Worldwide FI Summary

November 2012

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:

- Buffer stop collision
- Driver error
- Train protection
- Derogations (rail regulator)
- Lack of event recorders
- Safety critical communications
- Signaller error
- Wrong-routing
- Driver-groundstaff communications
- Near miss
- Resource management – and poor teamwork
- Overspeeding
- Signal design
- Risk assessment
- Road vehicle incursion
- Knowledge sharing
- Animal strikes
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**Published 5 November**

**US: Buffer stop collision at Hoboken, New Jersey, 8 May 2011**

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

At 08:32 (local time) on 8 May 2011, a Port Authority Trans Hudson Corporation (PATH) commuter train struck the buffer stops at the end of Platform 2 at Hoboken. Thirty passengers, the driver and the guard were taken to hospital with non-life-threatening injuries.

The National Transportation Safety Board (NTSB) determined that the probable cause was the failure of the driver to control the speed of the train when entering the station. The lack of an automatic train protection system was deemed a contributory factor.

The NTSB also noted that between 1994 and 2011, PATH trains were operated without event recording equipment, as required by Federal Railroad Administration (FRA) regulations. However, PATH requested a waiver, which was neither approved nor denied by the FRA. Furthermore, the FRA did not enforce PATH’s obligation to install and maintain event recorders.

**Recommendations**

- The FRA should audit the waiver process to verify that it is being managed as required by the Code of Federal Regulations.
- The FRA should audit the inspection and enforcement programme in all regions for compliance with statutes and regulations related to railway safety, and correct any deficiencies as required by the Code of Federal Regulations.

**Published 15 November**

**New Zealand: Wrong-routing, overspeeding, near miss and SPAD at Tamaki, Auckland, 13 August 2010**

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

On 13 August 2010, a Papakura–Britomart service carrying approximately 100 passengers was involved in a SPAD incident in Tamaki, central Auckland. An unscheduled shunt move was signalled, which would involve a formation following the passenger train from Westfield to Tamaki, so that it could enter a siding. However, there was a miscommunication when details of the shunt were passed from Otahuhu signal box to Auckland signal box. As a result, the Auckland signal box controller confused the running order of the two trains. He set the route at Tamaki to divert what he thought was the shunt to the opposite line in preparation for its entering the siding. This wrong-routing of the passenger train was the first of a set of four related incidents.

A worksite had been set up within the Tamaki station limits to enable work to be undertaken by a maintenance gang. Tamaki station is a short distance from Panmure. The passenger train was due to stop at Panmure and continue through the worksite along the Up Main. The driver of the passenger train was not aware that the route had been incorrectly set to divert his train to the Down Main. His train had passed a yellow signal before Panmure, suggesting that the next one would not be green. Instead, the next signal was a ‘low speed’ signal, advising the driver that the points were set to divert his train to the Down Main and that he should be running at no more than 25 km/h.

The passenger train stopped and exchanged passengers at Panmure. The train was running behind schedule owing to several small delays. Before departing from Panmure, the driver called the maintenance gang and asked for permission to pass through the worksite. He was granted permission to do so ‘at normal speed’. The gang member who answered the call had noticed that Points No.15 at Tamaki had moved to set the route for the next train across to the Down Main, but did not mention this to the driver.
Keen to make up lost time, the driver accelerated away from Panmure with the intention of reaching full speed. He appeared to have forgotten that the previous signal had been yellow and was not expecting the next signal to be a low-speed one. When he saw it on rounding the bend, he braked heavily, but the train went through the low-speed crossover at nearly twice the limit. The train reacted violently, but did not roll over or derail. There were no reported injuries, although some passengers were shaken.

One of the track workers was walking beside the Down Main with his back to the approaching train. As the driver was bringing it to a stand, it narrowly avoided striking the track worker.

The driver was also shaken, but decided after a short pause that the signaller’s intention must have been to re-route his train to the Up Main further down the line. Without speaking to the signaller (or Control), he moved his train along the Down Main line towards the next set of points. He was not looking at the signals, but instead was looking at the line ahead to check the points. When he saw that they were not set for the Up Main, he stopped his train, but not before he had passed a red signal.

The Transport Accident Investigation Commission (TAIC) investigated and found that the wrong-routing had occurred through a combination of poor communication and failure to adhere to standard procedures when switching Tamaki station to manual control. However, if the driver had driven to the signals, the wrong-routing should not have created any danger to his train and its occupants. That said, the TAIC recognised that systems put in place to help drivers remember previous signals were not well designed for the task and not routinely used by train drivers.

