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Panel on Transport

Subcommittee on Matters Relating to Railways
Meeting on 2 January 2015

**Background brief on outcome of the independent expert review of the
MTR Corporation Limited's overhead line system as a result of the
insulator incidents in February 2014**

Purpose

This paper provides background information on the outcome of the independent expert review of the MTR Corporation Limited's ("MTRCL") overhead line system¹ as a result of the insulator incidents in February 2014. It also summarizes the major views and concerns expressed by Members during previous discussions on heavy rail and light rail incidents.

Background

East Rail Line incidents on 9 February and 18 February 2014

2. According to the information provided by the Administration², on 9 February 2014, the East Rail Line service was delayed after an insulator on the overhead line near University Station broke, triggering the overhead line's safety protection system to cut off power supply on the southbound track from University to Tai Wai Stations. To facilitate repairs, power supply was turned off on the southbound track between Fo Tan and Tai Po Market Stations. The service of the whole East Rail Line was maintained by implementing bi-directional working of trains on the northbound track at reduced frequencies. Free MTR shuttle bus service was operated as

¹ The overhead line system is designed with a safety protection system which will cut off the power supply whenever any irregularity such as excessive flow of electrical current or short circuit is detected.

² Source: The Administration's paper on "Follow-ups on the Service Suspension of Tseung Kwan O Line and Part of Kwun Tong Line on 16 December 2013, and Report on Subsequent Major Incidents on East Rail Line and Light Rail" in February 2014 [LC Paper No. CB(1)980/13-14(05)]

well between Sha Tin and Tai Po Market Stations to supplement the limited train service.

3. On 18 February 2014, a similar incident took place. At around 4:20 pm, a faulty overhead line insulator on the northbound track near Fanling Station affected power supply in the section. To facilitate urgent repairs, the northbound track between Tai Po Market and Lo Wu/Lok Ma Chau Stations was closed. Using bi-directional working on the southbound track, train service to all East Rail Line stations was maintained, although at a frequency lower than normal. To minimize inconvenience to passengers, free MTR shuttle buses were deployed as a supplementary service along this section. At the other end of the line, a five-minute train service was maintained between Tai Po Market and Hung Hom Stations. After MTRCL's engineering staff completed repair works, normal train service resumed at 7:21 pm.

Light Rail incident on 22 January 2014

4. At around 6:00 am on 22 January 2014, a faulty overhead line insulator near Tong Fong Tsuen Stop triggered the overhead line safety protection system to cut off power supply between Hang Mei Tsuen Stop and Tong Fong Tsuen Stop, as well as between Hang Mei Tsuen Stop and Hung Shui Kiu Stop. As a result, Light Rail service at eight stops between Hang Mei Tsuen Stop and Yuen Long Terminus was suspended. Five Light Rail routes including 610, 614, 615, 751 and 761P were diverted. Light Rail service within Tin Shui Wai area remained unaffected while services from Tin Shui Wai to Yuen Long and from Tin Shui Wai to Tuen Mun were disrupted. MTRCL deployed a total of 130 free shuttle bus services to carry more than 7 600 passengers in the affected section. After the completion of urgent repair works, the Light Rail service resumed normal at 8:32 am.

Causes of the incidents

5. MTRCL's investigations into the incidents concluded that the East Rail Line incidents on 9 February and 18 February 2014 and the Light Rail incident on 22 January 2014 involved faulty overhead line insulators. These faulty insulators came from the same supplier with those used on the East Rail Line overhead line system manufactured in the Mainland while those used on the Light Rail system manufactured in the United Kingdom. As at February 2014, arrangements were made to replace all insulators procured since 2009 and installed at the 65 critical locations on the East Rail Line. Also, MTRCL replaced all insulators that arrived in the same

batch as the faulty one causing the Light Rail incident on 22 January 2014, totalling 39 pieces.

Independent expert review of MTRCL's overhead line system

6. In view of the abovementioned incidents, MTRCL has engaged an independent overhead line expert from overseas to conduct a comprehensive review of MTRCL's overhead line system, covering key aspects like technical specifications, procurement, quality control, installation and repairs/maintenance. Besides, the Administration mentioned that the Electrical and Mechanical Services Department ("EMSD"), being the railway safety regulator, would monitor the progress of MTRCL's external expert review and enlist the assistance of an independent expert to conduct a review on the findings of MTRCL's expert review. In the light of the findings of EMSD's independent expert, the Administration would decide whether or not there would be a need to extend the scope of the review to cover other parts of the MTR network, and if so, the purpose would be to identify possible systemic defects or problems in other parts of the MTR network.

