RAIB

Rail Accident Investigation Branch

Rail Accident Report

Trackworker fatality at Trafford Park
26 October 2005

Department for Transport

Report 16/2006
August 2006

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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This report is published by the Rail Accident Investigation Branch, Department for Transport.

Trackworker fatality at Trafford Park 26 October 2005

Contents

Introduction

1 The sole purpose of an investigation by the Rail Accident Investigation Branch (RAIB) is to prevent future accidents and incidents, and improve railway safety.

2 The RAIB does not establish blame or liability, or carry out prosecutions.

3 Network Rail, Carillion, Schweizer, Central Trains and Central Maintrain freely gave access to staff, data and records.

4 Appendices at the rear of the report contain Glossaries explaining the following:

- acronyms and abbreviations are explained in the Glossary at Appendix A; and
- certain technical terms (shown in *italics* when they first appear in the body of this report) are explained in the Glossary at Appendix B.

Summary

Key facts about the incident

5 A train travelling between Liverpool and Manchester struck and fatally injured a railway *trackworker* at Trafford Park West Junction, 2 miles to the west of Manchester, at 09:28 hrs on Wednesday 26 October 2005.

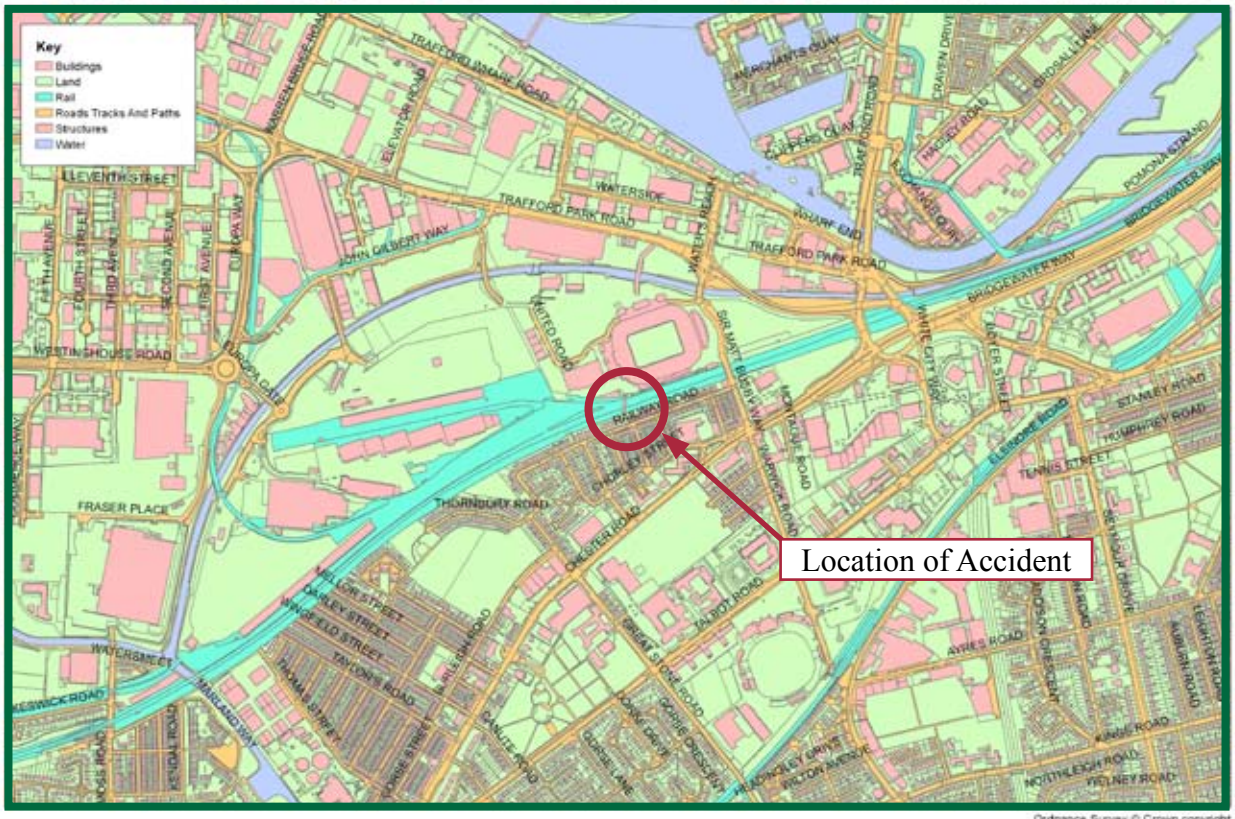

Figure 1: Extract from OS map showing location of the accident and surrounding area

