

LegCo Panel on Transport
Subcommittee on matters relating to railways

Preventive and Response Measures for Emergency Incidents

Purpose

This paper sets out the preventive and response measures by MTR Corporation Limited (MTRCL) and Kowloon-Canton Railway Corporation (KCRC) for emergency incidents and also their planned improvement measures.

Background

2. Government is very concerned about the arson incident on 5 January 2004 where a passenger unlawfully ignited some inflammable materials on a MTR train travelling from Tsim Sha Tsui Station to Admiralty Station. While the incident was satisfactorily handled by MTRCL and did not result in serious injuries to passengers, the Government has asked both railway corporations to examine if the existing facilities, arrangements, procedures were adequate to prevent and handle railway incidents and whether any improvements should be made. A comprehensive review has been conducted by both railway corporations.

Review of both railway corporations

3. The outcome of MTRCL's and KCRC's review is summarised at Annex A and Annex B respectively. In general, both railway corporations consider that their existing facilities, arrangements, procedures are adequate to prevent and handle railway incidents, but have also proposed some improvement measures. Generally speaking, the existing high safety standards of our railway network are attributed to the following areas:-

- (a) safety features in the design of railway premises and trains. For example, all train carriages are constructed with fire retardant materials and equipped with fire extinguishers; there are safety devices on trains including ventilation windows, audio communication system with train drivers, public announcement system within stations and trains, emergency doors, etc; and fire alarm and fire fighting systems are available on platforms;
- (b) comprehensive contingency plans and emergency manuals are in place to cater for different scenarios of railway incidents, e.g. fire incident handling and control, malicious acts, power supply system failures;
- (c) adequate staff training to ensure that staff members are trained and equipped to work safely and react to emergency incidents; and
- (d) drills and exercises with relevant Government departments including the Fire Services Department, the Hong Kong Police Force and other emergency services to develop an efficient joint response system.

4. Both railway corporations have also identified areas for further improvements. The key areas are summarised as follows:-

- (a) stepping up of enforcement actions of the by-laws of respective corporations, in particular the provisions relating to prohibition of carriage of dangerous goods into railway premises. (The need for additional power to search passengers' belongings is discussed in a separate paper);
- (b) taking further measures to enhance the design and effectiveness of train equipment, e.g. easier-to-open ventilation windows, making the location of fire extinguishers easier to identify during fire incidents, consideration of provision of Closed Circuit Televisions

inside train compartments;

- (c) improving the procedures for handling incidents and the dissemination of information to passengers;
- (d) organising a joint training programme on railway accident investigation with Police; and
- (e) stepping up public education programme to enhance public awareness of the regulations under the by-laws and emergency procedures for railway incidents. Both corporations are also considering the involvement of passengers in the drills and exercises.

Conclusion

5. Railway safety is the primary concern of both railway corporations and Government. While the railways are being operated at a high safety standard, both railway corporations will continue to explore areas for further improvement. The Hong Kong Railway Inspectorate (HKRI) will also follow up with both railway corporations on their reviews and monitor the implementation of the recommendations. We will also facilitate the knowledge sharing between MTRCL and KCRC on enhancement measures that are commonly applicable to both corporations.

Environment, Transport and Works Bureau
March 2004

MTRCL's Preventive and Response Measures for Emergency Incidents

Purpose

In response to the concern expressed by Members about the arson attack occurred on 5 January 2004, this paper provides information on the preventive and response measures for emergency incidents, investigation of the incident occurred on 5 January 2004 and the proposed enhancement measures.

Background

2. On 5 January 2004, an arson attack occurred with a fire broke out inside the first compartment on a train running from Tsim Sha Tsui to Admiralty station on Tsuen Wan Line. An enquiry panel was set up by MTRCL on 6 January 2004 for the investigation and to recommend areas for improvements.

Preventive measures for Emergency Incidents

Safety standards and design

3. In MTR, passenger safety is of absolute importance. A comprehensive and structured risk control system is adopted to identify any possible hazards in the system as well as to develop adequate measures to mitigate them. As such, the operational risk is reduced to a level as low as reasonably practicable. A system of safety inspection and audit is also in place to identify any areas requiring to be improved. Also, international safety experts visit the MTR on a regular basis to review its safety management system and to provide advice on how to do better.

4. The Corporation is required to work with the Fire Services Department among other Government departments when planning railway extensions or undertaking modifications, e.g. station renovation. Equipment, plant and structure on trains and at stations are designed in such a way that passengers can travel safely in the system at all times. MTR trains are constructed to contain fire and limit fire spread. Fire retardant and

non-combustible materials are used with the result that the fire load is maintained at a low level.

