Legislative Council Panel on Transport
Subcommittee on Matters Relating to Railways

Retrofitting of Platform Screen Doors at MTR Railway Stations and the Study on the Feasibility of Retrofitting Automatic Platform Gates

Purpose

This paper provides information on the progress of retrofitting platform screen doors (PSDs) at MTR railway stations and the study on the feasibility of retrofitting automatic platform gates (APGs).

MTR PSDs and APGs

2. With a view to providing a better travelling environment in the MTR system, the Corporation started studies in 1996 to examine the feasibility of retrofitting PSDs at existing MTR stations which were built in the 1970s and 1980s.

3. Following successful completion of the trial installation at Choi Hung Station and further assessment of the scheme in 1997, the Corporation announced in 1999 its plan to proceed with the PSD Retrofitting Programme at 30 underground stations on the Tsuen Wan Line, Kwun Tong Line and Island Line in phases.

4. For railway lines built since 1998, i.e. Airport Railway and MTR Tseung Kwan O Line, PSDs have become a standard feature of its stations and was included in the design stage of these railway lines.

5. To blend in with the unique open-air design of the Disneyland Resort Line (DRL), platforms of Sunny Bay and Disneyland Resort Stations were designed to come with APGs which function in a similar manner as PSDs in existing MTR system.

6. PSDs are not essential safety equipment in railway operations. With PSDs, temperatures at station concourses and platforms can be better maintained at comfortable levels which in turn reduce energy consumption and enhances environmental protection. In addition, PSDs help minimize service disruptions caused by unpredictable falling on tracks incidents.

7. The Corporation maintains very high safety standards for its railway operations and has put in place effective safety measures to ensure the safety of passengers waiting for trains at the platform. High safety standards have been built into the MTR system and are strictly followed in its daily operations. CCTV cameras are installed at every station platform to facilitate effective monitoring and management of the platform. Platform Supervision Booths are equipped with extensive communication and control facilities. Emergency Train Stop Buttons are available at every platform, located on the pillar or wall panel.

The MTR PSD Retrofitting Project

8. Retrofitting of PSDs at platforms of an operational railway line involves highly complicated works. Since there was no similar overseas experience, the Corporation had to plan, design and construct the PSDs from scratch. To meet MTR's system design, technical specifications and performance requirements, as well as the stringent safety and operational requirements during construction, tremendous challenges in terms of programme and budget control of the project had been experienced in the retrofitting works, especially during the initial years.

9. The retrofitting of PSDs involves major alterations to the station/tunnel ventilation, air-conditioning and smoke extract systems so as to suit the changed station environment. Thus, while feasible, the technical challenges were tremendous. In addition, to avoid causing disruption to passenger service, all the works in relation to retrofitting had to be carried out during the very tight non-operating hours between two to five in the morning.

10. PSD retrofitting work at all 74 platforms of 30 underground stations was completed in the first half of 2006 and the final system test and adjustment works for the PSD retrofitting project recently has been completed.

11. The PSD retrofitting programme is a highly expensive project which includes various contracts for design, manufacturing, installation, testing and delivery of the PSDs, modification of the environmental control systems (which comprise the ventilation, air-conditioning and smoke extract systems), construction of equipment rooms, and modification of signaling system for the new operating environment with PSD retrofitted. A large part of the project cost is financed by the Corporation whilst contribution from passengers is arranged through the collection of $0.1 per Octopus MTR journey from passengers since July 2000.

12. With a capital cost of $2 billion, contribution from passengers, which amounts to half of the cost, is $1 billion. As at 31 December 2006, the contribution of 10 cents for each Octopus passenger trip collected by the Corporation totalled about $470 million. The collection of the $0.1 passenger contribution will therefore continue until it reaches $1 billion.

Study on the Feasibility of Retrofitting APGs

13. Currently, there are eight at-grade or aboveground stations in the MTR system, which are provided with natural ventilation only. The retrofitting of PSDs is subject to more complex technical constraints. The scale of work required to install the necessary ventilation and air-conditioning systems is highly akin to rebuilding those stations given the limits of the station structures. With the experience gathered from the PSD Retrofitting Project and the APG design experience from the DRL, the Corporation has commenced a feasibility study on retrofitting APGs to the operational platforms in the MTR system.

14. The preliminary study has just been completed. A number of engineering and operational challenges for the retrofitting of APGs in an

operating railway environment have been identified. There are similar as well as different technical issues to the PSD retrofitting project. The experience in the PSD retrofitting project could be used in tackling some of the challenges in retrofitting APGs, which are of different design and make and are operated in a different environment.

15. It has also identified three key issues that are specific to the installation of APGs and would require further studies:

(a) Platform edge loading – in the PSD retrofitting project, part of the load is taken via the header structure whereas the remaining load is transmitted to the platform. In the case of the APGs, all the loads have to be taken by the platform edge structure. Given these loads will not be part of the original platform design, a more substantial station modification is deemed necessary. Therefore, a detailed study is required to understand the platform edge loading and to design suitable modifications to the platform edge structure to take up this additional load.

(b) Ventilation – with the provision of APGs, the Corporation has yet to examine the effect of air movement on the platform. Detailed studies and trials are required to understand the effect of APGs on station ventilation in order to develop a solution that will ensure the best possible environment on the platform for passengers.

(c) Earthing Protection – with the APGs retrofitted to the platform edges close to open areas, electrical potential between the train body and APG structure would need to be properly addressed in the design and installation process as APGs are outdoor electrical installation subject to adverse weather conditions. Detailed study on the earthing system of individual stations will be conducted.

16. Apart from the technical difficulties mentioned, works in relation to retrofitting APGs have to be carried out during the very tight non-operating hours between two to five in the morning so as to avoid

causing disruption to passenger services. As the works involve modifications to the platform structure in open air at the at-grade or aboveground stations, the coming study will also address the possible noise and nuisance generated to residents nearby despite the possible noise mitigation measures that would be implemented. It should also cover the possible communication programme with the local community.

17. It is expected that further studies on the platform edge loading and suitable modifications to the design of the platform edge structure will be completed by the end of this year.

Conclusion

18. The MTR PSD Retrofitting Programme has been successfully completed, making it the first railway company in the world that has retrofitted PSDs to a railway system that is already in operation. The technical constraints have been well-addressed and the works were completed in a smooth manner without adverse impact on passenger services.

19. With the experience thus gained, the Corporation concludes that more detailed studies, planning and comprehensive trial were essential to the overall success of the project.

20. With this in mind, the Corporation will continue its technical study on the feasibility of retrofitting APGs at its at-grade and aboveground stations with a view to delivering a safe and reliable service to the public of Hong Kong.

MTR Corporation
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