Worldwide FI
Summary

October 2013

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:

- Safe systems of work planning (including location knowledge, experience of planner, workload)
- Adequacy of safety monitoring data
- Absence of safe system of work, and failure to challenge that absence
- Competence
- Safety culture
- Weather conditions
- Shunting (procedure and execution)
- Failure to secure wagons
- Crossing user behaviour
- Crossing signage
- Driver error
- Lack of train control
The incident occurred at 09:31, when a Nottingham–Worksop service struck and seriously injured an off-track inspector near Bulwell station, in Nottingham. At the time of the accident, the off-track inspector was undertaking an inspection of lineside vegetation on foot.

The off-track inspector was struck by the train because he was standing too close to the track. His awareness of where he was standing had become reduced as he was focused on determining his location. It may also have become reduced because he needed to concentrate on some elements of the inspection.

Because the off-track inspector was working on a line open to traffic, he had implemented a pre-planned system of work to protect himself from train movements. However, this system was unsuitable for the location and task being undertaken. Had the most appropriate type of system of work been planned and implemented, then the accident would have been avoided. The off-track inspector did not realise that the system he was using was unsuitable during the inspection, probably due to the way in which it was implemented. He had also not realised it was unsuitable when the system was issued to him prior to the inspection; this was because the information provided to help him check that it was appropriate did not effectively highlight why it was unsuitable.

This system of work was issued to the off-track inspector because the planner who had prepared it was unfamiliar with the location. Information provided to support her decisions about which type of system to use either did not effectively highlight its unsuitability or was found by her to be impracticable to use given her workload. In addition, it had become normal practice within the off-track section to plan and implement the least protective type of system of work for undertaking vegetation inspections. This was, in part, because the section only had a limited range of systems to choose from, but probably also because there was an informal agreement within the section to adopt this practice, which contravened the requirements of Network Rail’s standards. Senior managers were unaware that this had occurred as they were provided with inaccurate safety monitoring data. The increased workload of planners within off-track sections was also identified as a factor in the accident.

RAIB has identified two key learning points:

- That the relevant Network Rail standard should be observed during the planning, approval and verification of systems of work; and
- That any incident where a train has struck something whilst passing persons working on or near the line should be initially treated as an accident.

Since the accident, Network Rail has introduced a new version of its SSoW planning system (SSOWPS), known as SSOWPS 2. This includes new features that are directly relevant to a number of the issues identified in this investigation, including:

- SSoW packs can now cover multiple SSoW. This allows separate and, if necessary, different SSoW types to be planned and documented for separate activities (such as walking to a site of work and working). It will also accommodate alternative SSoW for the same activity, if different systems could potentially be adopted by the COSS/IWA depending on the conditions at site. This is termed as having ‘parallel’ SSoW;
- A modified RT9909 form is produced as part of the SSoW pack. This allows COSS/IWA to calculate multiple warning times and sighting distances within a single form.
- There is an automatic interface with the sectional appendix and national hazard directory, which will insert targeted extracts of both into the SSoW pack. This should reduce the amount of data which planners and COSS/IWA have to consider when planning, verifying and implementing SSoW.
Network Rail expects that SSOWPS 2 will reduce the workload of planners.

Network Rail is also introducing a new electronic asset management information system known as ORBIS. This will initially feature digitised infrastructure diagrams, with further layers of data (such as overhead line equipment and access points) being added by 2018. As part of the roll-out of this system, Network Rail has launched a pilot study which involves this data being accessed remotely by staff using smart phones and tablet computers; this is expected to improve their site familiarity.

Furthermore, Rail is developing a system called TrackView, which is intended to provide photographs of any location on their infrastructure both from above and also forwards and rearwards, as if viewed from a train. This new system is again expected to improve the site familiarity of staff, once it is introduced.

Network Rail has stated within its Transforming Safety & Wellbeing vision and strategy document for 2012–2024 that it plans, by 2015, to prohibit the use of Red Zone lookout (including COSS/IWA) SSoW when working near junctions and for moving work-sites, such as inspections on foot. Staff will be required from this point onwards to use a more protective type of SSoW from within the hierarchy of safe systems of work.

Network Rail’s East Midlands route has briefed all responsible managers across the route as to the requirements of Issue 8 of NR/L2/OHS 19, including the requirement for responsible managers to review and accept SSoW packs. In addition, senior managers at Network Rail have tried to improve the availability of line blockages to infrastructure maintenance teams based at Derby MDU by both increasing the number of line blockages which each signaller can manage simultaneously and also by working to reduce the number of conflicting line blockages granted by GZAC.

