RAIB

Rail Accident Investigation Branch

Rail Accident Report

Near miss with a group of track workers at Egmanton level crossing, Nottinghamshire 5 October 2017

Report 11/2018
August 2018

This investigation was carried out in accordance with:

- the Railway Safety Directive 2004/49/EC;
- the Railways and Transport Safety Act 2003; and
- the Railways (Accident Investigation and Reporting) Regulations 2005.

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Preface

The purpose of a Rail Accident Investigation Branch (RAIB) investigation is to improve railway safety by preventing future railway accidents or by mitigating their consequences. It is not the purpose of such an investigation to establish blame or liability. Accordingly, it is inappropriate that RAIB reports should be used to assign fault or blame, or determine liability, since neither the investigation nor the reporting process has been undertaken for that purpose.

The RAIB's findings are based on its own evaluation of the evidence that was available at the time of the investigation and are intended to explain what happened, and why, in a fair and unbiased manner.

Where the RAIB has described a factor as being linked to cause and the term is unqualified, this means that the RAIB has satisfied itself that the evidence supports both the presence of the factor and its direct relevance to the causation of the accident. However, where the RAIB is less confident about the existence of a factor, or its role in the causation of the accident, the RAIB will qualify its findings by use of the words 'probable' or 'possible', as appropriate. Where there is more than one potential explanation the RAIB may describe one factor as being 'more' or 'less' likely than the other.

In some cases factors are described as 'underlying'. Such factors are also relevant to the causation of the accident but are associated with the underlying management arrangements or organisational issues (such as working culture). Where necessary, the words 'probable' or 'possible' can also be used to qualify 'underlying factor'.

Use of the word 'probable' means that, although it is considered highly likely that the factor applied, some small element of uncertainty remains. Use of the word 'possible' means that, although there is some evidence that supports this factor, there remains a more significant degree of uncertainty.

An 'observation' is a safety issue discovered as part of the investigation that is not considered to be causal or underlying to the event being investigated, but does deserve scrutiny because of a perceived potential for safety learning.

The above terms are intended to assist readers' interpretation of the report, and to provide suitable explanations where uncertainty remains. The report should therefore be interpreted as the view of the RAIB, expressed with the sole purpose of improving railway safety.

The RAIB's investigation (including its scope, methods, conclusions and recommendations) is independent of any inquest or fatal accident inquiry, and all other investigations, including those carried out by the safety authority, police or railway industry.

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Near miss with a group of track workers at Egmanton level crossing, Nottinghamshire, 5 October 2017

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Summary

At around 11:22 hrs on 5 October 2017, a group of track workers narrowly avoided being struck by a train close to Egmanton level crossing, between Newark North Gate and Retford on the East Coast Main Line. A high speed passenger train was approaching the level crossing on the Down Main line at the maximum permitted line speed of 125 mph (201 km/h), when the driver saw a group of track workers in the distance. He sounded the train's warning horn, but saw no response from the group. A few seconds later the driver gave a series of short blasts on the train horn as it approached, and passed, the track workers.

The track workers became aware of the train about three seconds before it reached them. One of the group shouted a warning to three others who were between the running rails of the Down Main line. These three workers cleared the track about one second before the train passed them. During this time the driver had continued to sound the horn and made an emergency brake application before the train passed the point where the group had been working, thinking his train might strike one or more of them. The train subsequently came to a stand around 0.75 miles (1.2 km) after passing the site of work.

The immediate cause of the near miss was that the track workers did not move to a position of safety as the train approached. The group had been working under an unsafe and unofficial system of work, set up by the Person in Charge (PiC). Instead of adhering to the correct method of using the Train Operated Warning System (TOWS) by moving his team to, and remaining in, a position of safety while TOWS was warning of an approaching train, the PiC used the audible warning as a cue for the lookout to start looking out for approaching trains in order to maximise the working time of the group on the track. This unsafe system of work broke down when both the lookout and the PiC became distracted and forgot about the TOWS warning them of the approaching train.

Although the PiC was qualified, experienced and was deemed competent by his employer, neither his training nor reassessments had instilled in him an adequate regard for safety and the importance of following the rules and procedures. Additionally, none of the team involved challenged the unsafe system of work that was in place at the time. Even though some were uncomfortable with it, they feared they might lose the work as contractors if they challenged the PiC.

As a result of its investigation the RAIB has made three recommendations. These relate to:

- strengthening safety leadership behaviour on site and reducing the occurrences of potentially dangerous rule breaking by those responsible for setting up and maintaining safe systems of work;
- mitigating the potentially adverse effect that client-contractor relationships can have on the integrity of the Worksafe procedure such that contractors' staff feel unable to challenge unsafe systems of work for fear of losing work; and
- clarifying to staff how the Train Operated Warning System (TOWS) should be used.

The findings of this investigation have also reinforced the importance of railway staff understanding their safety briefings, and challenging any system of work that they believe to be unsafe.

Introduction

Key definitions

1 Metric units are used in this report, except when it is normal railway practice to give speeds and locations in imperial units. Where appropriate the equivalent metric value is also given.

2 Sources of evidence used in the investigation are listed in Appendix A.

The incident

Summary of the incident

3 Around 11:22 hrs on 5 October 2017, a group of track workers narrowly avoided being struck by a high speed passenger train which was travelling at its maximum permitted speed of 125 mph (201 km/h) on the East Coast Main Line. The incident took place close to Egmanton level crossing, which is situated between Newark North Gate and Retford stations (figure 1).

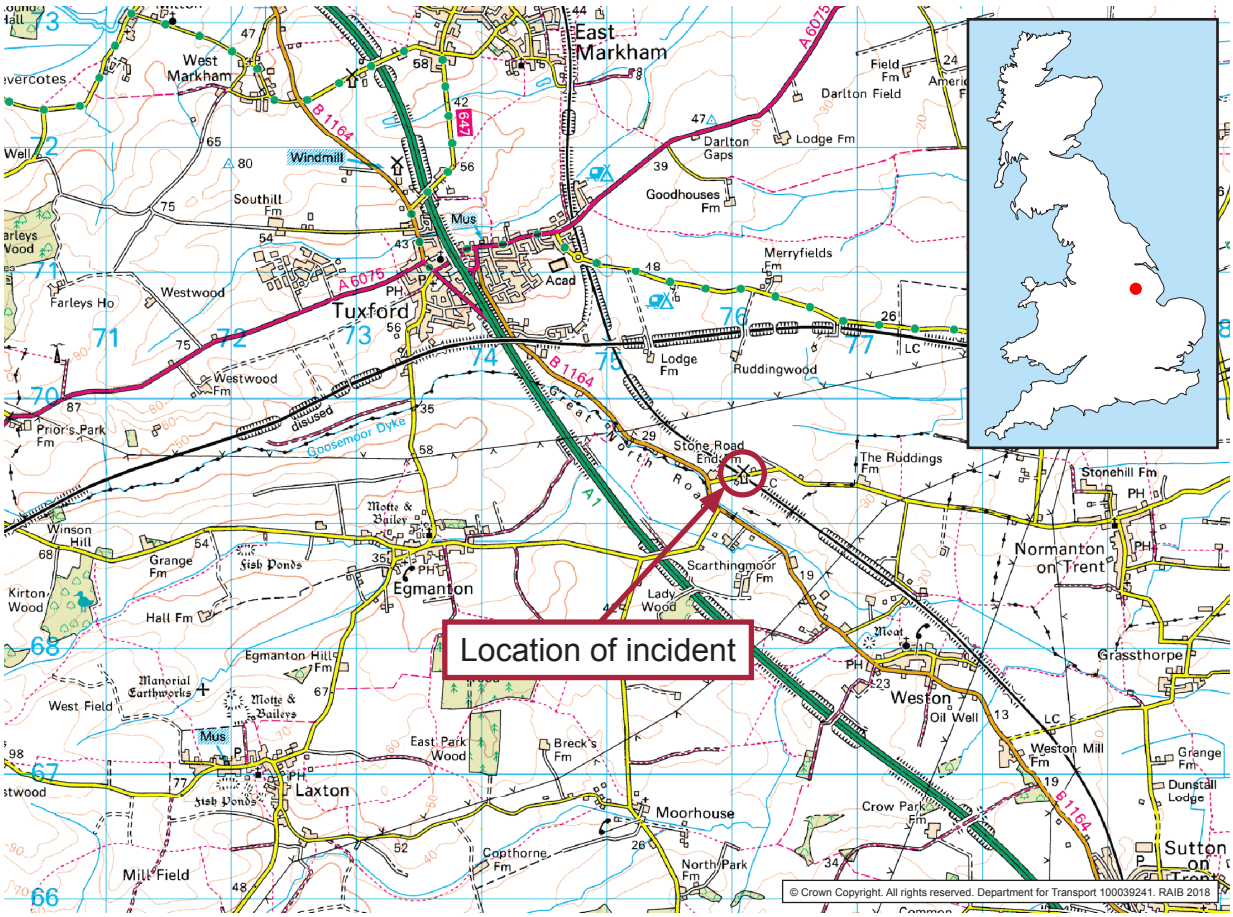

Figure 1: Extract from Ordnance Survey map showing location of incident

4 The group on the track consisted of seven contract track workers under the direction of a Network Rail Person in Charge (PiC). The PiC was responsible for managing the group's safety as well as leading and helping with the work.

