

**Legislative Council Panel on Transport**  
**Subcommittee on matters relating to railways**

**Government's assessment on the independent review by  
Lloyd's Register Rail on the MTR system**

**Purpose**

This paper sets out the Government's assessment on the independent review report on the performance and asset management of the Mass Transit Railways (MTR) system carried out by the Lloyd's Register Rail ("Lloyd's").

2. The Government's assessment focuses on the following areas -
  - (a) whether the review is sufficiently comprehensive and adequate to give a meaningful assessment of the performance and asset management of MTR;
  - (b) whether the approach and methodology of the review is appropriate and robust;
  - (c) analysis of MTR performance over the years including the spate of incidents in the latter half of 2004;
  - (d) assessment on whether MTRCL's maintenance and outsourcing arrangements have posed any adverse impact on the service performance and whether there is an ageing problem with the railway system; and
  - (e) whether the recommendations of the review are effective in enhancing the service of MTRCL.
3. In examining the report, the Government has exchanged views with local experts on the findings.

## **Background**

4. Arising from the spate of incidents occurring in the MTR network in the latter half of 2004 which has caused considerable public concerns over the safety and reliability of the railways, MTRCL commissioned Lloyd's in mid-October 2004 to carry out an independent review on the MTR system. The review was completed in end-January 2005 and the final report of the review was submitted to the Government on 4 February 2005. Copies of the Executive Summary and full report have been sent to Members on the same day.

## **Scope and Approach of the Report**

5. Lloyd's structured its study by carrying out an overall review of MTRCL's asset management across the whole system at the high level. It also reviewed the performance of MTR by examining the incident data over the last four years. In order to have a better understanding of how MTR performed, benchmarking exercises with other similar metros in overseas countries were also conducted. Overall speaking, the Government considers that the review has comprehensively looked into areas of crucial importance to MTR operation.

## **Analysis of MTR's performance**

### *International benchmarking with other metro railways in the world*

6. Lloyd's benchmarked the performance of MTR with other 9 similar metros in other cities. These metros, including MTR, are voluntary members of the Community of Metros (CoMET)<sup>1</sup> – a benchmarking consortium of 10 of the world's largest urban railways all with a daily patronage over 2 million. CoMET is managed by Railway Technology Strategy Centre (RTSC) - an independent research centre at Imperial College, London. This benchmarking exercise is considered quite representative as the metros benchmarked are all very busy ones in cities like Tokyo and New York. Moreover, the study is based on well defined performance indicators all adjusted independently by RTSC so

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<sup>1</sup> The CoMET comprises metros in Berlin, Hong Kong, London, Madrid, Mexico City, Moscow, New York, Paris, Sao Paulo, and Tokyo.

that they are comparable since 1995.

7. In the review by Lloyd's, MTR was compared with other members of CoMET across six elements, namely safety, reliability, service quality, asset utilization, cost and labour efficiency. These are all essential criteria for the operation of railways, particularly the first three, which are directly related to passengers and the purpose of the review. In each criterion, a key performance indicator is used to reflect its performance. These key performance indicators are considered representative and are internationally accepted in the railway industry in measuring the performance of a railway.

8. The results of the benchmarking exercise show that MTR attained the highest level in safety, service quality and asset utilization and second highest in reliability in 2003 (the year on which the latest data is available). This benchmarking exercise is able to demonstrate that MTR's performance compares favourably with that of other metro systems in the world.

9. In studying the performance of the MTR system, Lloyd's reviewed the service data for the past four years from January 2001 to December 2004. This period covered is considered reasonable because it is sufficiently long to provide an overview of the trends that reflects the latest situation.

#### *Reliability and Performance Requirements*

10. The Transport Department (TD) and MTRCL have jointly reviewed the Performance Requirements (PRs) stipulated in the Operating Agreement annually since 2000. The existing key PRs, namely, Train Service Delivery, Train Punctuality and Passenger Journeys On Time, aim to measure the train service availability and punctuality. The definition of the three key PRs are as follows -

- (a) Train Service Delivery: measuring the percentage of trains trips actually run against the number of trains scheduled;
- (b) Train Punctuality: measuring the percentage of train trips completing their journeys without experiencing a delay; and

- (c) Passenger Journeys on Time: measuring the percentage of passengers who complete their journeys without experiencing a delay of five minutes or more.

Details on calculation of the PRs are at *Annex I*.

11. MTRCL has been able to meet all the PRs. As provided by Lloyd's on p.23 of the review report, the MTR performance from 2001 to 2004 is shown as follows -

	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>
Train Service Delivery (%) <sup>1</sup>	99.8	99.9	99.9	99.9
Passenger Journeys on Time (%) <sup>1,2</sup>	99.9	99.9	99.9	99.9
Train Punctuality (%) <sup>1,2</sup>	99.3	99.3	99.6	99.7

<sup>1</sup> Tseung Kwan O Line excluded until July 2004;

<sup>2</sup> Airport Express Line excluded.

It can be seen that the Train Service Delivery improved from 2001 to 2004. For Train Punctuality, there was a slight decrease in 2002 due to the teething problems caused by the introduction of the Korean-trains (K-trains) and commissioning of the Tseung Kwan O Line (TKL). The performance has picked up and increased since then.

12. Lloyd's considers that MTR performance is already very high by world standards. It points out that setting and achieving even higher performance measures against existing performance criteria may not offer the most benefit to the customers. On this, Lloyd's view is that substantial increases in reliability would require much higher initial capital costs and annual lifetime maintenance costs with more upgrades during the asset lifecycle. Moreover, the upgrading costs for operating railways will be much higher than a new railway due to limited access and the upgrading works may cause the system performance to be reduced during the transitional period.

13. There has also been a suggestion from some Members requesting the Government to introduce an additional performance indicator on train service disruptions. We have thoroughly considered

this in consultation with the local experts. The considered view is that the existing PRs are commonly used international standards and that Hong Kong should not deviate from them to use other not proven or well tested service indicators. It is only through the international standard that we can measure Hong Kong's performance against other systems. Moreover, having a train service disruption indicator may inadvertently create pressure on the front-line staff in incident recovery due to the risk of being sanctioned for service delay, thereby affecting railway safety and quality of services.

14. In fact, the existing PRs measure the overall railway performance in a comprehensive, objective and transparent manner. For instance, if there were frequent railway incidents causing delays and slippage of train schedule, it would be reflected in the performance in Train Service Delivery and Train Punctuality. Furthermore, if more incidents occurred during peak hours, it would have more significant effect on Passengers Journey on Time since there was a larger number of passengers during that period. In this light, the Government considers that introducing additional indicators to measure railway service standards will not give rise to any practical benefit. Moreover, the current arrangements for the Government to call for and examine incident reports and monitor implementation of remedial measures are effective measures to ensure railway safety and quality of services.

15. Apart from the standard PRs related to train service, the trend of incidents serves also a very good indicator on the service reliability of the system. An incident is defined as one causing delay of 5 minutes or more, which is a common practice in the railway industry. The incident trend of MTRCL in the past four years is shown in the following table which shows that the performance has improved over the years -

Year	2001	2002	2003	2004
No. of $\geq 5$ mins incidents	501	832	433	324

16. As regards Members' question on the difference in the monthly average number of incidents causing delays of eight minutes or more while MTRCL and Kowloon-Canton Railway Corporation (KCRC) have recorded similar performance on train service delivery over 99.5%, it

should be noted that the total number of train trips running on the two networks every day is different. It is about 3,000 trips for MTRCL and around 1,400 trips for KCRC's East Rail (including Ma On Shan Rail) and West Rail. Given that the total number of train trips is different, the difference in the number of incidents for the two railway systems will not necessarily give a proportional difference in the train service delivery performance.

### *Safety*

17. Under the existing regulatory regime, the following arrangements and requirements are in place to ensure that the MTR system will be maintained to very high safety standards -

- (a) MTRCL is required to maintain and operate the railway at all time, having full regard to the safety of the system and to the satisfaction of the Hong Kong Railway Inspectorate (HKRI);
- (b) MTRCL is required to establish a safety management system to review, control and minimise safety risks;
- (c) MTR Regulations require MTRCL to notify the Government of all safety related incidents occurring on the MTR systems and empower HKRI to investigate these railway incidents;
- (d) should MTRCL fail to take remedial action, the Government could require it to take such remedial action and impose a penalty if it does not comply with the requirement;
- (e) MTRCL should engage an independent expert to review its safety management system at a regular interval of not more than three years; and
- (f) MTRCL shall not commence operations of any new railway project or open any station or major facilities until the HKRI confirms that it is safe to be used for the conveyance of passengers and their luggage and goods.

18. The MTR system has been operated safely in the past years and most of the safety related incidents reported to the Government under the MTR Ordinance were related to the escalators (more than 50%), platform gaps (about 13%) and train doors (including platform screen doors, about 12%). Safety incidents in connection with railway systems are rare and so far there has been no passenger fatality related to train operations caused by equipment fault or staff error since the operation of the MTR system. In terms of safety (total fatalities due to incidents per billion passenger journeys), MTR ranks first among CoMET Members. The safety performance of MTRCL since 1998 is summarized in the following table -

Year	1998	1999	2000	2001	2002	2003	2004
No. of safety incidents per million passengers	1.06	1.09	0.96	0.89	0.88	0.82	0.83

19. As shown, the safety performance of MTR system has been maintained at a consistently satisfactory level over the years. The slight increase in 2004 was due to the increase in escalator incidents in summer 2004 when quite a few incidents were related to passengers wearing sandals. It is noted that MTRCL has already reinforced promotion and public education in this aspect.

### **Incidents in the Latter Half of 2004**

20. Lloyd's analysed the data on delays of five minutes or more from 2001 to 2004. It was found that 2004 had the fewest incidents of the four years reviewed. The number of incidents in the last quarter of 2004 (October to December) was the lowest in any of the 16 quarters reviewed. Lloyd's considers that the perception of an upsurge in problems may have been influenced over the long term by other factors such as the memory of the performance issues associated with the introduction of the Tsueng Kwan O Line and Korean Trains, the arson case in January 2004 and a number of incidents involving passenger distress such as the generation of "smoke" from the brake hanging and the child walking on the tracks.

21. In order to understand whether the spate of incidents occurring in the latter half of 2004 were caused by systemic errors or ageing problem, the Government also examined the incidents occurring from July to December 2004. A summary of the MTR incidents causing delays of 8 minutes or more is at *Annex II*. For completeness, the summary table for KCRC is also attached at *Annex III*.

22. We found that the causes of these incidents were random. Incidents due to equipment failures were caused by different parts of the railways, and happened at different times and locations. There was no recurrence of incidents with repetitive cause within a short period of time. Hence, it does not appear that the occasional occurrence of the incidents suggests ageing or systemic problems.

23. While most incidents did not have any safety implications, the Government is aware that some incidents did cause much concerns among passengers, e.g. emission of smoke and generation of loud noise. Incidents that have attracted public attention, such as the two brake hanging incidents occurring in Tung Chung Line on 18 September 2004 and 6 October 2004 respectively, the train cable short-circuited incident at Quarry Bay Station on 13 October 2004 and the rail crack incident near Shek Kip Mei Station on 9 November 2004, are cases in point. We concur with Lloyd's that individual incidents involving emission of smoke and generation of loud noise may have led to the public's doubt or perception about whether the MTR performance is deteriorating. On this, MTRCL should pay more attention to catering for the customer distress issue.

### **Maintenance and outsourcing arrangements**

24. Apart from the study by Lloyd's, the Government carried out its own assessment of the MTRCL's maintenance regime and the outsourcing arrangement of part of its maintenance activities for the purpose of this review. The assessment was conducted through data collection from and site visits to MTRCL.