Major concerns raised by the Legislative Council Members

7. Members' major concerns on past heavy and light rail incidents in the Fourth and Fifth Legislative Council are summarized in the ensuing paragraphs.

Both heavy and light rail incidents

Penalty

8. The Administration completed the review of Fare Adjustment Mechanism ("FAM") of MTRCL in April 2013 and the new mechanism became effective from June 2013. Under the revised FAM, there is a service performance arrangement whereby a fine, ranging from \$1 million to \$15 million, will be imposed on MTRCL for serious disruptions of the heavy and light rail service, defined as disruptions of 31 minutes or above. The Administration agrees with the argument advanced by MTRCL that disruptions of a shorter duration should not be counted for this purpose in order not to put undue pressure on MTRCL's frontline staff who otherwise might be tempted or pressured into rushing their repair works to avoid the penalty, putting quality or safety at risk. It should also be noted that disruptions caused by factors outside MTRCL's control such as passengers' behaviour and bad weather, will not be counted either. The arrangement

is similar to some practices adopted overseas, such as in Singapore and Melbourne. Any fine imposed is credited to a fare concession account for fare concessions through the time-limited "10% Same Day Second Trip Discount" scheme.

9. Regarding the cumulative total amount of fines paid by MTRCL since the introduction of the aforesaid service performance arrangement in 2013, the Administration³ advised in May 2014 that MTRCL had been fined a total of \$40.5 million for service disruptions of 31 minutes or above in 2012 and 2013. The proceeds were returned to passengers through the "10% Same Day Second Trip Discount" scheme. The accumulated fine of \$13 million due to the incidents in 2012 had been returned to passengers from July 2013 onwards, and the \$27.5 million accumulated due to the incidents in 2013 would be returned to passengers starting from June 2014.

10. At the Subcommittee of the Matters Relating to Railways ("the Subcommittee") meeting on 4 December 2009, 28 June 2012 and 4 July 2014, members expressed concerns on railway service performance. They urged that the Administration should step up monitoring effort and impose a penalty system on MTRCL, such as issuing warning letters to or imposing fines on MTRCL in case of substandard performance. Also, the Subcommittee members suggested that MTRCL should introduce a mechanism for the offer of compensations to passengers affected in railway incidents, and the Administration should consider apportioning blame for railway incidents or introducing a penalizing mechanism. On 20 December 2013, the Subcommittee passed a motion, urging the Administration to consider expanding the scope of penalty imposed on MTRCL by including deductions of the remunerations and bonuses of its directors, as well as setting out the timetable for implementation of the said deductions.

11. At the Subcommittee on 24 May 2013, some members expressed views on the penalty to be imposed on the concerned Light Rail captain and MTRCL as a result of the derailment incident. Also, they suggested that the salary of MTRCL's senior management staff should be deducted for failing to ensure the smooth operation of railway service.

³ Source: The Administration's press release on "LCQ15: MTR railway services" issued on 14 May 2014

Heavy rail incidents

Incident handling

12. Under the existing arrangements, MTRCL is required by the Transport Department ("TD") to issue an Amber or Red Alert message to TD and other public transport operators in accordance with the seriousness of the railway incident. MTRCL is also required to notify TD within eight minutes of any service disruption incident that has occurred for eight minutes or is expected to last for eight minutes or more. Besides, according to Mass Transit Railway Regulations, MTRCL should report to EMSD any incident which has a direct bearing on the safe operation of the railway.

13. In case of a major incident, MTRCL will activate the Incident Control Post to deal with the incident together with Administration departments including the Fire Services Department, the Police and TD in accordance with established procedures of contingency plans so as to expedite safe evacuation of passengers. In case the power supply to MTRCL is affected, a backup system on board of the trains will be activated to supply electricity to major facilities on trains, including some of the lighting, ventilation and communication systems. Moreover, staff will be swiftly deployed to assist with passenger detrainment.