5 The train driver reported that he saw a group of track workers in the distance as the train was approaching the site of work on the Down Main line. He sounded the train's warning horn, but saw no response from the group. A few seconds later he gave a series of warning blasts of the horn. Seeing no response from the group, the driver applied the emergency brake around 4 seconds before reaching them, and continued to sound the horn.

6 The track workers first became aware of the train about three seconds before it reached them, when one of the group shouted a warning to three others who were between the running rails of the Down Main line and at risk of being struck. The train driver continued to sound the horn as the train was braking, and the three track workers moved clear of the train's path about one second before it passed them. The train subsequently came to a stand around 0.75 miles (1.2 km) after passing the site of work.

7 All those involved in the near miss, including the train driver, were shaken by the incident, but none were injured.

Context

Location

8 The incident occurred around 30 metres north-west of Egmanton level crossing (figure 2) which is located on the East Coast Main Line (ECML) at 130 miles 29 chains from London Kings Cross. The location is between Newark North Gate station to the south, and Retford station to the north.

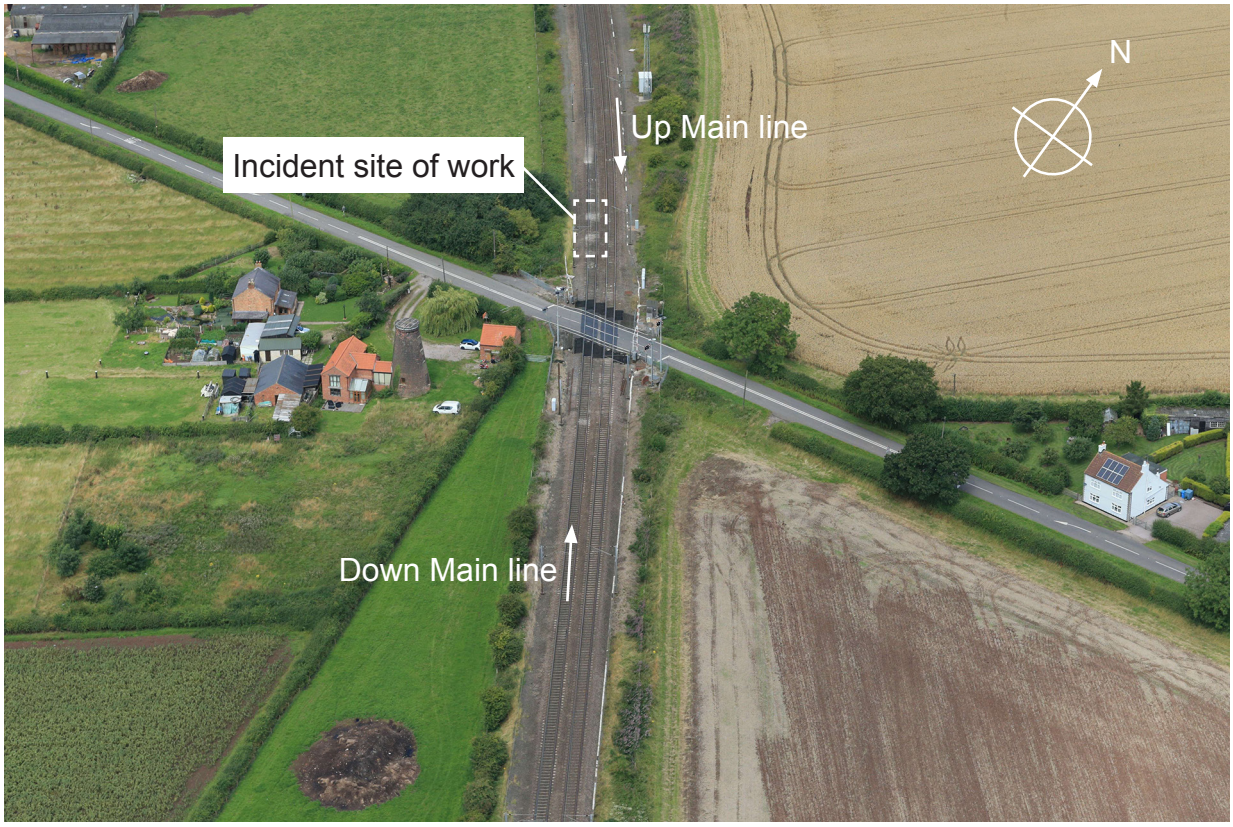

Figure 2: The track layout and the incident site of work near Egmanton level crossing (image courtesy of Network Rail)

9 In this area there are two running lines. These are the Down (northbound) and the Up (southbound) Main lines. Both have a maximum line speed of 125 mph (201 km/h).

Organisations involved

10 Network Rail owns, operates and maintains the ECML, including the level crossing at Egmanton. It was also the employer of the PiC involved in the incident.

11 Vital Human Resources Ltd (VHRL), which is a subsidiary of Morson Group, was the provider of the track workers involved. They were working under a 'zero-hour contract' arrangement with VHRL and were provided to Network Rail for a series of track based tasks including those on the day of the incident.

12 Virgin Trains East Coast[1] was the operator of the train involved and employed the driver.

13 All organisations freely co-operated with the investigation.

Train involved

14 Train 1D09 was the 10:03 hrs Virgin Trains East Coast service from London King's Cross to Leeds. It comprised a class 91 locomotive at the leading end, eight coaches and a driving van trailer[2] at the rear.

The trackside warning system involved

15 Sections of the ECML around Egmanton level crossing are fitted with the Train Operated Warning System (TOWS). This is a permanently installed system consisting of a series of trackside sirens which provide a warning of approaching trains on both lines. The warning is triggered when trains are detected by the track circuits which are part of the signalling system.

16 TOWS is installed at this location because the maximum permitted line speed and the track curvature did not allow sufficient sighting time of all trains by an unassisted lookout to give an adequate warning to those working on the track to move to a position of safety before a train travelling in the up direction arrived.

17 The TOWS system is activated by staff using trackside switches. Once active, and when no trains are present in the TOWS section, the sirens emit a short two-tone sound every two seconds. This is known as the safe tone. When a train travelling in either direction is detected within the section, the sirens emit a continuous oscillating tone, known as the warning tone. Network Rail's instructions for using TOWS state that when the warning tone is given, all workers should immediately move clear of the track to a position of safety. When the signalling system detects that the TOWS section is clear from trains, it reverts to the safe tone, indicating that it is safe to go back on to the track.

18 The TOWS section that was active during this incident gives a minimum warning time for trains travelling at the maximum permitted line speed of 34 seconds for down direction trains and 45 seconds for up direction trains. These minimum warning times are at locations at the extremities of the TOWS section. At other locations within this section the warning times are longer. At Egmanton level crossing, TOWS gives a warning time before the arrival of a down direction train of approximately 50 seconds. The warning time is approximately 90 seconds for a train travelling in the up direction. For trains travelling slower than the maximum permitted line speed, warning times are proportionally longer.

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[1] From 24th June 2018, the Virgin Trains East Coast franchise ceased and was replaced by London North Eastern Railway.

[2] A non-passenger carrying, non-powered, vehicle fitted with a driving cab.

Staff involved

19 The PiC involved in the incident was employed by Network Rail as a Team Leader (Track Inspection), leading the Retford track maintenance team. He was assigned as the PiC (and hereafter referred to as the PiC in this report) by the Grantham track section manager (TSM) for the work being undertaken at the time of the incident. The role of PiC[3] is not itself a certified competency. However, those undertaking the role of PiC are required to be certified as competent to act as a controller of site safety (COSS). PiCs are nominated on a task-by-task basis, based on their suitability to manage both the safety of staff on site by controlling the risks from moving trains, and to manage the safety of the work activity.

