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.

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Key issues in this edition:

- Inadequate track maintenance
- Track maintenance procedures
- Driver distraction
- Mobile phone use
- Lack of train protection systems
- Level crossing use
- Level crossing risk assessments
- Whistle boards
- ERTMS at level crossings
- ERTMS and driver distraction
- Effects of temperature on track
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Declared to ERA 5 June

Spain: Freight train derailment near Canfranc, 11 July 2011

At 11:55 (local time) on 11 July 2011, a freight train derailed in a tunnel near Canfranc station. There were no reported injuries.

The cause was found to be poor track maintenance. In total eight wagons were damaged, three significantly so.

Recommendations

- As the track at the accident site has been renewed, a speed limit imposed and further inspections undertaken, no recommendations have been made.

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Declared to ERA 5 June

Spain: Freight train derailment between Santa Lucía and Villamanin, 24 May 2011

At 16:30 (local time) on 24 May 2011, a freight train derailed between Saint Lucia and Villamanin. There were no reported injuries.

The investigation found that the accident was caused by poor infrastructure maintenance. Specifically, there was insufficient ballast to support the track, due to a failure to complete planned maintenance work. Furthermore, the foreman handed the possession back to the traffic manager without informing him of this anomaly.

Recommendations

- The practicability of drawing up a standard for the condition of track after the completion of works, whether under normal or degraded conditions, should be assessed.

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Declared to ERA 6 June

Czech Republic: Passenger fall derailment between Ostrava-Kunčice and Ostrava-Svinov stations, 22 October 2011

At 19:26 (local time) on 22 October 2011, a passenger train passed a signal at danger and subsequently collided with a buffer and derailed. Seven people were injured, including the train driver. The investigation found that the driver had been distracted by resetting the passenger information system and sending a text message.

Recommendations

- The infrastructure manager should speed the introduction of ETCS to main and regional lines.
- The infrastructure manager should introduce a train protection system to lines on which ETCS is not to be installed.
- Train operators should speed the installation of the on-train elements of ETCS, in order to facilitate full functionality as soon as the infrastructure is ready.
- The National Safety Authority should take its own measures to enforce the implementation of the above recommendations.

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UK: Fatal accident at Mexico footpath crossing, Penzance, 3 October 2011

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

At around 15:50 on Monday 3 October 2011, a pedestrian was struck and fatally injured by a train on Mexico footpath crossing, near Penzance. On approaching the crossing round a curve, the train driver had seen a person standing to the side of the line and had sounded the warning horn. However, the pedestrian then attempted to cross and was struck.

Although it is not possible to be certain why the pedestrian tried to cross, RAIB considers that she either misjudged the speed of the approaching train or misjudged her position in relation to it. She probably saw the train too late to make a reasoned judgement about whether she should cross.

The driver had sounded the train’s horn as required by a lineside ‘whistle board’ when the train was approximately 15-16 seconds from the crossing, and out of sight. If the pedestrian had heard and responded to the sounding of the horn at this stage, it is likely that she would not have passed through the gate and onto the interface until the train had passed.

RAIB also suggests three possible causal factors:

- When the train horn was sounded at the whistle board, it was inaudible to the crossing user; or
- The user heard a horn being sounded at the whistle board, but did not distinguish it as coming from a train; or
- The user did not register that the train horn was sounded at the whistle board because she was not focused on crossing the railway at the time.

In addition, RAIB observes that:

- Network Rail is not consistent in the approach that it takes to measuring sighting distances at level crossings.
- The decision points were not marked at Mexico footpath crossing; the industry has made little progress to date in researching the issue of marking decision points despite previous RAIB recommendations in this area.
- Near-miss data and data from different censuses on crossing usage at Mexico footpath crossing was not being used in a manner that enabled Network Rail to establish an accurate estimate of the risk.
- Train horn testing is not mandated following relevant accidents or incidents and there is no requirement for the objective testing of train horn volume.
- The positioning of whistle boards at level crossings across the main line railway network has not been optimised.
- Drivers sometimes sound train horns a significant distance before a whistle board, rather than when passing it, as required by the Rule Book.

