This is a collation of some of the world’s railway formal inquiry reports. It includes a brief incident synopsis, along with the main causes and recommendations from each investigation. Readers may find some of the actions and recommendations useful to their own operations.

Co-ordinated by Greg Morse and Suzanne Taberneso, RSSB

Contents: (click to navigate)

UK: ‘Trap and drag’ incident at Jarrow (Tyne & Wear Metro), 12 April 2012
UK: Pedestrian fatality at Johnson’s footpath crossing, Bishops Stortford, 28 January 2012
UK: Near miss at Ufton AHB, Berkshire, 4 September 2011

Key issues in this edition:

- Door design
- Door maintenance
- Door extraction forces
- Passenger behaviour and culture
- (Mis)interpretation of standards
- Platform visibility (from cab)
- Crossing user behaviour
- Risk assessment and modelling
- Signaller error
- Signaller workload
- Signal box crossing indicator equipment
- Possessions involving level crossings
- Safety critical communications
At around 09:55, a passenger became trapped in one of the doors of a train at Jarrow station. The passenger had arrived on the platform as the doors were closing and placed her arm in the path of the closing leaves.

The closing doors trapped her arm, forcing her to run alongside the train as it left the station. A timely activation of the emergency door release by a passenger on board allowed the passenger to free herself and she fell onto the platform. The passenger left the station immediately. CCTV evidence suggests that she did not sustain significant injuries.

The RAIB investigation found that, in addition to the passenger’s actions, the following factors led to the incident:

- There was a fault condition on the set of doors involved in the incident which, with the arm trapped, not only disabled the obstruction detection system and prevented the door reopening, but also enabled the driver to release the train brakes and apply traction power;
- The passenger was unable to pull her trapped arm out of the door; and
- The driver of the train did not notice the trapped passenger in the few seconds between closing the doors and leaving the station.

RAIB also noted that misuse of the doors by passengers is commonplace on the Tyne & Wear Metro and appears to be encouraged by the following factors:

- The design of the doors, which usually reopen fully when obstructed, encourages people to stop the doors closing if they are late for the train;
- There were no additional warnings to passengers or reminders in the form of station announcements or other information to reinforce the message on the door stickers about not trying to board or alight when the doors are closing; and
- There was no enforcement of the Metro’s bye-laws which make it an offence to obstruct or interfere with the train doors, except in an emergency.

Finally, RAIB observed that the method used by Tyne & Wear to check the extraction force for thin obstacles (less than 15 mm) deviates from the intention of GM/RT2473 and BS EN 14752 (on which it is based) in respect of the geometry of the test obstacle and its material. It also deviates in terms of the direction of pull. These differences arose from a misunderstanding of GM/RT2473, which lacks some of the details given in BS EN 14752.

**Recommendations**

- DB Regio Tyne & Wear should:
  - Develop its current actions to reduce the frequency of door obstruction by passengers into an ongoing long-term strategy and implement this; and
  - Introduce a system of monitoring the frequency of door obstructions on its network, in order to check the efficacy of the above measures when implemented and to optimise the strategy where appropriate.
- DB Regio Tyne & Wear should identify ways to improve the reliability of the door obstruction detection and traction interlock systems, including consideration of improvements in:
  - Design of the control circuitry;
Worldwide FI Summary

- Ingress protection of the microswitches;
- Switch cleaning method;
- Replacement procedures; and
- Implement identified improvements.

- DB Regio Tyne & Wear should:
  - Review the visibility of trapped passengers from driving cabs at stations on its network, including consideration of how lighting, shadows at different times of the day, colour of passenger's clothing and train paint schemes may adversely affect that visibility; and
  - Implement identified improvements, to include consideration of realignment of platform mirrors and provision of additional CCTV monitors.

- DB Regio Tyne and Wear should change the test method it uses for checking compliance of its train doors against the obstacle extraction forces specified in Railway Group Standard GM/RT2473, so that it is also aligned with the requirements specified in BS EN 14752:2005.

- RSSB should clarify the section in Railway Group Standard GM/RT2473 relating to the obstacle extraction force with respect to the geometry and material of the test obstacle and the direction of pull, and/or cross reference BS EN 14752.

Published 13 December

UK: Pedestrian fatality at Johnson’s footpath crossing, Bishops Stortford, 28 January 201

For the full report, click here: [LINK](#)

On Saturday 28 January 2012 at 11:40, a train struck and fatally injured a pedestrian who was using Johnson’s footpath crossing, in Bishop’s Stortford, Hertfordshire.

The pedestrian started to walk over the crossing as a train was approaching, despite warnings provided by a red miniature stop light and an audible alarm, and crossed into the path of the train. RAIB consider this to be due to one of the following possible reasons:

- The pedestrian may have been unaware of the warnings provided by the red miniature stop light and audible alarm; or
- The pedestrian may have been aware of the warnings but was unaware that a train was closely approaching.

In addition, Network Rail had not developed a proposal to install a footbridge to replace the crossing, after an analysis undertaken in 2007 had shown that the benefits of so doing would exceed the costs. Following a further cost-benefit analysis in 2010, a footbridge was in development and has since been installed; Johnson’s footpath crossing was closed on 1 August 2012.

Although not linked to the accident on 28 January 2012, RAIB observed that:

- The cost-benefit analysis result obtained from the All Level Crossing Risk Model is critically dependent on the census data.
- Only three of the thirteen potentially viable options for mitigating risk at station and footpath crossings identified in RSSB’s research report ref. T730 are explicitly referred to in the Level Crossing Risk Management Toolkit.

