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, RSSB

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Key issues in this edition:

- Crossing user behaviour
- Waiting times at level crossings
- Maintenance procedures (error)
- Maintenance supervision
- Effect of sunlight on level crossing warning lights
At 17:37 – during darkness – on 24 January 2013, a cyclist was struck and fatally injured at Motts Lane level crossing by a passenger train travelling close to 100 mph. The crossing’s warning lights were showing red, and the audible warning was sounding. The cyclist was unaware that the train was so close to the crossing, probably because it was difficult to pick out the train’s headlight amongst the lights of Witham station, about 700 metres away. RAIB says that it is not possible to say why he rode onto into the path of the train against the red lights, although it may have been because he was used to seeing the lights at red for long periods before trains arrived at the crossing, and decided that it was safe to cross.

The lights showed red for long periods because there were deficiencies in the design of the area’s railway signalling system, which was not being used as designed. The cyclist may also have misjudged the train’s speed and position.

RAIB added that a causal factor was that Motts Lane crossing had not been replaced by a bridge, despite previous plans to build one.

RAIB observed that Motts Lane crossing is heavily used, but Network Rail’s figures did not accurately reflect this.

**Action taken**

The day after the accident, Network Rail instructed the signallers at Liverpool Street IECC to use the appropriate stopping or non-stopping signalling setting for all trains passing through Witham. Although this will not fully resolve the extended warning time issue, it will improved the situation until a bridge is provided.

Network Rail has appointed staff with suitable qualifications to its Liability Negotiation team, and has changed its internal guidance on level crossing closure processes to address the problems that were encountered with the initial application to extinguish the bridleway rights at Motts Lane.

Network Rail plans to close Motts Lane crossing and replace it with a bridleway bridge. Planning permission has been obtained and preliminary site works began in September 2013, with the deck being lifted into place over Christmas.

**Recommendations**

- Network Rail should, as soon as possible, review all automatic level crossings (including AHBs, ABCLs, AOCLs and MSLs) to identify locations where complex track and signalling layouts, nearby stations and/or railway operations may lead to the red road/pedestrian lights showing for an excessively long time. At each location identified, Network Rail should assess the risk from extended closure times, and take action to manage this risk as necessary.

- Network Rail should determine, in the light of the risk that arose from the indiscriminate use of the non-stopping setting at Liverpool Street IECC, whether there are any other locations where local instructions/practices may be at risk of introducing unnecessarily long waiting times at automatic crossings, and take appropriate action to correct the situation.

- Network Rail should review its processes for designing and implementing Automatic Route Setting where it interacts with level crossing controls, and amend or enhance them as necessary to produce assurance that the design will result in the crossing operating in accordance with relevant standards and guidance.

- Network Rail should establish, by carrying out research or otherwise, appropriate maximum time(s) for red lights to be designed to be shown at MSL crossings, and acceptable levels of
variability for this time (taking into account factors such as the types of train, and stopping patterns), in view of the risk that users may become intolerant of extended waiting times. Taking account of the results of this work, it should modify its risk management processes for MSL crossings to include consideration of the length of time that the red lights show.

Published 16 January

**USA: Passenger train derailment at Niles, Michigan, 21 October 2013**

For the full report, click here.

At 10:10 (local time) on 21 October 2012, a four-car passenger train working ‘top-and-tail’ entered Niles Yard, Michigan, at 61 mph, derailing around 291 feet beyond the pointwork. It travelled a further 1,148 feet before coming to rest in a siding, upright and in line with the track. Thirteen people were injured, eight of whom required hospital treatment for non-life threatening conditions.

Images from the forward-facing cameras showed that the train was proceeding on a clear signal (CP190) and that the points were set for entry into Niles Yard. The track entering the yard was limited to 15 mph, and the track beyond was limited to 5 mph.

At the time of the accident, an Amtrak signal supervisor was at CP 190, engaged in maintenance activities involving the use of jumper wires. The National Transportation Safety Board (NTSB) determined the probable cause of the accident to be the unauthorised use of a jumper wire that provided a false proceed aspect while the points were set for entry into Niles Yard. This usage was inconsistent with Amtrak procedures for using jumper wires to override signal and train control safety-critical circuits.

The NTSB noted that a contributory factor was Amtrak’s failure to ensure the employment of proper jumper wire safeguards.

**Action taken**

On 26 October 2012, Amtrak issued a safety notice and conducted a system-wide safety stand down for signal maintenance personnel. Amtrak managers discussed the circumstances of the Niles derailment and reviewed proper jumper wire procedures at safety meetings throughout the system.