5. To ensure continuous power supply, the MTR system is a very robust design with support from the two electricity companies in Hong Kong. Electrical essential equipments are fed from secure electrical supplies which are provided with alternative sources or battery back up.

6. The MTR bylaws prohibit any persons from carrying dangerous goods into the system. The system is patrolled by MTR staff and the Police. All public areas are under 24 hours surveillance by closed-circuit television.

Safety equipment

7. Safety equipment is available in stations and on the trains. This equipment include Emergency Call Handle, Ventilation Window and Fire Extinguishers. In an event of any fire in an MTR station, a fire alarm is automatically transmitted to the Fire Services Department, and fire engines will be dispatched for all alarms.

8. Railway tunnels are equipped with Emergency Fans which can be operated to extract the smoke in the event of any fire. Emergency doors are available at each end of the train, and they can be operated by passengers in emergency. Once operated, the emergency doors will form a ramp for safe evacuation onto the track.

9. There is a high-integrity and reliable radio system connecting all trains, stations, other operating locations and staff on patrol with the Operations Control Centre. Train borne equipment, i.e. communication systems, train door control, emergency lighting, are supported by an emergency power supply i.e. a battery which will last for a period of 45 minutes in case there is any interruption of regular train power supply.

Staff Training and Public Education

10. Extensive safety training is provided to staff to ensure that all staff members are trained and equipped to work safely and react to any emergency. Safety of the passengers is our utmost priority for any staff in the discharge of our duties.

11. At least six joint exercises are conducted with the emergency services, including the Fire Services Department and Police each year, to drill on the relevant procedures, equipment, test fire system and our ability to evacuate stations, trains and tunnels.

12. Educational and promotional programmes are organized by the Corporation to raise safety awareness among passengers. Safety information, through booklets, notices, signage, public announcements, information panels on trains, the passenger information display system and other media are provided. November of each year is assigned as the Safety Month, during which special promotions on passenger safety is organised.

13. Clear labels providing step-by-step instructions for the operations of emergency devices are shown on the emergency exits, Platform Screen Doors, Emergency Call Handles, etc. for passengers to follow. Safety booklets carrying all the details are available at MTR stations. In case of any incidents, passengers are advised to keep calm and follow the instructions given by MTR staff.

Response Measures for Emergency Incidents

14. MTR has comprehensive procedures and contingency plans for handling various disaster scenarios in crowd control and evacuation.

15. If there is an emergency or a major fire in a train car, because of the large number of passengers on board, priority is placed on ensuring speedy evacuation and extraction of smoke. For most parts of the MTR system, the distance between stations is very short and a train on fire can reach the next station very quickly, where all passenger doors can be opened for speedy evacuation.

16. If, however, in the unlikely event that a train is on fire and becomes immobile between two stations, the Train Operator will arrange for emergency detrainment of passengers onto the track through a passenger operable emergency detrainment ramp provided at each end of the train and tunnel lighting will be switched on to illuminate the escape path.

17. Public announcements will be made both at stations and on trains to inform passengers if an emergency emerges. Electronic media will be

informed as soon as practicable for information dissemination to the general public.

Investigation on the Arson attack

18. The enquiry panel concluded that the arson attack occurred on 5 January was handled appropriately with minimal damage. The Incident Report is attached in Appendix for reference.

19. The investigation reveals that the successful containment of the incident was a direct consequence of the combined effect of a passenger's brave intervention and the following elements attributable to MTR and the emergency services:

- effective implementation of operational and emergency procedures and contingency plans which are adequate, regular training of staff and regular exercises jointly held with emergency services;
- speedy, appropriate and intrepid staff response;
- early attendance of the Police and Fire Services;
- appropriate saloon design and materials: fire retardant and non-inflammable;
- effective and efficient means of communication, both internal and external;
- other appropriate system and station designs: fire service provisions, evacuation facilities, smoke extraction, etc.

20. Passengers were detained and evacuated in an orderly and swift manner. Nevertheless, further enhancement, i.e. improvement on public announcement messages, etc. has been identified.

21. The investigation also concludes that information dissemination during the incident was adequate and appropriate. Electronic media were informed within 8 minutes of the outbreak of the incident, followed by telephone interviews and, within 15 minutes, the issue of a press statement on the ad hoc train service arrangement.

