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Legislative Council

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Panel on Transport

Subcommittee on Matters Relating to Railways
Meeting on 3 January 2014

Background brief on
the rail inspection regime of the MTR Corporation Limited

Purpose

This paper provides background information on the rail inspection regime of the MTR Corporation Limited ("MTRCL"). It also summarizes the major views and concerns expressed by Members during previous discussions on the subject.

Background

MTRCL's rail inspection regime

2. According to MTRCL¹, there are established stringent procedures for the inspection and maintenance of rails. The aim is to identify irregularities and rail cracks² or breakages³ in their early stages of development so that preventative maintenance or replacement of the rail can be conducted in a timely manner. This serves to minimize the chance of cracks or breakages occurring in passenger service hours and causing delays as a result of temporary repairs having to be carried out. In accordance with the Administration in February 2011⁴, MTRCL's track preventive maintenance inspection frequency is determined by the utilization and loading of the track. Visual inspections are conducted once every 72 hours to 2 times per week for the MTR heavy rail lines and

¹ Source: MTRCL's paper on "Recent railway incidents involving MTR rail cracks" in February 2011 [LC Paper No. CB(1)1323/10-11(03)]

² Cracks refer to the situation where a crack has appeared on a rail surface.

³ Breakages refer to the gap formed as a result of the breakage through the whole cross-section of a rail.

⁴ Source: The Administration's paper on "Recent railway incidents involving MTR rail cracks" in February 2011 [LC Paper No. CB(1)1323/10-11(02)]

Light Rail. Ultrasonic testing vehicle ("UTV") inspections are conducted once every 2 to 6 weeks for heavy rail and once every 3 months for Light Rail. MTRCL also employs test equipment such as portable ultrasonic crack detector for the track patrol team as well as dye penetration checks. The frequency of track inspection as at 2011 by UTV and visual inspection by patrolling is attached in **Appendix I**.

3. According to MTRCL, when cracks or breakages are found during operation hours, careful inspection and assessment will be conducted on site to confirm that safe train operations will not be affected. Temporary repairs will be carried out to reinforce the concerned rail section with steel plates so that trains can resume automatic operations. Whereas, replacement of the concerned rail section will be arranged after service.

Rail crack or breakage incidents

4. From 1 January 2008 to 10 February 2011, there were a total of 14 MTR rail crack or breakage incidents, details of which are summarized in **Appendix II**. In view of the incidents, MTRCL engaged the Institute of Railway Technology ("IRT") at Monash University, Australia in March 2011 to conduct a study. The scope of the study included assessment and comparison of MTRCL standards with international standards and practices adopted by other railway operators in respect of MTRCL's rail procurement; quality control, inspection and maintenance of rails relevant to rail breakages; non-destructive testing technology; and management measures taken upon detection of rail breakages. In addition, the Electrical and Mechanical Services Department ("EMSD") commissioned the Office of Rail Regulation of the United Kingdom⁵ to review the consultancy report prepared by IRT to ensure that the methodology adopted and scope covered were appropriate.

Major concerns raised by the Subcommittee on Matters Relating to Railways ("the Subcommittee")

5. Members have discussed the rail inspection regime of MTRCL at the Subcommittee meetings on 2 May 2008, 21 February, 18 March and 4 November 2011. Members' major concerns are summarized in the ensuing paragraphs.

⁵ The Office of Rail Regulation is a railway safety regulator of the United Kingdom.

Enhancement measures

6. The Subcommittee at the meetings on 21 February and 18 March 2011 expressed grave concern about the rail crack or breakage incidents and urged MTRCL to tighten up procedures for rail procurement and maintenance. The Subcommittee also requested the Administration to strengthen monitoring of MTRCL in their rail maintenance works.

7. At the meeting on 4 November 2011, the Subcommittee members noted that IRT review, completed in July 2011, had concluded that the standards adopted by MTRCL in their rail procurement, quality control, inspection and maintenance regime were generally adequate after having made reference to appropriate international standards. Maintenance techniques were equivalent to those used elsewhere and inspection was performed at similar or higher frequencies. MTRCL adopted the recommendations proposed by IRT to further enhance their rail management regime. EMSD would be responsible for monitoring and following up MTRCL's improvement measures and their progress to ensure their implementation.

Outsourcing of maintenance staff

8. At the 3 Subcommittee meetings held in 2011, members in general expressed concern that the rail crack or breakage incidents might be caused by MTRCL's outsourcing of maintenance service, which might adversely affect the standard of rail maintenance. During the aforesaid meetings, MTRCL explained that contractor staff was responsible for regular visual inspections; dye penetration tests and 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.

