

EMSD announces investigation results on incident of new signalling system testing on MTR Tsuen Wan Line

The Electrical and Mechanical Services Department (EMSD) has completed an independent and comprehensive investigation of the incident of the new signalling system testing on the MTR Tsuen Wan Line on March 18 this year, with the assistance from overseas railway safety experts. The EMSD investigated the cause of the incident and released the investigation report today (July 5).

According to the investigation findings, the cause of the incident was a programming error during software rectification of the new signalling system by the system contractor at the design and development stage. This programming error caused a failure to establish the data of the crossover track at Central Station after switchover from the primary zone controller to the warm-standby tertiary zone controller (Note). As a result, the Automatic Train Protection system could not function as required to prevent two trains from entering a crossover track at Central Station at the same time, leading to a train collision.

Beyond the programming error, the EMSD considers that the provision of a warm-standby tertiary zone controller is a unique and non-standard design of the system contractor, which is different from its standard signalling system products, but the potential risk arising from the introduction of the warm-standby tertiary zone controller was not comprehensively included in the contractor's risk assessment. Simulation tests to the maximum extent possible were also not conducted by the contractor prior to the site tests. Moreover, the EMSD considers that, having regard to the significance of this project and the fact that the system design is a non-standard one, the MTR Corporation Limited (MTRCL) should avoid over-reliance on the contractor and ought to be extra-vigilant at all times.

The EMSD has also thoroughly reviewed the report of the MTRCL's Investigation Panel submitted on June 17 and accepted the investigation outcome of the Panel on the cause of the incident, which was the programming error in the software of the new signalling system as a result of multiple implementation errors by the system contractor. This finding aligns with the finding of the EMSD's independent investigation.

The EMSD also notes the Panel has made a number of recommendations to the contractor and the MTRCL and agrees that such recommendations aim to rectify the programming error and enhance the development and testing process of the new signalling system, with a view to preventing recurrence of similar incidents. The EMSD will closely monitor the MTRCL's full implementation of the improvement measures and assess their effectiveness. The Government will only allow the MTRCL to resume dynamic train testing of the new signalling

system on the MTR Tsuen Wan Line after the MTRCL has fully completed the remedial work and the EMSD has confirmed the safety of the new signalling system upon inspection.

The investigation report has been uploaded to the EMSD's website ([www.emsd.gov.hk/filemanager/en/content_1377/TWL_New_Signalling_System_Testing_Incident_Report_\(Eng\).pdf](http://www.emsd.gov.hk/filemanager/en/content_1377/TWL_New_Signalling_System_Testing_Incident_Report_(Eng).pdf)).

Note: A warm-standby tertiary zone controller is a redundancy system design. When the active primary zone controller is in operation, the tertiary zone controller remains in the warm standby mode and obtains partial data from the primary zone controller. Therefore, the data of the active primary zone controller and the warm-standby tertiary zone controller are not synchronised. When the primary and secondary zone controllers do not run smoothly, they will automatically be switched over to the warm-standby tertiary zone controller to control the overall train operations.