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Panel on Transport

Subcommittee on Matters Relating to Railways

Meeting on 4 May 2007

**Background Brief on
Retrofitting of platform screen doors and automatic platform gates at
railway stations**

Introduction

The Council has along been concerned about the retrofitting of platform screen doors¹ (PSDs) and automatic platform gates² (APGs) at railway stations to ensure the safety of passengers awaiting trains at platforms. Over the years, Members have raised a number of questions at Council meetings, requesting the Administration to examine the feasibility of retrofitting PSDs or APGs at railway stations. In May 1999, the then Mass Transit Railway Corporation (MTRC) decided to proceed with the PSD Retrofit Programme, which involved 74 platforms at 30 underground stations of the Kwun Tong Line, Tsuen Wan Line and Island Line. Since then, Members have been following up with the Administration and the two railway corporations on the funding arrangements for the retrofit programme, the progress of the related works, and the feasibility of retrofitting PSDs and APGs at the remaining stations. In the context of the rail merger, the Bills Committee formed to study the Rail Merger Bill has also reviewed the difficulties encountered by the two railway corporations on the retrofitting of PSDs and APGs at the at-grade or aboveground MTR stations, East Rail, Ma On Shan Rail and Light Rail stations.

Retrofitting of PSDs and APGs at MTR stations

Underground stations

2. In mid 1996, the then MTRC started to consider the benefits of retrofitting PSDs and the feasibility of retrofitting PSDs at existing MTR stations which were built

¹ Platform screen doors are full height, total barriers between the station floor and ceiling.

² Automatic platform gates are chest-height sliding doors at the edge of railway platforms to prevent passengers from falling off the platform edge onto the railway tracks.

in the 1970's and 1980's. In May 1999, upon completion of a feasibility study and taking into consideration public views, the Corporation decided to proceed with the PSD Retrofit Programme, which involved 74 platforms at 30 underground stations of the Kwun Tong Line, Tsuen Wan Line and Island Line. The Retrofit Programme was completed in 2006.

3. The capital cost of the PSD Retrofit Programme was about \$2 billion. It includes various contracts for design, manufacturing, installation, testing and delivery of the PSDs, modification of the environmental control systems (which comprises the ventilation, air-conditioning and smoke extract systems), construction of equipment rooms, and modification of signalling system for the new operating environment with the retrofitting of PSDs. On-going maintenance costs for the operation of PSDs are not included in the \$2 billion project cost.

4. In June 2000, the Corporation announced that the capital cost of the project, which was not covered in the original investment plan of the urban lines of MTR, would have to be borne by both passengers and the Corporation. Under the proposed arrangement, the Corporation would collect \$0.1 from each MTR Octopus journey starting from July 2000 until the total contribution from passengers reaches \$1 billion (i.e. half of the capital cost of the project). Without taking into account the time value of money and changes in patronage, the Corporation estimates that it takes about 15 years to collect \$1 billion from passengers counting from July 2000, when the \$0.1 contribution was introduced.

New railway stations

5. As regards new railway stations, PSDs were first introduced in Hong Kong as a new feature on the Airport Railway, which commenced service in 1998. With the satisfactory performance of PSDs at the Airport Railway, the Corporation had decided to adopt PSDs as a standard feature for its new railway projects, including the Tseung Kwan O Line of which installation of PSDs was included in the design stage. APGs were also installed at stations of the Disneyland Resort Line.

At-grade or aboveground stations

6. The Corporation points out that for existing at-grade or aboveground MTR stations, which are provided with natural ventilation only, the retrofitting of PSDs is subject to more complex technical constraints. The scale of works, including the installation of the necessary ventilation and air-conditioning systems, is highly akin to rebuilding those stations, given the limits of the stations structure.

7. The Corporation also advises that it is currently studying the installation of APGs at aboveground stations. However, there are a number of difficulties in constructing such platform gates in an operating railway environment. Many of these are similar to the problems encountered and overcome in the PSD retrofit project. The primary lesson learned from that project is that detailed study and planning at the

initial stages are essential to the overall success of the project.