25. The scope of the Government's assessment on the adequacy of MTRCL's maintenance arrangement covers the following aspects -

- (a) maintenance strategy;
- (b) maintenance philosophy;
- (c) replacement policy;
- (d) maintenance structure and organisation;
- (e) staff competence;
- (f) quality management system;
- (g) maintenance regime for major systems (i.e. rolling stock, signalling system, traction power system and permanent way); and
- (h) performance of MTR system as a whole to reflect the maintenance output.

26. We note that an Integrated Management System is in place for the implementation of maintenance and replacement of assets. Advanced maintenance philosophies of preventive maintenance, condition based maintenance and reliability centre maintenance are employed. Life Cycle Analysis is used for planning maintenance and for asset replacement. The maintenance regimes in various systems appear to be robust and fit for the purpose. As shown in the following table, the number of incidents related to the equipment failure of the rolling stock and signalling system has shown a decreasing trend since 2002. Moreover, the number of incidents caused by equipment failures of the traction power system and permanent way are kept to a very low level.

	Year	2001	2002	2003	2004
Incident Caused by	Rolling stock	245	459	220	168
	Signalling System	100	125	54	37
	Permanent way	2	6	3	7
	Traction Power System	1	11	2	5

27. Outsourcing is not something new in MTRCL. From the very beginning of MTR operations, maintenance work has been outsourced to contractors who have met the qualification requirements of

the Corporation. As the outsourcing items of major concerns are the maintenance of trains and infrastructure of the Tseung Kwan O Line (TKL), the Government assessed the corresponding MTRCL's outsourcing arrangement.

28. Regarding contractors' technical competence, it is found that pre-qualifications exercises were carried out to ensure the technical competency. The contractors now employed by MTRCL are reputable companies in the railway industry and have previous experience in working with MTRCL either in the construction of railway systems or in the modification of the trains. Financial capability of the potential tenderers was also assessed in the pre-qualifications exercise.

29. Regarding contractors' staff competency, besides the specified qualification and experience requirement, the contractors' staff receive the same training taken by MTRCL's staff and are required to go through the same qualification exercise. For work instructions and procedures, both in-house staff and the contractors are using the same work instructions and are working according to the same procedures. Contractors are allowed and required to access and use the maintenance information system of MTRCL. In this way, the Contractors' maintenance activities are supported by the same information system used by their MTRCL counterparts. MTRCL also keeps real time asset information in their information system. Regarding spares, MTRCL sets minimum spares levels for contractors and keeps stocks of critical spares. Daily supervision is carried out by MTRCL resident staff on the maintenance output and regular meetings are held to review progress and other issues. A commercial framework of demerit system is in place to encourage the contractors to achieve targets. Although the daily maintenance of the TKL is outsourced, the MTRCL maintenance staff still carry out the immediate responses of urgent faults and incident handling. Moreover, risk assessments were carried out prior to outsourcing arrangement and MTRCL is capable to take over the maintenance work immediately in case of detrimental performance of contractors.

30. A comparison of the performance of TKL with other MTR Urban Lines was conducted in order to assess if the outsourcing arrangement has any adverse effects on the system (*Annex IV*). TKL

was selected for comparison purpose since the maintenance of both the trains and infrastructure has been outsourced and the performance of the railway should therefore be more relevant to Contractors' performance. It is found that the number of incidents caused by equipment fault in TKL is either lower or comparable to those of Urban Lines. Performance of TKL for the key performance indicators in the past three years is also comparable or even better than other lines. There is no evidence to suggest that the performance of TKL is not as good as that of other lines due to outsourcing of the maintenance work.

31. In light of the above, it appears that the maintenance management system is able to ensure the safety and service performance of the MTR system. There is no evidence to suggest that the performance of the outsourced part of the system is adversely affected. Notwithstanding, the Government considers that MTRCL should guard against complacency. It should continue to closely monitor the Contractor's performance over the coming years.

32. Separately, as regards KCRC, its safety audit and maintenance systems are set out at *Annex V*. The Government considers that KCRC's current safety audit and maintenance systems are effective in ensuring the provision of safe and reliable services.

### **Assessment on the recommendations of the Review**

33. Lloyd's has put forward a total of 16 recommendations for MTRCL to consider. The Government considers that these recommendations are appropriate to further enhance the performance of the MTR system.

34. Moreover, having regard to the findings of the report and in consultation with the local experts, the Government has requested MTRCL to pay special attention to the following areas -

- (a) condition monitoring on various railway systems down to key assemblies level as appropriate and IT systems for asset management should be enhanced as this could help minimise chances of occurrence of railway incidents. With proper

condition monitoring, it will lead to better performance and as a result could in a way help address the passenger distress issue;

- (b) it is important for MTRCL to continuously and vigilantly monitor contractors' performance in order to avoid fluctuation or deterioration of contractors' performance over the years;
- (c) coordination and information flow on incident data among different divisions should be further enhanced such that areas of improvements and long-term preventive and remedial actions could be formulated. The incident data should be accurate, consistent, and properly recorded. Research should also be strengthened for more focused and coordinated incident prevention and investigation; and
- (d) as regards staff competency, training of staff including continuous assessment of staff's professional knowledge should be further enhanced. The Lloyd's recommendations should be properly disseminated to front-line staff to ensure that these recommendations could be effectively implemented.

## **Conclusion**

35. The Government, in conjunction with the local experts, concurs with the findings and recommendations of the report. We have requested MTRCL to put in place these improvement measures as soon as possible and to vigilantly monitor its performance to upkeep public confidence in its operation. Relevant Government departments would also closely monitor the implementation of these recommendations with a view to ensuring that they are followed up properly.

ETWB

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**MTR – Performance Requirements**

The formula for calculating Train Service Delivery, Passenger Journeys On Time and Train Punctuality are shown as follows:

Performance Criteria	Performance Definitions	Performance Requirements <sup>1</sup>
Train Service Delivery	<p>“Train Service Delivery” shall be a percentage calculated by the Corporation by applying the following formula for each month in an operating period and then calculating the mean thereof:</p> $\frac{\text{Actual Train Trips in a Month}}{\text{Scheduled Train Trips in a Month}} \times 100\%$	98.5%

<sup>1</sup> To meet public expectations, MTRCL sets its Customer Service Pledges (CSPs) at a level 1% higher than the Performance Requirements.

Performance Criteria	Performance Definitions	Performance Requirements
Passenger Journeys on Time	<p>“Passenger Journeys on Time” shall be a percentage calculated by the Corporation separately for: (i) the AEL; and (ii) other parts of the railway (the “MTR”), by applying the following formulae (as appropriate) for each month in an operating period and then, for each of: (i) the AEL; and (ii) the MTR, separately calculating the mean thereof:</p> <p>(i) <u>AEL</u></p> $\frac{\text{Incoming AEL Patronage in a Month} - \text{AEL Passengers in a Month delayed by at least 5 minutes}}{\text{Incoming AEL Patronage in a Month}} \times 100\%$ <p>(ii) <u>MTR</u></p> $\frac{\text{Incoming MTR Patronage in a Month} - \text{MTR Passengers in a Month delayed by at least 5 minutes}^2}{\text{Incoming MTR Patronage in a Month}} \times 100\%$	<p>(i) AEL 98.0%</p> <p>(ii) MTR 98.5%</p>

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<sup>2</sup> The five-minute benchmark for Passenger Journeys On Time is derived from the extent of allowance which passengers have indicated in MTR's past passenger surveys that they would give when travelling on MTR and AEL.

Performance Criteria	Performance Definitions*	Performance Requirements
Train Punctuality	<p>“Train Punctuality” shall be a percentage calculated by the Corporation separately for: (i) the AEL; and (ii) the MTR by applying the following formulae (as appropriate) for each month in an operating period and then, for each of: (i) the AEL; and (ii) the MTR, separately calculating the mean thereof:</p> <p>(i) <u>AEL</u>  <math display="block">\frac{\text{Actual AEL Train Trips in a Month} - \text{AEL Train Trips in a Month Delayed by at least 5 minutes}^3}{\text{Actual AEL Train Trips in a Month}} \times 100\%</math></p> <p>(ii) <u>MTR</u>  <math display="block">\frac{\text{Actual MTR Train Trips in a Month} - \text{MTR Train Trips in a Month Delayed by at least 2 minutes}}{\text{Actual MTR Train Trips in a Month}} \times 100\%</math></p>	<p>(i) AEL 98.0%</p> <p>(ii) MTR 98.0%</p>

Summary of Incidents on MTR Lines in 2004  
(Incidents causing 8 minutes delay or more)

	Date	Incident Time	Railway Line Affected	Cause of Incident / Findings of Investigation	Remedial actions taken
1.	3 Jan	6:16 pm	Kwun Tong Line	A Tiu Keng Leng bound train could not run at its normal speed because of trainborne computer locked-up. It had to run at reduced speed of 22 kph in the section from Kowloon Tong Station to Diamond Hill Station where the computer lock-up could be reset.  The failure could not be simulated in the subsequent inspection.	The trainborne computer was thoroughly examined and calibrated.
2.	4 Jan	9:23 pm	Kwun Tong Line	A Yau Ma Tei bound train was withdrawn from service at Shek Kip Mei Station because a pair of doors could not be closed.  Investigation revealed that a panel rubber seal was kicked loosen by unknown person.	The rubber seal was fixed.
3.	5 Jan	8:26 am	Kwun Tong Line	A Yau Ma Tei bound train could not run at its normal speed in the section from Shek Kip Mei Station to Yau Ma Tei Station because the trainborne computer failed. It was taken out of service upon arrival at Yau Ma Tei Station.	The trainborne computer was thoroughly examined and calibrated.



	<b>Date</b>	<b>Incident Time</b>	<b>Railway Line Affected</b>	<b>Cause of Incident / Findings of Investigation</b>	<b>Remedial actions taken</b>
4.	5 Jan	9:12 am	Tsuen Wan Line	<p>The train services between Central Station and Tsim Sha Tsui Station were suspended because a fire occurred in a Central bound train when approaching Admiralty Station. The fire was put out by station staff at Admiralty Station.</p> <p>Investigation revealed that it was an arson case.</p>	The fire was put out by station staff by using portable fire extinguishers. All passengers were immediately detrained and evacuated at Admiralty Station.
5.	10 Jan	6:01 am	Island Line	<p>A Sheung Wan bound train was delayed at Causeway Bay Station by a defective engineer's train in front.</p> <p>Investigation revealed that the engineer's train lost the battery supply after working in non-traffic hours.</p>	The faulty battery set was replaced.
6.	14 Jan	5:35 pm	Tseung Kwan O Line	<p>Po Lam bound trains were delayed at Hang Hau Station because of a trackside fixed signal could not be cleared for train running. Trains were required to run at reduced speed of 22 kph through the affected area.</p> <p>Investigation revealed that a signal electronic card was faulty.</p>	The faulty signal electronic card was replaced.

	Date	Incident Time	Railway Line Affected	Cause of Incident / Findings of Investigation	Remedial actions taken
7.	15 Jan	8:09 am	Tung Chung Line	<p>Hong Kong bounded trains were delayed at Tai Ho Wan because absence of Automatic Train Protection codes. Trains were required to run at reduced speed of 22 kph through the affected area.</p> <p>Investigation revealed that a signal transceiver card was faulty.</p>	The faulty signal transceiver card was replaced.
8.	17 Jan	10:13 pm	Tseung Kwan O Line	<p>A train was withdrawn from service at Po Lam Station because of an unresettable safety device alarm.</p> <p>Investigation revealed that the Train Divided Indication Relay sustained an open circuit fault.</p>	The faulty Train Divided Indication Relay was replaced.
9.	19 Jan	7:57 am	Tung Chung Line	<p>Some Hong Kong bound trains were delayed because extra time was required for door closing at some stations.</p> <p>Investigation revealed that doors could not be closed completely because of the prevailing strong monsoon in open sections.</p>	Lubricant was applied to door assemblies of train doors.

