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Mr Andrew Hall
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Dear Andrew,

RAIB Report: Passenger dragged a short distance by a train at Holborn station

I write to report¹ on the consideration given and action taken in respect of recommendation 1 addressed to ORR in the above report, published on 23 October 2014.

Annex A to this letter provides details of the consideration given/action taken in respect of this recommendation. The status of recommendation 1 is '**Part Implemented**', part 2 being reported as '**Implemented**' and part 1 as '**Non-implementation**' about which we consulted with you on 20 August 2015. We do not propose to take any further action in respect of this recommendation unless we become aware that any of the information provided becomes inaccurate, in which case I will write to you again.

We will publish this response on the ORR website on 1 October 2015.

Yours sincerely,

Andrew Eyles

¹ In accordance with Regulation 12(2)(b) of the Railways (Accident Investigation and Reporting) Regulations 2005

Recommendation 1

The intention of this recommendation is that staff performing the SATS role should be properly equipped to reduce risks at the platform/train interface by being able to take effective action to stop trains in an emergency. Consideration of how this can best be achieved should take into account the possibility that the waving of two hands in the 'emergency stop' signal is not sufficiently conspicuous on a crowded platform.

London Underground Ltd should provide staff acting as Station Assistant (Train Services) (SATS) with an effective means of alerting the train operator to a dangerous situation that arises after the SATS has given the signal to start the door closing sequence, and before the train has begun to move.

London Underground Ltd should also review how the role of the SATS is described in Rule Book 8 and other company documents, so that the duty of the SATS to rapidly respond to dangerous events that occur during the despatch process is given appropriate emphasis.

Steps taken or being taken to address the recommendation

1. In respect of the first element of RAIB's recommendation London Underground Limited (LU) provided a response on 9 January 2015 which advised that a workshop had been held at which additional effective methods by which SATS could alert the Train operator to dragging incidents had been considered. LU's view was that none of the options identified could be justified as offering a 'reasonably practicable' alternative due to cost (supported by Cost Benefit Analysis) and significant engineering works required to deliver potential solutions.
2. ORR wrote subsequently to LU on 30 January 2015 seeking further information on the Cost Benefit Analysis undertaken. Following a subsequent meeting between LU and ORR on 25 February 2015 where ORR also raised the question of the potential use of radio communications to discharge this recommendation, LU provided a further response as follows on 30 March 2015:

LU held a workshop to consider the RAIB recommendation of additional effective methods by which staff completing SATs duties may alert the Train Operator should an emergency arise during the departure sequence.

Potentially effective methods discussed included:

- *Radio communication between the staff member completing the SATs duties and the Train Operator.*

This was discounted as it was considered it went against the fundamental arrangements where the only person who contacts the Train Operator through the radio system is the Line Controller. This arrangement has been in place for many years and is based on experience of railway operations and incident management.

- *Technically viable options*

- *Placing additional signals or indication devices ahead of the train operated by the staff member completing SATs duties.*

A review by members of LUs signal assurance team calculated the costs of installing an additional signal ahead of the train operator as being between £300,000 and £500,000 per signal. This figure considers development of the solution, wire counting correlation, site surveys, development of operational rules, materials, design, approvals and testing.

If this option was to be applied to all fifty-three Piccadilly Line stations based on one signal per station the costings would be in excess of £26.5 million.

- *Installing code breakers within the signal system, which could be operated by the staff member completing SATs duties.*

This option was also reviewed and costs calculated for the Northern Line. If an emergency stop plunger was installed on each platform, development, design, installation and testing is calculated at approximately £500,000 per station. Therefore the costs of implementing this option at fifty stations is calculated in excess of £50 million

- *Installing red lamps in the SATs batons which the Train Operator would view through the One Person Operated (OPO) monitors and mirrors.*

The cost of installing red lamps in SATs batons, including initial design, testing, procurement, training and updating of documentation i.e. rule books and training material, but not ongoing maintenance was calculated to circa £250,000.

Utilising LU Category 1 standard S1521 'Safety Decision Making' LU completed a cost benefit analysis (CBA) of using SATs batons with red lamps to identify if there was a safety benefit. The results of the CBA identified the cost of any technically viable option was greatly disproportionate to the safety benefit achieved.