Enhancement measures

22. After the arson incident, MTR immediately stepped up the enforcement of our by-laws on dangerous goods and bulky objects. The majority of the intercepted passengers were cooperative, reflecting the adequacy of the existing by-law arrangement.

23. Following the review, the Corporation will take measures to enhance the design, effectiveness and efficiency of equipment items, with risk analyses as appropriate, such as ventilation windows and Passenger Alarm Devices. Also, appropriateness and feasibility for the provision of saloon closed-circuit television and other systems will be reviewed. Based on passengers' feedback, we will also explore how to improve public announcement in noisy environment and the identification of portable fire extinguishers inside trains.

24. Public education and involvement will be stepped up to enhance the public awareness of our ban on dangerous and bulky objects and the use of emergency equipment and procedures. Meanwhile, a warning message will be shown on the display units at entrances and concourses with similar printed message put up at entry gates as well. We will also explore how passengers can be involved in exercises in terms of both extent and frequency.

Conclusion

25. The Corporation will follow up with the findings and recommendations from the investigation with a view to seeking improvement in emergency handling and dissemination of information to passengers and the public in case of any emergency incidents.

Incident Report of the Arson case on 5 January 2004

Introduction

1. As directed by the Operations Director, an Enquiry Panel was set up on 6 January 2004 to investigate into an arson which occurred on a train running from Tsim Sha Tsui Station to Admiralty Station on Tsuen Wan Line Down (TWL/D) on 5 January 2004 with a view to achieving the following objectives:
 - (a) To establish the sequence of events of the incident and its immediate aftermath.
 - (b) To examine the timeliness and effectiveness of incident handling by the staff involved and the adequacy of the relevant procedures, including information dissemination to passengers.
 - (c) To examine whether the equipment relevant to the handling of the fire was working properly.
 - (d) To examine the adequacy of the existing practice in forbidding dangerous goods and bulky objects from being brought by passengers into the system.
 - (e) To recommend areas of improvement, both technical and procedural, in respect of reducing the probability of a recurrence and more effective handling of a fire on train in future.
 - (f) To review the information provided to the public regarding fire safety and evacuation on MTR, and assess whether enhancements are required, in particular the extent and frequency of emergency scenario exercises involving members of the public.

The Arson

2. The Inception

On Monday, 5th January, 2004 at 0912 hours, a first-ever arson attack on the MTR occurred in the leading car A167

of Train 61 (T61) while it was travelling with about 1,000 passengers on board from Tsim Sha Tsui Station (TST) to Admiralty Station (ADM) on Tsuen Wan Line Down (TWL/D, i.e. in the direction of Central) in Automatic mode. According to the accounts given to the enquiry board by 4 passengers at the scene, at that time, an elderly Chinese male passenger was standing right next to and facing a portable fire extinguisher (PFE) on the bulkhead partition with the driving cab adjoining door D1B (first pair of passenger doors on the left hand side in the direction of travel) of this car. He had squeezed between him and the PFE a handcart laden with a tarpaulin travel bag and a rucksack lying on the floor beside the handcart. As it transpired, inside the bag there were 6 bottles of suspected thinners, 5 canisters of labeled liquid petroleum gas (LPG), towels and some inner tubes of bicycle tyres. He suddenly started a fire to some of the inflammable substances with a cigarette lighter half way between door D1B and the cab/saloon door.

3. Passenger Intervention

Witness Mr. B allegedly attempted to stop the culprit by shouting at him, and then stomped on the lighted material thrown by the culprit to the floor next to the first grab pole. While Mr. B's 2 attempts to foil the arson attack failed to stop the culprit, it did succeed in delaying him and warning other passengers of what was happening. This, in the opinion of the enquiry panel, succeeded in preventing the fire from spreading quickly.

4 An Unknown Passenger

According to the witnesses, when the burning material hit the floor, some flames sprang up and caught a leg of the trousers of a male passenger. He managed to slap out the small fire on his trousers, apparently without suffering any injury. However, he could not be traced after the incident.

5. The Passenger Train Operator's (PTO) Immediate Actions

The Passenger Train Operator (PTO) heard the commotion right outside his driving cab. His immediate response

was to turn his head to look at the cab/saloon door. He saw flashes of light with short tongues of fire seeping in and out from the bottom gap of the door. Smoke was coming in, though in small traces to start with. He recognised the seriousness of the situation. Within seconds he received an alarm that some passenger alarm device (PAD) had been operated, but no intelligible messages could be heard over the PAD intercom. T61 was then about 1.2 km from TST with another 1.2 km to go before reaching ADM about 1.5 minutes away. Although he could not clearly hear what passengers were saying because of the commotion, he established a fire had broken out and radioed the Traffic Controller (TWC) (TC(TWC)) in the Operations Control Centre (OCC) at Tsing Yi Station immediately on the seriousness of the situation using the designated emergency channel and told him of the fire. He then made 2 public addresses (PAs) in Cantonese, first to calm and tell passengers to move to the back and the second to repeat the first message but adding that passengers should move away from the fire. Both announcements were made before the train reached ADM.