20 The PiC was based in Newark and reported to the Grantham TSM. He had worked on the railway for around 23 years, was very familiar with the area and had been passed as competent to act as lookout, controller of site safety (COSS), engineering supervisor (ES) and senior person in charge of possessions (SPiCOP). He had also attended courses on team leader development and safe work leader[4] (SWL). His last track safety assessment was on 8 February 2017 and consisted of a review of both the results from computer tests of his knowledge and evidence that he had practiced his safety competencies over the previous assessment period. There is no evidence indicating his involvement in any past safety related incidents or accidents.

21 The team of track workers provided by VHRL comprised eight people, although at the time of the incident only seven of this group were on the track. The most experienced member of the VHRL team was its team leader. He had 12 years' railway experience and was passed as competent to act as controller of site safety and engineering supervisor, and was a provisional lookout (Lookout (P)). The next most experienced VHRL track worker was passed as competent to act as lookout and COSS, and had worked on the railway for around four years.

22 There were also two other track workers in the VHRL team who were passed as competent to act as lookout. One of these was present on the trackside at the time of the incident and the other was in a van parked close by. The track worker on site had worked on the railway for around two years and had qualified as a provisional lookout a few weeks previously. The remaining four members of the team had worked on the railway for between four and twelve months. One of them had begun work on the railway in June 2017 and wore a blue helmet on site indicating that he was newly qualified in personal track safety (PTS).

23 All of the group were deemed competent to use the tools required for the planned work tasks and none of them had any known history of involvement in past safety related incidents. All but the two most experienced had little or no familiarity with working on open lines or with TOWS. Most had gained their railway experience from working in possessions[5] where normal rail traffic is prevented from running.

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[3] The role and duties of a PiC are defined within Network Rail standard NR/L2/OHS/019, Issue 9, 4 March 2017, 'Safety of people at work on or near the line'.

[4] Safe work leader (SWL) – the role of an employee of Network Rail, or one of its principal contractors, who manages safe delivery of work and who holds, as a minimum, a valid COSS competence.

[5] Railway lines on which the normal running of trains has been blocked to allow engineering work to be carried out.

External circumstances

24 CCTV footage from the trains passing the site indicate that it was dry at the time of the incident, with good visibility. There is no evidence to indicate that sun glare played any part in the incident.

The sequence of events

Events preceding the incident

The planning of the work

25 The Grantham TSM had allocated funds to attend to 'white ballast'[6] sites between Newark and Retford on the ECML. These sites had been identified by the TSM as requiring remedial work. This involved lifting the track, typically over a few sleepers, removing and replenishing the ballast, and manually tamping[7] it to restore the track's vertical alignment.

26 The TSM met with VHRL and its nominated team leader in September 2017, to arrange a series of contracts for a track team to undertake the work over a five to six week period. The contract specified a team of eight, comprising a team leader, two lookouts and five multi-skilled track operatives.

27 The TSM had identified that the Retford track inspection team leader was qualified to lead and manage the work as the Person in Charge (PiC). He was also considered to be sufficiently experienced. One of the PiC's duties was to work with the Grantham section planner to create 'safe work packs'[8] (SWPs) for each site of work.

28 The work to correct the white ballast sites began in the week before the incident. During that week, the team worked for four weekdays on sites between Newark and around 2 miles (3.2 km) south of Egmanton level crossing.

29 The PiC worked on other railway duties during the intervening weekend, and was rostered off duty on 2 and 3 October 2017. On 3 October, he phoned the planner to arrange two SWPs for 5 October, the day of the incident. No work was possible on 4 October as there was a safety stand down day, during which he, and other staff at Network Rail's Grantham depot, were briefed on safety issues related to health and wellbeing, fatigue and stress.

30 On 3 October 2017, the planner produced the two SWPs. The first SWP, which is relevant to this incident, allowed the PiC to attend to two sites of work previously identified by the TSM south of Egmanton level crossing.

31 The first site of work covered by this SWP was approximately 1 mile (1.6 km) south of Egmanton level crossing and the second was around 20 metres south of the crossing (figure 3). The PiC and the planner, who was also familiar with the area, agreed that this plan could be used to cover both sites of work. The SWP covered a distance of approximately 2.75 miles (4.4 km), allowing the PiC to decide the most appropriate entry and exit points to the railway. The planner suggested that Egmanton level crossing be an access location to the second site of work, so this became the northerly limit stated on the SWP.

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[6] White ballast sites are where the local track support conditions have given rise to increased vertical deflections causing mechanical damage to the ballast leading to it becoming powdery.

[7] Consolidating the ballast beneath the sleepers.

[8] A safe work pack contains information on the safety arrangements for the work to be undertaken.

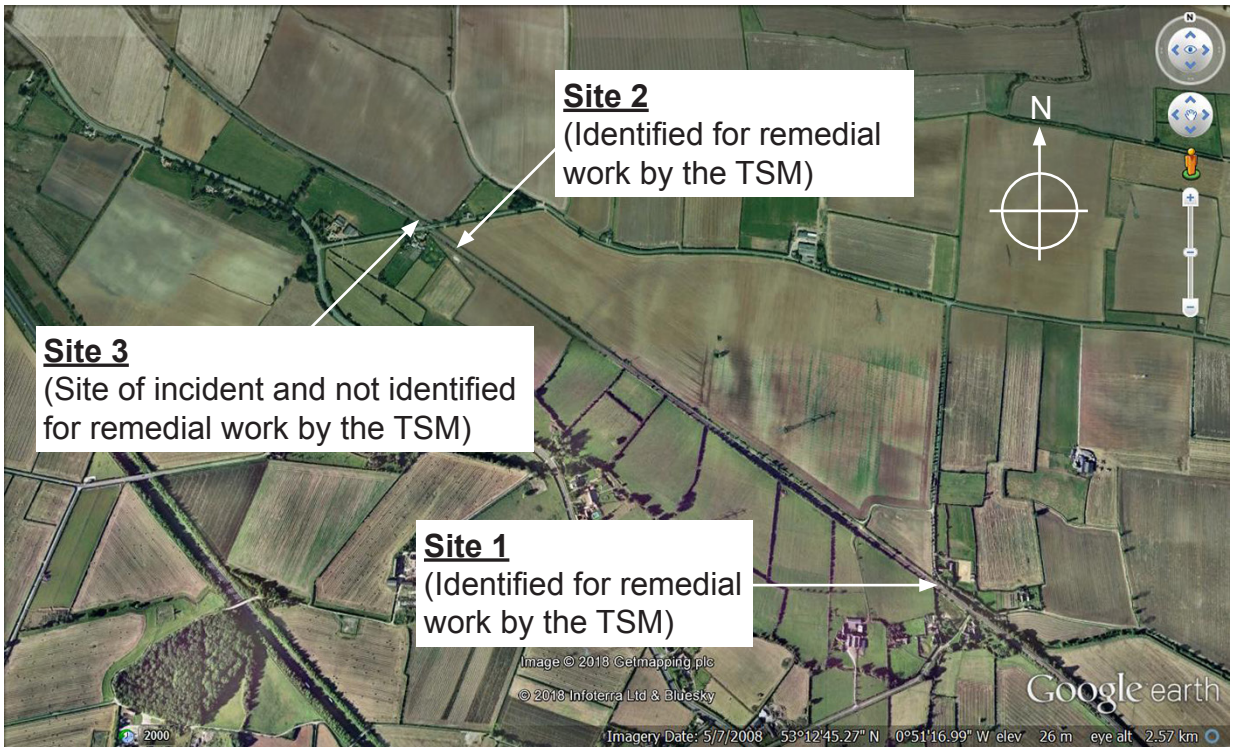

Figure 3: Locations of the three sites of work (image courtesy of Google Earth)

32 When deciding on how to protect themselves on the railway, staff are required to choose the safest system of work that it is practicable to implement. To do this they refer to a list of systems of work. These are listed in order of level of risk control, with the safest method listed first and the least safe listed last. This 'hierarchy' of systems is specified in Network Rail standard NR/L2/OHS/019, Issue 9. The method chosen by the planner and agreed by the PiC was warning by lookout, and this was recorded on the SWP. According to standard NR/L2/OHS/019, lookout warning has the lowest level of risk control, and should only be chosen when no other system of work is reasonably practicable.

33 The planner told the RAIB that lookout warning was the most appropriate because using a series of intermittent line blockages, which is shown as a safer system in the hierarchy, was not possible because the green zone access control system (GZAC) would only allow two line blockages to be granted at the same time. This restriction on line blockages was to minimise signaller workload, and the planner had already submitted two line blockages for that time for track patrols in the signaller's area. The PiC stated that it was necessary to undertake the work in daylight so that he could watch trains travel over the sites of work to check that the work had been done satisfactorily. Both the PiC and the planner understood that TOWS, which is a safer system of work in the hierarchy than lookout warning, could be used if the PiC was in an area where TOWS was available, although this was not stated in the SWP.

