

Legislative Council Panel on Transport

Railway Incidents and MTR Service Performance

Purpose

This paper provides information on recent train service disruptions and overall MTR service performance.

Recent MTR Incidents & Recovery

2. In recent weeks, there have been a number of incidents in the MTR system that caused concerns and inconvenience to passengers. **Annex I** provides a summary of railway incidents from July to mid October 2004, which have caused delays of 8 minutes or above, together with the corresponding remedial actions. Incidents causing delay of less than 8 minutes but have attracted media attention have also been included.

3. Each and every incident is thoroughly investigated to identify the root causes. On top of the remedial actions, findings will be used for the enrichment of staff training programme and for improvement. In addition, the Corporation has established a high-level internal task force led by the Deputy Operations Director to review the recent series of the events in its totality.

4. It is important to emphasize that at no time was passenger safety ever compromised.

5. The Corporation is fully aware of and understands the concerns of passengers, especially in incidents where smoke and noise were generated. We have decided that, in addition to our internal investigations and reviews, an independent third party review should be carried out on MTR performance, conditions of service critical assets and the adequacy of our maintenance

regime. If weaknesses and shortcomings are identified, the Corporation will correct them and put in place improvements.

6. Lloyd's Register Rail, an independent verification agency which reviews safety, risk, system performance and asset management services for international railways with extensive experience in Europe and Asia, has been appointed. The independent review will cover the following areas:

- To examine MTR's current asset management systems
- To examine the current signaling and train maintenance processes
- To examine MTR's current performance with both historical and international comparisons as appropriate
- To review recent incidents
- To identify any weakness in the MTR asset management systems and to identify areas where enhancement can be effectively implemented

7. Lloyd's will commence the study immediately and the review will take three months to complete. Lloyd's will work closely with the Hong Kong Government's Inspector of Railways throughout the process.

Service Performance and International Benchmarking

8. Over the years, the MTR has maintained a very high standard of service, setting and achieving high customer service performance targets.

9. In the first nine months of 2004, MTR maintained a Train Service Delivery performance of 99.8% to 99.9%, exceeding our customer service pledge of 99.5%. Passenger

Journeys On Time was maintained at 99.9% which also exceeds our pledge of 99.5%. In terms of train reliability, the number of train car-kilometers operated before there is a train failure causing a delay of 5 minutes or more is 1,033,959 car-kilometers. This is compared to the customer service pledge of 500,000 car-kilometers.

10. As a measure for the Corporation to seek further improvements with the available railway management technology and engineering development, an annual international benchmarking study exercise with nine other heavy metros in major cities around the world (Community of Metros "CoMET") is conducted. The average performance of train service delivery with passenger journeys completed within five minutes of the normal schedule of all these metro systems in 2003 was 98% whilst MTR is one of the top performers achieving 99.8%.

11. Railway operations is the result of a large number of systems comprising millions of different components working together. It should be recognized that at times, delays may occur. It means that out of the approximately 3,000 train journeys that the MTR operates each day, there are one to two cases where trains may arrive at their terminal stations five minutes or more later than schedule.

12. But the fact that the primary focus of the Corporation and all of its staff is to seek continuous improvements in the service we provide.

13. To minimize the impact of any delays, detailed incident handling and proper service recovery procedures are a requirement in railway operations to ensure that safety is not compromised and the inconvenience caused to passengers is kept to a minimum.

14. MTR service performance for the last three months of 2004 and average performance for the past three years are summarized in Annex II.

Safety Performance

15. Safety is a key point of consideration in the design of the railway, the establishment of operation procedures and in the training provided to railway staff.

16. MTR is designed to the fail-safe principle, in which, each system and each piece of equipment are designed to minimize risk. Trains would be brought to a safe halt immediately if an essential component or system fault is detected. The safety of passengers will not be jeopardized even if an incident occurs due to a component or device failure.

17. Safety performance of MTR operations has been maintained at a high level over the years. The rate of passenger accidents has been on a downward trend, with the number of incidents decreasing from 0.89 cases per million journeys in 2001 to 0.82 cases per million journeys in 2004 and the majority of these cases involve escalators incidents. The safety performance for the last three years and the first nine months of 2004 are summarized in **Annex III**.

