LCQ4: New signalling system of East Rail Line

Following is a question by the Hon Michael Tien and a reply by the Secretary for Transport and Housing, Mr Frank Chan Fan, in the Legislative Council today (October 21):

Question:

In May this year, three abnormal incidents happened during the testing of the new signalling system of the East Rail Line (EAL). The investigation report released by the MTR Corporation Limited (MTRCL) in mid-August indicated that such incidents were unrelated to the operation and safety of the signalling system. It was uncovered by a media report on September 11 that an incident of a train "taking the wrong route" happened during the testing of the signalling system, but the MTRCL had not made public the incident all along. The MTRCL subsequently announced the suspension of its plan, originally scheduled for September 12, of the commissioning of the new signalling system for EAL and the gradual introduction of new trains to EAL. In this connection, will the Government inform this Council:

(1) whether it knows if the successive emergence of problems in the signalling system during the testing was a result of the supplier of system software failing to cope with the excessive requirements on data collection set by the MTRCL for the system, which are higher than those set in general by the railway operators in various places; whether the MTRCL has reviewed if its practice of setting the aforesaid special requirements has brought additional risks to the system;

(2) given that while the incident of a train "taking the wrong route" reportedly happened as early as in May, the signalling system could still obtain approval from the Electrical and Mechanical Services Department (EMSD) in August, whether the Government has examined if there are loopholes in the vetting and approval mechanism, as well as whether it involved deliberate concealment of the problem from the EMSD; how the Government will improve the vetting and approval mechanism and hold the persons concerned responsible; and

(3) how the Government will urge the MTRCL to make concrete improvements to its mechanism of vetting and approval for and overseeing the implementation of works contracts; whether it knows if the MTRCL will change the practice of procuring tailor-made software for the signalling system?

Reply:

President,

During the test of the new signalling system of the East Rail Line (EAL) conducted by the MTR Corporation Limited (MTRCL) on May 11, 2020, there were

system reliability related abnormalities which might cause a train to enter an incorrect route and an incorrect station. Having been informed of the above on September 10, the Government requested the MTRCL to suspend the use of the new signalling system of the EAL. The Government requested the MTRCL to submit detailed report on the incident and to conduct further inspection and more detailed tests on the new signalling system. The new signalling system of the EAL can only be put into service after its system reliability is further assured.

After consulting the Electrical and Mechanical Services Department (EMSD), the Transport Department (TD) and the Highways Department, my reply to the respective parts of the Hon Michael Tien's question is as follows:

(1) The new signalling system of the EAL applies the "Communication Based Train Control" technology. Through continuous two-way communication between trainborne and trackside signalling equipment, data such as real-time speed and train position is collected for calculating the maximum moving distance of the trains, so as to maintain the safety distance between operating trains. The same signalling system technology has also been adopted by railways in other regions.

The new signalling system has to continuously collect the required information and data about operating trains to serve the above-mentioned functions after computer processing. During the test, more information and data about operating trains must be collected for analysis. This approach is widely applied in the tests, installation and signalling system upgrading of modern railway; and was the basis of the test and upgrading of the new signalling system of the EAL. Both the MTRCL and its software contractors possess relevant technology and test experience.

(2) The EMSD has been rigorously vetting the matters about the upgrading of the EAL's signalling system on the premise of a risk-based approach in accordance with the established mechanism. Based on the test records of the EAL new signalling system, the risk assessment reports submitted by the MTRCL, and the views of the independent safety assessor, the EMSD has rigorously monitored, audited, inspected and assessed the work procedures and tests that might pose higher risk to the safe operation of railway. The EMSD has also participated in the on-site safety function tests for the signalling system to ensure the compliance with the relevant European Standards.

As regards the assessment of train services, the TD has requested all types of trains in the EAL, including the existing 12-car trains and the new 9-car trains, to provide stable and smooth operations under the new signalling system. The TD has rigorously inspected and vetted the actual train operations, relevant in-train and station facilities and the like; and requested the MTRCL to arrange more tests as necessary to strengthen the inspection of the overall train service reliability under the new signalling system.

During all the tests including various comprehensive trials of stress tests with a full line of 30 trains conducted by the MTRCL in the presence of the EMSD and TD before September 10, 2020, all trains could be directed to

the correct routes under the new signalling system and there was no incorrect train entry to stations. In addition, the MTRCL has never reported relevant problems to the EMSD, TD or other government departments.

The MTRCL announced the establishment of an investigation panel for this incident on September 13. The scope of the investigation includes whether the mechanism for reporting to relevant government departments has been properly followed. It is expected to complete the investigation and submit the investigation report to relevant government departments within three months. The MTRCL will give a full account of the incident to the public in due course. Since the incident is still under investigation, the Government's top priority is to find out the whole story of the incident, and to urge and supervise the MTRCL to implement remedial measures as early as possible to ensure safe and reliable railway services. If any violation of the law is found during investigation, the Government will follow up seriously.

(3) In response to this incident, the EMSD requested the MTRCL to submit a technical investigation report to explain in detail the causes of the incident and propose remedial measures. The EMSD, in collaboration with the TD and other departments, will review the report. The Government will only approve the commissioning of the new EAL signalling system upon further confirmation of the technicalities and service reliability of the system.

If, in the course of the above follow-up actions, it is confirmed that the incident is related to the MTRCL's mechanisms for vetting and monitoring the works, the Government will request the MTRCL to review its related mechanisms, learn from experience and make improvement to avoid recurrence of similar incidents in the future.

Thank you, President.