14. The Subcommittee discussed MTRCL's incident handling at the meetings on 16 December 2008, 4 December 2009, 4 November 2010, 18 March 2011, 28 June 2012, 20 December 2013, 28 February and 4 July 2014. Members were gravely concerned about the delayed notification to TD and the contingency measures taken during the incident. In particular, members expressed dissatisfaction with the confusion in the dissemination of information to passengers regarding the service suspension and train service available, emergency bus arrangements, lack of crowd control at the emergency bus pick-up points, and the ad hoc changes made to the locations of those points. At the meeting on 4 November 2010, members of the Subcommittee passed a motion to express their dissatisfaction with MTRCL railway operations and demand that MTRCL withheld the bonus payments to its Chief Executive Officer and other management staff concerned as a punishment.

Outsourcing of maintenance staff

15. When discussing railway incidents at the Subcommittee meetings on 16 December 2008, 4 December 2009, 18 March 2011, 20 December 2013 and 28 February 2014, members in general expressed concern that the

railway incidents might be caused by MTRCL's outsourcing of maintenance service, which might adversely affect the standard of rail maintenance. MTRCL explained that contractor staff was responsible for regular visual inspections; dye penetration tests, small scale preventive maintenance work and track cleaning; while tasks such as replacement of rails, ultrasonic testing and rail grinding were carried out by MTRCL's in-house staff. They also assured the Subcommittee members that outsourced and in-house maintenance works were subject to the same standards and requirements. At the Subcommittee meeting on 20 December 2013, members passed two motions urging MTRCL to review or cease the outsourcing arrangements so as to improve the maintenance quality and avoid recurrence of the similar incident.

16. MTRCL at the meeting on 28 February 2014 updated the Subcommittee on the information of their outsourcing maintenance staff. As at 2013, the number of in-house and outsourced maintenance staff deployed in the MTR network was 4 031 and 1 201 respectively. Among the outsourced maintenance staff, 57.9% were responsible for station maintenance; 29.1% for infrastructure maintenance; and 13% for rolling stock maintenance. The number of in-house and outsourced maintenance staff deployed in the MTR network is in **Appendix I**.

Ageing problems of railway systems

17. At the Subcommittee meetings on 5 July 2013 and 4 July 2014, members expressed concern about ageing problems of railway systems. Some members wondered whether the railway service disruptions reflected any ageing problems of the railway systems (say, the signalling system and the central monitoring and communications system) of the East Rail Line which had been operating for more than 30 years. Besides, two Members shared similar concerns and raised questions at the Council Meetings of 14 May and 21 May 2014. In response, the Administration mentioned that the East Rail Line signalling system would be upgraded in tandem with the Shatin to Central Link project, which was expected to be fully completed in 2020. According to MTRCL, with routine repair/maintenance and component replacement, the data network transmission had shown no sign of ageing.

Quality management

18. At the Subcommittee meeting on 28 February 2014, members noted that a broken fastening wire in an overhead line support bracket near Tiu Keng Leng Station had caused the train service suspension on 16 December 2013. MTRCL informed members that the breakage was due to improper

installation of the overhead line support bracket during construction. Also, MTRCL reported that the East Rail Line incidents on 9 February and 18 February 2014 as well as the Light Rail incident on 22 January 2014 had been caused by faulty overhead line insulators. In this connection, the Subcommittee urged MTRCL to enhance their quality management in railway operations.

Light rail incidents

Causes of Light Rail incident

19. At the Subcommittee on 24 May 2013, some members raised concerns about the causes of the derailment incident on 17 May 2013. They asked if there existed any MTRCL's internal rules like punctual arrival at each stop that had prompted speeding in the incident. In response, MTRCL explained that they did not impose any penalties for Light Rail captains not arriving punctually at each stop. After the derailment incident, they had implemented safety enhancement measures, such as increased random speed checks along Light Rail network. Moreover, the stipulated speed limit for all rail junctions in Light Rail network was 15 kilometres per hour to ensure traffic safety.