18. No less than once every three years, a panel of independent experts are invited to conduct safety audits including assessment on the MTR-specific safety management system, strategic safety reviews with the management at all levels and contractor safety audits. They are complemented by ad hoc audits which focus on particular safe systems or activities for in-depth evaluation. Around 200 audits are conducted annually. Contingency plans are in place for incident handling and recovery across all stations and systems.

19. Safety training is provided to ensure all staff members are trained and equipped to work safely and react appropriately to any emergency situation. At least six joint exercises are conducted with the emergency services including Fire Services Department and Hong Kong Police Force each year, to ensure effective handling of emergencies and efficient recovery of railway operations.

20. A high level of safety awareness among passengers on railway is also crucial in the delivery of a safe railway service. Safety promotion activities are held every year and safety messages are delivered through a variety of channels. Safety promotion activities for members of the public held in 2004 include demonstration of safety equipment, publication of new safety booklet, launch of web game on MTR safety, production of new safety videos, organization of Safety Carnival, etc.

Maintenance and Asset Management

21. An asset management system is in place to maintain the safety and quality of MTR services. A Risk Based Approach is adopted, using risk determination to balance performance, customer service and efficiency against an evaluation of the various risks involved. Within the asset management system established, Technical Audits are conducted regularly to verify that the full capability of assets are maintained or enhanced to meet business requirement over the longer term.

22. MTR's maintenance regime is underpinned by three principal philosophies and approaches:

- Preventive Maintenance - regular procedures established to prevent deterioration or breakdown;
- Condition Based Maintenance - monitoring performance and maintaining the equipment. The intent is that components are changed before they fail; and
- Reliability Centred Maintenance - managing maintenance frequency and content with the objective of avoiding failures, to achieve high levels of reliability and availability of service.

23. Life cycle analysis is used to plan maintenance and asset renewal requirements. There is a plan for every asset which specifies the maintenance process that it will undergo. The maintenance process is programmed,

scheduled, documented and recorded. A Management Information System keeps track of all activities, and the analysis of trends focuses attention on any residual maintenance issues. Different components are replaced and renewed according to the condition, maintenance and replacement programme. External experts are engaged to review our asset management practice regularly to confirm the robustness of the programme.

24. A comprehensive Quality Management System (QMS) certified to ISO 9001:2000 is used with a three level documented scheme of control. This QMS is the foundation for further improvements in maintenance management on an ongoing basis.

25. On average, HK\$2 billion is spent a year on maintaining, renewing and modernizing railway assets including equipment, systems, structure, tracks and trains in order to maintain system efficiency and provide better quality service. Capital Improvement Works and Maintenance Expenditures in recent years are summarized in Annex IV - a.

26. Major upgrading projects continue to be carried out in railway signaling, train, and station systems. Proven new engineering technology are introduced to improve the quality of service as well as boost productivity. For example, automatic cleaning robot arms have taken over the labour intensive manual cleaning of train bogies; work process improvement in train and infrastructure maintenance; Trains with motor alternator are replaced with static inverter to achieve high reliabilities, etc

27. Annex IV - b provides a summary of major improvement projects and productivity improvement works in the last few years.

28. While the total manpower strength of the MTR maintenance team has been maintained at about the same level over the last few years, productivity gain achieved through the introduction of new technology, asset renewal programme and streamlined work procedures means we

actually have more human resources available to concentrate on the more important safety and reliability related tasks and move our maintenance staff up the value chain. (Annex IV - c).

Outsourcing

29. Outsourcing has been a part of MTR operations since the railway commenced service in 1979. Outsourcing is beneficial when the contractor has specialized expertise, and performs the same and similar processes for multiple customers. Synergy, cost saving, efficiency enhancement and a reduction in overheads can be achieved through outsourcing certain types of work.

30. The outsourcing and tendering process of maintenance follows the high internal standards to ensure no compromise to quality compared to MTR in-house work. Contractors must satisfy the requirement of pre-qualification which proves their technical competency and financial adequacy. Technical analysis will then be used to review and assess the submission of tenderers. In addition, cost and benefit analysis, and the risk analysis will be carried out to ensure the competency of contractors.