6. The Operations Control Centre's Immediate Actions

With due consideration to the serious potential, the OCC took action immediately upon receiving the PTO's report:

- (a) stopping and reversing Train 43 (T43) that followed the incident train at 0912 hrs.;
- (b) notifying the Station Controller (SC) in the Station Control Room (SCR) of ADM at 0913 hrs. for attendance;
- (c) informing the Fire Services Department (FSD) and Railway Police for assistance, declaring major incident and advising the Transport Department (TD) of it and for the raising of the red alert, all at 0914 hrs.

7. Actions at Admiralty Station

7.1 The PTO and Detrainment

When T61 arrived at ADM TWL Down Platform (D/P) on the upper platform level at 0914 hrs., the PTO opened the train doors and platform screen doors (PSDs) by pressing the correct buttons in the driving cab. Because dense smoke immediately started rushing out from both his cab and the first pair of passenger doors, the PTO could not see whether the PSDs had been opened. In order to ensure that the PSDs were open for emergency detrainment, he operated the relevant controls in the PSD control panel (PSL) at the headwall. Passengers were evacuated within 1 minute from the train and to a place of safety and out of the station very quickly.

7.2 Station Staff and Fire Fighting

Upon receipt of the TC's call, the SC immediately summoned station staff assistance and prepared for station evacuation, making an all-call radio announcement to that effect in the process. The TWL Down Platform Supervision Booth (DPSB) Station Operator (SO), who was on his way back to the PSB and next to the 5th car position of the platform received the all-call message, and was the first member of staff to attend to the fire. Making use of a PFE at the non-cab end of car A167, he attempted to fight the fire from the platform edge just outside the first pair of passenger doors at 0914 hrs. He no longer saw naked fire half way through the PFE contents but continued to douse it with the dry powder. A Station Supervisor emptied another PFE shortly afterwards and 2 members of station maintenance staff did the same subsequently.

7.3 Station Evacuation and Smoke Extraction

- (a) Meanwhile the SC triggered off the station evacuation procedure at 0916 hrs. by operating the controls on the integrated back-up panel (IBP) to switch all gates to freewheel mode, switch on the evacuation public address (PA) and illuminate the "fire no entry" sign on the entrance passenger information display (PID) units.

(b) While the passengers on board T61 had detrained quickly, many of them were still lingering around outside the second and third cars at 0916 hrs. to watch from a distance. According to witness Mr. B, he and some of these on-lookers had the intention of catching the culprit. With the joint efforts of station staff (both operators and maintainers) and a Railway District Policeman who arrived at this time, the TWL D/P was cleared of passengers in one minute. The whole station was evacuated of passengers and completely closed by 0927 hrs. In the interim, smoke extraction was actuated by the Environmental System Controller (ESC) in the OCC and it managed to clear the smoke, which had always been confined to the first two cars and the adjacent part of the platform, in 2 minutes.

7.4 Fire Services Department's (FSD) Attendance

FSD personnel arrived at the platform at 0920 hrs., declared control of the scene and doused the burned materials with water from 0925 hrs to 0929 hrs. to prevent any re-ignition.

7.5 The Train Service

As for the train service, from 0915 onwards, TWL train operation was confined to between TST and Tsuen Wan Station (TSW), and Island Line (ISL) trains non-stopped ADM, both until normal service resumption at 0940 hrs. That was after T61 had been routed to Admiralty Sidings (ADS) at 0935 hrs. and the platform had been cleared of water. As a result, the train service suspension for TWL between TST and CEN lasted 25 minutes.

The Passengers

8. 14 passengers were sent to hospital by FSD for treatment of trauma and/or smoke inhalation, but none of them suffered any apparent injury. 13 of them were

discharged within an hour or two while the remaining passenger was released in the afternoon.

9. 2 other passengers allegedly went to see the doctor on their own, one after reporting smoke inhalation to Causeway Bay Station (CAB) and the other before reporting a sprain to TST.
10. The ADM TWL DPSB SO, who was the first person to fight the fire, also consulted the company doctor for smoke inhalation.
11. As mentioned before, there was no trace of the male passenger whose trousers were said to have caught fire momentarily.

