrival of train 768 to Västerås (Vå), the vehicles (an X40 consist) were to be taken to the depot at Västerås Västra (Våv). This transport/movement was to be carried out as a shunting movement. Please refer to figure 3 for track and signal layout information.

The driver contacted the traffic control centre and requested a route be set for the shunting movement to Våv. As there was a train approaching, the shunting was postponed to avoid delaying the train. After the train in question had passed, the driver of the shunting movement again contacted traffic control and received the information that yet another train needed to pass, but the route would be prepared, and set in increments as conflicting train routes were dissolved. The signal Vå 136 was then changed to show a clear signal for shunting.

The shunting route was set only to the next shunting signal, which showed "Stop". The driver, however, did not stop at this signal (Vå 138), but proceeded. The shunting movement was then led to the left by the facing points in switch 438, towards switch 439 in the track that was used for the oncoming train 2169, an X12 EMU. The shunting movement proceeded to force switch 439 open and continued heads-on with the approaching train 2169. At that point, both the drivers noted the anomalous situation and applied the brakes. The two movements came to a standstill at a distance of 1,6 metres between the couplers of the leading vehicles.

In the instant the shunting movement passed Vå 138, the conditions for the train route for 2169 were no longer fulfilled, as a track circuit within the route or its protective zones became occupied, and signal Vå 123 should have changed aspect from "Clear" to "Stop" (Danger). However, as 2169 had already passed that signal, this was not a barrier under the circumstances in this case. A collision was avoided only by the fact that the drivers noted the problem in time and acted accordingly.

The transports of vehicles between Vå and Våv depot are carried out as shunting movements and not as "proper trains".

In this case, the train route for 2169 needs protection from a shunting route set from Vå 136 to Vå 138. The object that gives protection is the shunting signal Vå 138, but the distance from the signal to a conflict point is fairly short.

Operational safety is realised through the technical devices (the interlocking plant and the signals) and the operational rules. The barriers that come into effect in a situation as the one dealt with in this report, depend on the correct function of the signalling system and on adherence to the operational rules by the personnel active in the environment. Risk assessment must address the possibility of failures in the barrier system.

Signalling systems are designed and built to be "fail-safe", meaning that technical problems should lead to a situation where permissive signalling is prevented, rather than to "false positives". Over time, signalling systems failures have had very little direct impact on the risk level.

Failing to stop a movement at a signal showing a "Stop" aspect is a serious situation, and many Railway Undertakings (RU's) follow up these events thoroughly, as does the Infrastructure Manager (IM). The risk as such is recognized.

In the situation at hand, neither the IM nor the RU have performed an assessment of the risks that may exist in areas where train and shunting movements are mixed. The rules and routines for these two types of movement have been in effect for many years and are well known and considered adequate by both the IM and the RU. However, the number of movements (trains and shunting movements) in certain areas/places (e.g. Västerås) has increased considerably over time, which may indicate that the situation has developed into something a bit different from the one that existed when rules and routines were formed.

The immediate cause for the incident was that the "Stop" aspect in signal Vå 138 was not heeded by the driver of the shunting movement.

A probable contributing factor was that the headlights of the oncoming train were in the field of vision of the driver of the shunting movement, and that may have diverted his attention.

### **Safety Recommendations**

With reference to planned and ongoing activities related to SPAD incidents, no safety recommendations are issued in connection with this investigation report.