9. In May 2013, MTRCL updated the Subcommittee on the information of their outsourcing maintenance staff. As at 2012, 1 166 outsourcing maintenance staff in total were engaged in major maintenance contracts and took up about 20% of MTRCL's total maintenance and infrastructure manpower. Among the 322 outsourcing maintenance staff for civil maintenance, 4 were responsible for conducting visual and other non-destructive means for rail inspection. Indeed, rail inspection works were mainly conducted by around 190 staff directly employed by MTRCL. The numbers of outsourcing maintenance staff engaged in MTRCL's major maintenance contracts from 2010 to 2012 are attached in **Appendix III**.

Responsibility of rail manufacturers

10. At the meeting on 2 May 2008, the Subcommittee suggested that MTRCL should seek compensation from the concerned rail manufacturers for replacing 13 rail crossings related to the rail crack or breakage incidents on the East Rail Line. On 21 February 2011, the Subcommittee members asked MTRCL to consider issuing warning letters to the rail manufacturers concerned or replacing them if the cases involved weak weld joint which was related to the manufacturing process; or if the cases involved impurities inside the rail or design deficiency. The Subcommittee at the meeting on 18 March 2011 suggested that MTRCL might take legal actions against the concerned rail manufacturers and expressed concern over the cost incurred to MTRCL for the replacement of defective weld joints manufactured by Edgar Allen.

11. In May 2011, MTRCL provided written response and updated the Subcommittee on the costs incurred and rail manufacturers concerned in respect of incidents involving rail cracks or breakages. Among the 14 rail crack or breakage incidents from 1 January 2008 to 10 February 2011, a total of 8 cases involved Balfour Beatty and Tata Group, and the costs of materials and installation for the rail replacement were about \$480,000. For the rail incidents on 25 January and 13 February 2010, it was found that 2 defective rail crossings were manufactured by Edgar Allen and the replacement of a total of 6 rail crossings incurred costs of about \$600,000 for materials and another \$600,000 for installation. For the abovementioned cases, MTRCL did not pursue compensation or refund from the rail manufacturers due to various reasons, such as expiry of contract warranty period, and irrelevance of the rail cracks or breakages to the manufacturing process.

Legislative Council question

12. Hon Wong Kwok-hing expressed concern over rail crack or breakage incidents and raised a Council question on 9 March 2011. The question and the Administration's reply are attached in **Appendix IV** for members' reference.

Recent developments

13. The Administration plans to brief the Subcommittee on rail inspection regime of MTRCL at the meeting to be held on 3 January 2014.

Relevant papers

14. A list of relevant papers is in **Appendix V**.

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Frequency of track inspection as at 2011

Line	Track Inspection Frequency	
	Ultrasonic Testing Vehicle Inspection	Visual Inspection by Patrolling
Kwun Tong Line	once every 2 weeks	once every 72 hours
Tsuen Wan Line	once every 2 weeks	once every 72 hours
Island Line	once every 4 weeks	once every 72 hours
Tseung Kwan O Line	once every 4 weeks	once every 72 hours
Tung Chung Line / Airport Express Line / Disneyland Resort Line	once every 4 weeks	once every 72 hours <i>(Disney Resort Line: once every 48 hours)</i>
East Rail Line	once every 3 weeks <i>(Lok Ma Chau: once every 6 weeks)</i>	once every 72 hours <i>(Lok Ma Chau: 2 times per week)</i>
Ma On Shan Line	once every 6 weeks	2 times per week
West Rail Line	once every 6 weeks	2 times per week
Light Rail	once every 3 months	2 times per week

Source: The Administration's paper on "Recent railway incidents involving MTR rail cracks" in February 2011 [LC Paper No. CB(1)1323/10-11(02)]

Appendix II

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Case summary of reported rail crack / breakage occurrences (1 January 2008 to 10 February 2011)