Opportunities for correcting or preventing all four of these incidents were lost through substandard levels of crew resource management that should have had all of the rail participants working as a team to manage safe railway operations.

A lack of clarity in the daily work bulletin issued to all rail participants and the failure to follow standard procedures when switching Tamaki signal box to manual contributed to the signal box controllers being unaware that a compulsory-stop-protected worksite existed within the Tamaki station limits.

Safety actions
A number of safety actions were taken by KiwiRail to address immediate safety issues around communication, and as part of the upgrade to the Auckland rail network the signal boxes involved with this incident have been decommissioned and incorporated into the Wellington National Train Control Centre. These safety actions have superseded the need for other safety recommendations.

Recommendations
The New Zealand Transport Agency should address safety issues concerning:

- Systems to help drivers remember the status of signals their trains have already passed when having to deal with the distraction of stopping at intervening stations; and
- The clarity of daily work bulletins disseminating important operating information to rail personnel.

Key lessons
The key lessons from the inquiry were:

- Safe rail operations rely on good communications between all operating personnel;
- All individuals and groups of individuals working in the rail industry need to understand fully and be working to a common objective before safe rail operations can be achieved; and
- Documents created for the purpose of providing essential information to rail participants should be clear, unambiguous and in a format suitable for the intended recipients.
Canada: Derailment near Pointe-Saint-Charles, Quebec, 24 September 2011

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

At 03:16 (local time) on 24 September 2011, six wagons of a Canadian National freight derailed near Pointe-Saint-Charles, Quebec. A number of points and around 650 feet of track were damaged. There were no reported injuries and no hazardous material spillages.

The investigation found that the derailment occurred when an excessive lateral force due to overspeeding, coupled with the sudden application of the brakes, caused the wheel of the 58th wagon to lift.

The investigation also found that the crew lacked sufficient knowledge of the route and its associated speed limits.

The report listed the following factors:

- When qualified locomotive engineers have not worked in part of a subdivision for a long time, or when they work there sporadically, and do not fully utilize available operating instructions, the risk that they will make inappropriate decisions increases, which can lead to accidents.
- The ambiguity between signal indications and instructions in the timetable with regard to authorized speeds can result in inaccurate interpretations, and can consequently increase the risk of accidents.
- Crews that work variable, unpredictable schedules are exposed to an increased risk of diminished alertness associated with the de-synchronisation of their circadian rhythms.

UK: Derailment at Bletchley Junction, 3 February 2012

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

At 02:27 on 3 February 2012, a Class 90 derailed as it negotiated the diverging route at Bletchley Junction at 65.5 mph (the speed limit is 15 mph).

The driver received minor injuries. Significant damage was caused to the underside of the locomotive, the track and the OHLE.

The driver correctly reduced the locomotive’s speed on the approach to the red signal before the junction but when this changed to green, with an ‘F’ indication for the diverging route, he applied full power in the belief that he was going straight on. It is likely that the driver only realised that he was to take the diverging route around the time he was passing the signal, by which time it was too late to prevent the derailment.

RAIB found that the driver did not immediately observe and/or register what was displayed by the signal’s route indicator, even though he understood its meaning. This was despite the fact that the approach view of the route indicator was found to be satisfactory, free of obstructions and with sufficient time for a driver to see and understand its meaning. RAIB has concluded that the driver’s belief that he was continuing on the Up Slow overcame the fact that the ‘F’ indication was clearly visible to him.

RAIB also identified that the route risk assessment process had not identified an overspeeding risk at Bletchley Junction and therefore there was no specific route learning mitigation associated with it. It is ‘possible’ that the following factors were relevant:
The form of junction indicator fitted to signal BY19 and
The driver was distracted by personal matters external to his work.

Additional observations
Although not causal to the accident on 3 February 2012, RAIB observes that:

- The driver of train 0A90 had not noted from the Weekly Operating Notice the work taking place south of Bletchley Junction; and
- Virgin Trains had no process in place to use on-train data recorder downloads from class 90 locomotives as part of the driver competence management system. This made it less likely that any driver exceeding the permitted speed of light class 90 locomotives would be identified.