On 18 March 2013, Amtrak issued a Bulletin, listing the procedures specified in its Communications and Signals Manual. The procedures explain that jumper wires should only be used as a last resort to restore train operations. The procedure requires the signaller to be notified in all cases where any signal system is inoperative and shows how protection is provided until repairs are made and the jumper wires are removed. It further requires the signal employee to obtain permission from the assistant division engineer for C&S or the signal supervisor for C&S in charge of the territory. The assistant division engineer or the signal supervisor must then obtain approval from the division engineer or the deputy division engineer. A jumper permission form must be prepared and signed by the employee requesting the jumper, approved by the employee authorizing the jumper, and retained for 30 days.

Amtrak also revised its observation programme for signal maintenance activities to include a variety of safety-sensitive behaviours and to emphasise that the focus of audits must be in the field, away from headquarters. Amtrak stated that it had increased overall field observations by 20% and that managers/supervisors will observe employees in the field using rules associated with the tasks they are given for that particular day and job. Observation locations will be listed by milepost number rather than by the nearest station.

On 8 March 2013, the NTSB issued safety recommendations to the Federal Transit Administration (FTA) and the Federal Railroad Association (FRA):

- In coordination with the FRA, the FTA should evaluate the best practices outlined in the FRA’s Safety Advisory 2002-01, and issue an updated safety advisory to all rail transit agencies that (1)
advises them of the circumstances of the Miami, Florida; Madison, Illinois; and Niles, Michigan accidents involving signal system maintenance procedures and (2) highlights the importance of adhering to the specified industry best practices regarding the use of jumper wires.

- The FTA should instruct state safety oversight agencies to audit all rail transit agency procedures and maintenance oversight programmes regarding the use of jumper wires to ensure they incorporate the current best industry practices outlined in the revised Safety Advisory recommended above and that transit procedures comply with the relevant sections of the Code of Federal Regulations.

**Published 16 January**

**UK: Freight train derailment at Castle Donington, 21 January 2013**

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

At about 19:55 on 21 January 2013, a freight train derailed at Castle Donington. There was extensive track damage, but no reported injuries.

RAIB found the immediate cause to be cyclic top before the point of derailment, which excited the suspension of the eighteenth wagon causing the left-hand leading wheel to become unloaded and to derail to the left. There had been a recurrence of cyclic top in the vicinity of where the derailment occurred, and the routine inspection and maintenance had not kept the track in an acceptable condition. In particular, planned stoneblowing on 20 November 2012, which should have included the track through the point of derailment, stopped before reaching it due to a shortage of time.

An underlying factor was that the ballast supporting the track was fouled, causing the track to be inadequately supported and leading to the recurrent cyclic top. The need to renew the ballast had been identified, but the work was not programmed to be carried out until 2016/17. This was in line with Network Rail’s policy for renewals on the route.

Although not causal to the derailment, RAIB observes that – had the signaller not shown vigilance and returned a signal to danger on the adjacent line – it is possible that an approaching train could have collided with the derailed wagon of the incident train, which was foul of the down Chellaston line. This could have occurred because following an abnormal brake application, which may have been caused by the train dividing, the Rule Book requires the driver to check the train is complete before contacting the signaller. This may take several minutes.

**Action taken**

Two days after the derailment, Network Rail ran a track geometry recording train over the Castle Donington route.

It also brought forward the reballasting of the up Chellaston line in the Back Lane area to 2013/14. This was completed on 19 August 2013.

Network Rail’s requirements relating to the competence of those required to raise speeds have been implemented in the Trent section manager’s organisation.

In addition, RAIB has identified three learning points re:

- Checking track, following the passage of trains, after lifting and packing work;
- Using appropriately qualified staff to raise speed restrictions following work to remedy poor track condition; and
Staff communicating safety information so that it is clearly and accurately understood.

**Recommendations**

- Network Rail should review, and if necessary improve, the planning of stoneblowing so that:
  
  - There is sufficient time allocated within the duration of a possession to complete the work planned to be carried out; and
  - If the duration of the possession is reduced after the work has first been planned, the implications for the completion of the work are examined, and the work re-planned so that the highest priority locations may be completed in the reduced time available).

- RSSB, in conjunction with the rail industry, should undertake a review of the Rule Book requirements relating to the action to be taken following an abnormal brake application on a freight train and make any changes found to be necessary to reduce the risk of collision with a derailed vehicle. Such a review should consider under what circumstances and how quickly the signaller should be contacted and the actions to be taken, such as cautioning the first train to pass on the adjacent line.

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**Declared to ERA 30 January**

**Estonia: Collision at Raasiku station level crossing, 23 August 2013**

For the full report, click [here](#) (includes summary in English).

At 14:30 (local time) on 23 August 2013, a passenger train struck a motor car on the open, automatic level crossing at Raasiku station. The car driver was killed instantaneously.

The Estonian NIB determined that the accident had been caused by the car driver failing to stop at the crossing, although the warning lights were flashing and the audible alarm was sounding. However, the report notes that her vision may have been adversely affected by sunlight.

**Recommendations**

- The infrastructure manager should improve the intensity of the crossing lights and provide barriers.