Item	Date	Line	Location	Width of Gap	Rail Manufacturer	Cause / Action Taken
1	19-Jan-2008	East Rail Line	North of Mong Kok East Station	5 mm gap <i>(rail crossing weld)</i>	Balfour Beatty	The cause was attributable to manufacturing flaws. All Balfour Beatty crossings were subsequently removed from system by July 2008.
2	19-Mar-2008	East Rail Line	South of Fanling Station	9 mm gap <i>(plain rail weld)</i>	Panzhihua	Un-molten welding material was found in the joint. This lot of welding material was disposed of.
3	12-Jan-2009	Light Rail	Tuen Mun Ferry Pier Terminus	2 mm gap <i>(switch rail weld)</i>	Kihn	The cause was due to excessive impurities introduced in the welding process by the manufacturer. The incident rail was replaced.
4	18-Nov-2009	East Rail Line	North of Tai Wai Station	9mm gap <i>(stock rail)</i>	Balfour Beatty / Tata Group	Impurities found and the incident rail was replaced.
5	24-Nov-2009	East Rail Line	Hung Hom Freight Terminal (Non-passenger Area)	Insignificant gap <i>(plain rail)</i>	Chinese Mainland	The cause was due to corrosion at the rail foot section. The incident rail was replaced.
6	25-Jan-2010	East Rail Line	North of Sheung Shui Station	5 mm gap <i>(rail crossing weld)</i>	Edgar Allen	This was a manufacturing defect. All Edgar Allen crossings of the same

Item	Date	Line	Location	Width of Gap	Rail Manufacturer	Cause / Action Taken
						batch were subsequently removed from system by April 2010.
7	13-Feb-2010	East Rail Line	North of Sheung Shui Station	6 mm gap (<i>rail crossing weld</i>)	Edgar Allen	Same batch of Edgar Allen crossing as in the 25 Jan 2010 incident. All Edgar Allen crossings of the same batch were subsequently removed from system by April 2010.
8	10-Mar-2010	Kwun Tong Line	Between Kwun Tong Station and Lam Tin Station	2 mm gap (<i>plain rail weld</i>)	Tata Group	Sub-standard workmanship on site leading to moisture contamination during joint formation. Improvement measure by temperature crayon to ensure sufficient pre-heat temperature of welding crucible was introduced in May 2010. This section was re-welded.
9	15-Jul-2010	Tsuen Wan Line	Between Kwai Fong Station and Kwai Hing Station	insignificant gap (<i>plain rail weld</i>)	Tata Group	Test result revealed that brittle material (evidence of rapid cooling) was formed during the welding process. This section was re-welded.
10	24-Jul-2010	Kwun Tong Line	Between Kowloon Bay and Ngau Tau Kok Station	Insignificant gap (<i>switch rail</i>)	Balfour Beatty / Tata Group	Test result revealed that this was a fatigue failure due to stress concentration caused by design deficiency. The incident rail was replaced.

Item	Date	Line	Location	Width of Gap	Rail Manufacturer	Cause / Action Taken
11	1-Nov-2010	Tsuen Wan Line	Between Central Station and Admiralty Station	insignificant gap (<i>plain rail weld</i>)	Tata Group	Test result revealed that brittle material was formed during the welding process. This section was re-welded.
12	13-Jan-2011	East Rail Line	North of Fo Tan Station	3 mm gap (<i>plain rail</i>)	Bao Gong	The incident rail section was sent for laboratory analysis to ascertain the exact cause(s) of failure. The incident rail was replaced.
13	19-Jan-2011	Airport Express Line / Tung Chung Line	Near Sunny Bay Station	5 mm gap (<i>plain rail</i>)	Tata Group	The incident rail section was sent for laboratory analysis to ascertain the exact cause(s) of failure. The incident rail was replaced.
14	10-Feb-2011	Tsuen Wan Line	Near Admiralty Station	1 mm gap (<i>plain rail weld</i>)	Tata Group	The incident rail section was sent for laboratory analysis to ascertain the exact cause(s) of failure. The incident rail was replaced.

Source: The Administration's paper on "Recent railway incidents involving MTR rail cracks" in February 2011 [LC Paper No. CB(1)1323/10-11(02)]

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**Numbers of outsourcing maintenance staff engaged in
MTRCL's major maintenance contracts (2010 to 2012)**

Job Nature	Numbers of outsourcing maintenance staff		
	2010	2011	2012
Station Maintenance	731	781	674
Rolling Stock Maintenance	143	174	160
Civil Maintenance	308	314	332
Total	1 182	1 269	1 166

Source: MTRCL's supplementary information paper on their outsourcing maintenance staff and train service delays in May 2013 [LC Paper No. CB(1)978/12-13(01)]

Press Releases

LCQ12: Railway safety

Following is a question by the Hon Wong Kwok-hing and a written reply by the Secretary for Transport and Housing, Ms Eva Cheng, at the Legislative Council meeting today (March 9):