Safety measures

20. On 24 May 2013, the Subcommittee members generally expressed concerns over the effectiveness of the announced safety enhancement measures. Some members suggested that MTRCL should adopt an automatic braking system, similar to that of heavy rail, for Light Rail. A computer system should also be installed inside all Light Rail vehicles to monitor the travelling speed, particularly at points of rail junctions. The Administration and MTRCL noted members' views and explained that application of the automatic braking system to Light Rail was not feasible. Unlike heavy rail, Light Rail was operated on the open road shared with other road users, instead of operated in a closed environment used only by the railway. Also, at the Subcommittee meeting on 28 February 2014, a member showed concern about what follow-up actions had been taken after the Light Rail incident on 22 January 2014. In response, MTRCL explained that after the incident, all the insulators with quality issue were replaced and the mechanical strength of the newly ordered insulators was higher.

Latest developments

21. The Administration plans to brief members on the outcome of the independent expert review of MTRCL's overhead line system as a result of the insulator incidents in February 2014 at the Subcommittee meeting to be held on 2 January 2015.

Relevant papers

22. A list of relevant papers is in **Appendix II**.

Council Business Division 4
Legislative Council Secretariat
29 December 2014

Panel on Transport
Subcommittee on Matters Relating to Railways

**The number of in-house and outsourced maintenance staff
deployed in the MTR network
(2010 to 2013)**

	Number of in-house and outsourced maintenance staff in the MTR network			
	2010	2011	2012	2013
Number of in-house maintenance staff	3 828 (76.4%)	3 891 (75.4%)	3 960 (77.3%)	4 013 (77%)
Number of outsourced maintenance staff	1 182 (23.6%)	1 269 (24.6%)	1 166 (22.7%)	1 201 (23%)

Job nature	Number of outsourced maintenance staff			
	2010	2011	2012	2013
Station Maintenance	731 (61.8%)	781 (61.5%)	674 (57.8%)	695 (57.9%)
Rolling stock maintenance	143 (12.1%)	174 (13.7%)	160 (13.7%)	156 (13%)
Infrastructure maintenance	308 (26.1%)	314 (24.7%)	332 (28.5%)	350 (29.1%)
Total	1 182	1 269	1 166	1 201

Source: The Administration's paper on "Follow-ups on the Service Suspension of Tseung Kwan O Line and Part of Kwun Tong Line on 16 December 2013, and Report on Subsequent Major Incidents on East Rail Line and Light Rail" in February 2014 [LC Paper No. CB(1)980/13-14(05)]

Panel on Transport
Subcommittee on Matters Relating to Railways

**List of relevant papers on outcome of the independent expert review
of the MTR Corporation Limited's overhead line system as a result of
the insulator incidents in February 2014**

Date of meeting	Committee	Minutes/Paper	LC Paper No.
16.12.2008	Subcommittee on Matters Relating to Railways	Administration's paper on MTR Kwun Tong Line overhead power system failure on 8 December 2008 and recent railway incidents	LC Paper No. CB(1)398/08-09(01) http://www.legco.gov.hk/yr08-09/english/panels/tp/tp_rdp/papers/tp_rdp1216cb1-398-1-e.pdf
		The MTR Corporation Limited's paper on MTR Kwun Tong Line overhead power system failure on 8 December 2008 and recent railway incidents	LC Paper No. CB(1)398/08-09(02) http://www.legco.gov.hk/yr08-09/english/panels/tp/tp_rdp/papers/tp_rdp1216cb1-398-2-e.pdf
		Minutes	LC Paper No. CB(1)1786/08-09 http://www.legco.gov.hk/yr08-09/english/panels/tp/tp_rdp/minutes/rdp20081216.pdf
4.12.2009	Subcommittee on Matters Relating to Railways	Administration's paper on MTR Tseung Kwan O Line signalling equipment fault incident on 9 October 2009 and Tsuen Wan Line train fault incident on 10 October 2009	LC Paper No. CB(1)309/09-10(01) http://www.legco.gov.hk/yr09-10/english/panels/tp/tp_rdp/papers/tp_rdp1216cb1-309-1-e.pdf

