

立法會

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Panel on Transport

Background brief on Railway incidents

Purpose

This paper provides an overview of railway services in Hong Kong and sets out the major concerns and suggestions made by members of the Panel and its Subcommittee on matters relating to railways (the Subcommittee) in respect of the prevention of railway service disruptions to ensure the provision of safe, reliable and efficient railway services for the travelling public.

Background

Railway network in Hong Kong

2. Under the Government's transport policy, railways form the backbone of the public transport network. At present, railways account for about one-third of the public transport passenger trips.
3. The existing railway network in Hong Kong consists of two major railway systems, separately run by the MTR Corporation Limited (MTRCL) and the Kowloon-Canton Railway Corporation (KCRC).
4. The MTR system is a heavily utilized railway network consisting of five urban lines, viz. Kwun Tong Line (1979), Tsuen Wan Line (1982), Island Line (1985) with the Eastern Harbour Crossing connecting Lam Tin to Quarry Bay (1989), Tung Chung Line (1998) and Tseung Kwan O Line (2002). The Airport Express Line came into service in 1998, and provides transport access to the airport
5. The total route length of the MTR together with the Airport Express Line is 87.7 kilometres (km) and the number of stations is 50. The network carries about 2.3 million passenger trips on weekdays. In 2001, MTRCL was privatized and became a publicly listed company.

6. KCRC currently operates three domestic passenger railway lines. East Rail, which covers a distance of 34 km with a total of 13 stations, is a suburban mass transit service operating between Hung Hom and the boundary at Lo Wu. From 1973 to 1983, KCRC embarked on a modernization programme including the double tracking and electrification of the railway. West Rail, which opened in December 2003, is a 30.5 km-long mass transit service running between the North West New Territories and urban Kowloon with nine stations. The Light Rail system was established in 1988. It was formerly a stand-alone transit system to provide local passenger transport within the North West New Territories. With the opening of the new Tin Shui Wai extension on 7 December 2003, the Light Rail network has been extended to a route length of 36.15 km with 68 stops. It is now also a feeder service for West Rail. The average daily ridership of East Rail, West Rail and Light Rail was 537 000, 170 000 and 290 000 respectively.

Regulatory framework

7. Under section 9 of the Mass Transit Railway Ordinance (Cap. 556) (MTRO), MTRCL "shall maintain a proper and efficient service at all times during the franchise period in accordance with this Ordinance and the operating agreement". In accordance with the Operating Agreement signed between MTRCL and the Government, MTRCL is required to meet a number of performance requirements. The performance requirements and MTRCL's actual performance are reviewed by the Commissioner for Transport each year. Amongst them, there are three requirements which measure train service levels and performance of MTRCL:

- (a) train service delivery which measures actual train trips run by MTRCL against train trips scheduled;
- (b) train punctuality which is a measure of punctual train trips against actual train trips in a month; and
- (c) passenger journeys on time which is a measure of on-time passenger journeys against actual passenger journeys in a month.

8. In case MTRCL fail to meet the service thresholds, the Chief Executive in Council can, on a reference by the Secretary for the Environment, Transport and Works, give directions in accordance with the relevant provisions under MTRO for imposing financial penalties and, in serious cases, suspension or revocation of franchise.

9. Under section 5 of the Kowloon-Canton Railway Corporation Ordinance (Cap. 372), KCRC is required to operate its railway services in a safe and efficient manner. Under section 6, the Chief Executive in Council

may, if he considers the public interest so requires, give a direction in writing of a general or specific character to the Corporation subject to certain conditions. Section 6A also provides that the committees and subcommittees of the Legislative Council may request the Chairman and the Chief Executive Officer to attend its meetings and they shall comply. The Chairman and the Chief Executive Officer shall answer questions raised by the Members of the Legislative Council at the meetings.

10. As far as Government oversight is concerned, the Chief Inspecting Officer (Railways) of the Hong Kong Railway Inspectorate (HKRI) is responsible for overseeing railway safety concerning the operating railway lines while the Transport Department (TD) is responsible for the monitoring of the standard of railway services by reference to the specified performance requirements.