31. Whether the maintenance is carried out by MTR staff or contractors, the requirements and standards are the same. Monitoring and supervision of work quality is carried out by MTR staff. Contractor staff are assessed and certified to ensure they are equipped with the adequate skills and techniques in maintaining MTR trains and systems.

32. In the MTR system, station cleaning services, maintenance works for station lifts and escalators, platform screen doors, fire services equipment, gondola and gantries, and other building service equipments, trains in Tseung Kwan O depot, etc. are outsourced to competent contractors. Their job and performance are under close supervision of the Corporation with regular reports, on-site supervision and spot checks.

Conclusion

33. The Corporation has always adopted a factual, honest and proactive approach to improving its railway service. It will continue to seek further improvement with available railway management technology and engineering development. MTR is committed to operating a safe, reliable and efficient mass transit service and we are determined to continue providing the people of Hong Kong with one of the world's best metro railroad networks.

MTR Corporation
October 2004

Summary of MTR Incidents from July to mid-October 2004
(Incidents causing 8 minutes delay)

	Date	Incident Time	Railway Line Affected	Cause of Incident / Findings of Investigation	Remedial actions taken	Degree of Service Disruption		
						i) Incident Duration (min.)	ii) Extension of Journey Time (min.)	iii) Extension of Headway (min.)
1.	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 a 19-minute delay to service.</p> <p>Preliminary investigations revealed that the train had an electrical fault causing a short circuit.</p>	<p>1,500 passengers on board were arranged to alight the train. Normal service resumed at 8:35 am when the defective train was removed from the running line.</p> <p>Further investigation to be conducted.</p>	19'	Nil	-
2.	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>Train service was not affected.</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>	8'	Nil	No
3.	8 Oct	7:06 pm	Kwun Tong Line	<p>A train was suddenly tripped to stop when entering Kowloon Bay</p>	<p>The power rack of the trainborne computer was</p>	6'	Nil	-

	Date	Incident Time	Railway Line Affected	Cause of Incident / Findings of Investigation	Remedial actions taken	Degree of Service Disruption		
						i) Incident Duration (min.)	ii) Extension of Journey Time (min.)	iii) Extension of Headway (min.)
				<p>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 computer sustained a transient fault but could be reset.</p>	replaced.			
4.	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.	16'	Nil	-
5.	7 Oct	7:30 am	Island Line	<p>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.</p> <p>The rubber seal on the middle part of the incident train door was found displaced.</p>	All passengers were arranged to alight from the train and were carried by the following train to continue their journey.	8'	Nil	-
6.	1 Oct	7:51 pm	Airport Express Line	A train was tripped to stop at Kap Shui Mun Bridge due to wheel slip/slide during heavy rain.	Monitor the occurrence of wheel slip/slide on wet track during rainy weather.	18'	Nil	-

	Date	Incident Time	Railway Line Affected	Cause of Incident / Findings of Investigation	Remedial actions taken	Degree of Service Disruption		
						i) Incident Duration (min.)	ii) Extension of Journey Time (min.)	iii) Extension of Headway (min.)
				<p>It continued to run at reduced speed of 22-40 kilometres per hour to Tsing Yi Station where it was taken out of service.</p> <p>Investigation revealed that the wheel slip/slide was caused by wet track during heavy rain. A thunderstorm warning was issued at the time of the incident.</p>				
7.	29 Sep	7:00 pm	Airport Express Line	<p>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. Train service was not affected.</p> <p>Investigation revealed that the signalling antenna was defective.</p>	The defective antenna was replaced.	28'	Nil	-
8.	29 Sep	4:52 pm	Tung Chung Line	<p>A train was taken out of service at Hong Kong Station because of air leakage from the pneumatic system. Train service was not affected.</p>	The defective elbow fitting was replaced.	8'	Nil	No

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						i) Incident Duration (min.)	ii) Extension of Journey Time (min.)	iii) Extension of Headway (min.)
				Investigation revealed that the air dryer elbow fitting sleeve loosened.				
9.	21 Sep	6:32 pm	Tsuen Wan Line	<p>The failure of a point on the Tsuen Wan Line at Mongkok Station resulted in trains having to drive at reduced speed of 22 kilometres per hour through the section. Train journey from Mongkok 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 signaling 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.	28'	2'	4.5'