Recommendations
- Virgin Trains should review, and amend as necessary, its route knowledge training and assessment process so that the risk from drivers exceeding permissible speeds at diverging junctions is adequately controlled. The review should consider the need to reinforce the knowledge by driving over the routes concerned, cab simulation, video based scenario training, or other suitable techniques, and the required frequency of each. Note: that the principle applied by this recommendation may apply to other train operators.
- Network Rail, in conjunction with train operators, should assess the risk from overspeeding at potentially high-risk diverging junctions with approach control following the clearance of the junction signal. As a minimum, the scope should include consideration of:
  - Junctions where the speed of the diverging route is significantly lower than the approach speed;
  - Junction signals fitted with standard alphanumeric route indicators; and
  - The type of traction using the junction and its ability to accelerate following the clearance of the junction signal from red.
    The outcome of the risk assessments should be used to determine whether different/additional mitigation is required.
- Network Rail, in conjunction with train operating companies, should review and where necessary modify the Weekly Operating Notice to identify the information that drivers need to assure safety and how this content is presented so that it can be readily assimilated.

Published 25 November

UK: Road vehicle incursion and collision at Stowmarket, 30 November 2011

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

The incident occurred at around 19:36, when a car that was being driven on the B1113 Stowmarket Road, towards the village of Old Newton, left the carriageway and passed through the wire fence onto the railway line north of Stowmarket.

The driver was injured, but was able to escape to a place of safety, and reported the accident to Suffolk Police. A short time later the car was struck by a Cambridge–Ipswich service. Fortunately the train did not derail and neither passengers nor members of the train crew were physically injured.
RAIB found the immediate cause of the accident on the highway to be that the driver of the car lost control of his vehicle. The subsequent collision with the train occurred because the car came to rest in a position where it was obstructing the railway line and there was insufficient time to stop the train.

Suffolk County Council had undertaken a risk assessment in 2005 and assessed the risk from road vehicle incursion (RVI) at the location where the accident occurred. It had not implemented steps to control that risk. Network Rail was also aware of the risk at the location, but had no process in place to monitor the actions of local highway authorities to address RVI risk and had assumed that Suffolk County Council was taking suitable actions.

RAIB identified a number of underlying factors which showed Network Rail’s awareness of RVI incident sites to be limited, and the joint risk management process adopted by Network Rail and Suffolk County Council in 2003 (following the fatal train accident at Great Heck in 2001) to be incomplete.

As a consequence, the investigation identified that there were nine locations within Suffolk where action to reduce RVI risk had still to be taken. Network Rail has identified over 200 sites on the national rail network where action has still to be taken to reduce RVI risk.

It was also found that the Department for Transport’s (DfT) monitoring of the progress to mitigate the risk at known sites with significant RVI risk was not effective, nor did it emphasise to local highway authorities and Network Rail the requirement to complete such works. The RAIB considers that regulatory oversight by the Health and Safety Executive (HSE) and Office of Rail Regulation (ORR) of works to address the risk of road vehicle incursion was affected by a lack of clarity as to which body has enforcement powers to require local highway authorities to take action.

RAIB listed the following observations:

- The locations of high risk RVI sites had not been shared with other organisations (police / fire and rescue services). For this reason, the possibility of an event at such a location could not have been taken into account in local emergency response planning.
- During the investigation the RAIB identified other incidents where a vehicle incursion had occurred but had not been identified and was not recorded on Network Rail’s tracker database. Evidence shows that some incursion points could not have been foreseen at the time. However new mapping technology (e.g. Google Earth / Street View / DfT / ACPO crash database) is now available which may allow locations which pose a threat of incursion to the railway to be identified.
- There is no process for Network Rail’s structures department to be made aware that the incursion risk may have been altered as a result of vegetation being removed or managed.
- The RAIB has informed the police and SCC road safety team of its concerns about how vehicles are negotiating the kiss bend on the Stowmarket Road.

Recommendations

- Suffolk County Council (SCC) should commission an independent review of the actions it has taken following the accident in order to assess their completeness and effectiveness. In particular this should address the following areas:
  - The processes that are in place to ensure all road vehicle incursion locations are identified, assessed (possibly making use of recent internet tools (such as Google Earth / Street View)), acted upon (including consideration of low-cost mitigation measures as well as more expensive options), monitored and periodically reviewed. If actions are identified, SCC should develop and implement a time-bound programme that will be shared with DfT and Network Rail and progress reported to those bodies. This process should be documented and supervised by senior SCC management.
Staff are trained and procedures in place for undertaking and reviewing risk assessments of road vehicle incursion locations.