The Damage

12. Of the 6 bottles of suspected thinners, the smallest 700ml bottle and all of its contents were burnt and the towel wrapping 1 of the 4 nos. of 2-litre bottles was burnt while the other 2-litre bottles and the 4.5-litre container and their contents remained intact. As for the 5 canisters of LPG, 2 were discharged/explored while the other 3 were still intact.
13. Due to the fire withholding capabilities of design and materials, the resulting fire and explosion only caused the following damage, concentrated in a small area of car A167:
 - (a) 2 tiny spots of de-lamination on the surface of the 30-minute fire resistance period (FRP) plywood inlay of the saloon floor (superficial)
 - (b) the melamine veneer in the lower half of the pair of cab/saloon door leaves (moderate)
 - (c) the melamine veneer of the 'B' side bulkhead partition (moderate)
 - (d) the emergency door notices at eye level on the cab/saloon door (charred)

- (e) the emergency exit sign above the cab/saloon door (minimal blisters)
- (f) the no.1 air-conditioning unit's (ceiling-mounted near door D1A) filter (melted)
- (g) door D1A's ceiling lighting diffuser glass (cracked)
- (h) the cover of the PFE at door D1A (minimal blisters)

Sequence of Key Events

14. The following sequence of the key events summarises the main happenings during this incident with those of vital importance as described above emphasised in bold in the Remarks column:

Time (hrs.)	Lapsed Time		Event	Remarks
	Since time zero	Since T61's arrival at ADM		
0912	0'	-2'	PTO noticed commotion, heard a male voice shouting help and fire. He also saw fire tongues seeping in and out underneath the cab/saloon door with smoke seeping into the driving cab.	Fire Started
			PAD was operated when the train was half way from TST to ADM.	
			PTO radioed TC by designated e-channel about the fire.	PTO informed TC

Time (hrs.)	Lapsed Time		Event	Remarks
	Since time zero	Since T61's arrival at ADM		
			PTO made PA in Cantonese twice, asking passengers to move towards the rear part of the train and away from the fire.	
			TC instructed the following train T43 to stop. The train stopped at South Ventilation Building (SVB) on ADM 10T about 360 metres short of ADM.	Following train stopped
0913	1'	-1'	TC informed SC(ADM) of the incident via direct line and instructed him to prepare for detrainment.	TC informed ADM
0914	2'	0'	T61 arrived at ADM TWL D/P with train doors and PSDs opened within 2 seconds for immediate detrainment.	Station Detrainment
			PTO operated PSL control to ensure opening of PSDs.	

Time (hrs.)	Lapsed Time		Event	Remarks
	Since time zero	Since T61's arrival at ADM		
			CC instructed CoC to call FSD and Police.	
			SC(ADM) immediately informed an SS(ADM) and SO of the fire and instructed them to take a PFE to the platform to deal with it.	
			CoC informed FSD and Railway District Police via direct line.	Emergency Services called
			CC declared Major Incident.	Major incident declared
			CoC issued teleprinter message to inform all stations.	
			CC informed TD of the Major Incident and raised the Red Alert.	TD informed + Red Alert
			SS(ADM) and SO(ADM) arrived at the platform and saw dense smoke in the first car and the TWL DPSB SO using a PFE to fight the fire.	

Time (hrs.)	Lapsed Time		Event	Remarks
	Since time zero	Since T61's arrival at ADM		
			PSB SO emptied his bottle of PFE with no more naked fire seen.	Naked fire put out
0915	3'	1'	TWL train service between CEN and TST suspended	
			ISL trains started non-stopping ADM.	
0916	4'	2'	On seeing some sparks and smouldering at the scene, SS(ADM) also discharged a bottle of PFE on the burned materials.	
			SSM(ADM) operated the Station EVA button on the IBP to start the station evacuation process.	Station evacuation started
			First Railway Policeman arrived at ADM TWL D/P and helped evacuate the detained passengers to the concourse.	Police arrived
0920	8'	6'	FSD arrived at ADM TWL Down platform.	FSD arrived