**Recommendations**

- Network Rail should make information available to those responsible for the planning, approval and verification of safe systems of work about which safe systems of work it considers to be appropriate for a specified section of the line. This information should support the application of the principles of the hierarchy of safe systems of work. Network Rail should ensure that the information:
  - Takes account of variations such as different types of work, resource levels, times of day and environmental conditions;
  - Is periodically validated and maintained; and
  - Is easily accessible to those responsible for the planning of safe systems of work.

- Network Rail should review the effectiveness of the current arrangements in place to monitor the usage of Red and Green Zone safe systems of work. It should identify and implement any appropriate measures identified as necessary for this monitoring to be effective.

- Network Rail should determine what resources are necessary for the effective planning and approval of safe systems of work within off-track sections. It should take action to ensure that the required resources are available and that systems are put in place to ensure that they will remain so should additional tasks be assigned to these sections in the future. This recommendation may also apply to other parts of Network Rail where staff are required to work on or near the line.

- Network Rail should establish if the requirement within NR/L2/OHS/019 issue 8 for non-cyclic safe systems of work to be approved by the responsible manager has been effectively implemented. In doing this it should specifically consider:
  - How the requirement was promulgated throughout its organisation;
  - The briefing and training of responsible managers; and
  - Other barriers to implementation.
It should develop a plan to implement any appropriate changes identified.

- Network Rail, in conjunction with RSSB, should review, and improve where necessary, the sections of the railway rule book and any standards, guidance and forms relevant to the patrolling, examining or inspecting of an open line when working alone. The review and any improvements made should aim to provide clear and consistent information regarding the calculation of required warning times.

**Published 24 October**

**US: Fatal shunting accident at Mason City, Iowa, 31 July 2012**

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

At 02:25 (local time) on 31 July 2012, a Union Pacific Railroad (UPRR) shunter was killed after being crushed between two wagons in the yard at Mason City, Iowa. He had gone on duty on at 22:30 on 30 July 2012, along with a driver and a yardmaster. During the shunting operations, the shunter discovered a coupler knuckle with a missing pin.

He instructed the driver to stop propelling the wagons, and asked for ‘three-point protection’ (referred to as a ‘red zone’). The driver responded ‘set and centred’, which meant that the locomotive brakes were on and that the reverser was in the centre position (which prevents movement of the locomotive).

According to the driver and the yardmaster, after about 60 to 90 seconds, the 13 wagons that were coupled to the locomotive suddenly moved towards it. The driver said he radioed the yardmaster, but neither of them could ascertain the cause. The driver said that he remembered the shunter’s command for a red zone, meaning that the shunter intended to move into the ‘four-foot’ and was therefore exposed if any wagons moved. The driver said that both he and the yardmaster tried to contact the shunter by radio, but they got no response.

As the shunter repaired the defective coupler, the two railcars that were moved to Track 3 rolled back and crushed him. The handbrakes had not been applied on either wagon, and the shunter had not verified that they had successfully coupled to the rest of the rake.

The National Transportation Safety Board (NTSB) determined the probable cause of the accident to be that the shunter had not ensured that the runaway wagons were properly secured before he tried to repair the coupler knuckle. The NTSB adds that the lack of a thorough job briefing by the rail yard crew, specifically a review of securement requirements, before the shunter entered the ‘four-foot’ was a contributory factor.

After the accident, the UPRR issued a Safety Alert Bulletin that gave a brief description of the accident and listed operating practices that require more focused attention. The Bulletin was distributed to all managers, train crews, engine crews, and yard employees throughout the company.

RSSB’s [special topic report on shunting](#) is still available.

**Recommendations**

- None issued.

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At 07:30 (local time) on 19 March 2013, a Warrnambool-bound freight collided with a car at Brown Street level crossing in Allansford. The crossing is protected by warning and stop signs.

The car driver sustained fatal injuries. The vehicle was severely damaged while the train sustained minor damage. The train crew were not injured.

The Australian Transport Safety Bureau (ATSB) found that the driver of the motor vehicle did not come to a stop at the ‘Stop’ line and proceeded onto the crossing and into the path of the train. The ATSB concluded that the driver's familiarity with this crossing, combined with the expectation that a train would not be present due to the low frequency of rail traffic on this line, probably influenced his behaviour.

When at the ‘Stop’ line south of the crossing – the direction the motor vehicle driver approached the crossing – there was adequate sighting to the east, the direction from which the train approached.

For approaches other than the occurrence scenario, the level crossing did not meet the requirements of the relevant Australian Standard (AS 1742.7-2007, Manual of uniform traffic control devices, Part 7: Railway crossings). However, this issue was not found to be contributory to this accident.