LU also completed a risk tolerability analysis utilising LU Category 1 standard S1521 'Safety Decision Making'. The results of this identified the risk is broadly acceptable and no significant effort is necessary to further reduce risk, see Annex B. LU notes as required by S1521 it should (and will)

maintain existing controls to manage the risk as low as reasonably practicable (ALARP), this being an LU term within S1152 which the RSSB note in their document 'Taking Safe Decisions' is sometimes used to express the term so far as is reasonably practicable (SFAIRP).

3. On 18 August 2015, in response to an ORR question regarding the possible implementation of lower cost solutions, LU provided the following update:

There were many solutions put forward at the workshop, they ranged from whistles and flags (which are similar physical arrangements as those presently available) through to platform edge doors at all stations, however moving forward LU focused on solutions that were reasonably do-able and potentially effective, these tended to be the more technical and expensive options as listed in our response.

4. In respect of the second element of the recommendation LU has confirmed that it has reviewed how SATs duties are described in Rule Book 8 and other company documents. In its response dated 30 March 2015 LU confirmed the following:

- LU Rule Book 8 'Managing the Platform Train Interface' will be amended at its next planned update (January 2016) to provide appropriate emphasis to those completing SATs duties to, rapidly respond to dangerous events that may occur during their dispatch process.*
- In the interim period, prior to Rule Book 8 being updated LU has directed all staff completing SATs duties that if an emergency arises during the departure sequence they should immediately stop the train. This has been completed through entries in traffic circulars 25 (24th November 2014) and 26 (8th December 2014), these entries will be completed every three months until the update to Rule Book 8 is completed.*
- The Customer Service Assistance (CSA) training course notes have been updated thus staff completing SATs duties are instructed that if an emergency arises during the departure sequence they should stop the train immediately.*
- To provide confirmation that items 4 and 5 have been understood by those completing SATs duties LU has completed sample verification through discussion with SATs at various stations.*

5. On 18 August 2015, in response to an ORR question regarding the way that SATs could stop a train immediately when no additional solution had been provided under part one of this recommendation, LU provided the following update:

At the date of the incident the rule book stated:

If an emergency arises as the train is leaving the platform you must try to stop the train by using any of the following methods (as appropriate):

- emergency stop signal*
- emergency stop plunger*

- *headwall tunnel telephone*
- *section ahead plunger*
- *traction current plunger.*

The traffic circular entries and the forthcoming Rule book update advises those completing SATs duties that the train should be immediately stopped, this emphasises the need for a rapid response using the methods presently available (as listed above).

ORR decision

6. Having reviewed the responses and discussed them with the end-implementer ORR is satisfied that LU has considered possible alternatives for SATs to alert train operators of instances of dragging. However, given the very low number of such incidents (~ 1 RIDDOR report / year 2010-15 figures²) that occur each year in comparison with the 1.3Bn annual passenger journeys, and when considering the grossly disproportionate cost of implementing the alternatives (as supported by Cost Benefit Analysis undertaken by LU and reviewed by ORR), ORR considers that implementing any of these options would not be 'reasonably practicable' in accordance with law and therefore not enforceable by ORR. The first part of the recommendation is therefore reported as 'non-implementation'.

7. With regards to the second part of the recommendation LU has reviewed the SATs role and re-briefed it out. LU has confirmed that Rule Book 8 will be amended in January 2016 to provide emphasis on responses to dangerous events during dispatch, and in the interim period has and will continue to circulate guidance to all relevant staff through entries in quarterly traffic circulars. ORR is therefore content that this element of the recommendation can be reported as 'implemented'.

8. After reviewing all the information received from London Underground Limited, ORR has concluded that, in accordance with the Railways (Accident Investigation and Reporting) Regulations 2005, London Underground Limited has:

- taken the recommendation into consideration; and
- has taken action to implement the second part of the recommendation only.

Status: Part Implemented.

² There are probably ~3 draggings per year as passengers experiencing these are not always taken to hospital.

Extract from LU risk tolerability analysis