**Recommendations**

- Taking account of the deficiency in sighting time for vulnerable users, Network Rail should:
  - Consider whether improvements can be made to sighting towards the east for pedestrians on the south side of Mexico footpath crossing.
  - Determine the optimum position of the whistle boards at Mexico footpath crossing and make any required adjustments. The assessment should identify a better location for the boards that will improve the audibility of train horns at the crossing, taking account of the need to provide adequate warning for all users and including consideration of any local factors which may have a bearing on the decision.
RSSB should:

- Identify any additional data that should be captured within SMIS from accidents and near-miss incidents to inform future safety decision-making about level crossings and make the necessary arrangements for that data to be collected by duty holders; and
- Using the data obtained from implementing part a of this recommendation and any further intelligence contained within SMIS or other sources, enhance its current approach to reviewing the impact of the change to sounding only the low tone of the warning horn for whistle boards at level crossings between 07:00 and 23:00 and take actions, if appropriate.

Network Rail, in conjunction with RSSB where appropriate, should undertake a project to develop a standard national approach to:

- Identifying the optimum decision point at each footpath and user worked crossing used by pedestrians;
- Marking and signing the optimum decision point at each crossing;
- Using that decision point in estimates of sighting distance at footpath and other crossings; and
- Briefing staff involved in crossing risk assessment with regard to the approach.

When addressing issues in relation to the marking of decision points, Network Rail should liaise with RSSB on emerging findings from research project T984 ‘Research into the causes of pedestrian accidents at level crossings and potential solutions’, and give consideration to the need to draw upon relevant elements of that research project to inform the development of the national approach. In this context RSSB should prioritise those elements of research project T984 that deal specifically with the marking of decision points, so that they are completed at an early stage in the programme. Once the approach has been developed, Network Rail should implement a programme to review and modify crossings accordingly.

First Great Western should make a proposal to RSSB to modify relevant Railway Group Standards to mandate the requirement to test train horns in an objective manner when a train has been involved in any accident or incident involving circumstances where the sounding of the train horn was either required by the rule book or employed by the driver during the event.

Network Rail should conduct a review of the arrangements for providing warnings for pedestrians at level crossings currently equipped with whistle boards. The review should address:

- The costs and benefits at each crossing of providing audible or visual warnings at the crossing itself rather than by approaching trains (taking account of the possibility of the significantly reduced costs of visual warnings; and
- At crossings where whistle boards will remain, whether the position of the board at each crossing has been optimised taking account of all relevant local factors including (but not limited to) prevailing wind, local topography, sources of noise and the traverse time for crossing users and the positive and negative effects on railway neighbours.

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**Published 26 June**

*Australia: Passenger train SPAD near Henty, NSW, 5 February 2011*

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

At about 13:28 (local time) on 5 February 2011, a scheduled XPT Melbourne–Sydney service passed signal 09-6 (Henty) at danger. The train stopped about 95 metres past the signal, with the front of the leading power car on Yankee Road level crossing.
The Australian Transport Safety Board (ATSB) concluded that, notwithstanding a reported issue with the brakes on the leading power car, the driver did not apply sufficient braking to enable the train to be stop ahead of the signal.

The ATSB also found the following contributory factors:

- The driver anticipated and perceived that signal 09-6 was displaying a ‘low speed’ indication.
- The driver was distracted by a vehicle travelling at high speed on the adjacent road. This occurred at a critical point on the approach to the signal.

The ATSB stated that the brakes on the leading power car were not applying until a step 7 (emergency) application was made, however this was identified – and rectified – shortly after the SPAD event. It is noted that, while said brakes were not applying normally, the train braking performance was within the appropriate standard.

Currently there is no system in place to alert drivers when approaching critical phases of train operation, such as braking cues or signals, other than previous signal indications and driver attention. The Australian Rail Track Corporation (ARTC) is currently trialling a system called Advanced Train Management System (ATMS), an automatic train protection system, which will provide enforcement of authorities on each locomotive if a train is at risk of exceeding its authority.

Recommendations

- None issued.

Published 27 June

UK: Incident at Llanbadarn ABCL, 19 June 2011

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

Shortly before 22:00 on 19 June 2011 a passenger train ran onto the level crossing at Llanbadarn while the barriers were raised, coming to a stop with the front of the train about 31 metres beyond the interface. There were no road vehicles or pedestrians on the crossing at the time.

The immediate cause of the incident was that the train driver did not notice that the crossing indicator was flashing red until it was too late for him to stop ahead of it.

RAIB also listed the following causal factors:

- The driver’s ‘workload’ meant that he was distracted by observing the ERTMS driver-machine interface (DMI) at the same time that he should also have been observing a lineside indicator;
- Llanbadarn ABCL’s closure sequence did not start (barriers or lights) when the train reached the strike-in point;
- The driver was pre-occupied with accelerating after the running brake test; and
- The ERTMS system (on-board the train) was reset by the driver on the instruction of the signaller.