**Recommendations**

- Network Rail should investigate ways to make cost-effective improvements to the conspicuousness of visual warnings of approaching trains, taking account of the findings of relevant RSSB research projects. Such improvements might include moving existing miniature...
stop light indications to the near side of the railway, or the provision of ‘back-to-back’ or ‘side-to-
back’ indications. The results of this investigation should be used to determine the optimum
configurations for new installations, as well as the situations in which it would be reasonably
practicable to enhance existing installations. If appropriate, Network Rail should then arrange for
the Level Crossing Risk Management Toolkit to be updated accordingly.

- Network Rail should amend its guidance on risk mitigations to take account of possible
improvements in the visibility of approaching trains at level crossings equipped with miniature stop
lights, particularly where signage or other level crossing equipment may obscure the view of the
Line
- Network Rail, in consultation with RSSB, should review the thirteen level crossing risk reduction
options identified in RSSB research, in order to determine whether or not each option should be
included as a mitigation available to those responsible for managing the risk at level crossings.
Network Rail should embed the findings of this review in its management of level crossing risks,
and communicate these changes to all relevant staff. Guidance should be provided to the relevant
staff on potential costs and benefits, as well as the specific circumstances in which each measure
might be effective.

Back to top

Published 20 December

UK: Near miss at Ufton AHB, Berkshire, 4 September 2011

For the full report, click here: [LINK]

At 12:28, the 11:13 Paddington–Bedwyn went over the crossing at 61 mph while the barriers were in the
raised position and the red road traffic signals were not flashing. A car approaching the crossing had to
stop suddenly to avoid a collision. The train driver had seen the car and realised the barriers were
raised. He was braking heavily as it passed over the crossing. The train stopped approximately 480
metres after the crossing.

No injuries or damage resulted from the incident, but there was clearly potential for a collision between
the train and the car.

Engineering work meant that the equipment which normally operated the crossing automatically had
been disabled and the crossing barriers and lights were being operated by a local attendant.

The incident occurred because a signaller did not carry out the rules requiring him to speak with the
attendant and the train driver so that the barriers were lowered and the train approached the crossing at
low speed. It is probable that these omissions were a result of a lapse and the signaller being
overloaded by activities that he was required to undertake in connection with the engineering work and
the resumption of passenger services after completion of this work. It is possible that the signaller
actions were affected by shortcomings in the presentation of information on the display screens used at
his workstation. Inadequate consideration of signallers’ workload associated with engineering work is
considered a probable underlying cause.

RAIB listed the following causal factors:

- The signaller did not caution the driver of the train at the signal that protects the crossing, in order
to to inform him that Ufton crossing was under local control;
- The signaller did not instruct the level crossing attendant to lower the barriers; and
- The signaller could not contact the level crossing attendant to confirm that the barriers were in the
lowered position.

A ‘probable’ causal factor was that the signaller’s workload was high.

‘Possible’ causal factors were:
The status of the level crossing was not displayed adjacent to the signaller’s control that might have been used to remove the reminder; and

The level crossing barrier status message was positioned at a location where it could be overlooked by a signaller setting a route over the crossing.

In addition, RAIB noted that the plan for amending possession limits, testing signalling equipment and introducing the passenger service created the potential for overloading the signaller. There was no effective means for taking account of the signallers’ workload associated with the plan.

Recommendations

• Network Rail should identify, and provide a time bound plan to eliminate, all IECC VDU controls which permit a signal or point reminder to be removed in situations where the signaller cannot see sufficient on-screen messages and indications to inform the decision whether to remove the reminder.

• In respect of automatic half barrier level crossings supervised from IECC installations, Network Rail should consider interfacing information about level crossing status with signal controls to reduce the risk of signallers permitting a train to pass over the crossing without applying the rules applicable to local control. Network Rail should include consideration of a warning or reminder which must be acknowledged on each occasion that a signaller attempts to set a route over a level crossing under local control. If found practical, Network Rail should modify standards and specifications to require this feature in future IECC upgrades and new installations.

• Network Rail should review the local control indications displayed in respect of automatic half barrier level crossings on the Thames Valley Signalling Centre (TVSC) VDUs to identify any inconsistencies with the associated Network Rail specification requirements. If any of these inconsistencies have the potential to have a significant adverse effect on safety, Network Rail should amend the indications displayed at TVSC and/or the Network Rail IECC control and indication specification so that appropriately positioned conspicuous indications are displayed on all IECC VDUs.

• Network Rail should examine and implement ways in which the workload of signallers can be kept within reasonable levels during engineering possessions, particularly those involving multiple changes to possession limits. This work should aim to avoid, where practical, situations in which signallers must delay engineering work or train services in order to avoid excessive workload.

• Network Rail should modify appropriate standards and specifications so that future IECC installations include a system to fully record signaller’s actions. Information recorded should include:
  o Reminder appliance override;
  o Signaller’s selection of VDU view; and
  o The view used when controls are operated using a VDU view.

Where practical, the system should incorporate a playback feature.

• Network Rail should review the existing requirements concerning the number of red flags or lights to be placed on each side of a level crossing under local control. Network Rail, if necessary in cooperation with the RSSB, should then take appropriate action to ensure that the correct, clear and consistent information is included in training, instructions and rules applicable to level crossing attendants.

• Network Rail should re-brief staff that level crossing attendants’ red lamps/flags must never be removed when crossings are under local control and the barriers are raised or the gates are open.