34 The SWP documented that the safe system of work required the use of one site lookout and one distant[9] lookout to give the required minimum warning time of 25 seconds. The planner told the RAIB that it was an oversight not to specify the site lookout as a touch lookout in the SWP. A touch lookout gives warnings to the group by touch, and was necessary because some elements of the work involved using powered tools. This required workers to use ear defenders which reduces their ability to hear audible warnings.

35 The planner submitted the SWP on the planning system and verified it on behalf of the PiC, having verbally confirmed the arrangements with him. He then printed out a copy for the Grantham TSM to authorise, which the TSM did by signing it on 3 October 2017. The PiC collected the SWP from the Grantham depot on 4 October and he signed it and backdated it as verified on 3 October 2017. This was not in line with the requirements of the process within standard NR/L2/OHS/019 for creating and issuing plans, in that the TSM authorised the SWP before the PiC had signed it as verified. This non-compliance was a result of the PiC not being in the office on the day the plan was created. However, this non-compliance had no bearing on the incident.

The events on the day

36 At around 08:30 hrs on 5 October 2017, the PiC met the VHRL team at an access point approximately 1 mile (1.6 km) south of Egmanton level crossing. The first site of work was not fitted with TOWS, so the lookout warning method was used. The PiC appointed a site lookout and a distant lookout.

37 Members of the VHRL team told the RAIB that the PiC neither fully briefed the team on the safety arrangements, nor checked their track safety qualifications. Nevertheless, they all signed the SWP to acknowledge that they had received a briefing. Additionally, the PiC did not test the safe system of work by checking the time available from the first sighting of a train before commencing work, as required by the Rule Book[10], and he did not appoint a site lookout as a touch lookout (which was necessary given his plan to use noisy tools). Team members who were not directly involved in the work acted as touch lookouts in an unofficial capacity and the work was completed without incident.

38 The second site of work was approximately 20 metres to the south of Egmanton level crossing. At around 10:30 hrs, the PiC and the VHRL team arrived in their vehicles and parked close to the crossing. The PiC, knowing that TOWS was installed in this area, accessed the railway via the gate to the north side of the crossing to switch on TOWS. As he was doing this, he noticed that there was a dip in the track on the Down Main line approximately 30 metres to the north of the level crossing. He returned to the team and they walked south along the down cess to the second site of work.

[9] A distant lookout is positioned at a distance from the group allowing the lookout earlier sighting of trains. This distant lookout gives warning to the site lookout who is close to the group working on the line, which enables an increase in the overall warning time.

[10] Rule Book GE/RT8000-HB7 Issue 5: General duties of a controller of site safety (COSS).

39 As at the first site of work, the PiC did not give a full safety briefing before beginning the work, and did not appoint a site touch lookout. Although he told some of the team that they were using TOWS, an explanation of how the system works was not given to those who had not previously worked with this warning system. One of the team who had been a lookout on the first site of work told the RAIB that they had to ask one their own team to explain how TOWS worked.

40 The exact time when the group was working on the down line at this site is not known, but signalling records show that between 10:30 hrs and 11:10 hrs, ten trains passed through the section, five in each direction. Initially the PiC and the team moved clear of the line when TOWS sounded a warning. Team members told the RAIB that there was one period where they had to remain in the position of safety for "quite a while". Signalling records indicate that around 10:45 hrs, the TOWS warning was likely sounding continuously for a few minutes. This was due to a warning activation by a down direction train followed by an up direction train entering the TOWS section before the down direction train had left the section.

41 The PiC and VHRL team members told the RAIB that following this period off the track, the PiC asked one of the group, who had acted as a lookout at the first site of work, to look out for trains in the down direction only when TOWS sounded a warning. The PiC stated to the RAIB that he did this because he knew that the sighting of trains approaching in the down direction allowed the group more than the required minimum 25 seconds of warning time to stop work, move clear of the line and be in a position of safety for 10 seconds before the train arrived. When the lookout saw a train approaching in the down direction, he blew his horn to warn the group to move clear of the track. The PiC decided that if a train was on the up line, the group could continue to work on the down line, so he had not asked the lookout to provide a warning for trains approaching in this direction. However, witness evidence suggests there were differences between the team members as to what actual means of warning they were using to alert them to move to a position of safety. Some of the group moved off the track when TOWS sounded. Others used the warnings from the level crossing Yodalams (sirens), or the lowering of the barriers, as a warning to move clear before TOWS began sounding a warning of an approaching train.

Events during the incident

42 Shortly after 11:00 hrs, the work on the second site was completed and the group moved north of the level crossing to the section of track that the PiC had previously identified as needing attention when he turned on TOWS (paragraph 38). This third site of work was not one of those that had been identified by the TSM as requiring attention. It was also outside the geographical limits of the SWP that had been issued for the previous two sites of work.

43 Before the work began at the third site of work, the PiC noticed that one of the group, who had been the distant lookout at the first site of work, was not wearing the correct protective footwear. The PiC told him to sit in one of the vans to look after the tools, replacing the worker who had performed this role in the van when the group was at the second site of work.

44 The PiC decided that the work involved lifting both rails of the down line and tamping the ballast under a few sleepers to improve the track's level. The work required the use of powered tools, but as for the second site, the PiC did not appoint a site touch lookout. Witness evidence suggests that the PiC had assumed that the group understood that the method of warning he had used later at the second site (paragraph 41) was in operation at this third site. However, this was not clear to the team member who had performed the role of lookout at the second site. The PiC told the RAIB that he did not brief the group before beginning the work at this third site of work.

45 The PiC reported that the Down Main line rail closest to the Up Main line was lifted first. This was completed before 11:17 hrs, when the group had to stand off the track for train 1S11 travelling in the down direction. Witness evidence is unclear as to what initiated group members to move clear.

46 Around 20 seconds after the passage of this train, train 1E06 passed the group on the up line. The CCTV image from the front of train 1E06 shows that the group had recommenced work as soon as train 1S11 had passed (figure 4). At this time the TOWS warning tone would have continued to sound as both trains were present in the section.

Figure 4: Forward facing CCTV image from train 1E06 approaching the group on the Up Main line, captured 20 seconds after train 1S11 had passed them on the Down Main line (image courtesy of Virgin Trains East Coast)

47 Train 1E06 was also fitted with a rear facing CCTV camera (figure 5). The RAIB has determined that the person marked 'A' in the image, is the PiC who is bending over to read a cross level gauge with his back to trains approaching in the down direction. The person marked 'B' is operating a track jack, and is the track worker whom the PiC appointed as the site lookout at the first site of work and who performed the lookout role later on at the second site of work (paragraph 41).

Figure 5: Rear facing CCTV image from train 1E06 passing the group on the Up Main line, showing the positions of the PiC ('A'), and the lookout ('B') (image courtesy of Virgin Trains East Coast)

48 At around 11:22 hrs the work was nearly complete and TOWS began sounding the warning tone as train 1D09, the incident train, was approaching in the down direction (figure 6).

Figure 6: Forward facing CCTV image from train 1D09 showing three workers on the track as it approached the group on the Down Main line approximately 2 seconds before reaching the site of work (image courtesy of Virgin Trains East Coast)

49 The approximate positions of the members of the group, and their actions immediately prior to the arrival of train 1D09, are based on witness evidence and forward facing CCTV images from this train (figure 7).