Question:

It has been reported recently that among the 12 MTR rail breakage incidents since 2008, eight of them had not been disclosed to the public. On January 19 and February 10 this year, cracks were identified respectively at a section of the track at Sunny Bay Station and at a section of the track between Admiralty Station and Tsim Sha Tsui Station. Some experts have commented that these incidents were unusual and urged the MTR Corporation Limited ("MTRCL") to thoroughly inspect the quality of rail tracks. In this connection, will the Government inform this Council:

(a) given that serious incidents are involved when a "Red Alert" is issued by MTRCL under the current notification mechanism, how the authorities and MTRCL define serious incidents, and of the criteria adopted;

(b) since MTRCL has used the words "裂紋" and "裂縫" as the Chinese renditions of "cracks", how the authorities and MTRCL define these words;

(c) whether it knows the total length of all rail tracks (including the Light Rail) in Hong Kong in the past decade and the changes in the number of staff members responsible for railway maintenance; whether MTRCL will increase the number of maintenance staff to cope with future demand; if it will, of the details; of the ratio between the total length of rail tracks (including the Light Rail) and the number of maintenance staff;

(d) whether it knows the MTR extensions in respect of which the maintenance work has been outsourced at present; of the number of contracts involved, the relevant contract sums and the number of staff of outsourced services involved;

(e) whether it knows the criteria adopted by MTRCL in determining the use of outsourced services; whether MTRCL can terminate the existing outsourced services gradually and take over the management and maintenance work (such as telecommunications equipment, equipment for power supply switching and infrastructure equipment, etc.); if it cannot, of the reasons for that; and

(f) of the number of civil servants who are dedicated to monitoring the operation and maintenance of MTR at present, and whether the authorities will expand the existing scale and organisational structure in this respect in order to cope with increasingly heavy workload relating to railway matters; if the authorities will, of the details; if not, the reasons for that?

Reply:

President,

For the various parts of the question, our reply is set out below -

(a) At present, the MTR Corporation Limited (MTRCL) will notify the public of serious railway incidents. Regarding incidents causing serious service disruptions or emergencies (including those requiring the issuance of "Red Alert") whereby the Transport Department must be notified, MTRCL will also notify the public if such notification will be of assistance to passengers likely to be affected in planning their journeys. In addition, MTRCL will notify the public should there be incidents involving safety, such as those related to train operation and are of public concern and those which have resulted in or could potentially result in injuries or deaths.

(b) Generally speaking, "breakage" (i.e. "裂縫") refers to the gap formed as a result of the breakage through the whole cross-section of a rail while "crack" (i.e. "裂紋") refers to the situation where a crack has appeared on a rail surface. According to MTRCL, in respect of the usage of "cracks"/"breakages" (i.e. "裂紋"/"裂縫" in Chinese), the corporation has been using the English term "crack" to describe the phenomenon, and it used the Chinese term "裂紋" but not "裂縫" in describing the recent rail breakage incidents in public. MTRCL has since noted comments that the use of the term "裂紋" could have caused misunderstanding among the public. In the interest of clearer communication, MTRCL has now adopted the term "裂縫" to describe rail breakages from top to bottom and the term "裂紋" to describe cracks detected without breakage in the rail.

MTRCL has clarified its use of the terms and has apologised for any misunderstanding caused. The Government has asked MTRCL to state clearly when making announcements about similar incidents in future whether they involve "cracks" (i.e. "裂紋") or "breakages" (i.e. "裂縫").

(c) According to MTRCL, railway maintenance involves many aspects including rolling stock, tracks, overhead lines, signalling systems, station facilities etc. Generally speaking, with an extension of a railway line in length, there will be a need to increase the number of maintenance staff. Nevertheless, the actual increase in the number of staff depends on various factors including the nature of the maintenance work and operational needs etc. For example, after a railway line is extended, as the same signalling system is used, the increase in the number of maintenance staff for signalling system will be relatively small. Similarly, after a railway line is extended, train service can be enhanced through adjusting the train service timetable and there is no immediate need to increase the train fleet size. Under such circumstances, the number of rolling stock maintenance staff may not need to be increased.

In addition, with the advancement of technology, the reliability of railway operations has been enhanced, leading to reduction of railway maintenance procedures which require manual

operation. For example, in the past, the inspection of train wheels used to be conducted manually. Today, it is conducted through laser monitoring technology, which has enhanced the effectiveness and efficiency of inspections. As a result, staff members are given more training opportunities to upgrade their skills.