	Date	Incident Time	Railway Line Affected	Cause of Incident / Findings of Investigation	Remedial actions taken
10.	20 Jan	6:05 am	Island Line	<p>Chai Wan bound trains were delayed at Admiralty Station by a defective engineer's train which remained immobile in the section between Wai Chai Station and Causeway Bay Station.</p> <p>Investigation revealed that a faulty brake component caused all brakes of the defective engineer's train could not be released.</p>	<p>Another engineer's train was deployed to push out the defective engineer's train.</p> <p>The faulty brake component was replaced.</p>
11.	22 Jan	8:01 am	Tung Chung Line	<p>A Hong Kong bound train was taken out of service at Nam Cheong Station because of sluggish movement.</p> <p>Investigation revealed that the bearing component an axle was faulty.</p>	The whole axle assembly was replaced.
12.	23 Jan	9:04 pm	Tseung Kwan O Line	<p>A Po Lam bound train was withdrawn from service at Hang Hau Station because trace of white smoke was found coming out from underframe of the train.</p> <p>Investigation revealed that there was oil leakage at the main air compressor.</p>	The faulty main air compressor was replaced.

	<b>Date</b>	<b>Incident Time</b>	<b>Railway Line Affected</b>	<b>Cause of Incident / Findings of Investigation</b>	<b>Remedial actions taken</b>
13.	26 Jan	6:12 pm	Tung Chung Line	<p>A Tung Chung bound train was taken out of service at Tsing Yi Station because of door failure.</p> <p>Investigation revealed that a door control component at the last car was faulty.</p>	The faulty door component was replaced.
14.	30 Jan	2:36 pm	Tsuen Wan Line	<p>A man jumped onto the track at Tsuen Wan Station and was hit by a train and bounced him back to the platform.</p> <p>Investigation by police revealed that it was a suicide case.</p>	Ambulance was summoned to convey the injured person to hospital.
15.	4 Feb	6:44 am	Tung Chung Line	<p>A train was taken out of service at Hong Kong Station because a door could not be closed.</p> <p>Investigation revealed that strong air current flowing from saloon to outside of train caused the door difficult to close.</p>	Lubricant was applied to door assemblies of train doors.
16.	7 Feb	3:31 pm	Tsuen Wan Line	<p>A Tsuen Wan bound train was taken out of service at Kwai Fong Station because of brakes hanging-on on one of the cars.</p> <p>Investigation revealed that a brake control component was faulty.</p>	The faulty brake component was replaced.

	Date	Incident Time	Railway Line Affected	Cause of Incident / Findings of Investigation	Remedial actions taken
17.	9 Feb	7:43 am	Kwun Tong Line	<p>A train at Tiu Keng Leng Siding was delayed because of failure of automatic turnaround function.</p> <p>Investigation revealed that an electronic card of the trainborne computer was faulty and caused the train failing to pick up the track side signal.</p>	The faulty electronic card of the trainborne computer was replaced.
18.	13 Feb	7:38 am	Tung Chung Line	<p>A Tung Chung bound train was taken out of service at Tsing Yi Station because of the activation of an alarm of an operated Passenger Alarm Device.</p> <p>Investigation revealed that a door control card was faulty and caused the false alarm.</p>	The faulty door control card was replaced.
19.	26 Feb	6:37 am	Kwun Tong Line	<p>A Yau Ma Tei bound train was taken out of service at Yau Tong Station because of trainborne computer locked-up.</p> <p>Investigation revealed that the trainborne computer was faulty.</p>	The faulty trainborne computer was replaced.
20.	5 Mar	12:09 pm	Tsuen Wan Line	<p>A Tsuen Wan bound train was withdrawn from service at Jordon Station because the trainborne computer sustained failure.</p> <p>Investigation revealed that an electronic card of trainborne computer was faulty.</p>	The faulty electronic card of the trainborne computer was replaced.

	<b>Date</b>	<b>Incident Time</b>	<b>Railway Line Affected</b>	<b>Cause of Incident / Findings of Investigation</b>	<b>Remedial actions taken</b>
21.	6 Mar	7:25 am	Tung Chung Line	<p>A Tung Chung bound train was delayed at Tai Ho Wan because of failure of a point at Tai Ho Wan.</p> <p>Investigation revealed that a point module was faulty.</p>	The faulty point module was replaced.
22.	6 Mar	4:55 pm	Kwun Tong Line	<p>A Tiu Keng Leng bound train was withdrawn from service at Choi Hung Station because of trainborne computer failure.</p> <p>Investigation revealed that a coded odometer was faulty.</p>	The faulty coded odometer was replaced.
23.	9 Mar	7:51 am	Kwun Tong Line	<p>A Tiu Keng Leng bound train was delayed at Choi Hung Station because of a passenger operated the Passenger Alarm Device on train.</p> <p>Investigation revealed that a female passenger's ring finger was nipped by the closing train doors.</p>	Train doors were re-opened.
24.	13 Mar	7:09 am	Tsuen Wan Line	<p>Tsuen Wan bound trains were delayed at Mei Foo Station because of absence of Automatic Train Protection codes.</p> <p>Investigation revealed that a component of the trackside signalling computer was faulty.</p>	The faulty component of the trackside signalling computer was replaced.

	Date	Incident Time	Railway Line Affected	Cause of Incident / Findings of Investigation	Remedial actions taken
25.	17 Mar	5:37 pm	Kwun Tong Line	<p>A Tiu Keng Leng bound train was withdrawn from service at Kwun Tong Station because the trainborne computer suddenly halted.</p> <p>Investigation revealed that the train computer halt was caused by a software error.</p>	The software error in the trainborne computer was fixed.
26.	29 Mar	8:36 am	Island Line	<p>Chai Wan bound trains were delayed at Sheung Wan Turnaround Track because of a point failure.</p> <p>Investigation revealed that a timer relay of the point was faulty.</p>	The faulty timer relay was fixed.
27.	30 Mar	8:00 am	Kwun Tong Line	<p>A Tiu Keng Leng train was withdrawn from service at Wong Tai Sin Station because of a pair of train doors failed to close.</p> <p>Investigation revealed that a door control component was faulty.</p>	The faulty door control component was replaced.
28.	1 Apr	12:55 am	Tsuen Wan Line	<p>A Central bound train was delayed at Mong Kok Station because of a point failure.</p> <p>Investigation revealed that the gauge of the point's operation assembly was slightly mis-aligned.</p>	The point's operation assembly gauge was re-adjusted.

	<b>Date</b>	<b>Incident Time</b>	<b>Railway Line Affected</b>	<b>Cause of Incident / Findings of Investigation</b>	<b>Remedial actions taken</b>
29.	6 Apr	10:17 pm	Tseung Kwan O Line	<p>A Po Lam bound train was withdrawn from service at Tiu Keng Leng Station because its trainborne signalling computer failed after platform duties.</p> <p>Investigation revealed that an electronic card of the trainborne signalling computer was faulty.</p>	The faulty electronic card of the trainborne signalling computer was replaced.
30.	7 Apr	11:41 pm	Tseung Kwan O Line	<p>A man jumped onto the track at Quarry Bay Station and was hit by a North Point bound train.</p> <p>Investigation by the police revealed and classified that it was a suicide case.</p>	The man was rescued from track by firemen.
31.	14 Apr	11:26 am	Tung Chung Line	<p>A Tung Chung bound train was withdrawn from service at Kowloon Station because a passenger alarm device was found operated but could not be reset.</p> <p>Investigation revealed that the passenger alarm MCB was faulty.</p>	The faulty MCB was replaced



	<b>Date</b>	<b>Incident Time</b>	<b>Railway Line Affected</b>	<b>Cause of Incident / Findings of Investigation</b>	<b>Remedial actions taken</b>
32.	24 Apr	4:10 pm	Tung Chung Line	<p>A Hong Kong bound train was delayed between Tung Chung and Tsing Yi Stations because it was tripped to stop at Tsing Ma Bridge and had to run at reduced speed of 22 kph for some distance before it could resume normal operation.</p> <p>Investigation revealed that an electronic card of the trainborne signalling computer was faulty.</p>	The faulty electronic cards of the trainborne signalling computer were replaced.
33.	24 Apr	6:04 pm	Tsuen Wan Line	<p>A Tsuen Wan bound train was withdrawn from service at Yau Ma Tei Station because the Train Operator mistook a door opened indication as a passenger alarm.</p> <p>Investigation by station staff confirmed no passenger alarm was operated.</p>	The Train Operator concerned was suitably disciplined.
34.	26 Apr	7:31 am	Kwun Tong Line	<p>A Tiu Keng Leng bound train was delayed at Yau Tong Station because it could not receive the Automatic Train Protection codes.</p> <p>Investigation revealed that the trainborne computer sustained a software error.</p>	The software error was fixed.

	<b>Date</b>	<b>Incident Time</b>	<b>Railway Line Affected</b>	<b>Cause of Incident / Findings of Investigation</b>	<b>Remedial actions taken</b>
35.	30 Apr	9:51 am	Kwun Tong Line	<p>A Yau Me Tei bound train was delayed at Ngau Tau Kok Station because Point NTK22 failed to detect its positions. Station staff had to access onto track to manually secure the point for trains to run.</p> <p>Investigation revealed that a point component was found faulty.</p>	The faulty point component was replaced.
36.	1 May	12:17 pm	Tseung Kwan O Line	<p>A Po Lam bound train was delayed from entering Po Lam Station because of trackside signalling computer failure.</p> <p>Investigation revealed that a receiver card of the trackside signalling computer was faulty.</p>	The faulty receiver card of the trackside signalling computer was reset.
37.	6 May	10:36 pm	Tseung Kwan O Line	<p>The signalling control of Quarry Bay Station failed and all trains had to work at reduced speed of 22 kph through the affected area.</p> <p>Investigation revealed that a trackside signalling component was faulty.</p>	The faulty trackside signalling component was faulty.
38.	8 May	9:58 am	Tseung Kwan O Line	<p>The signalling control of Quarry Bay Station failed and all trains had to work at reduced speed of 22 kph through the affected area.</p> <p>Investigation revealed that a trackside signalling module was faulty.</p>	The faulty signalling module was fixed.

	Date	Incident Time	Railway Line Affected	Cause of Incident / Findings of Investigation	Remedial actions taken
39.	11 May	8:47 am	Tung Chung Line	<p>A Hong Kong bound was delayed upon arrival at Hong Kong Station because the strap of a passenger's rucksack was nipped by an off-platform-side train door when he rushed to the train at Nam Cheong Station. The train was subsequently withdrawn because, after the release of the rucksack, the train sustained a fault on the detection of door closing.</p> <p>The fault self-rectified afterwards.</p>	The train door detection circuit was thoroughly examined and adjusted.
40.	11 May	10:43 am	Kwun Tong Line	<p>A North Point bound train was delayed between Tiu Keng Leng and Yau Tong Stations and subsequently withdrawn from service upon arrival at Yau Ma Tei Station because of a fault of the trainborne signalling computer.</p> <p>Investigation revealed that the trainborne signalling computer was faulty.</p>	The software error in the trainborne signalling computer was fixed.
41.	12 May	8:31 am	Tseung Kwan O Line	<p>The signalling control of Quarry Bay Station failed and all trains had to work at reduced speed of 22 kph through the affected area.</p> <p>Investigation revealed that a trackside signalling module was faulty.</p>	The fault at the signalling module was fixed.