11. In case of any service disruption incidents, the railway corporation concerned is required to submit an initial report to the Government setting out the preliminary causes identified. Following detailed investigation, the findings as well as the improvement measures would be submitted to the Government for assessment. If warranted, the HKRI or TD would make further recommendations, and they are also responsible for monitoring implementation of the recommended remedial and improvement measures by the railway corporation concerned.

Concerns and suggestions made by members during previous discussions

12. In the past sessions, the Panel and its Subcommittee had held a number of meetings to review with the Administration and the railway corporation concerned investigation findings of major service disruption incidents. The discussions focused mainly on the causes of such disruptions, the lessons to be learnt as well as the improvement measures to be sought.

MTR Tseung Kwan O Line and other urban lines

13. In light of the series of service disruption incidents occurred during the initial operation of the MTR Tseung Kwan O Line in August 2002, the Subcommittee had held a series of meetings in September/October 2002 to review the performance of the new Tseung Kwan O Line and that of other operating lines of the MTR. Areas of major concern raised by members include:

- (a) Operation of the signalling system on the new line;
- (b) Pre-commissioning testing and trial operations;

- (c) Performance of new trains from Korea deployed to run on the Kwun Tong Line and other operating lines;
- (d) MTR maintenance and outsourcing;
- (e) Reliability and ageing of the MTR system;
- (f) Arrangements for handling of contingencies; and
- (g) Alerting procedure and information dissemination.

14. Concerned about the need to strengthen monitoring on service performance, some members called on the Administration to consider setting an additional performance indicator on train service disruptions under MTRCL's Operating Agreement so as to reflect the inconvenience service disruptions caused to the passengers. This could also facilitate the Chief Executive in Council's exercise of the relevant powers to impose financial penalty or other sanctions for the purpose of maintaining railway safety.

Airport Railway

15. On 23 July 1998, Tung Chung Line service was disrupted and the frequency of service on the Airport Express Line reduced due to an incident involving damage to a rail crossing at Tsing Yi Station. In reviewing the details and cause of the incident at the Panel meeting on 31 July 1998, members raised concern on the following areas:

- (a) staff training of train operators;
- (b) effectiveness and efficiency of the recovery action;
- (c) adequacy of system testing prior to the opening of the railway;
and
- (d) contingency strategies for handling emergencies.

16. The Subcommittee also met on 1 August and 29 September 2003 to review the Airport Railway service disruption incident on 27 July 2003 due to a signalling control problem. At the meetings, members pointed out that the repeated occurrence of major service disruptions on the Airport Railway as a result of problems in the power supply or signalling systems were signs of systemic failure. They asked the Administration and the Corporation to review the maintenance programme, in particular, the implications of outsourcing on the standard and quality of maintenance works. There was also a need to provide sufficient emergency transport services, and timely and precise information to the affected passengers.

West Rail

17. The Subcommittee held a meeting on 3 June 2004 to review the West Rail service disruptions occurred on 21 and 22 May 2004. Major concerns and suggestions made by members are as follows:

- (a) The frequent occurrence of service disruption incidents on West Rail since its opening in December 2003 had called into question its reliability;
- (b) In light of the repeated occurrence of signalling system failures on West Rail during its initial operation, KCRC should adopt more stringent standards for the testing and trial operation of subsequent new railway lines or extensions; and
- (c) KCRC should improve its procedures and systems for compliance with the established alert mechanism of issuing notification within eight minutes after any service disruptions so as to facilitate the making of alternative transport arrangements by the commuting public and the making of contingency arrangements by TD.

Light Rail

18. At the meeting held on 25 February 2003, the Subcommittee reviewed the investigation findings of the Light Rail derailment incident occurred on 18 December 2002. Concerns and suggestions were made by members in respect of the following:

- (a) Reliability and ageing of the Light Rail;
- (b) Standard of maintenance programme for the Light Rail; and
- (c) Need for engaging an independent expert to review the safety management system of KCRC, as that required for MTRCL.

