

**Legislative Council Panel on Transport  
Subcommittee on Matters Relating to Railways**

**Supplementary Information on Retrofitting Automatic Platform  
Gates along the East Rail Line and Ma On Shan Line**

**Background**

At the meetings of the Subcommittee on Matters Relating to Railways on 21 January 2011 and 13 January 2012, the MTR Corporation Limited (MTRCL) presented to the Subcommittee the latest progress of retrofitting automatic platform gates (APGs), and explained the technical difficulties involved in retrofitting APGs along the East Rail Line (EAL) and that combining retrofitting APGs as part of the Shatin to Central Link (SCL) project is a logical solution to resolve these technical difficulties. This paper aims to provide supplementary information on the subject.

**Technical difficulties and challenges**

2. Technical studies reveal the following difficulties and challenges in retrofitting APGs along the EAL –
- (a) safety risk associated with wide platform gaps;
  - (b) limitations of existing signalling system;
  - (c) limitations of existing trains; and
  - (d) limitations of platform structures.

Safety risk associated with wide platform gaps

3. Platform gaps are required for safe train operations to prevent trains in motion from hitting the platform when arriving and departing a station. Because of the need to cater for different types of trains operating on EAL including intercity trains from Mainland China, the gap at stations where the platform is built in curve is comparatively wider. The installation of APGs at these platforms would hide the wider gaps from passengers' view, creating a serious safety risk. Therefore, the wider gaps at curved platforms must be resolved as a pre-requisite to installing APGs.

Limitations of existing signalling system

4. The existing signalling system has been used for many years. Longer processing time would be required for the existing signalling

system to control the operation of any additional system or equipment like APGs, leading to longer station dwell times, longer journey times and a lowering of the existing level of EAL service. On the other hand, the installation of APGs would require trains to be stopped at more precise marks to ensure train doors are aligned with the positions of APGs. The existing EAL signalling system is not designed for such accuracy, which means should APGs be retrofitted, when trains miss designated stopping marks, they would have to be moved backward or forward to the correct position before train doors and APGs can be opened to allow boarding and alighting of passengers. This would cause service delays in EAL. Furthermore, due to limitations of the existing EAL signalling system, it is not always able to detect an APG which is not completely closed and hence stopping the train from entering or leaving the platform, leading to safety risk.

5. It is concluded that if APGs are to be installed along the EAL, the existing signalling system would have to be replaced altogether to ensure safe train operations and for existing passenger service levels to be maintained.

#### Limitations of existing trains

6. The installation of APGs would require trains to stop more accurately at platforms. Other than a more sophisticated signalling system, train motoring and braking systems suitable for use with APGs would also be required. Existing EAL trains are not equipped with such motoring and braking systems. If the current fleet is to be refurbished to add motoring and braking systems suitable for use with APGs, the additional stress will impact on the structural integrity of the train cars, leading to a reduction in their asset life. Even though further structural enhancement may be possible, there would still be a high risk of causing structural damage to the trains.

#### Limitations of platform structures

7. Existing EAL station platforms are not designed to take on any additional loading. If APGs are to be installed, substantial modification will be necessary to strengthen the platform structures to support safe APG operations.

## **Retrofitting of APGs in tandem with SCL project**

8. Taking all factors into account, MTRCL is of the view that the logical solution is to combine the work of the SCL project and the retrofitting of APGs along the EAL because the wide platform gap issue at curved platforms could be resolved and the new signalling system, new trains and the required platform modification works could all be carried out at the same time when the SCL project's North-South Corridor is constructed. It is expected that APGs along the EAL will be operational by the time the North-South Corridor of the SCL is completed in 2020.