	Date	Incident Time	Railway Line Affected	Cause of Incident / Findings of Investigation	Remedial actions taken
42.	17 May	7:22 pm	Tsuen Wan Line	A Tsuen Wan bound train was delayed at Jordan Station because passenger alarms and a platform emergency plunger were operated at the same time for a sick passenger and an indecent assault.	Assistance from Railway District Police was summoned.
43.	19 May	7:43 am	Kwun Tong Line	A Yau Ma Tei bound train was delayed at Kwun Tong Station because a rushing passenger blocked the door from closing causing the door couldn't be closed and the train was subsequently withdrawn from service.	N/A
44.	20 May	11:38 am	Kwun Tong Line	A Tiu Keng Leng bound train was delayed between Lok Fu and Wong Tai Sin Stations and subsequently withdrawn from service upon arrival at Tiu Keng Leng Station because of a fault in the trainborne signalling computer.  Investigation revealed that the trainborne computer fault was caused by a fault in the software computing process.	The computer software was fixed.

	<b>Date</b>	<b>Incident Time</b>	<b>Railway Line Affected</b>	<b>Cause of Incident / Findings of Investigation</b>	<b>Remedial actions taken</b>
45.	28 May	9:36 am	Tsuen Wan Line	<p>The train services between Kwai Hing and Tsuen Wan Stations was suspended and Tai Wo Hau Station was closed to facilitate Police Bomb Disposal Team to handle a suspicious object inside a plastic bag which was found by a cleaning contractor staff.</p> <p>Railway District Police classified the case as 'Bomb Threat Hoax Report'.</p>	The train service was suspended, the station closed and the area cordoned off for police action.
46.	29 May	1:57 pm	Tsuen Wan Line	<p>A Tsuen Wan bound train was delayed at Tsuen Wan Station and subsequently withdrawn from service upon arrival at Kwai Hing Station because of a fault in the trainborne signalling computer.</p> <p>Investigation revealed that a coded odometer was faulty.</p>	The faulty coded odometer was replaced.
47.	30 May	5:17 pm	Tseung Kwan O Line	<p>A Po Lam bound train was withdrawn from service at Yau Tong Station because of brakes hanging on.</p> <p>Investigation revealed that a component of the braking system was faulty.</p>	The faulty component of the braking system was replaced.

	<b>Date</b>	<b>Incident Time</b>	<b>Railway Line Affected</b>	<b>Cause of Incident / Findings of Investigation</b>	<b>Remedial actions taken</b>
48.	3 Jun	5:24 pm	Tsuen Wan Line	<p>A Central bound train was delayed between Prince Edward and Mong Kok stations and subsequently withdrawn from service upon arrival at Mong Kok Station because the overhead traction current supply circuit breakers were tripped, de-energizing the traction current supplies between Prince Edward and Yau Ma Tei stations.</p> <p>Investigation revealed that the cover of an air-conditioner on the train roof detached and came in contact with the overhead line wires, hence the incident.</p>	The loosened cover was fixed.
49.	3 Jun	7:10 pm	Island Line	<p>A Chai Wan bound train was withdrawn from service at Wan Chai Station because the receipt of a passenger door opening alarm but station staff was unable to locate the alleged opened door.</p> <p>Investigation revealed that the belonging of a passenger was nipped by an off-platform-side train door when he / she rushed to the train at Admiralty Station.</p>	N/A

	<b>Date</b>	<b>Incident Time</b>	<b>Railway Line Affected</b>	<b>Cause of Incident / Findings of Investigation</b>	<b>Remedial actions taken</b>
50.	7 Jun	6:20 am	Tung Chung Line	<p>A Tung Chung bound train was delayed between Olympic and Nam Cheong Stations and subsequently withdrawn from service upon arrival at Lai King Station because of a fault alarm of brakes hanging on.</p> <p>Investigation revealed that there was water ingress in the connection box of the brake system, hence generating a false brakes hanging on alarm.</p>	The connection box was replaced.
51.	13 Jun	12:34 pm	Tung Chung Line	<p>A Tung Chung bound train was withdrawn from service at Kowloon Station because it could only run at reduced speed of 22 kph shortly after it departed Hong Kong Station.</p> <p>Investigation revealed that the trainborne signalling antenna was faulty.</p>	The faulty trainborne signalling antenna was replaced.
52.	13 Jun	7:55 pm	Tsuen Wan Line	<p>A Tsuen Wan bound train was withdrawn from service at Admiralty Station because of brakes hanging on.</p> <p>Investigation revealed that a component of the braking system was faulty.</p>	The faulty component in the braking system was replaced.

	<b>Date</b>	<b>Incident Time</b>	<b>Railway Line Affected</b>	<b>Cause of Incident / Findings of Investigation</b>	<b>Remedial actions taken</b>
53.	15 Jun	8:45 am	Tsuen Wan Line	<p>A Central bound train was delayed at Lai King Station because it overran the platform stopping mark during thunderstorm. The delay was prolonged because the safety protection was activated after the train was set back to the correct stopping mark for platform duties and the train had to work at reduced speed of 22 kph until Mei Foo Station where it resumed normal working.</p> <p>Investigation revealed the overrunning at platform was caused by low adherence between wheels and rail due to wet track under a thunderstorm.</p>	Monitor the occurrence of wheel slip/slide on wet track during rainy weather.
54.	22 Jun	2:10 pm	Tung Chung Line	<p>A Hong Kong bound train was delayed at Nam Cheong Station because it could not receive Automatic Train Protection codes when approaching Nam Cheong Station.</p> <p>Investigation revealed that a trackside signalling component was faulty.</p>	The faulty trackside signalling component was replaced.



	<b>Date</b>	<b>Incident Time</b>	<b>Railway Line Affected</b>	<b>Cause of Incident / Findings of Investigation</b>	<b>Remedial actions taken</b>
55.	24 Jun	6:09 am	Kwun Tong Line	<p>An out-bound train from depot was delayed to arrive at Choi Hung Station because signalling control failure at Choi Hung Station.</p> <p>Investigation revealed that a trackside signalling component was damaged and caused the signalling control failure.</p>	The damaged trackside signalling component was replaced.
56.	26 Jun	10:25 pm	Tung Chung Line	A Tung Chung bound train was withdrawn from service because a male passenger hit his head against a window glass after disputing with his girl friend, causing the glass cracked.	The cracked glass was replaced.
57.	27 Jun	4:54 pm	Tung Chung Line	<p>A Tung Chung bound train was delayed at Tsing Yi Station because of an intermittent fault of a track circuit which interlocked two Points from moving, interrupting the train movement of Tung Chung and Airport Express Lines.</p> <p>Investigation revealed that a trackside signalling receiver card was faulty.</p>	The faulty trackside signalling receiver card was replaced.

	<b>Date</b>	<b>Incident Time</b>	<b>Railway Line Affected</b>	<b>Cause of Incident / Findings of Investigation</b>	<b>Remedial actions taken</b>
58.	29 Jun	6:30 pm	Tung Chung Line	<p>A Tung Chung bound train was delayed at Tsing Yi Station because of an intermittent fault of a track circuit which interlocked two Points from moving, interrupting the train movement of Tung Chung and Airport Express Lines.</p> <p>Investigation revealed that a trackside signalling remote amplifier was faulty.</p>	The faulty trackside signalling remote amplifier was replaced.
59.	30 Jun	12:32 pm	Island Line	<p>Power surge occurred because of a CLP 400kV circuit fault, causing numerous platform screen doors failed to open at Admiralty, Wan Chai, Causeway Bay, Mong Kok and Yau Ma Tei Stations.</p> <p>Investigation revealed that the 96V main isolators which supplied power to platform screen doors were tripped during the power surge.</p>	The tripped main isolators were reset.
60.	30 Jun	5:15 pm	Tung Chung Line	<p>A Tung Chung bound train was withdrawn from service at Olympic Station because of brakes hanging on.</p> <p>Investigation revealed that a safety brake relay was faulty and caused the brakes hanging on.</p>	The faulty safety brake relay was replaced.

	<b>Date</b>	<b>Incident Time</b>	<b>Railway Line Affected</b>	<b>Cause of Incident / Findings of Investigation</b>	<b>Remedial actions taken</b>
61.	1 Jul	6:12 am	Island Line	<p>The failure of two track circuits in the section between Causeway Bay and Wan Chai stations caused trains to run at reduced speed of 22 kilometers per hour through the affected area. The fault was rectified at 06:36 am.</p> <p>A fuse of the power supply to signalling equipment was blown.</p>	The blown fuse was replaced.
62.	6 Jul	10:44 pm	Tseung Kwan O Line	<p>A train overran the platform of Tseung Kwan O Station under automatic mode working and stopped after passing the platform by about 66 metres. The train was instructed to continue its journey to Hang Hau Station. Those affected passengers whose destination was Tseung Kwan O Station was assisted to take the opposite direction train at Hang Hau Station for going back to their original destination. Train service was not affected.</p> <p>Investigation found the coded odometer faulty.</p>	The faulty odometer was replaced.

	Date	Incident Time	Railway Line Affected	Cause of Incident / Findings of Investigation	Remedial actions taken
63.	11 Jul	10:01 pm	Kwun Tong Line	An engineer's train stopped in the tunnel between Lok Fu and Wong Tai Sin Stations and blocked the passenger train behind. The engineer's train eventually regained movement after resetting the power fault.  The power fault was caused by a defect in the electronic control unit.	The electronic control unit concerned was replaced.
64.	17 Jul	6:09 pm	Kwun Tong Line	A woman was found jumping onto the track at platform one of Kwun Tong Station.	The train operator immediately sounded the horn and applied emergency brakes to stop the train.
65.	19 Jul	7:01 pm	Island Line	A train was withdrawn from service at Fortress Hill Station because a door could not be confirmed closed.  The door concerned was blocked from closing by an unknown passenger.	Messages to be included in passenger education programme.

	Date	Incident Time	Railway Line Affected	Cause of Incident / Findings of Investigation	Remedial actions taken
66.	21 Jul	6:00 am	Tsuen Wan Line	<p>Power disruption at Tsuen Wan Depot leading to reduced frequency in morning service on Tsuen Wan Line.</p> <p>Trains were run at a 10-minute headway at the outset of the incident and gradually resumed normal at 11:44 am.</p> <p>It was caused by a double failure in the 110V direct current control circuit for the 33kv circuit breakers. Two power diodes of the 110V charger failed and became short circuited, which in turn caused the back-up battery bank to be on-load.</p> <p>However, the battery bank was drained down very quickly and became "dead".</p>	The faulty charger and batteries were replaced, and a bank of spare batteries has now been made available for contingency use.
67.	26 Jul	4:51 pm	Kwun Tong Line	<p>A Tiu Keng Leng bound train was delayed between Shek Kip Mei and Kowloon Tong Stations because its trainborne signaling computer failed.</p> <p>Investigation revealed that a component of trainborne signaling computer was faulty.</p>	The faulty component of trainborne signaling computer was replaced.

	<b>Date</b>	<b>Incident Time</b>	<b>Railway Line Affected</b>	<b>Cause of Incident / Findings of Investigation</b>	<b>Remedial actions taken</b>
68.	28 Jul	7:58 am	Kwun Tong Line	A train was taken out of service at Choi Hung Station due to door control failure.  Investigation revealed that the door control push button failed.	The defective door control push button was replaced.
69.	2 Aug	10:05 am	Kwun Tong Line	A Tiu Keng Leng bound train was delayed at Kowloon Tong Station because a train door couldn't be closed after platform duties.  Investigation revealed that the glass panel of a trackside advertising panel smashed for an unknown reason when the train was at the platform, towards Yau Ma Tei Station previously. The flying glass residues spreaded into the door guide rail and jammed the door from closing.	The glass residues were removed.
70.	2 Aug	8:02 pm	Tseung Kwan O Line	A train was trapped at North Point Siding during train reversal because a track circuit failed.  Investigation revealed that a track circuit was faulty.	The faulty track circuit was fixed.