Prior to this accident, Brown Street crossing was identified as having sighting issues by the infrastructure manager and was included in the ‘2013/14 Fix Country Level Crossings Program’, a Victorian Government-funded initiative to upgrade rural level crossings by equipping them with active controls, including lights, bells and barriers.

Since the accident, the Warrnambool City Council has temporarily closed the crossing until it is equipped with active traffic controls.

A minor deficiency with respect to the signage north of the level crossing on Brown Street has also been rectified by the Warrnambool City Council.

The ATSB note that the accident highlights the need for motor vehicle drivers using railway level crossings to be vigilant, observe road warning signs, obey road rules and look out for trains.

**Recommendations**

- None issued.
The COSS had also failed to implement a safe system of work for the task in hand. None of the other track workers on site challenged it. They also failed to challenge the COSS for working within an unsafe area.

There were a number of factors which may have influenced the COSS in not requesting the Protection Controller to seek a blockage of both lines:

- His previous experience (before and on the day of the accident) was that it was difficult to obtain a line blockage of one line at this location and that there would be even less chance of getting a double line blockage;
- He may have wanted to complete the task as soon as possible and the cold weather may have acted as an additional incentive;
- The cold weather may also have affected the clarity of his decision-making processes;
- His familiarity with the location and the long sighting distance that was available for trains approaching on the Up line may have convinced him that he could provide adequate protection to anyone working in the six-foot.

RAIB also found that no effective action had been taken in response to the involvement of the COSS in two other safety incidents in the two months preceding the accident. Moreover, the COSS had not been subject to an effective formal performance review by the agency (SkyBlue) that had hired him for COSS duties for the work taking place on 4 December 2012 and on other occasions. Deficiencies and omissions within SkyBlue’s management systems had not been identified by its parent company (Carillion).

RAIB observed that the processes employed by the railway industry during its own investigation into the accident at Saxilby may have taken insufficient account of the trauma that some of the witnesses were suffering as a result of their proximity to the accident.

Since the accident, Carillion Construction Limited (encompassing Sky Blue) has introduced a requirement for a manager to review all completed point of work risk assessment forms. The review is intended to ensure supervisors understand their responsibility to complete the forms and to brief them to all parties on site. A training programme is being implemented for all supervisors, which explains the point of work risk assessment process.

Amey Colas has introduced a new procedure to specify how proposed restrictions on the certification of employees and agency workers arising from investigations into incidents and accidents should be dealt with.

Carillion has also:

- Established a Competency, Compliance & Rail Training (CCRT) unit to control, monitor and manage compliance with its own procedures and rail industry standards. All requests for temporary suspensions of certification will be made to the CCRT. A programme has been established to ensure all SkyBlue workers are trained and mentored.
- Re-briefed SkyBlue Rail Managers on their responsibilities to manage and develop agency workers to meet the required level. If sub-standard performance is identified, the Rail Manager will support and develop the competence or withdraw the worker from the particular activity.
- Employed staff to undertake on-site safety critical observational assessments, mentoring and developing agency workers and support the implementation of safety training and initiatives in conjunction with Carillion’s customers.
- Enhanced its incident database to provide an increased level of information relating to rail accidents and incidents involving external contractors. Carillion managers will now conduct frequent checks to review information relating to any incidents, accidents, performance or behavioural issues to identify common trends and linked investigations/individuals.
- Nominated a senior management team member as the responsible lead in the event of an incident, responsible for communications with the parties involved and deciding on the course of action to be taken.
Ensured that if an agency worker is involved in a safety critical incident, the worker’s certification (COSS) will be temporarily limited to track worker level until the outcome of any investigations is known.

Stipulated that a designated manager will undertake a formal review of any findings from incident investigations to record appropriate actions to be taken and by whom.

Network Rail has:

- Developed a system which will enable all staff (including those who book onto the railway through a site access control point) to have their certification checked prior to working on or near the line;
- Introduced the requirement for contractors and agencies to regularly monitor the performance, attitudes and behaviour of agency staff in order to ensure deficiencies are identified and addressed; and
- Issued guidance to all contractors and agencies on their responsibilities in applying the process for temporary suspension of the individual's certification within the Sentinel system.

Amey Colas has:

- Re-briefed its investigation process to all safety managers; and
- Changed its incident logging and tracking database to ensure a nominated safety manager is appointed for an investigation. (A periodic status report shows the nominated manager and their responsibility for all actions and recommendations through to closure of the investigation.)

Recommendations

- Taking account of the findings of this investigation (particularly in respect of the actions of the COSS on site and the absence of any effective performance review applied to the COSS), Network Rail should identify and then implement, suitable controls to assure the adequate performance of agency staff in safety leadership roles and/or take steps to reduce its dependence on such staff.