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						i) Incident Duration (min.)	ii) Extension of Journey Time (min.)	iii) Extension of Headway (min.)
10.	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.</p>	17'	Nil	-
11.	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 fault was rectified within 10 minutes. The affected train arrived at Hong Kong with an increase in journey time of 9 minutes.</p> <p>An electronic card in the Signal</p>	<p>Technical investigation has identified the root cause to be attributable to a defective fuse on the electronic card failure.</p>	10'	6'	No

	Date	Incident Time	Railway Line Affected	Cause of Incident / Findings of Investigation	Remedial actions taken	Degree of Service Disruption		
						i) Incident Duration (min.)	ii) Extension of Journey Time (min.)	iii) Extension of Headway (min.)
				Equipment Room was defective. The fault was fixed after the card was replaced and normal train service resumed at 9:10 am.				
12.	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.	13'	Nil	-
13.	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.	11'	Nil	-
14.	7 Sep	7:00 am	Tung Chung Line	<p>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.</p> <p>Investigation found that the train's signalling antenna assembly was faulty.</p>	The faulty antenna assembly was replaced.	28'	Nil	-

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						i) Incident Duration (min.)	ii) Extension of Journey Time (min.)	iii) Extension of Headway (min.)
15.	6 Sep	5:04 pm	Airport Express Line	<p>A train was tripped to stop at Tsing Ma Bridge and could only run at reduced speed of 22 kilometres per hour to Tsing Yi Station where it was taken out of service.</p> <p>Investigation revealed that the trainborne computer was faulty.</p>	The defective electronic cards of the trainborne computer were replaced.	20'	Nil	-
16.	4 Sep	6:34 am	Kwun Tong Line	A train was taken out of service at Lam Tin Station because it sustained trainborne 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 computer was replaced.	10'	Nil	-
17.	31 Aug	9:16 am	Kwun Tong Line	<p>Power supply circuit tripped at 9:16 am, affecting train service between Diamond Hill and Kowloon Bay Stations for 10 minutes.</p> <p>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.</p>	<p>Temporary repairs restored power, allowing normal train service to resume within 10 minutes.</p> <p>The relay was replaced after the end of normal train service that night.</p>	10'	Nil	-
18.	29 Aug	11:58 am	Kwun Tong Line	A boy spotted by a train operator walking on the tracks heading towards his train from Kowloon	Monitoring of platforms enhanced	16'	Nil	-

	Date	Incident Time	Railway Line Affected	Cause of Incident / Findings of Investigation	Remedial actions taken	Degree of Service Disruption		
						i) Incident Duration (min.)	ii) Extension of Journey Time (min.)	iii) Extension of Headway (min.)
				<p>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</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	Degree of Service Disruption		
						i) Incident Duration (min.)	ii) Extension of Journey Time (min.)	iii) Extension of Headway (min.)
				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.				
19.	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.	19'	Nil	NA
20.	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.	9'	Nil	-
21.	26 Aug	5:48 pm	Airport Express Line	An Airport Express train heading to Hong Kong Station stalled near Lai King Station. 150 passengers	Immediately conducted a fleet check of all antenna assemblies	69'	7'	15' - 20'

	Date	Incident Time	Railway Line Affected	Cause of Incident / Findings of Investigation	Remedial actions taken	Degree of Service Disruption		
						i) Incident Duration (min.)	ii) Extension of Journey Time (min.)	iii) Extension of Headway (min.)
				<p>on board were transferred to another train to continue their journey to Kowloon Station and Hong Kong Station.</p> <p>During the incident, Airport Express service was adjusted to a 15 to 20-minute headway. After an additional train was put into service, the train service resumed to the normal 12-minute frequency at 8: 00 pm. Train service for the Tung Chung Line was not affected.</p> <p>An antenna assembly from the preceding train dropped onto the track. This in turn damaged the antenna on the incident train and the train was brought to a stop. This is a feature of the fail-safe Automatic Train Control System.</p>	Enhanced inspection on fixings of antennae			
22	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.	8'	Nil	-