	<b>Date</b>	<b>Incident Time</b>	<b>Railway Line Affected</b>	<b>Cause of Incident / Findings of Investigation</b>	<b>Remedial actions taken</b>
71.	5 Aug	4:34 pm	Island Line	<p>A Sheung Wan bound train was delayed and subsequently withdrawn from service upon arrival at Tai Koo Station because of intermittent brakes hanging on.</p> <p>The fault could not be simulated during the technical investigation.</p>	The brake control circuit and assemblies were thoroughly examined and adjusted.
72.	14 Aug	11:46 am	Island Line	<p>A train was taken out of service at Wan Chai platform one due to brakes hanging on.</p> <p>Investigation revealed that a fuse for the power supply to the brake decode was blown.</p>	The blown fuse was replaced.
73.	19 Aug	9:31 pm	Tsuen Wan Line	<p>Signalling failure which required trains running at reduced speed of 22 kilometres per hours over the affected tracks between Admiralty Station and Tsim Sha Tsui Station.</p> <p>Investigation revealed that a faulty repeater relay caused the signalling failure.</p>	The faulty repeater relay was replaced.

	Date	Incident Time	Railway Line Affected	Cause of Incident / Findings of Investigation	Remedial actions taken
74.	23 Aug	12:48 pm	Island Line	A man was found jumping onto the track at platform one of Heng Fa Chuen Station.	Station staff at platform operated the Emergency Stop Switches to hold all train movements in/out Heng Fa Chuen when seeing a man jumping onto the track at the tailwall of platform one.
75.	28 Aug	7:20 am	Kwun Tong Line	A train was taken out of service at Kwun Tong platform one because of continual tripping to stop in the journey from Ngau Tau Kok Station to Kwun Tong Station.  Investigation revealed that the train sustained excessive wheel slip/slide under heavy rain when running in open area.	Monitor the occurrence of wheel slip/slide on wet track during rainy weather.



	Date	Incident Time	Railway Line Affected	Cause of Incident / Findings of Investigation	Remedial actions taken
76.	29 Aug	11:58 am	Kwun Tong Line	<p>A boy spotted by a train operator walking on the tracks heading towards his train from Kowloon Bay to Ngau Tau Kok. The train operator pressed the train horn and pressed the emergency stop button to bring the train to a halt. The boy heard the train horn and moved aside, leaning against the parapet wall to let the train pass.</p> <p>The child was not injured and continued walking back to Kowloon Bay Station where he was met by station staff.</p> <p>After staff conducted track check and ensured that there were no other persons on the track, train service resumed normal at 12: 15 pm.</p> <p>The six-year-old boy was visiting from the mainland and had boarded the train at Kowloon Bay Station along with his mother and older brother. He was inadvertently left on the train by his mother who got off with her other son after realizing they had boarded a train going in the wrong direction. Not familiar with the operations of the MTR system, the boy got off at Ngau Tau Kok Station and climbed down onto the track to make his way back to Kowloon Bay Station rather than seeking help from MTR staff.</p>	<p>Monitoring of platforms enhanced</p> <p>Additional warning notices posted at the headwall and tailwall of the platforms</p> <p>Passenger safety programmes enhanced</p> <p>Safety messages added to leaflets designed for visitors to Hong Kong</p>

	Date	Incident Time	Railway Line Affected	Cause of Incident / Findings of Investigation	Remedial actions taken
77.	29 Aug	2:38 pm	Tung Chung Line	The train could not obtain power while on its way to Hong Kong Station. Passengers were detrained at Kowloon and the train was taken out of service for inspection.	Overhead contact lines polished.
78.	30 Aug	7:09 pm	Tseung Kwan O Line	A North Point bound train was withdrawn from service because the traction current supply system was tripped.  Investigation revealed that a component of trainborne power supply system was faulty.	The faulty component of trainborne power supply system was replaced.
79.	31 Aug	9:16 am	Kwun Tong Line	Power supply circuit tripped at 9:16 am, affecting train service between Diamond Hill and Kowloon Bay Stations.  An electrical relay failed, causing a circuit breaker at Kowloon Bay Depot to operate, cutting power supply to the section of the Kwun Tong Line between Diamond Hill and Kowloon Bay Stations.	Temporary repairs restored power, allowing normal train service to resume within 10 minutes.  The relay was replaced after the end of normal train service that night.
80.	3 Sep	9:01 pm	Tung Chung Line	A Tung Chung bound train was withdrawn from service at Nam Cheong Station because a train door couldn't be closed after platform duty.  Investigation revealed that a component of door system was broken.	The broken component of door system was replaced.

	Date	Incident Time	Railway Line Affected	Cause of Incident / Findings of Investigation	Remedial actions taken
81.	4 Sep	6:34 am	Kwun Tong Line	A train was taken out of service at Lam Tin Station because it sustained trainborne signalling computer failure and could only be run at reduced speed of 22 kilometres per hour after it departed Yau Tong Station.	The switching unit of the trainborne signalling computer was replaced.
82.	5 Sep	7:53 am	Tseung Kwan O Line	A Tiu Keng Leng bound train was delayed between Yau Tong and Tiu Keng Leng Stations and subsequently withdrawn from service upon arrival at Tiu Keng Leng Station because its trainborne signaling computer failed.  Investigation revealed that an electronic card of trainborne signalling computer was faulty.	The faulty electronic card of trainborne signalling computer was replaced.
83.	7 Sep	7:00 am	Tung Chung Line	A train was tripped to stop at East Lantau Tunnel and could only run at reduced speed of 22 -40 kilometres per hour to Tsing Yi Station where it was taken out of service.  Investigation found that the train's signalling antenna assembly was faulty.	The faulty antenna assembly was replaced.
84.	9 Sep	11:44 am	Island Line	A man was found jumping onto the track at platform one of Sai Wan Ho Station.	The train operator immediately sounded the horn and applied emergency brakes to stop the train.

	<b>Date</b>	<b>Incident Time</b>	<b>Railway Line Affected</b>	<b>Cause of Incident / Findings of Investigation</b>	<b>Remedial actions taken</b>
85.	11 Sep	2:44 pm	Tsuen Wan Line	<p>The failure of a point at Tsuen Wan Station resulted in trains having to drive at reduced speed of 22 kilometres per hour through the affected area.</p> <p>Investigation found that a micro switch of the point's assembly was defective.</p>	The defective micro switch was replaced.

	Date	Incident Time	Railway Line Affected	Cause of Incident / Findings of Investigation	Remedial actions taken
86.	18 Sep	8:18 am	Tung Chung Line	<p>White smoke with burning smell was emitting from the underframe of a train car.</p> <p>The Brake Control Unit on the 5th car of the train was found malfunctioned, causing the brakes to be applied automatically on the wheels of that particular car. This is known as "brake hanging on".</p> <p>The friction between the brake pad and the brake disc generated heat and smoke. The brake pads are made of fire-retardant materials and the smoke generated is non-toxic.</p>	<p>Passengers were dropped off at the next nearest emergency platform at Siu Ho Wan to be picked up by the following train. The incident train was withdrawn from service and routed back to the depot for inspection. Train service resumed normal immediately after the incident.</p> <p>The Brake Control Unit was replaced on the same day.</p> <p>The faulty unit was sent to the manufacturer in the United Kingdom for technical investigation on the root cause of the failure. The manufacturer advised that the unit was found functioning normal in their tests.</p>

	<b>Date</b>	<b>Incident Time</b>	<b>Railway Line Affected</b>	<b>Cause of Incident / Findings of Investigation</b>	<b>Remedial actions taken</b>
87.	18 Sep	9:00 am	Tung Chung Line	<p>The failure of a track circuit at the crossover beyond Tung Chung Station caused one train to leave the station at a low speed of 22 kilometres per hour. The affected train arrived at Hong Kong with an increase in journey time.</p> <p>An electronic card in the Signal Equipment Room was defective. The fault was fixed after the card was replaced and normal train service resumed at 9:10 am.</p>	Technical investigation has identified the root cause to be attributable to a defective fuse on the electronic card failure.
88.	21 Sep	6:32 pm	Tsuen Wan Line	<p>The failure of a point on the Tsuen Wan Line at Mong Kok Station resulted in trains having to drive at reduced speed of 22 kilometres per hour through the section. Train journey from Mong Kok to Prince Edward Station extended by two minutes.</p> <p>As the fault occurred during the evening peak, a block-back effect caused delays to other trains departing from Central Station.</p> <p>A micro-switch in a point detector failed which prevented the signalling system from allowing trains to move at normal line speed. This is a fail-safe design of the system.</p>	Emergency repairs were conducted immediately at the scene. The fault was rectified at 7:00 pm and normal train service resumed.

	<b>Date</b>	<b>Incident Time</b>	<b>Railway Line Affected</b>	<b>Cause of Incident / Findings of Investigation</b>	<b>Remedial actions taken</b>
89.	29 Sep	4:52 pm	Tung Chung Line	A train was taken out of service at Hong Kong Station because of air leakage from the pneumatic system.  Investigation revealed that the air dryer elbow fitting sleeve loosened.	The defective elbow fitting was replaced.
90.	7 Oct	6:35 am	Island Line	A man was found jumping onto the track at platform two of Sai Wan Ho Station.	The train operator immediately sounded the horn and applied emergency brakes to stop the train.
91.	7 Oct	7:30 am	Island Line	A train was held at the up platform of Causeway Bay Station as a result of a pair of train doors failing to fully close.  The rubber seal on the middle part of the incident train door was found displaced.	All passengers were arranged to alight from the train and were carried by the following train to continue their journey.