The underlying factors were:

- The ETCS cab signalling system does not interface with automatic crossings on the Cambrian ERTMS lines. It is probable that some, or all, of the following influenced this decision:
  - Although there had been a number of near misses at Llanbadarn ABCL, Network Rail’s review concluded that the cost of implementing additional measures under ERTMS outweighed the safety benefits.
  - The Network Rail and Arriva Trains joint project team had closed out all recognised risks without requiring an ERTMS interface at the crossing and without carrying out a human factors analysis.
The derogation against Railway Group Standards was granted by the Control Command and Signalling Standards Committee contrary to advice from RSSB staff.

Neither a human factors report nor other risk assessment was undertaken by Network Rail as part of the derogation application process.

The documentation supplied by Network Rail to the Control Command and Signalling Standards Committee in support of its derogation application did not contain any risk assessments or human factors reports. It did not consider the particular issues related to the crossing at Llanbadarn.

The Control Command and Signalling Standards Committee did not request any additional task analysis or risk assessments from Network Rail as part of the derogation process.

**Recommendations**

- Network Rail should develop an engineered safeguard to reduce the risk of trains being operated under ERTMS passing over locally monitored automatic crossings (i.e. AOCL and ABCLs) when the crossings have not operated. This solution should then be applied at Llanbadarn ABCL crossing and, if appropriate, at higher risk crossings on the Cambrian lines and as part of future ERTMS installations. Assessments of risk should include an evaluation of human factors, previous history, including recorded incidents and accidents.

- Network Rail should change the design of circuitry at Llanbadarn ABCL to remove the need for a train driver on Network Rail to operate the plunger before departing Aberystwyth station, but still retain an interface between Network Rail and Vale of Rheidol Railway at the crossing to avoid ‘blocking back’ of road vehicles.

- Arriva Trains Wales should carry out a human factors analysis and risk assessment of the workload of drivers when departing Aberystwyth station under different ERTMS modes and implement any findings.

- Arriva Trains Wales should review the way in which drivers interact with ERTMS and DMIs and develop new training and on-going competence checks to encourage a move away from the ‘head down’ style of driving undertaken by some drivers under ERTMS.

- Network Rail should review its processes for seeking deviation (including derogation) from Railway Group Standards and Technical Specifications for Interoperability. The review should include consideration of the extent and nature of the risk assessments that should be carried out, and the supporting information provided, for each deviation request.

- RSSB should review and, if necessary, amend the processes and guidance applicable to Standards Committees and RSSB when taking decisions about applications to deviate from Railway Group Standards. This should include:
  
  - Considering the provision of guidance for Standards Committees on how to make the necessary judgement about whether the risk assessment and supporting analysis is suitable and sufficient and the extent to which location specific risks should be taken into account; and
  
  - Guidance on how the basis of the Standards Committee’s decisions should be recorded.

**Published 29 June**

*Australia: Freight train derailment at Goddards, WA, 28 December 2010*

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

At about 16:03 (local time) on 28 December 2010, a freight train derailed at Goddards, Western Australia. The derailment occurred within a recently constructed passing loop on a section of track managed by the ARTC.
There were no injuries, but 23 wagons of the 49-car consist derailed; many were significantly damaged (including all triple-deck car carrier wagons). Around 700 metres of track also required replacement.

The ATSB determined that the derailment was a result of flange climb initiated by a track misalignment which probably grew as the train traversed it, becoming large enough to initiate the derailment of the 11th wagon, which was followed by the 13th wagon and a further 20 in the consist.

Factors which contributed to the misalignment were the high ambient temperature, inadequately de-stressed rail and insufficient ballast through the derailment site. The ATSB also found that the ARTC’s quality assurance processes used during the contracted construction of the loop could be improved.

As a result of the incident, the ARTC has advised that it will reinforce its project management and audit processes, as outlined in its Project Management Procedure, with its employees, in particular the requirement for:

- ongoing “spot” audits of the works by nominated Project Managers and Engineers.
- ad hoc audits undertaken by an internal audit department
- formal close-out process and handover to the respective maintenance representatives.
- identification of any outstanding (punch list) items that may require follow up work and reviewing the documentation of the completed works.

Recommendations

- Track managers should have robust audit and quality control processes in place to ensure that work undertaken on their railway by contractors meets the relevant contracted standard.

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