Time (hrs.)	Lapsed Time		Event	Remarks
	Since time zero	Since T61's arrival at ADM		
0923	11'	9'	ESC switched on ADM ECS mode 202 for smoke extraction.	Smoke extraction switched on
0927	15'	13'	DSM CC Tang arrived at ADM TWL D/P to take up the role of Incident Officer.	
			Station evacuation was completed and ADM was closed.	Station closed after evacuation
0934	22'	20'	T61 was operated in Restricted Manual (RM) mode to Admiralty Sidings to clear the platform.	
0940	28'	26'	Service resumed after a 25- minute suspension between TST and CEN.	Service resumed
0942	30'	28'	CC stood down the Major Incident.	Major incident cancelled
			CC informed TD and cancelled the Red Alert.	TD informed + Red Alert lowered

5 Critical Moments

15. It is clear from the above that there were 5 critical moments which were very important in the outcome of the

incident and which prevented the incident from becoming a disaster. They are as follows:

- (a) intervention of the arsonist by witness Mr. B;
- (b) the composed reaction of the PTO to the fire and his firm and clear radio report to the TC about the fire using the designated channel for emergency reporting, without stopping the train nor opening the cab/saloon door, which could have ended up endangering himself and putting the train controls and hence passengers at risk;
- (c) the immediate triggering by the OCC staff of a series of appropriate actions for the major incident, including the stopping of the following train, summoning of emergency services and notification of Transport Department; and
- (d) the PTO's immediate opening of the train doors and PSDs upon arrival at ADM TWL D/P and his prudent action of using the controls at the headwall to open the PSDs again;
- (e) the early fire-fighting by the DPSB SO that managed to extinguish the naked fire, thus preventing heat build-up and the possible deterioration of the situation, helped further by the subsequent discharge of more PFEs by 3 other members of staff before the arrival of FSD.

Underlying Reasons for Containment of the Incident

16. The successful and appropriate handling of these 5 critical moments are important factors in preventing this potentially disastrous arson attack from deteriorating into a catastrophic event. However, some harm was still caused to 16 passengers and a staff member. This uneventful ending was a direct consequence of the combined effect of Mr. B's brave intervention and the following elements attributable to MTR and the emergency services:

- (a) effective implementation of operational and emergency procedure, and contingency plans which

are adequate, regular training of staff and regular exercises jointly held with emergency services;

- (b) speedy, appropriate and intrepid staff response;
- (c) early attendance of the emergency services, i.e. Police and FSD;
- (d) appropriate saloon design and materials: fire retardant and non-inflammable;
- (e) effective and efficient means of communication, both internal and external;
- (f) other appropriate system and station designs: fire service provisions, evacuation facilities, smoke extraction, etc.

Equipment Operation

17. Train Equipment

- (a) The incident train operated normally throughout the incident.
- (b) There were reports of passengers in the first 2 or 3 cars having difficulties in opening the hopper windows. All of them were subsequently found to be functioning properly, and of which 13 (1st car X 1, 2nd car X all 8, 3rd car X 4) were opened by passengers during the incident. After detailed inspection of other cars, 3 windows were found to be stuck in the 6th car (2 nos.) and 7th car (1 no.). This was identified to be an area for immediate follow-up.
- (c) As for the PADs, 9 (1st car X 4, 2nd car X all 5) were operated (the PADs in the 1st car were operated first) but the PTO was already aware of the fire and the seriousness of the situation due to the commotion and smoke. One of the PADs in the 2nd car was defective and the nature of its defect disabled the communication function of all the 5 PADs in that car. However, the driving cab still registered the operation of all the 9 PADs

properly. The communication defect had no effect at all on the outcome of the incident - the procedure upon operation of a PAD is for the train to continue to the next station where it is easier for any incident to be handled than in between stations. The PTO did exactly that.

18. Station Equipment

All the station equipment functioned as they are designed to do with the smoke extraction mode being effective in removing the smoke in 2 minutes' time and the 1,000 detained passengers and another 200 or so passengers in the station evacuated and the station closed only 13 minutes after the incident train's arrival.

Passenger Behaviour

19. The following summarises the behaviour of passengers during the incident as revealed by the 4 witnesses and observed from the CCTV recording of the ADM TWL D/P:

- (a) the first witness, i.e. Mr. A, was surprised and was unable to react
- (b) brave man in a suit, i.e. Mr. B, intervened the culprit
- (c) male passenger whose trousers were said to have caught fire remained unidentified
- (d) most passengers were quick in their escape from the 1st car to the 2nd car
- (e) some passengers operated PADs
- (f) some passengers opened hopper windows
- (g) a few passengers were immobilised by fear
- (h) a passenger called her father for advice
- (i) a witness, i.e. Mr. D, called the Police