- Network Rail, in consultation with all Sentinel sponsor organisations, should develop and implement arrangements to more effectively manage the risk arising from the use of agency staff undertaking work on and around the track. In developing the arrangements, Network Rail should, as a minimum, define improvements in respect of the following issues:
  
  - The requirement for the performance, attitudes and behaviour of agency staff to be regularly monitored;
  - The actions to be taken when deficiencies are identified, in particular the possible mechanisms to remedy the deficiency, reasonable timescales within which the deficiencies should be addressed, and the interim measures that can be applied pending resolution;
  - The process for temporary suspension of the relevant certification within the Sentinel system and for the prompt reinstatement (to include guidance to contractors and agencies on their responsibilities for updating the status of affected agency staff) on Sentinel; and
  - The arrangements for employers to share information in respect of the individuals involved in multiple investigations.

- Carillion, in conjunction with Sky Blue, should commission an independent review of the changes they have made to their safety management arrangements following this accident, with the aim of confirming that they have delivered the necessary improvements. The review should include specific consideration of whether the measures taken in respect of managing the performance of agency staff, and following-up accidents and incidents involving them, have been effective in controlling the risk identified in this report. The review should be completed by March 2014.
• Network Rail, in consultation with other industry partners as appropriate, should review its processes and examine ways of improving their practices for interviewing witnesses who have been involved in serious incidents and accidents. Taking account of best practice from specialists in this area, it should develop guidance on planning for interviews and techniques for dealing with such witnesses. Training should be provided for individuals who are involved in industry investigation panels or conduct interviews as part of an investigation.

Declared to ERA 31 October

Czech Republic: Passenger train derailment at Neopmuk station, 20 May 2013

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

At 18:35 (local time) on 20 May 2013, the locomotive hauling a long-distance passenger service derailed (rear bogie) as the train was arriving at Neopmuk. There were no reported injuries.

The Czech NIB has determined that the incident was caused by bogie failure, screws vital to the bogie’s integrity having worked loose and fallen out. The NIB conclude that this is a fault of manufacture, but add that inspections in this area are only visual and that major locomotive examinations do not occur with sufficient frequency.

Recommendations

• The railway undertaking should define an upper mileage limit to determine when major locomotive examinations are to be undertaken, updating the wording of its internal regulations to reflect this.

• The railway undertaking should update the same regulation to ensure that bogies receive a physical examination, as opposed to a merely visual one.

• The locomotive manufacturer should check the tightness of the bogie screws before release to the railway undertaking.

• The National Safety Authority should ensure the implementation of the above recommendations.

Published 31 October

Norway: Derailment near Nykirke, 15 February 2012

For the full report, click here.

At 10:30 (local time) on 15 February 2012, a northbound train derailed at Nykirke station. The train was an NSB Type 74 that was being handed over to NSB AS by the Swiss manufacturer, Stadler Bussnang AG. There were five people on board, one of whom was seriously injured; three more sustained minor injuries. All five carriages were completely destroyed.

The Accident Investigation Board of Norway (AIBN) deemed the immediate cause of the accident to be that the train was travelling too fast on the section of line in question. The driver had overlooked a speed restriction sign (taking linespeed from 130 to 70 km/h) and initiated braking too late. The AIBN
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has considered potential sources of distraction, but found none that can, with certainty, be linked to the driver overlooking the sign.

Updated Train Driver Regulations recently introduced new requirements for follow-up and control of personnel's knowledge of the line. The AIBN expects the change in requirements to have an effect. It has therefore chosen not to propose a safety recommendation concerning competence in relation to sections of track so soon after the regulations were amended.

Most of the Norwegian railway network is not equipped with any type of speed monitoring capable of preventing a train from exceeding the line speed. It is the AIBN's opinion that, in the absence of Full Automatic Train Control (FATC), the Norwegian National Rail Administration must look into the possibility of introducing sufficient barriers to prevent such railway accidents.

Recommendations

- At the end of the passing loop at Nykirke station, the line speed is reduced from 130 km/h to 70 km/h before a curved section. The speed at which the train was travelling was too high to manage the curve, and all the train's five carriages derailed and hit the cliff on the left-hand side of the tracks. Most of the Norwegian railway network is not equipped with a speed monitoring system capable of intervening if a train exceeds the line speed. The AIBN recommends that the Norwegian Railway Authority instruct the National Rail Administration to identify the places where large reductions in speed could pose a danger in connection with curves, and to implement sufficient barriers to improve safety in connection with large reductions in speed.

In Britain, two overspeeding accidents at Morpeth (in 1969 and 1984) led to changes in the way drivers are alerted to the presence of speed restrictions on curves.

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