Date of meeting	Committee	Minutes/Paper	LC Paper No.
		Administration's paper on MTR Tseung Kwan O Line signalling equipment fault incident on 21 August 2009	LC Paper No. CB(1)2607/08-09(01) http://www.legco.gov.hk/yr08-09/english/panels/tp/tp_rdp/papers/tp_rdp1-2607-1-e.pdf
		Minutes	LC Paper No. CB(1)1016/09-10 http://www.legco.gov.hk/yr09-10/english/panels/tp/tp_rdp/minutes/rdp20091204.pdf
4.11.2010	Subcommittee on Matters Relating to Railways	Administration's paper on MTR Tsuen Wan Line service disruption on 21 October 2010	LC Paper No. CB(1)277/10-11(02) http://www.legco.gov.hk/yr10-11/english/panels/tp/tp_rdp/papers/tp_rdp1104cb1-277-2-e.pdf
		Minutes	LC Paper No. CB(1)1068/10-11 http://www.legco.gov.hk/yr10-11/english/panels/tp/tp_rdp/minutes/rdp20101104.pdf

Date of meeting	Committee	Minutes/Paper	LC Paper No.
18.3.2011	Subcommittee on Matters Relating to Railways	Administration's paper on "MTR Tsuen Wan Line service disruption on 21 October 2010"	LC Paper No. CB(1)1585/10-11(03) http://www.legco.gov.hk/yr10-11/english/panels/tp/tp_rdp/papers/tp_rdp0318cb1-1585-3-e.pdf
		Administration's paper on "Recent railway incidents involving MTR rail cracks"	LC Paper No. CB(1)1585/10-11(04) http://www.legco.gov.hk/yr10-11/english/panels/tp/tp_rdp/papers/tp_rdp0318cb1-1585-4-e.pdf
		The MTR Corporation Limited's paper on "Follow-up actions on MTR Tsuen Wan Line service disruption on 21 October 2010"	LC Paper No. CB(1)1585/10-11(05) http://www.legco.gov.hk/yr10-11/english/panels/tp/tp_rdp/papers/tp_rdp0318cb1-1585-5-e.pdf
		The MTR Corporation Limited's paper on "Recent railway incidents involving MTR rail cracks"	LC Paper No. CB(1)1585/10-11(06) http://www.legco.gov.hk/yr10-11/english/panels/tp/tp_rdp/papers/tp_rdp0318cb1-1585-6-e.pdf

Date of meeting	Committee	Minutes/Paper	LC Paper No.
		Administration's paper on "Recent railway incidents involving MTR rail cracks"	LC Paper No. CB(1)1323/10-11(02) http://www.legco.gov.hk/yr10-11/english/panels/tp/tp_rdp/papers/tp_rdp0221cb1-1323-2-e.pdf
		The MTR Corporation Limited's paper on "Recent railway incidents involving MTR rail cracks"	LC Paper No. CB(1)1323/10-11(03) http://www.legco.gov.hk/yr10-11/english/panels/tp/tp_rdp/papers/tp_rdp0221cb1-1323-3-e.pdf
		Minutes	LC Paper No. CB(1)2913/10-11 http://www.legco.gov.hk/yr10-11/english/panels/tp/tp_rdp/minutes/rdp20110318.pdf
8.6.2011	Council meeting	Hon CHEUNG Hok-ming raised a question on MTRCL's rail services and fare adjustment mechanism	http://www.info.gov.hk/gia/general/201106/08/P201106080147.htm
8.6.2011	Council meeting	Hon WONG Sing-chi raised a question on rail service and incidents of MTRCL	http://www.info.gov.hk/gia/general/201106/08/P201106080126.htm

Date of meeting	Committee	Minutes/Paper	LC Paper No.
8.2.2012	Council meeting	Hon Mrs Sophie LEUNG LAU Yau-fun raised a question on contingency arrangements for railway incidents	http://www.info.gov.hk/gia/general/201202/08/P201202080250.htm
28.6.2012	Subcommittee on Matters Relating to Railways	The MTR Corporation Limited's paper entitled "MTR railway service performance"	LC Paper No. CB(1)2236/11-12(01) http://www.legco.gov.hk/yr11-12/english/panels/tp/tp_rdp/papers/tp_rdp0628cb1-2236-1-e.pdf
		The MTR Corporation Limited's paper entitled "Occurrences of non-stopping of MTR trains or door opening procedures not properly followed by MTR train captains"	LC Paper No. CB(1)1162/11-12(01) http://www.legco.gov.hk/yr11-12/english/panels/tp/tp_rdp/papers/tp_rdp0113cb1-1162-1-e.pdf
		Minutes	LC Paper No. CB(1)2626/11-12 http://www.legco.gov.hk/yr11-12/english/panels/tp/tp_rdp/minutes/rdp20120628.pdf
24.5.2013	Subcommittee on Matters Relating to Railways	The MTR Corporation Limited's paper on Light Rail incident on 17 May 2013	LC Paper No. CB(1)1072/12-13(07) http://www.legco.gov.hk/yr12-13/english/panels/tp/tp_rdp/papers/tp_rdp0524cb1-1072-7-e.pdf