- Data management systems (Accsmap and SCC Indexing system) and associated documents are in place to ensure that all data relating to injury and non-injury accidents at road vehicle incursion locations can be captured and identified for analysis and review.

- Processes are in place to ensure that information about road vehicle incursion incidents is shared between all interested parties.

- Processes are in place to ensure that staff are aware of the DfT guidance on the road vehicle incursion and risk assessment process.

Any areas for further improvement should be implemented. Progress with the implementation of identified risk mitigation measures should be reported to DfT and notified to Network Rail.

- Network Rail should review, and take actions to improve, the effectiveness of its processes for managing the risk from road vehicle incursions. Factors for consideration should include:
  - The exchange and management of information between different departments within Network Rail;
  - The profile of RVI within relevant working groups including those involving external parties;
  - The effectiveness of communications with bodies outside of Network Rail including arrangements for the reporting of all incursion incidents to local highway authorities and police forces; and
  - Arrangements for managing the relationship with local highway authorities and the monitoring of actions taken following assessments of road vehicle incursion risk.

- Network Rail should review its current data on road vehicle incursion sites, possibly making use of recent internet tools (e.g., Google Earth/Street View), to determine whether its knowledge of all current road vehicle incursion locations is complete and to assess any that had not previously been considered.

- SCC should brief parish and district councils, and Suffolk Constabulary on possible vehicle incursion locations to encourage the reporting of road traffic concerns at or near such places. The way in which this information is managed should be captured within a SCC procedure.

- The ORR and the HSE should jointly review their current Memorandum of Understanding and amend it as necessary to define clearly the responsibilities of each party in relation to enforcing actions to mitigate the risk arising from road vehicle incursions onto the railway. The revised Memorandum of Understanding should take into account the findings of the Law Commissions on level crossings, when published, and include:
  - A clear definition of the circumstances under which each party takes responsibility for enforcement; and;
  - A mechanism for resolving disputes over enforcement responsibility.

The HSE and ORR should jointly define a time-bound programme for the development and implementation of the review and consider actions that should be taken in the interim period if an amendment to current legislation is required to achieve the desired outcome.

- DfT should undertake a review of all outstanding road vehicle incursion sites and establish a regime to continuously monitor progress with the implementation of the required risk mitigation measures.

- DfT should implement a programme and forum to disseminate the key findings of this report to all local highway authorities. In particular, highway authorities should be reminded of the need to:
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- Ensure that time-bound programmes of action are taken to mitigate risk at known high risk road vehicle incursion locations;
- Reliably capture all data on all road accidents that have occurred near the railway boundary;
- Engage with Network Rail, British Transport Police and local police road safety units to ensure that there are processes in place to share intelligence relating to known or new road vehicle incursion locations; and
- Ensure that all current and new staff are aware of the procedures relating to the risk from road vehicle incursion sites.

- DfT should, in consultation with ACPO, undertake a review of existing data systems (e.g. Accsmap/Crash system/National Resilience Extranet) to improve the ways in which data relevant to the risk of vehicle incursions can be exchanged and shared with interested parties such as Network Rail, highways authorities and the police.

- The DfT should, in consultation with the Civil Contingencies Secretariat (Resilience, Capabilities and Risks) and Local Resilience Forums incorporate into the local risk assessment guidance the need to consider the potential for serious accidents at high-risk road vehicle incursion locations (particularly those where mitigation measures have yet to be implemented).

Published 20 November – bulletin

UK: Animal strike at derailment at Letterston Junction, 12 July 2012

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

At about 18:40 on 20 November, the 14:35 Gloucester–Fishguard Harbour struck several cows near Letterston Junction on the single line between Clarbeston Road and Fishguard & Goodwick stations in Pembrokeshire.

There were 28 passengers and two members of staff on board. There were no reported injuries. The emergency services were called immediately, but because the location was remote, it took them 39 minutes to reach the train; it was 20:11 before the passengers were evacuated to a bus to complete their journeys.

Seven cows and a calf were killed in the accident or had to be destroyed afterwards. There was substantial damage to 60 metres of track, and minor damage to the train.

RAIB has decided not to conduct a full investigation because it does not believe that this would identify any significant new safety lessons for the industry. However, the occurrence of this accident demonstrates the importance of preventing livestock from getting onto the railway line. Railway infrastructure managers should also ensure they have adequate arrangements in place to inspect, repair and renew lineside fences and gates, and that their fences and gates are built and installed to a standard which is appropriate for the location and is, where necessary, stock proof.