	Date	Incident Time	Railway Line Affected	Cause of Incident / Findings of Investigation	Remedial actions taken	Degree of Service Disruption		
						i) Incident Duration (min.)	ii) Extension of Journey Time (min.)	iii) Extension of Headway (min.)
23.	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. As a result, journey time was extended for 5 minutes.</p> <p>Investigation revealed that a faulty repeater relay caused the signalling failure.</p>	The faulty repeater relay was replaced.	48'	5'	No
24.	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. Investigation revealed that a fuse for the power supply to the brake decode was blown.</p>	The blown fuse was replaced.	7'	Nil	-
25.	28 Jul	7:58 am	Kwun Tong Line	<p>A train was taken out of service at Choi Hung Station due to door control failure.</p> <p>Investigation revealed that the door control push button failed.</p>	The defective door control push button was replaced.	5'	Nil	-

	Date	Incident Time	Railway Line Affected	Cause of Incident / Findings of Investigation	Remedial actions taken	Degree of Service Disruption		
						i) Incident Duration (min.)	ii) Extension of Journey Time (min.)	iii) Extension of Headway (min.)
26.	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.	204'	Nil	3'
27.	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.	Messages to be included in passenger education programme.	5'	Nil	-

	Date	Incident Time	Railway Line Affected	Cause of Incident / Findings of Investigation	Remedial actions taken	Degree of Service Disruption		
						i) Incident Duration (min.)	ii) Extension of Journey Time (min.)	iii) Extension of Headway (min.)
				The door concerned was blocked from closing by an unknown passenger.				
28.	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.	12'	Nil	-
29.	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.	7'	Nil	-
30.	8 Jul	4:08 pm	Airport Express Line	A speed sensor alarm was prompt to the train operator when the train was running in the midway from Airport Station to Tsing Yi Station where it was withdrawn from service for further	The defective speed sensor was replaced.	9'	Nil	No

	Date	Incident Time	Railway Line Affected	Cause of Incident / Findings of Investigation	Remedial actions taken	Degree of Service Disruption		
						i) Incident Duration (min.)	ii) Extension of Journey Time (min.)	iii) Extension of Headway (min.)
				inspection. It was found that the fault alarm was caused by a sudden defect of the speed sensor.				
31.	6 Jul	10:44 pm	Tseung Kwan O Line	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. Investigation found the coded odometer faulty.	The faulty odometer was replaced.	12'	Nil	No
32.	5 Jul	11:15 am	Airport Express Line	An Airport bound train was withdrawn from service at Hong Kong Station because a train door could not be fully closed when controlling all doors to close.	Fleet replacement of a more durable type of cable in the overhaul starting from 2004.	5'	Nil	No

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						i) Incident Duration (min.)	ii) Extension of Journey Time (min.)	iii) Extension of Headway (min.)
				A door motor power cable of the door concerned was found damaged.				
33.	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.	24'	2'	No

Summary of MTR Incidents from July to mid-October 2004
(Incidents causing less than 8 minutes delay but have attracted media attention)