8. The key issues that are specific to the installation of APGs include the following:

- (a) Platform edge loading – in the PSD retrofit 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 APG, 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 modification is deemed necessary. Therefore, detailed study is required to understand the platform edge loading and design suitable modifications to the platform edge structure to take up this additional load.
- (b) Ventilation – with the provision of APG, the Corporation has yet to examine to what extent the movement of air would be affected. Detailed study and trials are required to understand the effect of APGs on the 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 APG 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. Detailed study on the earthing system of individual stations is required.

Retrofitting of PSDs and APGs at KCR stations

9. For Kowloon-Canton Railway Corporation (KCRC), PSDs have been installed at stations adopting an enclosed design, that is, all stations of the West Rail and the East Tsim Sha Tsui Station of East Rail which commenced operation in 2003 and 2004 respectively.

10. Regarding the remaining stations, KCRC has been examining the feasibility of retrofitting APGs at platforms of East Rail and Ma On Shan Rail stations (except East Tsim Sha Tsui Station in which PSDs have been installed) with reference to the requirements and feasibility of installing APGs in overseas railways (e.g. Japan, United States). According to KCRC's initial findings, it is technically feasible to retrofit APGs at platforms. Nonetheless, the potential safety problem caused by the relatively wide gap between platforms and trains at some East Rail stations with curved platforms has to be resolved in the first place. This issue is being examined by KCRC and a trial scheme will be implemented shortly.

Retrofitting of APGs at Light Rail stops

11. KCRC advises that it has earlier studied the feasibility of installing platform gates at Light Rail platforms. Due to geographical constraints, most of the Light Rail platforms are only about 4 meters wide. After deducting the space occupied by platform facilities, a waiting area of only 2 to 3 metres wide is left for passengers taking Light Rail. If platform gates are to be installed, platform space will be further reduced. The situation will be worse during peak hours. Not only will the passengers boarding and alighting be inconvenienced, but also the time taken for boarding and alighting be extended. The efficiency of train operation may also be affected as well. In view of the above, KCRC has no plan to install platform gates at Light Rail stops.

Measures to enhance safety of passengers awaiting at platforms

12. In reply to a written question raised by Hon Audrey EU at the Council meeting on 22 March 2006, the Administration advised that the two railway corporations had adopted the following safety devices and arrangements in their daily operation to ensure the safety of passengers awaiting trains at platforms:

- (a) public announcements are made to advise passengers on approaching trains and remind them not to stand beyond the yellow line (at platforms without PSDs);
- (b) CCTV cameras are installed at every station platform to facilitate effective platform monitoring and management;
- (c) station staff and additional platform assistants are deployed to maintain order and provide assistance to passengers at platforms especially during peak hours;
- (d) passenger help lines and emergency train stop buttons are installed at each platform (except that of Light Rail) for emergency use; and
- (e) passenger safety education/publicity activities are conducted regularly.

For KCRC East Rail stations, the following measures have also been put in place to strengthen platform safety:

- (a) flashing lights, of which the colour will be changed regularly, are installed at the edge of curved platforms to alert passengers to the gap between platform and train;
- (b) additional platform assistants are deployed at stations with high Mainland visitor traffic such as Lo Wu, Sheung Shui, Kowloon Tong and Hung Hom stations during evening and nighttime; and

- (c) safety promotional materials are distributed to visitors arriving Hong Kong at Lo Wu station.

13. As regards the suggestion of setting a lower speed for trains entering stations so as to help mitigate the injuries caused by incoming trains to passengers who fall onto the railway track, KCRC explained that factors including the distance between stations, ambient environment of the railway sections and operation safety have been taken into account in designing the speed of East Rail trains. Operation safety would be compromised if the train speed for sections before entering stations were to be increased. In addition, KCRC said that the speed of East Rail trains in entering stations is safe and comparable to the design of other overseas railways, that is, trains would begin to decelerate before entering stations and come to a halt gradually. KCRC considered that if the train speed when entering stations were decreased, the journey time would be prolonged hence impact on the efficiency of railway service.

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