	<b>Date</b>	<b>Incident Time</b>	<b>Railway Line Affected</b>	<b>Cause of Incident / Findings of Investigation</b>	<b>Remedial actions taken</b>
92.	8 Oct	7:06 pm	Kwun Tong Line	<p>A train was suddenly tripped to stop when entering Kowloon Bay Station platform and could only be worked at reduced speed of 22 kilometres per hour to the station for platform duties. It could resume normal working when running to Choi Hung Station.</p> <p>Investigation revealed that the trainborne signalling computer sustained a transient fault but could be reset.</p>	The power rack of the trainborne signalling computer was replaced.
93.	12 Oct	5:25 pm	Tung Chung Line	<p>A female passenger operated the Passenger Alarm Plunger on a train at Tsing Yi Station platform 2. The edge of a tennis racket was found nipped by a pair of closed door leaves on the off-platform side. The racket was released with the door manually isolated and opened.</p>	<p>The passenger revealed that she used the tennis racket to block train doors from closing when she rushed into the train at Tung Chung Station when train doors were closing.</p> <p>Message to be included for passenger education programme.</p>



	Date	Incident Time	Railway Line Affected	Cause of Incident / Findings of Investigation	Remedial actions taken
94.	13 Oct	8:16 am	Tseung Kwan O Line	<p>An electrical fault on board a North Point-bound Tseung Kwan O Line train at Quarry Bay Station caused delay to service.</p> <p>Investigation revealed that the insulation of a trainborne high voltage cable broke down and short-circuited.</p>	<p>1,500 passengers on board were arranged to alight the train. Normal service resumed when the defective train was removed from the running line.</p> <p>The defective cable was replaced.</p> <p>Enhance inspection of trainborne high voltage cables using dielectric tester.</p> <p>Similar cables in the same batch of trains will be replaced by July 2005.</p>
95.	19 Oct	07:37 am	Kwun Tong Line	<p>A train was taken out of service at Kowloon Tong Station Platform 1 because a door at the 5th car could not be closed.</p> <p>A crystal-liked bead was found jammed at a concealed location between the door leaf and car body and prohibited the door from closing. Several other pieces of crystal-liked beads which could belong to a passenger's ornament accessories were also found on the floor inside the 5th car.</p>	<p>All crystal-liked beads were removed.</p>

	Date	Incident Time	Railway Line Affected	Cause of Incident / Findings of Investigation	Remedial actions taken
96.	19 Oct	06:01 am	Tsuen Wan Line	<p>An engineer's train had a breakdown in the section between Yau Ma Tei Station and Jordan Station in the direction towards Central due to a non-resettable train control fault. Another engineer's train was deployed to push out the defective train.</p> <p>Investigation revealed that an auxiliary power supply component of a locomotive was defective.</p>	The defective auxiliary power supply component was replaced.
97.	21 Oct	05:56 pm	Tseung Kwan O Line	<p>A train was taken out of service at Po Lam Station because of a faulty trainborne signalling computer. It could only run at reduced speed of 22 kilometres per hour to Tseung Kwan O Station for returning to depot.</p> <p>Investigation revealed that an electronic card of the trainborne signalling computer was faulty.</p>	The faulty electronic card was replaced.
98.	23 Oct	07:31 pm	Kwun Tong Line	<p>Trains have to run at reduced speed of 22 kilometres per hour from Yau Tong to Lam Tin because of a point failure.</p> <p>Investigation revealed that a micro switch for detection of the point's position was defective.</p>	The defective micro switch was replaced.

	Date	Incident Time	Railway Line Affected	Cause of Incident / Findings of Investigation	Remedial actions taken
99.	27 Oct	10:31 pm	Tseung Kwan O Line	<p>The train services in the immersed tube section between Yau Tong and Quarry Bay Stations in the direction towards North Point were momentarily interrupted to allow staff to inspect a short-circuit of electricity return current at a location in the tunnel.</p> <p>Investigation revealed that the short-circuit of electricity return current was due to some insulation breakdown between the rail and concrete track bed structure.</p>	Some damaged rail insulation pads were replaced.
100.	2 Nov	06:42 pm	Tsuen Wan Line	<p>A Central bound train was taken out of service at Jordan Station because the signal of Door Closed Light could not be obtained after all train doors were closed.</p> <p>Investigation suspected that an off-platform side door of the 3rd car might have been interfered by unknown passenger.</p>	Frontline staff were briefed to be vigilant in spotting mischievous act of passengers inside trains.
101.	7 Nov	01:52 pm	Kwun Tong Line	A man was found falling onto the track at Lam Tin platform two.	The train operator applied emergency brakes to stop the train.

	Date	Incident Time	Railway Line Affected	Cause of Incident / Findings of Investigation	Remedial actions taken
102.	8 Nov	08:42 am	Island Line	<p>A Chai Wan bound train, was taken out of service at Central Station because the trainborne signalling computer failure locked up twice when running from Sheung Wan to Central. It ran at reduced speed of 22 kph to Admiralty Siding for temporary stabling.</p> <p>Investigation revealed that the trainborne computing processor was faulty.</p>	The faulty trainborne computing processor was replaced.
103.	9 Nov	06:20 am	Kwun Tong Line	<p>A crack was found on a section of rail between Shek Kip Mei and Prince Edward stations. Trains were instructed to move at slow speed over the affected section.</p> <p>Preliminary investigation indicates that the sudden fracture of the rail was caused by a stress initiation from the rail foot.</p>	<p>Temporary repairs were conducted to strengthen the affected rail with steel plates. The section of fracture rail was replaced after close of traffic.</p> <p>Enhanced Ultrasonic Testing Vehicle inspection of rails on Kwun Tong and Tsuen Wan Lines from once a month to once every two weeks. Acceleration of rail replacement program on heavy-utilized sections.</p>

	Date	Incident Time	Railway Line Affected	Cause of Incident / Findings of Investigation	Remedial actions taken
104.	15 Nov	06:27 pm	Tsuen Wan Line	A woman attempted to commit suicide by jumping from the roof of Lai King Station building above the track.  Trains coming from Kwai Fong Station were momentarily held from entering Lai King Station.	Barbed-wire was installed at vulnerable areas of unauthorized access to the roof of station premises of Lai King.
105.	17 Nov	08:53 am	Kwun Tong Line	A Tiu Keng Leng bound train was taken out of service at Choi Hung Station because all train doors could not be closed after platform duties.	The defected Door Closed Pushbutton was replaced.
106.	23 Nov	00:58 am	Tsuen Wan Line	Interchange passengers from Island Line were delayed at Admiralty Station because the last Tsuen Wan bound train of Tsuen Wan Line prematurely departed.	An out-stabling train at Admiralty Siding was immediately called out to form as the last train to Tsuen Wan to serve the left-behind interchange passenger at Admiralty Station.
107.	23 Nov	12:01 pm	Tsuen Wan Line	Central bound train service was delayed by a non-passenger train which sustained trainborne signalling computer lock-up when it was running from Tsim Sha Tsui Station to Admiralty Station. It could only run at reduced speed of 22 kilometres per hour to a siding at Admiralty.	The faulty trainborne signalling computer was replaced.

	Date	Incident Time	Railway Line Affected	Cause of Incident / Findings of Investigation	Remedial actions taken
108.	30 Nov	08:11 am	Tsuen Wan Line	<p>A Central bound train was taken out of service at Lai King Station because the trainborne signalling computer failed. Then it could only run at reduced speed of 22 kph to Yau Ma Tei Siding for temporary stabling.</p> <p>Investigation revealed that a component in the power supply circuit was defective.</p>	The defective component in the power supply circuit was replaced.
109.	3 Dec	08:12 am	Kwun Tong Line	<p>The failure of a track circuit in the section from Shek Kip Mei to Prince Edward resulted in trains running at reduced speed of 22 kph through the affected area.</p> <p>Investigation revealed that a signalling transmitter card failed.</p>	The defective signalling transmitter was replaced.
110.	10 Dec	07:04 am	Kwun Tong Line	<p>A Yau Ma Tei bound train was taken out of service at Wong Tai Sin Station because of brakes hanging on.</p> <p>The initial investigation revealed that the brake control unit of the 5th car of the train was faulty, causing the brakes to be applied automatically on the wheels of that particular car.</p>	The train ran empty to Yau Ma Tei after operation of the brake isolation cock of the car concerned. The faulty brakes control unit was subsequently replaced.

	<b>Date</b>	<b>Incident Time</b>	<b>Railway Line Affected</b>	<b>Cause of Incident / Findings of Investigation</b>	<b>Remedial actions taken</b>
111.	14 Dec	01:53 pm	Tung Chung Line	<p>A Hong Kong bound train was taken out of service at Olympic Station because of locked axle fault alarm on its 5th car.</p> <p>Investigation revealed that the assembly of a gear box on the 5th car was defective.</p>	The defective gear box was replaced.
112.	24 Dec	07:23 am	Tung Chung Line	<p>A Hong Kong bound train was taken out of service at Nam Cheong Station because of sustaining symptoms of brakes hanging on.</p> <p>Investigation revealed that the Brake Control Unit at the 5th car of the train was faulty.</p>	The defective Brake Control Unit was replaced.
113.	30 Dec	10:33 am	Tsuen Wan Line	<p>A Central bound train was taken out of service at Lai King Station because of failure of the Automatic Train Control circuit.</p> <p>Investigation revealed that a component in the Automatic Train Control circuit was defective.</p>	The defective component was replaced.

	<b>Date</b>	<b>Incident Time</b>	<b>Railway Line Affected</b>	<b>Cause of Incident / Findings of Investigation</b>	<b>Remedial actions taken</b>
114.	31 Dec	05:37 pm	Island Line	<p>A Chai Wan bound train was taken out of service at Admiralty because of a fault in the door status proving circuit.</p> <p>Investigation revealed that a Door Maglock Switch in the door status proving circuit was faulty.</p>	The faulty Door Maglock Switch was replaced.

MTR Corporation Limited  
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## Railway incidents leading to an extension of journey time of 8 minutes or more in 2004

### East Rail

	Date	Incident Time	Incident description	Cause of Incident/ Findings of investigation	Remedial action taken
1.	20/01/04	1:39 pm	A southbound train experienced a traction problem and jammed brakes. It was withdrawn at platform 2 of Sheung Shui Station.	Brake component failure	The defective brake component was fixed and replaced
2.	25/01/04	8:28 pm	Two point machines failed south of Tai Po Market station.	Failure of point module	The point module was replaced
3.	09/02/04	11:55 pm	Overhead line tripped near University Station.	Train's pantograph fault	The fault was fixed
4.	11/02/04	6:13 am	The failure of the locomotive of an engineering train at Sha Tin Station affected service.	The air pressure of the locomotive could not be charged up	Locomotive shut down and air pressure recharged
5.	25/02/04	7:43 am	Owing to the breakdown of a Ktt through train at Hung Hom Station, the East Rail train service was affected.	Insufficient air pressure of 6 <sup>th</sup> coach due to air leakage	Air leakage was stopped by isolating the Air Suspension Isolating Cock
6.	06/03/04	2.04 pm	Smoke emitted from under frame of train due to brake component failure near Tai Wo Station.	Brake component failure	The defective brake component was fixed and replaced
7.	31/03/04	10:01 am	A door defect was found on a northbound train at Mong Kok Station.	Fault was found on Train Management System	The fault on Train Management System was fixed
8.	18/04/04	10:14 pm	Points failed near Sheung Shui Station.	Point module failure	The points were replaced
9.	20/04/04	3:18 pm	A door defect was found on a southbound train at Tai Po Market Station.	A battery charger control card failed	The defective control card was replaced
10.	22/04/04	2:19 pm	An overhead wire failure at Hung Hom Station affected service.	Failure of overhead wire	The overhead wire was re-aligned by staff
11.	28/04/04	6.06 am	A door defect was found on a train at Mongkok station.	Door defect	The door fault was fixed and repaired
12.	03/05/04	8:55 pm	A track circuit failure was detected near Lo Wu Station.	The fault was caused by a short circuit	The fault was rectified by staff
13.	08/05/04	5:45 am	The locomotive of an engineering train failed at Sha Tin Station.	The air pressure of the locomotive could not be charged up	Locomotive shut down and air pressure recharged