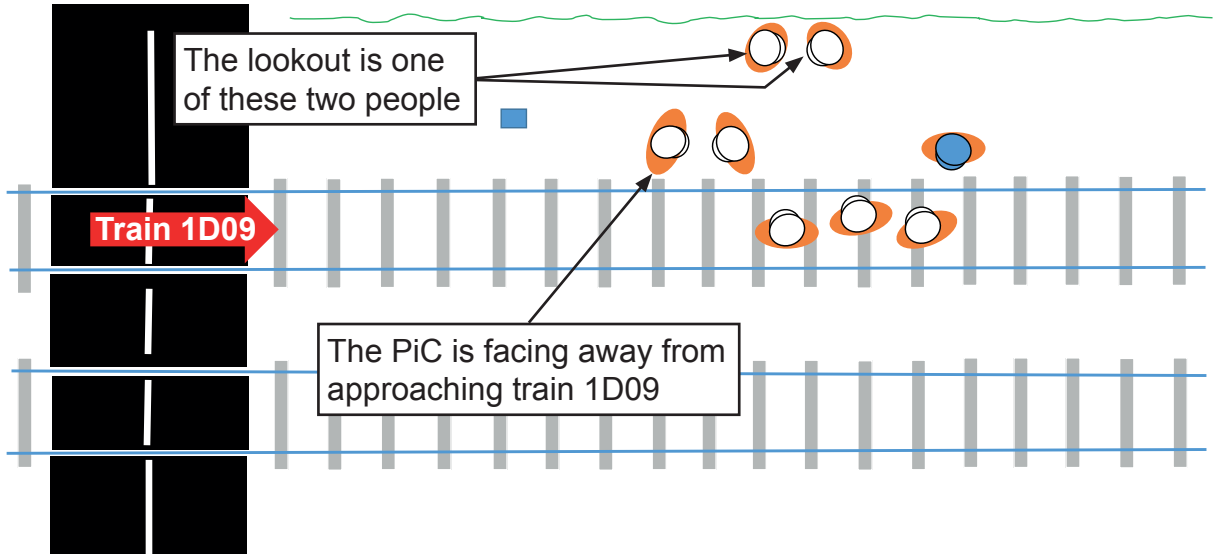

Figure 7: The approximate positions of the track workers immediately prior to the arrival of train 1D09

50 The PiC, who was standing close to the track with his back to the approaching train, told the RAIB that he was waiting for a down train to pass so that he could check that the track levelling work was satisfactory. Although accounts vary, it is likely that he was talking with one of the VHRL team who was facing the approaching train.

51 Four of the group had been on the track, clearing loose ballast from the top of the sleepers. One of them, who had been using a shovel, had moved clear leaving three on the track. The train's CCTV camera images indicate that around 5 seconds before the train arrived, one of them was crouching down, probably removing loose ballast with his hand. The track worker who was talking to the PiC and facing the approaching train shouted to the others when he saw it. This was around three seconds before the train arrived. The CCTV images show that the three workers on the track were clear of the track around one second before the train reached the site (figure 8).

52 Most of the group reported that they did not hear the train horn until a few seconds before the train reached the site of work. The driver told the RAIB that he sounded the horn twice on the approach, once when he first saw the group and then a continuous sounding of a series of short blasts from around nine seconds before reaching them. This is supported by evidence from the train's on-train data recorder (OTDR). The driver reported that after applying the emergency brake he closed his eyes as the train passed the site of work, expecting an impact.

53 It is likely that the track workers did not hear the horn earlier as, although the mechanised element of the work was complete, TOWS was sounding its warning, and some were still wearing ear defenders.

Figure 8: Forward facing CCTV image from train 1D09 showing the track workers moving clear of the train approximately one second before it passes them at 125 mph (201 km/h) (image courtesy of Virgin Trains East Coast)

Events following the incident

54 As train 1D09 slowed down under emergency braking, the driver made a priority GSM-R[11] call and reported that the train may have stuck more than one track worker.

55 Immediately following the incident, the group went back to their vans. Mobile phone records show that at 11:25 hrs, three minutes after the incident, the PiC made a phone call to the TSM. The TSM was in a meeting at the time and did not answer his mobile phone. The PiC then told the group to pack up the tools and go to Tuxford to get lunch. Meanwhile the TSM had received a message from Network Rail control who had been informed of the incident by the Doncaster signaller following the driver's emergency call. At 11:27 hrs, the TSM phoned the PiC and asked him whether his team was involved in the report of fatalities at the level crossing. The PiC told the TSM that he was not at Egmanton, but at Tuxford. Witness evidence from a member of staff at Carlton signal box, from where Egmanton level crossing is controlled, indicates that images from the CCTV at the level crossing showed that the group left the crossing at 11:28 hrs.

56 The PiC then drove from Egmanton to an access point near Tuxford, and saw that train 1D09 had stopped at a signal. He realised that the driver would have reported the near miss. At 11:38 hrs, he phoned the TSM and told him that the group had been involved in the incident.

[11] GSM-R (Global System for Mobile Communications – Railways). A radio system for data transmission to and from trains.

57 During this time, the train driver had examined his train for signs of impact, but found none. However, his earlier emergency call had already triggered Network Rail's emergency response, which resulted in the emergency services arriving at the crossing, including an air ambulance.

58 Shortly after 12:00 hrs, having returned to the level crossing, the track workers and the PiC were taken from the site to give statements. The PiC and the lookout who was present at the incident site were drugs and alcohol screened 'for cause'; both were clear.

Key facts and analysis

Identification of the immediate cause

59 **The group did not move to a position of safety when train 1D09 was approaching.**

Identification of causal factors

60 The near miss occurred due to a combination of the following causal factors:

a) the PiC set up a system of work that was neither safe nor compliant with the Rule Book[12] (paragraph 61); and

b) none of the members of the group effectively challenged the system of work (paragraph 80).

Each of these factors is now considered in turn.

The system of work set up by the PiC

61 **The PiC set up a system of work that was neither safe nor compliant with the Rule Book.**

62 The PiC was experienced and familiar with both the area and with TOWS. He understood that when TOWS sounded the warning tone, he and the group should immediately move to a position of safety. He also understood that they should remain there until TOWS reverted to the safe tone. However, he chose not to follow this method of working, and instead used his own method of warning, which was unsafe, in order to maximise the amount of time spent working on the track.

Response to down direction trains

63 The system of work set up by the PiC relied on using TOWS to alert the lookout to start looking for trains on the down line. If the lookout saw a train approaching on this line then he would give a warning for everyone to move to a position of safety. This system of work is contrary to the Rule Book which requires track workers to move to a position of safety as soon as the TOWS warning tone sounds. Using a lookout in this way is a less safe method of working than solely using TOWS, as it gives less warning time to move clear of the track. Also, in using this system, the lookout may forget to provide a second warning, or the TOWS warning may mask any subsequent audible warning given by the lookout.

64 The PiC told the RAIB that by not immediately moving to a position of safety when TOWS sounded the warning tone, his method allowed the group to continue to work on the down line for an additional 45 seconds before moving clear when an approaching down train became visible.

[12] Rule Book GE/RT8000-HB7 Issue 5: General duties of a controller of site safety (COSS).

65 Following the near miss, the PiC immediately asked the team on site where the lookout was prior to the incident. The PiC expected that the lookout would have seen the train approaching and given a warning on the horn. However, at the time of the incident the lookout was standing in the down cess which is on the inside of the curve of the track. The PiC, having used the lookout on the second site of work, at which there was good sighting of approaching down trains, had not reassessed this system on the third site of work where the curvature of the track restricted the sighting. The RAIB estimates that from the down cess at the third site of work, the sighting of down trains would have only allowed a warning time of 14 seconds, and not the 25 seconds minimum required. Additionally, the PiC did not ensure that the lookout was in a position where he could avoid possible distractions from others in the group as he is required to do.

66 The lookout claimed that he had been stood down from his duties by the PiC at the third site of work and was accordingly not acting as a lookout. The PiC stated that this was not so. However, CCTV evidence shows that the lookout had been involved in the work for at least some of the time (paragraph 47). Lookouts must not take part in the work, in order to avoid distraction. Any instruction given to the lookout by the PiC about his duties was such that the lookout thought he could become involved with the work, and subsequently did so unchallenged by the PiC.

67 The lookout was recently qualified (paragraph 22) and was not familiar with TOWS, and did not challenge the PiC about the system of warning being used (paragraph 80). It was the responsibility of the PiC to ascertain the experience of the lookout, to fully brief him and to ensure that he understood his role.

68 The PiC told the RAIB that during the work, he was also looking out for trains. This is not unusual, as experienced track workers regularly check for trains as a matter of habit. The PiC was very involved in the work because he was also responsible for managing the technical aspects of it. Handbook 7 of the Rule Book[13] and standard NR/L2/OHS/019 allows this, but this relies on the PiC having given a full briefing about the safe system of work to the group and establishing and testing the system of work, with regular checks to ensure that it remains in place. At the time of the incident, it is likely that the PiC had become distracted in conversation (paragraph 50).

Response to up direction trains

69 On both this, and the previous site, track workers remained on the down line at the PiC's instruction while trains passed them on the up line, even though they should have been in a position of safety in accordance with the Rule Book when working with TOWS. This was done at the PiC's instruction in order to minimise disruption to work.

70 The PiC has stated to the RAIB that he thought it was safe to remain on the down line during the passage of a train on the up line, as the VHRL team was working further than 2 metres from the nearest (six foot) rail of the up line.

[13] Rule Book GE/RT8000-HB7 Issue 5: General duties of a controller of site safety (COSS).