Latest development

19. On 10 September 2004, northbound Light Rail services at Chung Fu Stop and Tin Fu Stop were affected after a light rail vehicle on route 751 went off the track at the junction of Tin Shui Road and Tin Wing Road as a result of a broken steel wheel tyre of the second car at about 6:37am. KCRC had completed a detailed investigation into the incident and submitted a report to the HKRI. KCRC had also commissioned a group of professionals and

academics led by former President of The Hong Kong Institution of Engineers Mr Edmund LEUNG to review the results of the investigation and to provide independent professional advice. Their views had already been incorporated into the new measures for track inspection and maintenance. The expert group considered that the additional measures were sufficient for early detection of cracks in wheel tyres, and to prevent recurrence of similar incident. The Corporation would review the measures in six months. A press release from KCRC is at **Annex A**.

20. In light of a number of incidents occurring on the MTR in recent weeks which had caused delays to passenger train service, MTRCL announced on 13 October 2004 its decision to appoint a leading international rail expert, Lloyd's Register Rail, to carry out a comprehensive review of the MTR's service performance, the condition of its service critical assets as well as asset management practices. The review is on-going and is expected to take about three months to complete. A press release from MTRCL is at **Annex B**.

Council Business Division 1
Legislative Council Secretariat
19 October 2004

9 October 2004

Investigation results of the Light Rail broken wheel incident

The Chairman of the Kowloon-Canton Railway Corporation (KCRC) Mr Michael Tien said the Corporation was very concerned about the Light Rail broken wheel incident which happened on 10 September 2004. The KCRC has completed a detailed investigation into the incident and has submitted a report to the Hong Kong Railway Inspectorate of the Environment, Transport and Works Bureau.

On the night of the incident, the KCRC inspected all Light Rail vehicle steel wheel tyres. The Corporation also carried out an ultrasonic flaw inspection of all wheel tyres within a week and no cracks were detected. The existing Light Rail fleet is safe.

Mr Tien reiterated, "The KCRC's first and foremost priority is to ensure passenger safety. Over the years, the Corporation has undertaken a range of measures to enhance the safety level of our railway systems. The probe into the incident covered a number of areas including the supplier's production process for the wheel tyre, the Corporation's procedure on receipt and collection of the products, the maintenance procedure, accountability, and the measures to prevent recurrence of similar incidents."

According to Mr Tien, the KCRC's contract with the supplier requires that the latter employ an independent and qualified quality inspector to ensure all wheel tyres meet the production standards. The supplier is required to cut open samples of the wheel tyres to test the material and mechanical properties, and conduct ultrasonic flaw inspections on all tyres to ensure they do not have any cracks. This testing and acceptance regime is in line with the British Standard 5892 which is in compliance with international practice. Upon completion of the above procedures, the supplier will issue certificates for all wheel tyres prior to the delivery.

In keeping with its usual practice, the Corporation, upon receipt of the wheel tyres, would conduct ultrasonic inspection on 5% of the batch to further assure the quality of the wheel tyres.

Mr Tien added that the incident was very rare as past record showed that cracks would not develop in new wheel tyres. Investigation conducted by an independent laboratory showed that the processing factory of the supplier had carried out welding repairs to the tyre to cover up defects which appeared in the machining process. After the Light Rail vehicle had been in operation for a certain period of time, cracks appeared inside the welded tyre and grew larger as the mileage built up. The tyre finally fractured when the crack had grown to an extent that it was no longer able to withstand the loading.

Mr Tien said rectification by welding was absolutely forbidden in the manufacturing process. The welding could not be detected by ultrasonic flaw inspection unless the tyre was cut up for examination. However, it was impossible to cut all tyres for examination in the collection process.