	Date	Incident Time	Incident description	Cause of Incident/ Findings of investigation	Remedial action taken
14.	26/05/04	8:27 pm	A jammed brake was detected in a northbound freight train between Kowloon Tong Station.	Brake component failure	The defective component was replaced
15.	28/05/04	7:18 pm	A train lost traction due to door defect at University station.	Door defect	Repair work done
16.	06/06/04	8:13 am	A southbound train failed near Pak Shek Kok between Tai Po Market and University Stations.	The fault was caused by the failure of Automatic Train Protection channel modules	The defective equipment was repaired
17.	07/06/04	6:03 am	A track circuit failed at Hung Hom area.	Iron dust was found on the insulated rail joint	The iron dust was removed
18.	14/06/04	5:15 pm	A train had parking brake problem at Lo Wu Station.	Brake component failure	The defective component was replaced
19.	02/07/04	12:26 pm	A southbound train stalled at Fo Tan station due to a damaged motor alternator motor coil.	Motor alternator motor coil damaged	The defective motor was replaced
20.	20/07/04	00:30 am	The last northbound train was blocked by an empty train which stalled on the tracks.	The driver did not follow procedures	All drivers were briefed on the correct procedures
21.	02/08/04	9:10 am	A train stalled at Mong Kok Station after the train driver wrongly pressed the emergency stop button.	The train could not obtain traction power	All train drivers were briefed on the correct procedures
22.	10/08/04	10:58 pm	A point machine failed north of Hung Hom station.	Failure of circuit controller.	The defective circuit controller was replaced
23	30/08/04	11:00 am & 12:33 pm	A track circuit failed intermittently south of Lo Wu Station.	Short circuited by screws on an insulated joint	Replaced the screws
24	10/09/04	5:59 am	A track circuit failed near Tai Po Market Station.	Track circuit shown false occupation	Repaired work done
25.	02/10/04	7:46 pm	A northbound train failed after departing Hung Hom station.	Air leakage from the isolating cock of the Driver Safety Device	The fault was cleared after isolating the Driver Safety Device
26	09/10/04	7:48 am	A train failed at Tai Wo Station due to door defect.	A lock nut of bracket on the door was dislocated	The lock nut was replaced and adjusted
27.	21/10/04	1:53 pm	Two point machines failed south of Tai Wai Station.	Point machine failure	The defective point machine module was replaced

	Date	Incident Time	Incident description	Cause of Incident/ Findings of investigation	Remedial action taken
28.	5/11/04	9:22 pm	A train failed at Sheung Shui Station. The defective train was hauled to the depot.	A contact of the Master Controller inside a driving cab failed	The defective contact was replaced
29.	30/11/04	8:29 pm	The driver misjudged the train speed to stop the train before the signal. As a result, the train was tripped to stop by the signalling system.	The Driver's error	The performance of the driver has been closely monitored
30.	11/12/04	11:09 am & 11:52 am	Track circuits failed intermittently and affected services at Lo Wu.	Defective Insulated Rail Joint	The Joint was replaced
31.	13/12/04	7:48 am	A train failed south of Mong Kok and was withdrawn at Mong Kok Station.	Train Borne equipment failure	A faulty card was replaced
32.	20/12/04	11:30 pm	An unknown object fell on the track and caused a train trip the overhead line at Kowloon Tong Station.	Unknown object fallen on the train	The fallen object was removed
33.	22/12/04	11:29 pm	A point south of Lo Wu Station failed.	A defective point relay was found	The defective point relay was replaced

## West Rail

	Date	Incident Time	Incident description	Cause of Incident/ Findings of investigation	Remedial actions taken
1.	3/01/04	5:45 am	Trackside signalling equipment failure south of Kam Sheung Road.	Intermittent faults of Axle Counter Heads	Re-adjusted the setting of Axle Counter Heads concerned
2.	4/01/04	8:03 pm	Loss of power supply to trackside signalling equipment between Tsuen Wan West and Kam Sheung Road.	Loss of 110v d.c. power supply	Portable diesel generator provided
3.	5/01/04	8:38 am	Point failure at Kam Sheung Road, down track.	Point failed to move	Reset power supply to the point machine
4.	2/02/04	5:30 pm	Trackside signalling equipment failure between Tsuen Wan West and Kam Sheung Road Stations.	Intermittent axle counter block disturbance due to wiring faults	Replaced faulty wires and system wide check of similar installations conducted
5.	6/02/04	8:24 am	Trackside signalling equipment failure between Tsuen Wan West and Kam Sheung Road, up track.	Intermittent axle counter block disturbance due to failure of CPU cards at trackside Axle Counter Head	Replaced defective CPU cards and system wide check of all Axle Counter Heads conducted
6.	9/02/04	1:44 pm	Trackside signalling equipment failure between Tsuen Wan West and Kam Sheung Road, up track.	Intermittent axle counter block disturbance due to cable fault at junction boxes	Re-fixed cable termination and conducted system wide check
7.	12/03/04	8:28 pm	Signalling failure between Yuen Long and Siu Hong.	Signal loop failure due to the failure of an electronic component	Replaced defective cards and enhanced protection to these cards
8.	26/04/04	5:45 am	Loss of power supply to signalling equipment at Nam Cheong.	Station power supply failure due to defective control cards in Uninterrupted Power Supply Unit	Replaced the defective cards
9.	21/05/04	6:09 am	Signalling failure between Tsuen Wan West and Mei Foo, down track.	Communication link between the central equipment and wayside equipment failed	Replaced the defective cable

	Date	Incident Time	Incident description	Cause of Incident/ Findings of investigation	Remedial action taken
10.	22/05/04	6:09 am	Signalling failure between Tsuen Wan West and Mei Foo, down track.	Communication link between the central equipment and wayside equipment failed	Replaced cable termination block. System wide check conducted
11.	16/6/04	12:12 am	Trainborne signalling equipment failure at Nam Cheong platform 2. The train then operated in manual mode in slow speed.	Trainborne signalling equipment failure	Reset trainborne signalling equipment by the driver. Software upgraded by signals contractor to enhance the reliability of trainborne signalling equipment
12.	17/06/04	4:36 pm	Trainborne signalling equipment failure at Mei Foo platform 1.	Trainborne signalling equipment failure	The train was withdrawn from service. Software upgraded by signals contractor to enhance the reliability of trainborne signalling equipment
13.	20/06/04	8:23 am	Point failure south of Kam Sheung Road, up track.	Point control equipment failure	Reset the power supply to the point concerned. Software upgraded by signals contractor to enhance the reliability of point control equipment
14.	27/7/04	4:36 pm	A train lost signalling communication with the central computer.	Intermittent faults on the train borne computer.	The train operator reset the computers on the train in accordance with procedures
15.	20/08/04	3:22 pm	Signalling failure between Siu Hong and Tuen Mun.	Communication problem at one of the signal inductive loops	The concerned component has been replaced. A system check has been completed end December 2004
16.	25/8/04	8:38 pm	Train brake failure and detrainment inside Tai Lam Tunnel. Service was maintained throughout the incident by using the northbound track between Tsuen Wan and Mei Foo for both Nam Cheong-bound and Tuen Mun-bound trains.	The incident was caused by a brake loop cable short-circuiting due to contact with earth, resulting in the application of the emergency brake and the inability to release the brake in order for the train to resume normal operations	A fleet check was conducted. Insulation tests were also carried out to ensure the insulation integrity of critical wires and to improve the protection of the wires

	Date	Incident Time	Incident description	Cause of Incident/ Findings of investigation	Remedial action taken
17.	04/09/04	7:25 am	Signalling failure between Siu Hong and Tuen Mun Stations.	The incident was a result of poor earthing	A system-wide check on all earthing connections to signalling equipment has been conducted
18.	08/09/04	11:07 am	An axle counter problem inside Tai Lam Tunnel.	A controller card inside a trackside Axle Counter failed	Defective controller card replaced
19.	04/10/04	7:22 pm	Point machine failure at Tuen Mun Station.	Point machine failure caused by hardware fault	Faulty component inside the point machine replaced
20.	16/10/04	7:36 am	Due to a train failure, a Tuen Mun bound train had to detrain passengers at Tsuen Wan West Station.	Train-borne signalling equipment fault	Defective tachometer replaced
21.	21/10/04	6:27 pm	Point machine failure at Tuen Mun Station.	Failure caused by a faulty relay	Faulty relay replaced
22.	27/10/04	10:19 am	A train failed to receive a proceed signal at the northbound tracks inside Tai Lam Tunnel. The train was required to operate in manual mode when passing along that section of the tracks.	Trackside signalling equipment fault	Software upgraded by signals contractor to enhance the reliability of point control equipment
23.	07/11/04	3:54 pm	Point machine failure at Kam Sheung Road station. Trains were required to operate in manual mode when passing along the affected section of track.	Failure caused by a faulty relay	Faulty component replaced
24.	8/11/04	4:36 pm	Train-borne signalling equipment of a Tuen Mun bound train failed.	The train-borne signalling equipment lost communication with the central computer.	Faulty equipment rebooted to resume normal operations

## Light Rail

	Date	Incident Time	Incident description	Cause of Incident/ Findings of investigation	Remedial actions taken
1.	02/01/04	7:34 pm	A light rail vehicle hit a bicycle at Ming Kum stop.	Careless driving of the cyclist	KCRC organises a road safety campaign every year with the latest campaign held in December 2004. A new Announcement of Public Interest will be produced and broadcast
2.	02/02/04	12:03 pm	A light rail vehicle hit a bicycle at junction Tai Fong Street and Leung Choi Lane.	Careless driving of the cyclist	KCRC organises a road safety campaign every year with the latest campaign held in December 2004. A new Announcement of Public Interest will be produced and broadcast
3.	07/02/04	6:34 pm	A private car intruded onto ballast track at junction Tin Shui Road and Tin Wing Road.	Careless driving of the private car driver who ignored the traffic signs	KCRC organises a road safety campaign every year with the latest campaign held in December 2004. A new Announcement of Public Interest will be produced and broadcast.
4.	07/02/04	8:16 pm	A private car intruded onto ballast track at junction Castle Peak Road and Hung Tin Road.	Careless driving of the private car driver who ignored the traffic signs.	KCRC organises a road safety campaign every year with the latest campaign held in December 2004. A new Announcement of Public Interest will be produced and broadcast
5.	22/02/04	5:57 pm	Passage blocked by road traffic accident at junction Castle Peak Road and Ma Miu Road.	Blocked by road traffic accident	
6.	06/03/04	10:20 am	Passage blocked by road traffic accident at junction Tsun Wen Road and Tsing Lun Road.	Blocked by road traffic accident	
7.	02/04/04	7:38 am	A light rail vehicle without forward movement at Tai Tong Road stop.	The incident was caused by bad contact of the power supply control relay	The defective relay was replaced immediately. A fleet replacement was conducted
8.	13/04/04	11:14 pm	Person lying on track at Shui Pin Wai stop.	Person lying on track	

	Date	Incident Time	Incident description	Cause of Incident/ Findings of investigation	Remedial actions taken
9.	16/04/04	5:35 am	A Light rail vehicle derailed at Tin Wing stop.	Improper installation of external check rail after maintenance	KCRC conducted a comprehensive review on the design, installation and maintenance of external check rail assemblies
10.	29/05/04	12:40 pm	A light rail vehicle hit a pedestrian at pedestrian crossing of Ming Kum stop.	Carelessness of the pedestrian	KCRC organises a road safety campaign every year with the latest campaign held in December 2004. A new Announcement of Public Interest will be produced and broadcast
11.	04/06/04	1:48 pm	A light rail vehicle hit a private car near Ping Hong Villas.	Careless driving of the private car driver who ignored the red traffic light	KCRC organises a road safety campaign every year with the latest campaign held in December 2004. A new Announcement of Public Interest will be produced and broadcast
12.	07/06/04	3:07 pm	A light rail vehicle hit a taxi near Tin Shui Bus Terminus.	Careless driving of the taxi driver who ignored the red traffic light	KCRC organises a road safety campaign every year with the latest campaign held in December 2004. A new Announcement of Public Interest will be produced and broadcast
13.	20/06/04	8:03 am	Point failure at Tin Wing stop.	Point failure	The point was fixed immediately. A comprehensive check was conducted afterwards
14.	20/06/04	9:43 am	A taxi hit a pedestrian at junction Tsun Wen Road and Tsing Lun Road blocking light rail traffic.	Blocked by road traffic accident	
15.	28/06/04	3:29 pm	Point failure at Tin Wing stop.	Point failure	The point was fixed immediately. A comprehensive check was conducted afterwards
16.	30/06/04	12:39 pm	Power supply to point indicators at junction Ming Kum Road, Tin King Road and Tsing Tin Road was lost.	Point indicators power supply problem	KCRC arranged repairing work promptly and hand signal man to control traffic