Use of TOWS in the Grantham section

71 Network Rail staff in the Grantham section not involved in this incident, told the RAIB that the practice used when undertaking noisy work in a TOWS area, was to place a lookout in a safe position close to a TOWS siren as a 'listener'. The system works as follows. Once the TOWS warning tone starts, this lookout would blow a horn and wave a flag to alert a site touch lookout that a train is approaching. The site touch lookout, after acknowledging the warning, then warns the group to move clear. The group would then immediately move to the position of safety and remain there until TOWS reverted to the safe tone. They stated that this method of warning is similar to using a site touch and a distant lookout, except the 'distant' lookout is listening for TOWS to sound rather than watching for a train.

72 The PiC's Network Rail colleagues have told the RAIB that they had worked with him using this method of warning. They also stated that they had never used TOWS as a cue for a lookout to begin looking for trains, ie the system employed by the PiC in this incident, to maximise the working time on track.

73 Since the incident, Network Rail has started a review of the use of TOWS, as this incident has revealed that there is no clear guidance on how to use it correctly when undertaking noisy work. Although not causal to this incident, it is a safety related observation (paragraph 107).

Safety leadership on site

74 The PiC's behaviour indicates an inadequate regard for safety. Getting the work done was prioritised to such a degree that the rules were broken and safety was compromised. As well as not complying with the rules when using TOWS, evidence indicates that the PiC did not:

- fully brief the lookout and the group on the safety arrangements at each site before commencing work, and ensure that they understood the safe system of work and their roles (paragraphs 37, 39 and 44);
- brief on the work task risks and check that the group were all wearing the appropriate PPE before commencing work (paragraph 43);
- check the safety qualifications of the group members (he told the RAIB that there was a problem with his mobile phone that prevented him scanning cards using the 'Sentinel' app both that week and the week before, and relied on the VHRL team leader to check some of the cards) (paragraph 37);
- test the safe system before proceeding with the work (paragraph 37);
- appoint site touch lookouts when undertaking noisy work (paragraph 37), and
- seek authority to undertake work at the third site of work, where the incident occurred, for which there was no SWP (paragraph 42).

75 VHRL team members told the RAIB that the safety briefings given when they were working the previous week were also incomplete. It is likely that most of them had formed a view that the PiC had a lax attitude towards safety during this time.

76 The PiC did not take into consideration the team members' safety competencies or their experience. The more experienced VHRL individuals were providing safety information to the others and generally looking after one another, for example by unofficially acting in the role of site touch lookout (paragraph 37). It is likely that the PiC relied on those more experienced individuals to manage some of his own safety responsibilities. One of the VHRL team told the RAIB that they thought that the VHRL team leader was the COSS, suggesting that the PiC was not really acting in a way the COSS role requires.

77 The PiC told the RAIB that this contract with the Vital team was the first time he had worked with contractors on lines open to traffic. His previous experience in working with contractors was during possessions only, where normal train movements are blocked.

78 Witness evidence provided to RAIB indicates that the PiC was focussed on getting the work done and sought to exceed expectations whenever possible. He had a reputation within the section for being competitive in completing work and for being regarded as one of the best team leaders in the area. There is no evidence from his safety record that the PiC was prone to unsafe behaviour on site. However, it is possible that the PiC's apparent disregard for safety and following rules arose from working under former management systems which placed less emphasis on completing work in a safe manner than current procedures require.

79 The actions of the PiC following the incident indicate a deliberate attempt to cover up the near miss following the phone call from the TSM (paragraphs 55 and 56). This further illustrates the attitude of the PiC towards safety, including a belief that the VHRL team would not report the incident. Had the train driver not reported the near miss, it is likely that the incident would never have been investigated.

Challenging the safe system of work

80 **None of the members of the group effectively challenged the system of work.**

81 There was no effective challenge by the members of the VHRL team to the way in which safety was being managed. Following the incident, individuals stated to the RAIB that they realised that the system under which they had been working had been non-compliant and unsafe. Some of those who were more experienced had realised this before the incident and had been providing missing safety information to others (paragraph 39). The less experienced members told the RAIB that they trusted the others, thinking that they would not be on track if they felt it was unsafe. They also told the RAIB that initially they had an expectation that the PiC, being a Network Rail employee, would keep them safe.

82 One of the VHRL team who was familiar with working with TOWS, told the RAIB that he asked the PiC to give a full and clear safety briefing on the second site of work, as some in the team were unfamiliar with TOWS and were unloading tools from the van when the PiC said that they were using TOWS. He stated that the PiC 'just shrugged and walked off'.

83 The aim of a COSS safety briefing, whether the COSS is acting as a PiC or not, is to ensure that the group being supervised understand the safe system of work. The COSS training states that part of the briefing should include asking open questions to the group members to check their understanding. This presents an opportunity for them to seek clarification should they not fully understand the system of work before signing the briefing form.

84 The PiC confirmed to the RAIB that he did not give a safety briefing at the incident site of work. Furthermore, evidence indicates that the attitude of the PiC did not make the group feel like they could approach him. The PiC told the RAIB that he thought that the group did not challenge him because of their fear of losing work.

85 One of the VHRL team reported to the RAIB that while he was wearing ear defenders and tamping the ballast, he was looking up every five seconds to watch for approaching trains. He was using the lowering of the level crossing barriers as a warning that a train was approaching. This is an indication of the low degree of confidence that he had in the PiC's system of work. He reported that when the crossing barriers lowered, he told the group there was a train approaching, but was ignored by the PiC. When asked by the RAIB why he didn't challenge the PiC further on the system of work, he stated that he felt peer pressure from the group to continue working.

86 The source of the strong desire to persevere with the work despite the safety reservations of some of the VHRL team came from a fear of losing work and income. They were all contingent staff with no permanent contracts and no guaranteed regular incomes. Several VHRL team members told the RAIB that they were concerned that if they questioned the PiC, they would be regarded as trouble makers and would not be able to continue to work.

87 The TSM has told the RAIB that when they met to set up the contract, he asked the VHRL team leader to phone him if there were any problems with working with the PiC. However, the VHRL team leader did not contact the TSM prior to the incident. Although witness accounts vary, the RAIB has concluded that, despite his considerable experience of working on the track, the VHRL team leader did not want to raise any problems because he too did not want to lose work.

88 Members of the VHRL team reported to the RAIB that the PiC's attitude and manner did not make the group feel like they could question him without any repercussions. One member of the group told the RAIB that he felt that if they did not do the work the way the PiC wanted it done, they would be 'off the job'. The PiC also regularly referred to how his own team would do tasks, implying to them that they as contractors could be replaced by his, or other contracted staff.

Identification of underlying factors

Training and management of the PiC

89 **Network Rail's training, recertification and management of the PiC had not instilled in him an adequate regard for safety and the importance of following safety rules.**

90 The PiC had been in a team leader position since October 2004. He had worked on the railway for 23 years and was passed as competent to undertake a range of track safety roles (paragraph 20).

91 The role of PiC is not a certificated competency, but the PiC does require to be passed as competent to undertake COSS duties. The difference between a PiC and a COSS, as stated in standard NR/L2/OHS/019, is that a PiC is not only responsible for risks from moving trains, but also for the risks associated with work tasks and the site.

92 It is the PiC's responsible manager who nominates a COSS to act in this role. Network Rail's level 3 guidance supporting standard NR/L2/OHS/019 states that 'The work should also be considered and whether the nominated Person in Charge has the necessary competence, experience and attitude to be an effective Person in Charge.' The responsible manager has to provide them with sufficient time, resources and equipment to complete the work safely.

93 The level 3 guidance states that the responsible manager should use a variety of means to assess whether a COSS can be nominated as a PiC. These include referring to observed performance during planned general safety inspections and the output from the Annual Capability Conversations[14] (ACC), which is part of Network Rail's assessment in the line (AiTL) process.

94 The PiC's ACC was conducted in February 2017, during which the TSM discussed his competences and development needs. The assessment consisted of reviewing the results from the PiC's computer-based knowledge tests, and confirming that COSS and other competencies had been practised to the required quality. The TSM reviewed comments made by a supervisor during a site surveillance visit in June 2016, during which the PiC was acting in the role of COSS. Apart from omitting to brief the group on the details of the nearest hospital and the signal box contact details, the surveillance assessment confirmed that a safe system of work had been arranged and maintained. No development needs were identified in the ACC. The TSM stated to the RAIB that when they were both on track together, the PiC's behaviours gave the TSM no cause for concern.

95 The TSM, who had only been in post since August 2016, based his decision to nominate the PiC for this work upon the ACC review, his technical competence and the fact that he was a team leader. The TSM said that he had no other means of assessing his suitability for the role.