## **Retrofitting APGs at EAL stations as a standalone project or retrofitting APGs at straight platforms first**

9. To ensure safe and reliable train operations, the limitations of the existing signalling system and existing trains mentioned above need to be overcome whether the retrofitting of APGs along the EAL is carried out as a standalone project or at straight EAL platforms first. Regarding the time required for the project, about eight and a half years will be needed to procure and replace the signalling system and the train fleet with the first APGs being operational at the same time. As retrofitting work can only be carried out in a small window of three to four hours overnight during non-service hours so as not to affect normal passenger train service, the retrofitting of APGs at all the stations will take about one and a half years. Therefore the retrofitting of APGs as a standalone project at EAL stations will take about ten years to complete. The time required to complete the project is similar to that of retrofitting the APGs in tandem with the SCL project.

## **Timetable and work arrangements for retrofitting APGs along the Ma On Shan Line**

10. The Ma On Shan Line (MOL) is currently using 4-car trains. When the SCL comes into operation, it will be changed to allow ultimate operation of 8-car trains. Relevant platform modifications will be necessary. Both retrofitting APGs and the construction of the East-West Corridor of the SCL will involve modifications of MOL platforms. If the retrofitting of APGs along the MOL is carried out first, most of the APGs installed will have to be dismantled when construction of the SCL begins, as the train door opening positions for 4-car trains will be different from the positions for 8-car trains operating on the extended platform. The dismantling process will inevitably cause damage to the APGs, rendering them unfit for installation again, resulting in wastage.

11. From design, tendering, work implementation to completion, it took four years for MTRCL to complete the retrofitting of APGs at the eight at-grade and above-ground stations of the pre-merger MTR system. Taking this as a reference, if retrofitting of APGs is done at the existing MOL platforms for 4-car trains before they have been changed to allow operation of 8-car trains, when the project is completed in four years' time (i.e. in about 2016), platform modification works for the SCL's East-West Corridor will have also been completed. That means if retrofitting of APGs for 4-car trains and SCL's platform modification works are carried out at the same time, APGs for 4-car trains will have to be dismantled and re-installed before they are put into operation.

12. As retrofitting work can only be carried out in a small window of three to four hours overnight during non-service hours, the repeated work procedures involved in demolishing and re-installing the APGs will incur longer time for the whole project. Besides, during the demolishing and re-installing process, wastage will be incurred due to the inevitable damage to some of the APGs, as well as the fact that some APGs will need to be discharged and produced again with the change in location of installation. Moreover, repeated works on MOL platforms will persistently cause inconvenience and nuisance to passengers.

13. Therefore, MTRCL would carry out the APG retrofitting works at MOL stations in tandem with the construction of the East-West Corridor of the SCL project scheduled for completion by 2018. When the East-West Corridor of the SCL is completed and commences service, it is envisaged that the APGs will be operational at the same time.

14. On 12 January 2012, MTRCL started the pre-qualification process by inviting contractors to express interest to work on the MOL APG retrofit. According to the established assessment procedures including the pre-qualification exercise, official tendering and assessment on tenders received, it is expected that a contract for the project can be awarded in the fourth quarter of 2012. After the contract is awarded, MTRCL will discuss with the contractor on the detailed design, work plan and timetable of the project.

### **Cost of retrofitting APGs along the EAL and MOL**

15. Regarding the project cost, MTRCL is now conducting technical studies on retrofitting APGs along the EAL and MOL. However, to ensure fair and competitive tenders, the actual cost can only

be confirmed when contracts for the projects are awarded. As a reference, it cost \$2 billion (2006 prices) for MTRCL to retrofit platform screen doors at 30 underground stations and \$300 million (2011 prices) to retrofit APGs at eight at-grade and above-ground stations. As comparison, EAL has 14 stations and MOL has 9 stations.

## **Conclusion**

16. The logical solution for retrofitting APGs along the EAL and MOL is to carry out the retrofitting works in tandem with the SCL project, and arrangements to prepare for APG retrofitting works in this direction have commenced.

17. Before the retrofitting of APGs along the EAL and MOL, MTRCL will employ more than 200 additional Platform Assistants in 2011 and 2012 to maintain platform order and provide assistance to passengers to board and alight at EAL and MOL stations.

MTR Corporation Limited  
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