- (j) some passengers crawled to escape from the 1st car to the 2nd car to keep their heads below the smoke
- (k) while 2 of the witnesses said they had a feeling of despair at one point, neither of them nor other passengers they saw were really hysterical though the situation was pretty noisy
- (l) 40 to 50 detrained passengers lingered outside the 2nd and 3rd cars as on-lookers with some of them including Mr. B allegedly bent on catching the culprit
- (m) many evacuating passengers still used their Octopus cards/tickets before they passed the free-wheeled gates

Dissemination of Information to Passengers and Public

- 20. The PTO's PA messages on T61 served their purpose of advising the train-borne passengers to move back from the front of the train and evacuating them when the train arrived at ADM.
- 21. ADM's evacuation PA, which was broadcast at 0916 hrs., was clear in telling passengers to leave the station though 40 to 50 remained on the platform as on-lookers. The PA message content could be improved to tell evacuees that there is no need for them to use their Octopus cards or tickets, which many did.
- 22. OCC's 5 centralised PA (CPA) broadcasts for stations of TWL, ISL, Kwun Tong Line (KTL) and Tseung Kwan O Line (TKL) mentioned a fire at ADM in the first 3 and then a technical fault for the last 2. Some standardisation using appropriate wording would be an improvement.
- 23. Train Operators also made relevant broadcasts to passengers on trains based on information received from TCs over the radio. This was well received.
- 24. Corporate Relations Department informed all radio and TV stations at 0920 hrs. with telephone interviews conducted immediately afterwards. A press statement

followed at 0927 hrs. on the train service arrangement during the incident. All the information was clear.

Implementation and Adequacy of Procedures

25. The performance of various staff has been found to be in compliance with the following publications:
 - (a) Rules and Procedures Manual
 - (b) Accident, Incident and Emergency Procedures Manual
 - (c) Operations Control Centre Manual
 - (d) Passenger Train Operator Manual
26. The only publication which has not been followed in a totally compliant manner is that while ADM's Station Contingency Plan A1 for a train fire at platform requires the SC to operate the smoke extraction, the ESC in the OCC did that for him in this case because the SC was engaged in the numerous activities pertinent to the incident. This shift of responsibility had no bearing on the outcome of the incident.

Conclusion

27. The fire was obviously caused by an apparently pre-meditated arson possibly with lethal intent.
28. All 5 critical moments in the first few minutes of the incident led the fire not escalating to a more serious incident.
29. The incident was appropriately handled by all concerned staff and the emergency services
30. Essential train and station equipment functioned normally.
31. The detrainment at the platform was timely, quick and smooth.

32. The station evacuation was conducted in an effective, safe and orderly manner.
33. The procedures in place proved to be appropriate and adequate.
34. The train and station designs limited and contained the fire as designed.
35. The information provided to the emergency services, TD, passengers and media was timely, accurate and adequate.
36. The cooperation among the emergency services and MTR personnel and their effective and efficient operation reflect positively on the appropriateness and adequacy of joint exercises.

Actions to date

37. The following actions have been taken to date after the arson attack:

- (a) Enhancement of by-law enforcement for dangerous goods (DG) and bulky objects with redeployed resources for 20 days from the day following the arson attack, covering the peak season of the run-up to the Chinese New Year (CNY) and the CNY period. 111 DG items were identified and expelled, and 6,055 bulky objects were intercepted and dealt with appropriately. Of the offenders, 1 with DG has been prosecuted, 5 with DG were issued with a warning letter and 153 with bulky objects were similarly warned.
- (b) Fleet check of the hopper windows and PADs of all 736 other cars of the same type as the incident train's with the following result:
 - Hopper window (5,888 nos.)
 - 2 stuck (0.03%)
 - 193 difficult to open (3.3%)
 - PAD (3,680 nos.)
 - 2 defective (0.05%)

- (c) Modification of the wording of the station evacuation PA to include a statement that tickets are not needed to pass the gates
- (d) Inclusion in the passenger information display units at station entrances and concourses the message that inflammable or dangerous goods are prohibited with the additional message on the maximum penalty of \$5,000 fine and 6 months imprisonment for the concourse display units
- (e) Display of stanchion notices at all entry gates barring DG and bulky objects

Recommendations

38. As arson is a potentially disastrous happening, despite all the success in handling this particular one, complacency must not be allowed to set in. Instead, continuous improvement should be sought. To seize the opportunity offered by this incident, the following continuous improvement initiatives are recommended:

(a) Witnesses' Suggestions

Consideration of the 5 suggestions for improvement raised by the 4 witnesses:

- Louder PA in noisy situation
- Smoke extraction from train
- Flashing light for PFEs in a fire to facilitate their identification
- Easier-to-open hopper windows
- Air curtain at gangways against smoke spread

(b) By-law Enforcement

Exploring how to place more emphasis on DG by-law enforcement

(c) Review of the Effectiveness and Efficiency of Equipment Operation

Specifically:-

- Review of the design of those equipment items which have aroused public interest with risk analyses as appropriate, namely saloon CCTV, smoke detection and/or extraction, sprinkler (fire suppression in general), hopper window, etc.