96 The PiC had undertaken courses in team leader development to support his duties in that post. Additionally, he had passed the safe work leader 2 (SWL2) course in 2015 when Network Rail was introducing its Planning and Delivering Safe Work (PDSW) initiative to improve workforce safety. The SWL training contained some elements of developing and assessing non-technical skills (NTS).

97 NTS training was first introduced by the aviation industry in response to a number of accidents. RSSB's website[15] defines NTS as 'social, cognitive and personal skills that can enhance the way you or your staff carry out technical skills, tasks and procedures'. It states that by developing these skills, people in safety critical roles can learn how to deal with a range of different situations. NTS assessment has been used in the rail industry as part of the process for the selection of trainee train drivers[16], where the selection process considers an individual's behaviour and personality in influencing safe decision making.

[14] A one-to-one review of staff by their line manager to discuss their current competence and performance in their role in order to assess any future development needs.

[15] https://www.rssb.co.uk/improving-industry-performance/human-factors/non-technical-skills.

[16] 'Rail Industry Standard for Train Driver Selection'. RIS-3751-TOM, Issue Three: March 2015. RSSB.

98 In 2012 Network Rail planned to use its NTS initiative to improve safe decision behaviours of those passed to act as a COSS. All Network Rail staff passed to act as a COSS were due to have received the training by December 2014. Not attending this, or not passing the assessment, resulted in removal of the individual's certificate of competence, meaning the individual would no longer be able to act on site as a COSS. Network Rail had subsequently suspended COSS development training by December 2014 as it had introduced training for the SWL role as part of its PDSW initiative.

99 Some elements of the original COSS NTS training were incorporated within the SWL courses before the role of SWL was discontinued within route businesses in January 2016 (SWL's are currently only used within Network Rail Infrastructure Projects).

100 The current route to the COSS competence for new candidates is that an individual completes a pre-course COSS workbook to assist the line manager in determining whether the individual has the experience and non-technical skills before attending a COSS course. However, Network Rail does not currently provide specific NTS training to its staff, or their line managers who may be involved in the COSS assessment process. Furthermore, it does not use the full range of NTS evaluation originally proposed for the COSS role in 2012. This means that psychometric testing was not carried out as part of its selection and reassessment of its new, or existing staff for the COSS role.

Client/contractor relationships

101 **The nature of the client/contractor relationship stifled any effective challenge to the unsafe system of work.**

102 Network Rail has a procedure which enables employees to raise concerns about the safety of a system of work when on site. This procedure is known as Worksafe, and is specified in Network Rail standard NR/L2/OHS/00112, Issue 2, 5 December 2009.

103 Although this is a formal method of resolving issues relating to a safe system of work, members of the group can also simply seek clarification during a site safety brief, or informally ask the person in charge of safety for additional information or explanation once work has commenced. The reasons why these less formal methods were ineffective has been discussed in paragraphs 82 to 85.

104 The purpose of the formal Worksafe procedure is to give workers confidence that if they question the safety of a system of work and their concerns are not addressed, the work will be stopped and the system will be reviewed and changed if necessary. The procedure states that issues will be taken seriously with no 'recriminations'. If a safety issue is raised and cannot be resolved on site, it is escalated to a line manager for further investigation. Should no resolution be found the work will not proceed.

105 VHRL's Code of Conduct at the time it was signed by all of the track workers involved in the incident did not mention Network Rail's Worksafe procedure. VHRL introduced a reference to the Worksafe procedure into this Code of Conduct document in August 2017. However, VHRL and some of the track workers involved have told the RAIB that those involved had received briefings on it before the incident. VHRL also has its own confidential reporting system for its contractors to report health and safety issues.

106 It was clear from the reluctance of the VHRL team members to question the unsafe system of work (paragraph 86) that there was a strong perception among them that questioning the PiC about the safety of the system of work, or formally invoking the Worksafe procedure could lead to a loss of work and income. This indicates that neither informal discussion, nor formal invocation of the Worksafe procedure, can be relied upon as a safety barrier in cases where those responsible for the safety of zero-hours contractors do not follow safety rules, or set up unsafe systems of work.

Observations

TOWS instructions

107 Instructions for the safe use of TOWS as a warning system at the time of the incident were not clear about what to do when engaged in noisy work.

108 The PiC was not using TOWS correctly because he was not moving himself and requiring the group to move to a position of safety immediately the warning tone sounded.

109 The Rule Book, Handbook 7, 'General duties of a controller of site safety (COSS)' Issue 5, September 2015, states that TOWS should only be used as a method of warning of approaching trains if a member of the group is competent to use it. However, there is no specific competency requirement to use TOWS. Staff are reliant on local, undocumented knowledge when using it, which can vary from depot to depot. The practice that the PiC's local track team employed when undertaking noisy work with TOWS was to use a lookout as a listener and a site touch lookout (paragraph 71).

110 Network Rail has told the RAIB that since the incident it has identified that there is confusion as to whether the local track section's method of using TOWS is permissible. The safe system of work hierarchy within standard NR/L2/OHS/019 states that TOWS can be supplemented as necessary by other methods of warning, and COSS training material on TOWS mentions obeying a warning from either TOWS or the lookout. Although TOWS is not prohibited for use during noisy work, using it with a lookout as a listener is regarded by some in Network Rail as 'mixing' two safe systems and therefore not permissible.

111 Although not related to this incident, the RAIB has noted that there are no instructions on how to use TOWS when at the extremities of a TOWS section, where it may only give adequate warning of approaching trains from one direction and may require a lookout to watch for trains approaching from the other direction.

Previous occurrences of a similar character

112 The RAIB undertook a review of its previous investigations into track worker fatalities and serious near misses (ie incidents in which track workers narrowly avoided being struck by trains) from moving trains outside possessions, over the period January 2006 to December 2017 inclusive. The number of incidents each year in which the COSS's actions were a causal factor is shown in figure 9, subdivided into those arising from errors and those caused by rule breaking behaviour on the part of the COSS. The data indicates that rule breaking behaviour by the COSS was a factor in 14 of the 20 incidents.

113 Figure 9 shows the number of RAIB investigations into serious track worker incidents and accidents for every year since 2006. This suggests a persistent problem with track safety behaviours and leadership.

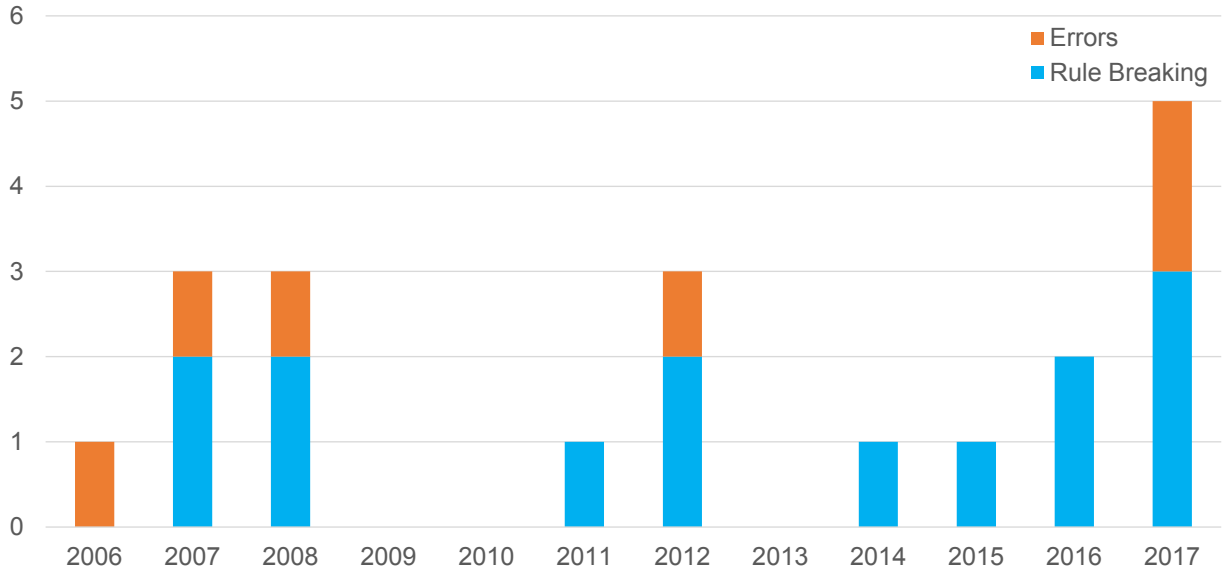

Figure 9: Stacked bar chart showing RAIB investigations into serious track worker incidents and accidents with moving trains, from 2006 to 2017 inclusive, where a causal factor was either an error, or rule breaking behaviour, by the COSS

114 In April 2017, RAIB published a report 'Class investigation into accidents and near misses involving trains and track workers outside possessions' (RAIB report 07/2017). Since then there have been five serious near miss incidents with track workers which the RAIB has investigated. In three of these five incidents, rule breaking behaviour by the COSS in charge of the safe system of work was a factor. These were:

- Great Chesterford, 21 April 2017, RAIB safety digest 12/2017;
- Dutton Viaduct, 18 September 2017, RAIB safety digest 18/2017; and
- Clapham Junction, 17 January 2018, RAIB safety digest 02/2018.