While the KCRC was conducting investigation into the incident, the supplier also carried out a detailed examination. It confirmed the investigation results of the Corporation and admitted that there were a total of six wheel tyres in the batch that were welded for rectification, including the one that was broken in the incident. Subsequently, the KCRC has also replaced the other five.

Mr Tien said, "The supplier has admitted responsibility for the violation of procedure. The KCRC will seek compensation for damages from it and will stop awarding it new contracts. I am highly concerned about the incident and will not tolerate recurrence."

Although the KCRC's existing testing and acceptance and maintenance procedures are in line with international standards, the Corporation will strengthen the procedures to ensure all Light Rail wheel tyres are always in good condition. Details are as follows:

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| Original procedures: | (1) Routine inspection once every 3 weeks |
| | (2) Ultrasonic inspection in the 24th month of operation |
| | (3) Ultrasonic inspection in the 40th month of operation |
| Additional measures: | (4) Ultrasonic inspection before installation of all new wheel tyres |
| | (5) Hammering test once every week |
| | (6) Ultrasonic inspection once every six weeks |

Mr Tien said that the KCRC would accelerate the existing wheel replacement programme in phases to

enhance public confidence in the Light Rail safety. All wheel tyres are expected to be replaced by the end of 2005.

KCRC has also commissioned a group of professionals and academics led by former President of The Hong Kong Institution of Engineers Mr Edmund Leung to review the results of the investigation and to provide independent professional advice. The new measures have already incorporated their views and they all consider the additional measures sufficient for early detection of cracks in wheel tyres, and to prevent recurrence of similar incident. The Corporation will review the measures in six months.

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Press Release

13 October 2004
PR 072/04**MTR Commissions Expert Independent Review of Rail Performance, Assets**

The MTR Corporation has appointed leading international rail expert, Lloyd's Register Rail, to carry out a comprehensive review of the MTR's service performance, the condition of its service critical assets as well as asset management practices.

The review is being carried out in light of a number of incidents occurring on the MTR in recent weeks which have caused some delays to passenger train service, including an incident this morning on the Tseung Kwan O Line.

MTR Chief Executive Officer Mr C K Chow said the MTR takes a very serious view of the recent incidents and is investigating each one to identify the root causes with a view to seek improvements. From the investigation findings available to date, they are independent incidents and there is no evidence to suggest any systematic problem.

Mr Chow apologised to passengers for the inconvenience caused and assured them that at no time was passenger safety ever compromised.

“Railroad is a large and technically complex system. The MTR is also designed to fail-safe principles, which means that any irregularity in a component will bring trains to a halt safely,” he added.

“Nonetheless, we do not find this series of incidents acceptable and we will adopt a factual, honest and proactive approach to improve our services,” said Mr Chow. “It is MTR's goal to operate a safe, reliable and efficient mass transit service and we are determined to provide the people of Hong Kong with one of the world's best metro railroad network. That is why we are appointing Lloyd's Register Rail to conduct an independent and comprehensive review of our recent service performance. If any weaknesses and shortcomings are identified, we are committed to correcting them and putting in place improvements.”

In this morning's service delay, an electrical fault on a Tseung Kwan O Line train caused a 19 minute delay during the peak period. The incident occurred at 8:16 am when a North Point-bound train was just pulling into Quarry Bay Station. The fault caused a “bang” and some sparking. The 1,500 passengers on board were arranged to alight the train at Quarry Bay Station and normal service resumed at 8:35 am when the defective train was removed from the running line.

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The Hong Kong Inspector of Railways has welcomed the commissioning of the independent review into the MTR's performance and asset management.

The review will start immediately and take about three months to complete. The government's Inspector of Railway will be involved throughout the process and the findings of the review will be made available to the government.

Headquartered in the United Kingdom, Lloyd's Register Rail is an independent verification agency which reviews safety, risk, system performance and asset management services for international railways with extensive experience in Europe and Asia. It is at the forefront of best-practice in railway asset management and has been involved in the development of verification processes to help rail operators confirm that they are managing their physical assets in an optimal way.

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