Optimising door closure arrangements to improve boarding and alighting

T1102

For more information contact:
enquirydesk@rssb.co.uk

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Raising passenger awareness and enhancing on-board auditory and visual cues will help passengers make better boarding and alighting decisions

Aim
The aim of this project was to understand how passengers interact with train doors during boarding and alighting, and to examine passengers’ understanding of door closure arrangements. The focus was on preventing door closure incidents, rather than mitigating their consequences. The study included an assessment of current door closure arrangements and interviews with passengers.

Findings
Two-thirds of passengers interviewed did not understand the door close alarm as indicating that they should ‘stand back’. Instead, passengers tend to disregard the alarm and continue to board, which shows that the meaning of hustle alarms is not well understood by passengers.

The majority (58%) of interviewees believe that, if obstructed, doors will automatically re-open like lift doors. This leads to late boarding and passengers deliberately blocking closing doors in the hope that they will open again.

Occasional leisure travellers are most risk of injury from closing doors, as most injuries happen in the summer holiday season and at off-peak times of day.

Doors that close automatically after a period of non-use (to regulate train temperature, referred to as auto-closing’) represent a large proportion of door closure incidents. Passengers are not always aware of the function and cannot always respond appropriately.

There are several different door closure arrangements in operation. Differences relate to the door close alarm duration (3 to 9 seconds), the time a door takes to close (2 to 5 seconds) and in the predefined times for auto-closing (between 10 seconds and 3 minutes). Assessment of these has not identified any clear preference in the current arrangements, nor is there evidence that achieving consistency in these arrangements is the key factor in improving passenger behaviour. Slower door closure arrangements were identified as a possible recommendation but may impact performance and have an adverse effect on timetabling.

Increasing the time that a door takes to close when auto-closing, by about 50% of the normal closing time, where possible, should to reduce the number of door closure incidents. However, this will have no impact on trap and drag risk. The public may also become familiar with a slower door speed and their behaviour may adapt accordingly.
Impacts and benefits

This research project fulfils the undertaking in the industry’s Platform Train Interface Strategy to conduct research into door closure arrangements. It highlights how passengers interact with and understand door closure arrangements, and has highlighted the following benefits:

- Increasing passenger awareness of door closure arrangements will enable passengers to make better boarding and alighting decisions and take appropriate evasive action when confronted with closing doors. The final report sets out the messages that should inform an awareness raising campaign.

- If train operating companies’ and rolling stock leasing companies’ personnel can identify passenger behaviours that cause concern, measures can be taken to prevent these situations from occurring. This will help to decrease the number of incidents occurring. Being aware of typical precursor behaviours may also improve staff confidence in identifying and reacting to a situation before it escalates.

- Enhancements made to the audible messages, and timings of warnings and alarm types for door closure arrangements will also support passengers’ decisions when boarding and alighting.

- Recommendations to clarify and increase the information that is available to passengers about which side of the train to alight, may decrease the number of incidents. Customers making better informed decisions may positively impact station dwell times.

- An increase in customer satisfaction by facilitating boarding through increased time available.

- Possible integration with EN14752, Railway applications. Body side entrance systems for rolling stock; the persons with reduced mobility technical specifications for interoperability; and Rail Industry Standard 2747, Functioning and Control of Exterior Doors on Passenger Vehicles.

This study has given greater insight into how passengers behave when train doors are about to close. A lack of clarity clearly exists around the purpose of the sound given before the door closes – stand back or jump on. The study concludes that this needs to be addressed and outlines potential options for trial. The use of door ‘auto-close’ has also been shown to contribute to passengers rushing, with the potential for PTI-related injury. A range of options to address this risk has also been identified.

Nick Swift, Eversholt Trains:
Background

The rail industry’s Platform-Train Interface Strategy identified the need for research into the effect of ‘hustle alarms’ on passenger behaviour and closing train doors prior to departure. The need for this research was hastened following ‘trap and drag’ events at West Wickham in April 2015 and Hayes and Harlington in July 2015.

Where to find out more

The final report for project T1102 is available to RSSB members on www.sparkrail.org. It is aimed at those that have a responsibility for strategic issues associated with door closure arrangements, covering both operations and rolling stock design. The research was delivered by DNV GL for RSSB.

A key theme for the PTI Strategy in 2017/2018 is passenger awareness; a key finding of this research project relates to passenger awareness so this project needs to be considered when agreeing the approach to the PTI strategy.

For more information, please email the RSSB enquirydesk@rssb.co.uk