Over the past decade, the rail network in Hong Kong has seen continuous expansion. The total rail length of the running lines (note 1) has increased from about 650 km (including Light Rail) in 2001 to about 980 km (including Light Rail) today. With the commissioning of new railway lines and extensions, MTRCL has increased the number of railway maintenance staff based on operational needs, i.e. from 3,426 in 2001 to 3,828 in 2010. In accordance with development of new railway lines, MTRCL will continue to increase the number of maintenance staff based on operational needs. However, as stated above, the actual increase in number of maintenance staff is not determined by the extent of the extension of railway lines.

(d) The outsourced maintenance work of MTRCL's train operations includes:

- passenger information display equipment;
- closed circuit television equipment;
- station lifts and escalators;
- platform screen doors and automatic platform gates;
- fire services equipment;
- telecommunications equipment;
- gondola and gantries;
- building services equipment;
- waste water treatment, plumbing and drainage;
- backup power supply equipment;
- general station lighting;
- baggage handling equipment for the Airport Express;
- centralised control equipment for power supply switching for the West Rail Line and East Rail Line;
- infrastructure equipment (tracks (note 2), signalling, power distribution and overhead line) of the Tseung Kwan O Line and trains which were originally operated on the Tseung Kwan O Line and deployed to the Kwun Tong Line since mid-2010; and
- automatic fare collection equipment of the West Rail Line, Tseung Kwan O Line, Tung Chung Line, Disneyland Resort Line, Airport Express and Light Rail.

The contracts for the outsourced maintenance works above amounted to about HK\$380 million in 2010. A total of 65 contracts are involved. According to MTRCL, the requirements and standards of the service are stipulated in the outsourcing contracts. MTR engineers are responsible for monitoring and supervising work quality to ensure they comply with the standards. In addition, contractor staff working on MTR trains and operations equipment are required to possess the proper qualifications. They must be certified to ensure that they are equipped with the skills and competencies similar to MTR staff doing the same jobs, and these requirements are specified in the contracts.

MTRCL follows up the training of contractor staff through working meetings. While the contractors are responsible for training their staff on work-related skills and safety, MTRCL also helps brief contractor staff on MTRCL's operation and safety

procedures.

(e) According to MTRCL, outsourcing of maintenance works is common among railway operations internationally. More efficient and effective services can be provided to passengers through making good use of the contractors' specialised skills. For some of the maintenance work such as that for fire services equipment, MTRCL must employ registered maintenance contractors in accordance with the statutory requirements.

In making any decision on outsourcing, MTRCL will take into account operational safety, reliability, service quality and implications to staff. All outsourced work must comply with MTRCL's requirements and service level to ensure service quality.

MTRCL has put in place a detailed monitoring system to ensure its maintenance work, including the outsourced maintenance work, meet the standards it adopts.

In fact, MTRCL applies the same standards and requirements to maintenance tasks carried out both by MTR in-house staff and staff of contractors. These standards are in line with good international practices and MTR engineers are responsible for monitoring and supervising work quality to ensure their compliance with standards. Outsourced maintenance work is also subject to the same regular checks as MTR in-house maintenance work. There are daily/weekly and monthly performance reviews, annual asset surveys and three-yearly asset condition assessments. On top of the above, outsourced maintenance work is subject to additional scheduled and random inspections and checks by dedicated MTR staff at supervisory level.

MTRCL conducts reviews of the performance and benefits of its outsourced work from time to time. Currently, it has no plan to terminate any outsourced work.

(f) The Government attaches a great deal of importance to railway safety. The Transport and Housing Bureau is responsible for overseeing the overall policy on monitoring railway safety and regulating railway services.

Electrical and Mechanical Services Department (EMSD) is responsible for monitoring the safe operation of railways. Its functions include investigating into railway incidents, ensuring the adoption of safety practices by the railway corporation, assessing and approving new railways and major modifications, assessing and following up the railway corporation's improvement measures, and ensuring that MTRCL fully complies with all safety requirements in the design, construction, operation and maintenance of the railway systems.

At present, there are nine professional grade staff in EMSD engaged in the regulatory functions of railway safety, including one Government Electrical and Mechanical Engineer, four Senior Engineers and four Engineers/Assistant Engineers. These professional staff are from different engineering disciplines including civil engineering, electrical and mechanical engineering and electronic engineering.