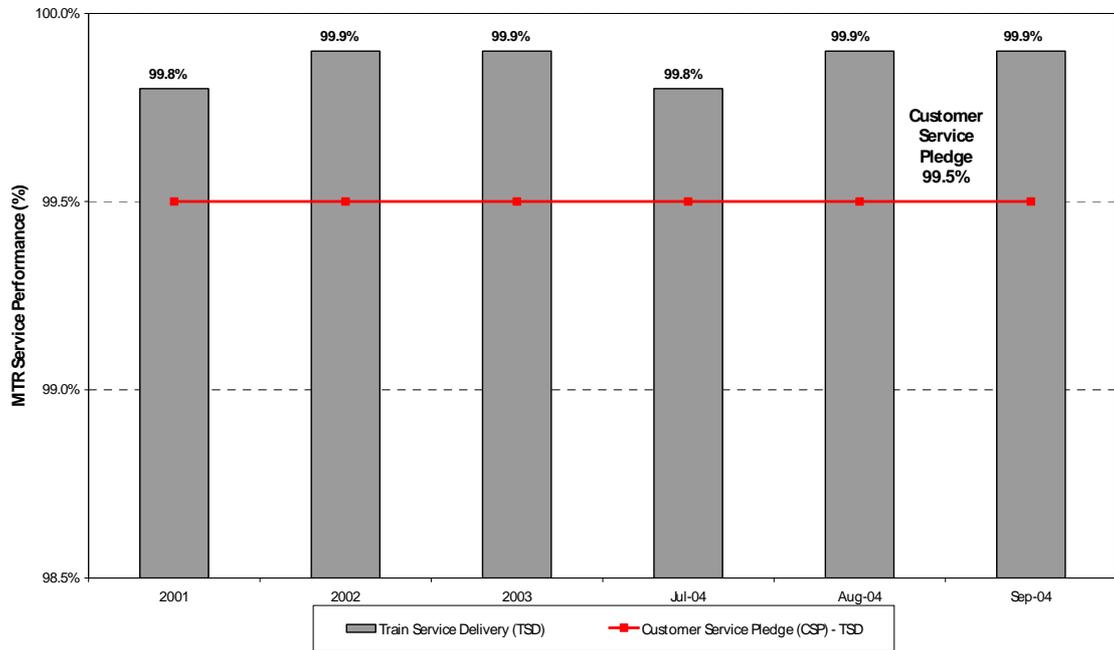
	Date	Incident Time	Railway Line Affected	Cause of Incident / Findings of Investigation	Remedial actions taken	Degree of Service Disruption		
						i) Incident Duration (min.)	ii) Extension of Journey Time (min.)	iii) Extension of Headway (min.)
1	16 Oct	1:23 pm	Island Line	Track circuit failure at Sheung Wan affected the train service between Admiralty and Sheung Wan Stations. Investigation found that a signalling electronic card was defective.	The defective electronic card was replaced	35'	4'	4'-7'
2	15 Oct	6:30 pm	Kwun Tong Line	Trains from Prince Edward to Shek Kip Mei did not receive line speed and had to run at reduced speed of 22 kilometres per hour over the affected section. Normal line speed was available after resetting the trackside equipment at 6:52 pm. Investigation revealed that the failure was caused by a signalling transmission loop cable fault.	The faulty signalling transmission loop cable was fixed after close of traffic.	22'	2'	3'
3	11 Oct	11:37 am	Tseung Kwan O Line	A traction current fault between North Point and Yau Tong Stations resulted in a 4-minute delay to train service.	Traction current was restored in 4 minutes.	4'	Nil	-

	Date	Incident Time	Railway Line Affected	Cause of Incident / Findings of Investigation	Remedial actions taken	Degree of Service Disruption		
						i) Incident Duration (min.)	ii) Extension of Journey Time (min.)	iii) Extension of Headway (min.)
4	7 Oct	7:03 am	Kwun Tong Line	<p>Traction power supply failure resulted in two trains being held at Wong Tai Sin and Choi Hung Stations.</p> <p>Train service resumed normal in 5 minutes.</p> <p>A misaligned circuit breaker caused the fault. The switching off of power supply was required in order to restore power.</p>	<p>Public announcements were made centrally from Operations Control Centre to the stations concerned. During this period, the emergency lighting on the affected trains remained illuminated and train doors kept open.</p> <p>The circuit breaker was realigned at 10:26 am.</p>	5'	Nil	-
5	6 Oct	7:56 am	Tung Chung Line	<p>A small amount of white smoke emitted from one wheel of the 3rd car of a Hong Kong-bound train when it was approaching Nam Cheong Station.</p> <p>Investigation revealed that there was a mechanical fault of one wheel's brake cylinder in the 3rd car. As a result, the brake of that wheel was unable to be fully released.</p>	<p>Passengers were immediately arranged to alight and carried by the following train which arrived Nam Cheong Station 4 minutes later.</p>	4'	Nil	No
6	7 Sep	2:07 pm	Tsuen Wan Line	<p>A glass panel on a platform screen door of Jordan Station was cracked in the pattern of a cobweb. Staff cleared the area of passengers.</p>	<p>The affected area of the platform and the platform screen door were cordoned off and staff cleared all glass fragments from the site.</p>	11' (until the platform screen door concerned was	NA	NA