Generally:-

- Review of the effectiveness of other systems and equipment associated with the incident

(d) Review of Procedures to build on the Success further

Specifically:-

- Remind SCs to switch on the appropriate smoke extraction mode themselves instead of letting the ESC do it for them

Generally:-

- Review of the effectiveness of other procedures associated with the incident

(e) Information to Passengers

- Review of CPA contents for standardisation
- Study of the use of SMS to inform mobile phone users of incidents
- Consideration of commercial radio coverage on MTR premises and trains

(f) Public Education and Involvement for Greater Public Awareness

- Public education on MTR's ban on of DG and bulky objects
- More public education on the use of emergency equipment and procedures

- Study the practicality of passenger involvement in exercises in terms of both extent and frequency

MTR Corporation Limited
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KCRC's Preventive and response measures for emergency incidents

Purpose

A fire broke out inside the first compartment of an MTR train on 5 January 2004 during an arson attack. This paper informs members of KCRC's preventive and response measures for emergency incidents, follow up actions and proposed enhancement measures.

Existing preventive and response measures

2. KCRC has established procedures for effective crowd management and efficient passenger evacuation in a variety of emergency situations. All frontline staff are required to attend classroom training on emergencies handling. They have to be qualified and are also required to attend drills and exercises.

3. All KCR train carriages have built in safety features to deal with all kinds of emergencies, including fires. The carriages are constructed with fire retardant materials, equipped with fire extinguishers, hopper windows and a two-way audio communication system between the driver and passengers. All West Rail and new East Rail train cars have closed circuit television systems to enable drivers to monitor train compartments. Control centres can also make announcements to passengers on trains.

4. An emergency egress feature is fitted in each train car that allows passengers to open the door for evacuation. Platform screen doors at West Rail stations can also be opened manually.

5. All East Rail and West Rail station concourses and platforms are fitted with fire alarms and fire fighting systems. At West Rail, all concourses or platforms are fitted with ventilation and smoke extraction systems and emergency walkways are provided all along the viaduct and

inside tunnels.

6. The Corporation conducts fire and evacuation drills regularly. Joint exercises are also conducted with Government emergency and rescue departments to test coordination.

7. KCRC By-laws prohibit passengers from carrying dangerous goods onto railway premises. These by-laws are enforced by dedicated teams that carry out regular patrols in stations and on trains. The teams, together with all station staff, would take action against offenders.

8. The Corporation conducts passenger education and publicity programmes regularly to heighten awareness of passenger safety. Safety messages, such as those warning passengers not to bring explosives and inflammable materials onto KCRC premises, are publicised through monthly newsletters, annual safety campaigns, leaflets and posters.

Follow up actions

9. Immediately after the MTR's incident, KCRC has taken a number of measures for the prevention of similar incidents and reviewed the related facilities and arrangement.

Immediate measures

10. All station staff, train drivers and control room operators were briefed on the incident and reminded of the proper procedures for handling malicious acts and train/station fires, and the proper use of fire fighting equipment. All fire protection facilities in stations and on trains were inspected to confirm they were functioning properly.

11. Additional staff are posted at entry gates and on-board patrols have been stepped up. At West Rail, the Railway Police District has also stepped up their patrol.

12. A safety leaflet is available at all Customer Services Centres. Posters were put up and public announcements were broadcast at stations.

Train facilities

13. Fire extinguishers on train will be relocated such that they can be easily seen and used by passengers in case of emergencies.

14. The hopper windows of light rail vehicles will be modified so they can be opened by passengers when necessary.

15. The feasibility of installing closed-circuit television system inside the old East Rail trains will be explored.

Passenger education and publicity programme

16. KCRC will strengthen passenger education on fire safety and emergency evacuation, and will make use of on-board LCD screens and passenger information displays in stations to publicize safety messages.

Staff training, drills and exercises

17. The Corporation will continue to organise joint emergency exercises with the Fire Services Department, the Hong Kong Police Force, and other emergency services. It will also invite passengers to participate in these exercises as a means of passenger education.