	Date	Incident Time	Incident description	Cause of Incident/ Findings of investigation	Remedial actions taken
17.	30/06/04	3:38 pm	The Bay management system, a system to decide which light rail vehicles stabling at which platform, at Yuen Long Terminus was failed.	The incident was caused by the failure of the Bay management system.	The bay allocation control of the Bay Management system was fixed immediately. A comprehensive check was conducted afterwards
18.	07/07/04	6:00 pm	The overhead line was entangled with an object at Kin Sang stop.	A piece of cloth got entangled with the contact wire of an overhead line equipment. As a result, light rail vehicles could not pass through	The piece of cloth was removed promptly
19.	23/07/04	11:13 am	A light rail vehicle collided with a light goods vehicle near Tin Shui Bus Terminus.	Careless driving of the Light Goods Vehicle driver who did not obey the red traffic light	KCRC organises a road safety campaign every year with the latest campaign held in December 2004. A new Announcement of Public Interest will be produced and broadcast
20.	28/07/04	10:41 am	A light rail vehicle could not move forward at Tin Wing stop.	The incident was caused by bad contact of the power supply control relays	The relays were replaced immediately. A fleet check was conducted
21.	21/08/04	4:32 pm	A light rail vehicle sustained power fault at Siu Hong Stop. Train service between Siu Hong Stop and Tuen Mun Ferry Pier was delayed.	The train-borne power supply cable was damaged	The damaged cable was replaced and a fleet check carried out
22.	10/09/04	6:37 am	A light rail vehicle derailed at junction Tin Shui Road and Tin Wing Road. Routes 706, 751 and 761 were affected. Northbound service at Chung Fu and Tin Fu was affected.	A wheel tyre was broken when crossing a junction, resulting in derailment of the second bogie of the coupled set of Light Rail vehicles  Non-conformance with the production standards was found on the broken wheel tyre and admitted by the manufacturer	A fleet check was carried out. Additional ultrasonic flaw inspections and hammering tests are being conducted

	Date	Incident Time	Incident description	Cause of Incident/ Findings of investigation	Remedial actions taken
23.	17/11/04	1:14 pm & 3:45 pm	A point machine failed intermittently near Tin Yat Stop in Tin Shui Wai.	Point machine failure	The defective point machine was repaired
24.	17/11/04	3:08 pm	Services were affected when a door of a light rail vehicle did not close properly.	The door circuitry fault	The faulty component was replaced accordingly
25.	24/11/04	7:28 pm	A light rail vehicle failed to release the brake.	The diode of the Car Control Unit failed	The diode was replaced
26.	06/12/04	9:34 am	Two light rail vehicles had a tail-on collision at Ping Shan stop.	The driver misjudged the braking distance	The driving skills of all LRV drivers with less than one year experience were checked and monitored to ensure their driving skill were up to standard
27.	23/12/04	10:52 pm	A light rail vehicle hit a taxi at junction near Grandeur Terrace. Routes 761 and 705 were affected.	Careless driving of the taxi driver who did not obey the traffic light	KCRC organises a road safety campaign every year with the latest campaign held in December 2004. A new Announcement of Public Interest will be produced and broadcast
28.	28/12/04	12:10pm	A light rail vehicle applied emergency brake to avoid a possible collision with a bicycle at a junction.	Careless driving of the cyclist	KCRC organises a road safety campaign every year with the latest campaign held in December 2004. A new Announcement of Public Interest will be produced and broadcast
29.	30/12/04	6:23am	The signalling equipment of a light rail vehicle failed.	Train-borne signalling equipment failure	The defective signalling equipment was replaced

KCRC

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## Comparison of TKL with other Urban Lines

### 1. Service Level Agreement and In-house Requirements

The performance requirements of the contractor in maintaining the systems/equipment are clearly defined in the contract documents. These performance requirements are the same as those for works carried out by MTRCL in-house staff. An example of this requirement is the 'car km per 5-minute delay incident', which is set at 500,000 and is the same for all lines.

### 2. Performance Compared with Other Lines

In order to understand the performance of the outsourcing contractors in comparison with that of the MTRCL in-house staff, a comparison of the reliability of the systems in different lines is conducted. The performance of TKL is compared with that of the other Urban Lines, i.e. Island Line (ISL), Tsuen Wan Line (TWL) and Kwun Tong Line (KTL). As the systems and operation mode of the Tung Chung and Airport Railways are different from those of the Urban Lines, it is not included in this comparison exercise.

The following table shows the total number of delays of 5 minutes or more caused by the equipment failures of the trains in different lines from Aug 2002 (when TKL commissioned and the contractor, United Goninan assumed maintenance of TKL trains) to Dec 2004.

Aug 2002 – Dec 2004	TKL	ISL	TWL	KTL	
				M-train	K-train
Train equipment	23	40	48	21	44
Train-borne signalling	13	15	34	25	281
Total	36	55	82	46	325

TKL: Tseung Kwan O Line; ISL: Island Line; TWL: Tsuen Wan Line; KTL: Kwun Tong Line

It can be observed that the number of incidents caused by the equipment of rolling stock including train-borne signalling equipment for TKL is the smallest when compared to all other lines since the contractor has taken over maintenance of TKL rolling stock.

The following table also shows the reliability of TKL rolling stock as compared with other Urban Lines.

Aug 2002 – Dec 2004	TKL	ISL	TWL	KTL
Car km per incident	1,058,700	930,718	840,657	876,328

TKL: Tseung Kwan O Line; ISL: Island Line; TWL: Tsuen Wan Line; KTL: Kwun Tong Line

The average reliability of the TKL trains is higher than that of other Urban Lines.

The following table compares the total of delays of 5 minutes or more caused by the failure of TKL infrastructure equipment maintained by contractor since July 2003 with those of other Urban Lines in the same period.

No. of 5-minute delay (Trackside Signalling + Traction + Permanent Way)	TKL		ISL		TWL		KTL	
	2003 Jul-Dec	2004	2003 Jul-Dec	2004	2003 Jul-Dec	2004	2003 Jul-Dec	2004
	14	10	0	6	4	10	6	12

TKL: Tseung Kwan O Line; ISL: Island Line; TWL: Tsuen Wan Line; KTL: Kwun Tong Line

It can be seen that upon completion of majority of the remaining new systems teething problems in year 2003, the performance of TKL in 2004 as reflected by the actual number of 5-minute delay incident is comparable with those of other Urban Lines.

### 3. Spate of Incident in latter half of 2004

While it can be seen from the above comparison that the incidents caused by equipment failures of TKL are less or comparable to those of other lines in past years, in order to further evaluate as to whether there is any relationship between the MTRCL's outsourcing arrangement and the spate of incidents occurred in latter half of 2004, the incidents from July to December 2004 are studied in more details. The following table shows the number of 5-minute incidents caused by equipment failure in the 2<sup>nd</sup> half of 2004 in different lines:

	TKL	ISL	TWL	KTL
Jul	1	2	2	8
Aug	2	4	4	6
Sep	2	0	3	7
Oct	5	2	2	8
Nov	2	2	3	7
Dec	0	3	1	3

TKL: Tseung Kwan O Line; ISL: Island Line; TWL: Tsuen Wan Line; KTL: Kwun Tong Line

It is noted that the number of incidents caused by equipment failure in TKL in the 2<sup>nd</sup> half of 2004 is low when compared with other MTR lines.

#### 4. KPI (Punctuality, Availability, PJOT)

Apart from comparing the incidents figures, a comparison of the train service performance among different Urban Lines shall also reflect the reliability of the systems.

The following table shows the key performance indicators of train services in different Urban Lines.

PR	Year	TKL	ISL	TWL	KTL
Train Service Delivery	2002	99.9%	99.9%	99.8%	99.7%
	2003	99.9%	99.9%	99.8%	99.8%
	2004	99.9%	99.9%	99.8%	99.8%
Train Punctuality	2002	99.9%	99.5%	99.1%	99.2%
	2003	99.9%	99.5%	99.5%	99.7%
	2004	99.9%	99.8%	99.5%	99.5%
Passenger Journeys On Time	2002	99.9%	99.9%	99.8%	99.8%
	2003	99.9%	99.9%	99.9%	99.9%
	2004	99.9%	99.9%	99.9%	99.9%

It is noted that the performance of TKL as reflected by the above three indicators are comparable or even higher than those of other Urban Lines.

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## **KCRC's Safety Audit and Maintenance System**

### **Safety audit system**

Kowloon-Canton Railway Corporation (KCRC) adopts a hazard management method to proactively and systematically manage the safety of assets, systems, people and the environment. The Corporation regularly conducts quality audits, risk assessments and statutory safety audits. KCRC's safety management is overseen by its senior management, which closely monitors all safety-related procedures.

2. KCRC has joined the Rail Safety Audit Program of the American Public Transportation Association (APTA). The programme features an in-depth safety audit conducted in a three-year cycle by independent experts. In August 2004, railway safety experts from APTA carried out the first stage of the audit programme on KCRC's safety and security management systems. They confirmed that KCRC had adequate safety and security management system and practices in place, as well as a sound system of command and control over safety critical procedures and practices.

3. APTA will conduct a full-scale safety audit in March 2005. Members of the audit team will consist APTA railway safety auditors as well as senior executives from railway systems in Toronto, Florida and Washington. They will jointly audit and review KCRC's safety and security management system, safety culture, operational rules and procedures, accident investigation, training, equipment maintenance and repair, security efforts and station operations.

4. APTA's final report will be submitted to KCRC's high-level Safety Management Committee, which will examine APTA's recommendations in detail and work out a timetable for implementation.

### **Maintenance system**

5. KCRC has established a comprehensive inspection and maintenance system based on modern maintenance strategies, which ensures that the safety and reliability of its railway systems are maintained at a high level.

6. KCRC's comprehensive inspection and maintenance regime is in line with international standards. Its maintenance strategies include preventive maintenance and reliability-centred maintenance. KCRC has also set up an ISO accredited quality

management system, which is audited by external auditors every year to ensure the quality of maintenance works. The Corporation has also laid down an inspection and maintenance timetable for every unit or component, covering tracks, overhead lines, signalling and communication systems, rolling stocks, station facilities and others.

7. The above-mentioned repair and maintenance system, together with well-planned asset replacement programmes, ensures all equipment is replaced before it ages or wears out such that a high level of safety, reliability, service delivery, durability and productivity could be maintained.

8. The Corporation constantly reviews and improves its maintenance system, including the scope and frequency of maintenance, to further enhance the safety and reliability of railway systems.

### **Maintenance expenditure and staffing level**

9. Over the past few years, the number of staff involved in maintenance works has increased steadily. With the commissioning of West Rail, the Tsim Sha Tsui Extension and the Ma On Shan Rail, the number of maintenance staff has been on the rise. The current number of maintenance staff is 1,798, representing an increase of 30% from 1,387 in 2000.

10. Regarding maintenance expenditure, KCRC spent a total of \$7,920 million during 2000-2004 on maintenance, asset renewal and replacement, and upgrading of railway systems. KCRC's forecast expenditure for 2005 in this area is \$1,740 million.

### **Outsourcing**

11. KCRC's daily maintenance of trains and infrastructure is carried out by qualified and experienced in-house staff. Manpower for maintenance is planned according to the workload required. KCRC points out that safety and reliability have not been compromised for the sake of manpower or maintenance costs savings. At present, only non-safety critical and general engineering tasks unrelated to railway systems such as lift, escalator, lighting and building maintenance are outsourced. The Corporation has established professional guidelines to govern these outsourced works to ensure the highest standard.