In addition to the above nine professional staff, the

Director of Electrical and Mechanical Services and the Deputy Director of Electrical and Mechanical Services (Regulatory Services) are also appointed as Inspectors for monitoring railway safety under the Mass Transit Railway Ordinance. If necessary, EMSD will also engage experts to offer assistance.

EMSD will create two posts of professional staff with effect from April 1, 2011 to undertake the influx of workload on assessing and approving new railway projects.

We would continue to monitor the work effectiveness in respect of regulation of railway safety and review the human resources when appropriate.

Note 1: There are two tracks on a railway line. Each track has two rails.

Note 2: Contractor staff are responsible for regular visual inspections; dye penetration tests and small scale preventive maintenance work, and track cleaning. Tasks such as replacement of rails, ultrasonic testing and rail grinding etc are carried out by MTR in-house staff.

Ends/Wednesday, March 9, 2011
Issued at HKT 16:15

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**List of relevant papers on the rail inspection regime of
the MTR Corporation Limited**

Date of meeting	Committee	Minutes/Paper	LC Paper No.
2.5.2008	Subcommittee on Matters Relating to Railways	Administration's paper on East Rail rail crack incidents (Chinese version only)	LC Paper No. CB(1)695/07-08(02) http://www.legco.gov.hk/yr07-08/chinese/panels/tp/tp_rdp/papers/tp_rdpceb1-695-2-c.pdf
		Administration's letter on East Rail rail crack incidents	LC Paper No. CB(1)817/07-08(01) http://www.legco.gov.hk/yr07-08/english/panels/tp/tp_rdp/papers/tp_rdpceb1-817-1-e.pdf
		The MTR Corporation Limited's paper on East Rail rail crack incidents	LC Paper No. CB(1)817/07-08(02) http://www.legco.gov.hk/yr07-08/english/panels/tp/tp_rdp/papers/tp_rdpceb1-817-2-e.pdf
		Minutes (Agenda Item V)	LC Paper No. CB(1)1747/07-08 http://www.legco.gov.hk/yr07-08/english/panels/tp/tp_rdp/minutes/rd080502.pdf

Date of meeting	Committee	Minutes/Paper	LC Paper No.
21.2.2011	Subcommittee on Matters Relating to Railways	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 (Agenda Item I)	LC Paper No. CB(1)3029 /10-11 http://www.legco.gov.hk/yr10-11/english/panels/tp/tp_rdp/minutes/rdp20110221.pdf
18.3.2011	Subcommittee on Matters Relating to Railways	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 "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_rdp031

Date of meeting	Committee	Minutes/Paper	LC Paper No.
			8cb1-1585-6-e.pdf
		Minutes (Agenda Item IV)	LC Paper No. CB(1)2913/10-11 http://www.legco.gov.hk/yr10-11/english/panels/tp/tp_rdp/minutes/rdp20110318.pdf
4.11.2011	Subcommittee on Matters Relating to Railways	Administration's paper on "Government's Assessment on the Consultancy Report on Rail Commissioned by the MTR Corporation Limited"	LC Paper No. CB(1)2973/10-11(02) http://www.legco.gov.hk/yr10-11/english/panels/tp/tp_rdp/papers/tp_rdpcb1-2973-2-e.pdf
		The MTR Corporation Limited's paper on "Review of MTR's Rail Procurement and Maintenance Regime"	LC Paper No. CB(1)2973/10-11(01) http://www.legco.gov.hk/yr10-11/english/panels/tp/tp_rdp/papers/tp_rdpcb1-2973-1-e.pdf
		Supplementary information provided by the Administration / the MTR Corporation Limited in response to Subcommittee members' requests raised at previous meetings held to discuss railway incidents	LC Paper No. CB(1)2922/10-11(02) http://www.legco.gov.hk/yr10-11/english/panels/tp/tp_rdp/papers/tp_rdp0221cb1-2922-2-e.pdf

Date of meeting	Committee	Minutes/Paper	LC Paper No.
		Supplementary Information provided by the MTR Corporation Limited	LC Paper No. CB(1)978/12-13(01) http://www.legco.gov.hk/yr12-13/english/panels/tp/tp_rdp/papers/tp_rdpcb1-978-1-e.pdf
		Minutes (Agenda IV)	LC Paper No. CB(1)783/11-12 http://www.legco.gov.hk/yr11-12/english/panels/tp/tp_rdp/minutes/rdp20111104.pdf

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