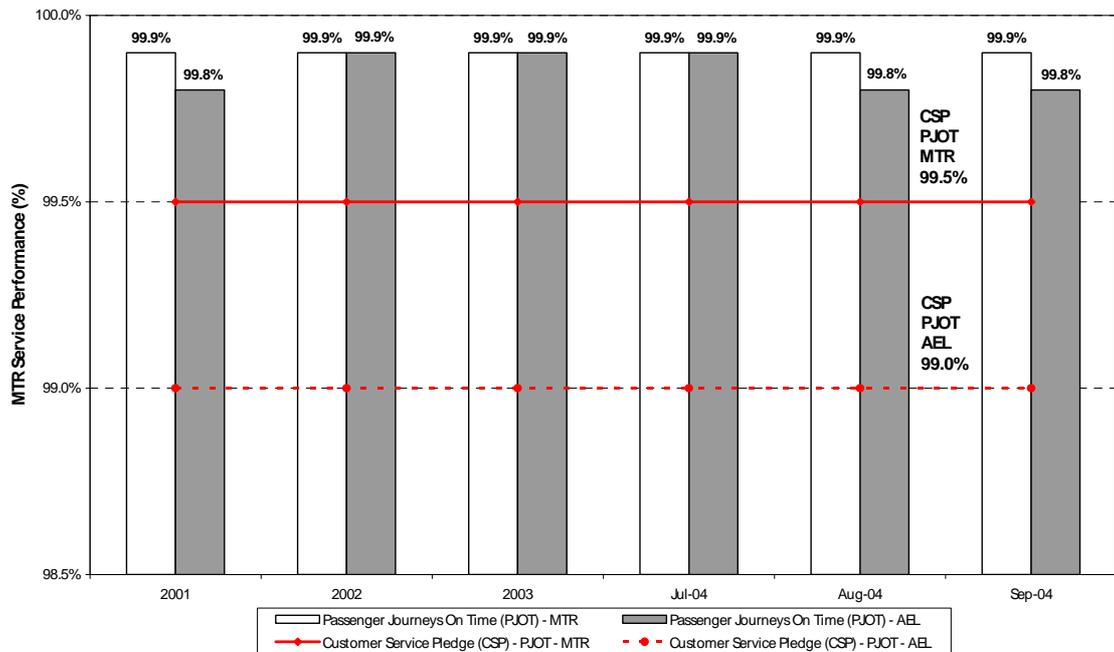
	Date	Incident Time	Railway Line Affected	Cause of Incident / Findings of Investigation	Remedial actions taken	Degree of Service Disruption		
						i) Incident Duration (min.)	ii) Extension of Journey Time (min.)	iii) Extension of Headway (min.)
				<p>There was no disruption or delay to train service.</p> <p>One passenger on the platform felt discomfort in her eye. Station staff called the ambulance. After having her eye cleaned by ambulance men, the passenger felt fine, declined an offer to be sent to the hospital and left the station.</p>	<p>An immediate check was conducted on the condition of platform screen doors at all stations.</p> <p>The broken glass panel at Jordan Station was replaced after the end of train service.</p> <p>A more detailed inspection of all platform screen doors was conducted overnight.</p> <p>Design, assembly and installation methods were reviewed and confirmed to be sound.</p> <p>Glass fragments from the affected door have been sent to the glass manufacturer in Germany for analysis. Awaiting the results of their tests.</p>	isolated)		
7	29 Jul	9:57 pm	Airport Express Line	<p>A train was taken out of service at Airport Station because sustained an automatic train control fault. Train service was not affected.</p> <p>Investigation revealed the train signalling antenna was defective.</p>	The defective train signalling antenna was replaced.	6'	Nil	No

	Date	Incident Time	Railway Line Affected	Cause of Incident / Findings of Investigation	Remedial actions taken	Degree of Service Disruption		
						i) Incident Duration (min.)	ii) Extension of Journey Time (min.)	iii) Extension of Headway (min.)
8 .	8 Jul	6:00 am	Airport Express Line	A train was not released from depot to join the service because a power supply micro switch was found faulty. This caused a delay of 4 minutes to the train departing Hong Kong Station.	The defective micro switch was replaced.	4'	Nil	No