All three of these incidents could have resulted in multiple fatalities. In two of the three, the COSS was a Network Rail employee, and in the other, a contractor.

Summary of conclusions

Immediate cause

115 The group did not move to a position of safety when TOWS was sounding a warning that a train was approaching (paragraph 59).

Causal factors

116 The causal factors were:

a) the PiC set up a system of work that was neither safe nor compliant with the Rule Book (paragraph 61, **Recommendation 1**); and

b) none of the members of the group effectively challenged the system of work (paragraph 80, Recommendation 2 and paragraph 127, **Learning point 1**).

Underlying factors

117 The underlying factors were:

a) Network Rail's training, recertification and management of the PiC had not instilled in him an adequate regard for safety and the importance of following safety rules (paragraph 89, **Recommendation 1**); and

b) the nature of the client/contractor relationship stifled any effective challenge to the unsafe system of work (paragraph 101, **Recommendation 2**).

Observation

118 The instructions for the safe use of TOWS when engaged in noisy work are not clear (paragraph 107, **Recommendation 3**).

Previous RAIB recommendations relevant to this investigation

119 RAIB report 'Class investigation into accidents and near misses involving trains and track workers outside possessions' (RAIB report 07/2017) Recommendation 2 was aimed at improving the non-technical skills of track workers:

> *Network Rail should review the effectiveness of its existing arrangements for developing the leadership, people management and risk perception abilities of staff who lead work on the track, as well as the ability of other staff to effectively challenge unsafe decisions. This review should take account of any proposed revisions to the arrangements for the safety of people working on or near the line. A time-bound plan should be prepared for any improvements to the training in non-technical skills identified by the review.*

The RAIB has been informed by the ORR that Network Rail has not yet provided a formal response setting out how it intends to address this recommendation.

Actions reported as already taken or in progress relevant to this report

120 Immediately following the incident, Network Rail temporarily suspended the track safety competence certificate of some of the track workers involved while it conducted its investigation. The PiC was subsequently subject to Network Rail's disciplinary process.

121 Network Rail has reviewed its current Skills Assessment Scheme, which includes the AiTL and ACC elements, and considers that it may not be as robust an assessment for the role of COSS as that used by its contractor organisations. The contractor's COSS assessment process involves a classroom recertification course every two years and an interim independent practical assessment, typically around 12 months following the classroom course. Network Rail is considering moving to this system for its own staff qualified as COSS.

122 Network Rail has undertaken a risk based assessment of the role of COSS and is planning to undertake a learning needs analysis for the requirements to act in this role. This includes consideration of whether to have separate levels of COSS competency for the different systems within the safe system of work hierarchy. Network Rail has told the RAIB that this analysis exercise will also consider whether to use psychometric testing to identify any risk taking, or rule breaking behaviours, to make the COSS preselection process more robust.

123 Network Rail has told the RAIB that it plans to issue an update to its Track Warning System standard, NR/SP/OHS/501, Issue 1, August 2005, to include TOWS. It is considering whether to create a separate training module within the COSS, site warden and lookout competencies to clarify the correct use of TOWS.

124 As from 22 January 2018, Network Rail's London North Eastern and East Midlands route has prohibited the use of TOWS, and other fixed warning systems, as a method of warning when using noisy hand tamping equipment.

Actions reported that address factors which otherwise would have resulted in a RAIB recommendation

125 VHRL has told the RAIB that by 31 October 2017 it had re-briefed all of its contracted individuals on Network Rail's Worksafe policy, its Life Saving Rules, and challenging unsafe acts and close calls. There was also a reminder not to sign a SWP briefing form unless they had received and understood the safe working arrangement.

Recommendations and learning point

Recommendations

126 The following recommendations are made[17]:

1 *The intention of this recommendation is to both strengthen safety leadership behaviour on site and reduce the occurrences of potentially dangerous rule breaking by those responsible for setting up and maintaining safe systems of work (ie COSS, SWL, PIC) (paragraph 117a).*

Network Rail should review its processes for monitoring and managing the safety leadership of its staff in COSS, SWL or PIC roles, in order to identify improvements such that only those who exhibit satisfactory safety attitude, leadership and compliance with safety rules and procedures, undertake these roles. The review should include consideration of the following:

a) risk based analysis of the non-technical skills required for different work scenarios (ie under protection and warning systems of work);

b) evaluation of the effectiveness of non-technical skills training since its initial introduction;

c) assessment tools (eg COSS pre-course workbook, 360 degree feedback) to assist managers with monitoring the ongoing suitability of staff for safety leadership roles; and

d) using re-certification training and assessments, independent of line managers, to reinforce good safety leadership and the importance of compliance with the rules.

Network Rail should then implement the identified improvements to relevant working practices and procedures.

[17] Those identified in the recommendations have a general and ongoing obligation to comply with health and safety legislation, and need to take these recommendations into account in ensuring the safety of their employees and others.

Additionally, for the purposes of regulation 12(1) of the Railways (Accident Investigation and Reporting) Regulations 2005, these recommendations are addressed to The Office of Rail and Road (ORR) to enable it to carry out its duties under regulation 12(2) to:

(a) ensure that recommendations are duly considered and where appropriate acted upon; and

(b) report back to RAIB details of any implementation measures, or the reasons why no implementation measures are being taken.

Copies of both the regulations and the accompanying guidance notes (paragraphs 200 to 203) can be found on RAIB's website www.gov.uk/raib.

2 *The intention of this recommendation is to mitigate the potentially adverse effect that client-contractor relationships can have on the integrity of the Worksafe procedure when contract workers are not willing to challenge unsafe systems of work set up by Network Rail staff in safety leadership roles, due to the fear of losing future employment (paragraph 117a).*

Network Rail should assess the effectiveness of its existing processes when its staff act as COSS, SWL or PIC to a team of contractors on site, and consider what additional measures can be taken to enable effective challenge in the event that an unsafe system of work is set up. Options for consideration should include:

a) using only those who are experienced in managing contractors;

b) including an experienced COSS from the contractor team to review the system of work prior to commencing work;

c) using an additional Network Rail staff member as part of the work team to perform a challenge function; and

d) reinforcing the importance of inviting questions as part of the safety brief.

Network Rail should then implement the identified improvements to relevant working practices and procedures.

3 *The intent of this recommendation is to clarify the working instructions for track workers on the correct use the Train Operated Warning System (TOWS) when working with noisy tools and/or when at the end of a TOWS area, so that there is safe and consistent practice across the network (paragraph 118).*

Network Rail should:

a) supplement its working instructions for TOWS to include clear instructions for the protection arrangements that must be in place when working with noisy tools and/or when working at the ends of a track section fitted with TOWS;

b) brief out the enhanced instructions to its staff and contractors and include them in training material for all relevant track competencies; and

c) include checks in the certification and re-certification assessments of staff in safety leadership roles that they are familiar with how to use TOWS in all situations they are likely to encounter.

Learning point

127 The RAIB has identified the following key learning point[18]:

1 All railway staff, including contractors and those employed through agencies, should remember the importance of understanding their safety briefings, and challenging any system of work which they believe to be unsafe, including use of the Worksafe procedure (paragraph 116b).

[18] 'Learning points' are intended to disseminate safety learning that is not covered by a recommendation. They are included in a report when the RAIB wishes to reinforce the importance of compliance with existing safety arrangements (where the RAIB has not identified management issues that justify a recommendation) and the consequences of failing to do so. They also record good practice and actions already taken by industry bodies that may have a wider application.

Appendices

Appendix A - Investigation details

The RAIB used the following sources of evidence in this investigation:

- information provided by witnesses;
- closed circuit television (CCTV) recordings taken from trains travelling past the site both before and during the incident;
- information taken from the on-train data recorder (OTDR) of train 1D09;
- signalling records;
- site photographs and measurements;
- weather reports and observations at the site;
- responses to questions put to Network Rail, VHRL and VTEC, and
- a review of previous RAIB investigations that had relevance to this incident.

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