Date of meeting	Committee	Minutes/Paper	LC Paper No.
		Minutes	LC Paper No. CB(1)1870/12-13 http://www.legco.gov.hk/yr12-13/english/panels/tp/tp_rdp/minutes/rdp20130524.pdf
5.7.2013	Subcommittee on Matters Relating to Railways	The MTR Corporation Limited's paper on service performance of the MTR Corporation Limited	LC Paper No. CB(1)1421/12-13(01) http://www.legco.gov.hk/yr12-13/english/panels/tp/tp_rdp/papers/tp_rdp0705cb1-1421-1-e.pdf
		The MTR Corporation Limited's supplementary information paper on service performance of the MTR Corporation Limited (follow-up paper)	LC Paper No. CB(1)1286/13-14(01) http://www.legco.gov.hk/yr12-13/english/panels/tp/tp_rdp/papers/tp_rdp0705cb1-1286-1-e.pdf
		Minutes	LC Paper No. CB(1)534/13-14 http://www.legco.gov.hk/yr12-13/english/panels/tp/tp_rdp/minutes/rdp20130705.pdf

Date of meeting	Committee	Minutes/Paper	LC Paper No.
20.12.2013	Subcommittee on Matters Relating to Railways	Administration's paper on Tseung Kwan O Line service disruption on 16 December 2013	LC Paper No. CB(1)595/13-14(01) http://www.legco.gov.hk/yr13-14/chinese/panels/tp/tp_rdp/papers/tp_rdp1220cb1-595-1-c.pdf
		Minutes	LC Paper No. CB(1)1011/13-14 http://www.legco.gov.hk/yr13-14/english/panels/tp/tp_rdp/minutes/rdp20131220.pdf
28.2.2014	Subcommittee on Matters Relating to Railways	Administration's paper on follow-ups on the service suspension of Tseung Kwan O Line and part of Kwun Tong Line on 16 December 2013, and report on subsequent major incidents on East Rail Line and Light Rail	LC Paper No. CB(1)980/13-14(05) http://www.legco.gov.hk/yr13-14/english/panels/tp/tp_rdp/papers/tp_rdp0228cb1-980-5-e.pdf
		Minutes	LC Paper No. CB(1)1928/13-14 http://www.legco.gov.hk/yr13-14/english/panels/tp/tp_rdp/minutes/rdp20140228.pdf
19.3.2014	Council meeting	Dr Hon LAU Wong-fat raised a question on MTR services	http://www.info.gov.hk/gia/general/201403/19/P201403190438.htm

Date of meeting	Committee	Minutes/Paper	LC Paper No.
3.4.2014	Finance Committee	Administration's replies to Members' initial written questions of the Estimates of Expenditure 2014-15 (Question Serial Nos. 0647, 1624, 0978, 1147, 1163, 4185, 4186, 5102, 6064)	http://www.legco.gov.hk/yr13-14/english/fc/fc/w_q/t_hb-t-e.pdf
9.4.2014	Council meeting	Hon Albert HO Chun-yan raised a question on railway safety	http://www.info.gov.hk/gia/general/201404/09/P201404090399.htm
14.5.2014	Council meeting	Dr Hon LAM Tai-fai raised a question on MTR railway services	http://www.info.gov.hk/gia/general/201405/14/P201405140494.htm
21.5.2014	Council meeting	Hon CHAN Chi-chuen raised a question on MTR services	http://www.info.gov.hk/gia/general/201405/21/P201405210371.htm
28.5.2014	Council meeting	Hon Charles Peter MOK raised a question on MTR East Rail Line incidents	http://www.info.gov.hk/gia/general/201405/28/P201405270868.htm