A. Train Service Delivery (Customer Service Pledge VS Performance)



B. Passenger Journeys On Time (Customer Service Pledge VS Performance)



MTR Safety Performance

	2001	2002	2003	2004 up to Sept
Incidents per million passengers carried	0.89	0.88	0.82	0.82

**Capital Improvement Works and Maintenance Expenditures
on Existing Railway Network**

In HK\$ billion

Year	2001	2002	2003	2004 estimates
\$	\$2.3	\$2.3	\$2.2	\$2.2

Major MTR Upgrading Projects in Recent Years

1. ATC Replacement Project

The automatic train control signaling system of the Kwun Tong, Tsuen Wan and Island Lines was completely replaced and renewed by a very advanced system, i.e. SACEM, in 1998. The replacement included all trackside and train-borne signaling equipment and apparatus.

2. MTR Train Modernization Programme

The MTR Train Modernisation Programme was started in August 1998 and completed in September 2001. The programme involved the refurbishment of all MTR trains with new and improved facilities including air conditioning and ventilation, brighter lighting, dipped seats, multi-purpose space for wheelchairs and baggage, new grab handles, and rewiring of driver cab and saloon, etc. Train Information System was also enhanced to monitor on board systems and provide more real time advice to the Train Operator in dealing with incidents. The programme was an initiative to make continuous improvements in MTR train service and the traveling environment for passengers.

3. MTR Platform Screen Door Retrofit Programme

The Corporation launched the "MTR Platform Screen Door Retrofit Programme" in 1999 with an aim to provide passengers with a more comfortable traveling environment and to reduce energy consumption. The programme sets a precedent for railways worldwide as it is the first time ever that platform screen doors have been installed in an operational heavily used railway system. The project covers 30 underground stations on the Kwun Tong, Tsuen Wan and Island Lines and is expected to be completed by 2006.

4. MTR Station Improvement Programme

MTR been carrying out the "MTR Station Improvement Programme" since 1999 in order to improve the environment of MTR Stations and operational efficiency. Major improvement works under the programme include refurbishment of concourse and platform areas, improvement of station entrances, increasing the number of escalators and passenger lifts in MTR stations, improving air-conditioning in underground MTR stations, enhancing the automatic fare collection system, public address system and closed circuit television, etc. This rolling programme of station improvements is targeted to be completed by 2006.

5. Escalator Refurbishment & Upgrading

All 462 escalators in Tsuen Wan Line, Kwun Tong Line and Island Line will be refurbished before 2019. Among them, the first batch of 90 escalators will be refurbished and upgraded by 2009.

Major Productivity Improvement Projects in Recent Years

Categories	Description of Works
Automation	<ul style="list-style-type: none"> • Automatic cleaning plant for cleaning components • Automatic air-conditioning condenser coil cleaning • Automatic cleaning robot arm • Wireless Local Area Network on data handling • Software upload to electronic card through network • Automation cleaning on air-conditioning unit during overhaul • Engineering Works & Traffic Information Management System (ETMS) for engineering work booking and Traffic Notice publication • High performance track inspection vehicle • High capability track and overhead line geometry inspection vehicle

Categories	Description of Works
Organisation Development	<ul style="list-style-type: none"> • Centralize building services and depot plant equipment maintenance • Depot Control Centre Rationalization • Re-grouping of maintenance support function
Work Process Improvement	<ul style="list-style-type: none"> • Adoption of full Train Based Maintenance for reducing the frequency of Over Head Line isolation/shuntings
Reliability & Cost Efficient Improvement	<ul style="list-style-type: none"> • Replacement of motor alternator by static inverter • Replace air-conditioning direct current motor by emergency inverter

Maintenance Manpower Level in Recent Years

Year	2001	2002	2003	2004
Train	920	921	903	897
Infrastructure	771	780	764	763
Station Maintenance	550	567	558	559
Total	2,241	2,268	2,225	2,219