6 The railway infrastructure is controlled by Network Rail. The line at this location is double track with a *double junction* into the freight terminal at Trafford Park.

7 The train involved was 1L13, the 08:52 hrs Liverpool Lime Street to Ely which consisted of a three-car class 170 *diesel multiple unit* (DMU). The train was operated by Central Trains and was being driven by a Driver employed by that company. The Driver had driven the train from Liverpool and was to take it forward as far as Nottingham.

8 The deceased was employed as the UK Operations Manager by Schweizer UK, who were operating as a subcontractor to Carillion. He was engaged in the installation of an *Automatic Track Warning System* (ATWS) at this location. At the time of the incident he was carrying out a visual inspection of the track layout with a Supervisor from Carillion, the main contractor, and a second Schweizer employee.

9 In addition to the death of the Schweizer Operations Manager, the Carillion Supervisor received a minor injury. The train was not damaged in any way and no one on the train was injured.

10 The emergency services attended the scene. The train was moved to Manchester Oxford Road Station at 09:44 hrs, where the passengers were detrained.

11 At 11:40 hrs, BTP confirmed to RAIB that the incident was not suspicious and the site handed to Network Rail at 11:52 hrs.

12 The line reopened to rail traffic at 13:00 hrs.

Immediate cause, contributory factors, underlying causes

13 The immediate cause of the accident was that the staff who were on the track did not respond to the approach of the train and move out of its path.

14 Causal factors were:

- the three persons involved were able to gain access and went onto the line in an unplanned and uncontrolled manner;
- there was not a defined, appropriate and adequate *Safe System of Work* (SSoW) for the inspection task being undertaken. Although the Schweizer Operations Manager had signed into the site in the capacity of a *Controller of Site Safety* (COSS), he had not identified himself to others as the COSS, or briefed them on the arrangements for the inspection task;
- although all three persons involved were certificated COSS and (Personal Track Safety) PTS, none of them challenged the inadequate safety arrangements in accordance with the training they had received.;
- all three staff were preoccupied with technical tasks, including the correlation of track features to schematic diagram, to the exclusion of other considerations.

15 Contributory factors were:

- a lack of understanding by the Schweizer Operations Manager of the sequence of the main track renewal works and the consequential effect upon the ATWS components and the system configuration;
- the ability of the Schweizer personnel to gain access to the Carillion site on that day without challenge regarding the content of their work activity;
- the ability of the Schweizer Operations Manager to sign in to the Carillion site in the capacity of a COSS without an appropriate safety plan;
- perception by the Schweizer Operations Manager of pressure to complete the installation of the ATWS system;
- the possibility that the Schweizer Operations Manager's request to complete the ATWS installation during the following weekend's possession was refused;
- a shortage of manpower to complete the ATWS installation works as originally planned during the previous weekend's *possession*.

16 Underlying cause:

- the current track safety skills accreditation system and operational safety rules, which allow staff to achieve and maintain levels of track safety responsibility, does not consider personal safety attitudes towards safety or the inherent safety culture of the organisations for which they work.

Key conclusions

17 A Safe System of Work had not been defined or implemented for the task being undertaken.

18 Safety protection could have been arranged in a number of ways for the inspection work being undertaken. Resources were present on site to facilitate these.

19 Inadequate planning and communications led to a situation where the Schweizer Operations Manager perceived he was under pressure to complete the works quickly.

20 The site staff did not comply with the Rule Book or company procedures in their response to the incident.

21 There was a long delay in attendance by Carillion's *'for cause' Drug & Alcohol* screening provider, although this did not affect the test results, which were negative.

22 The emergency services responded in an appropriate and professional manner.

Recommendations

23 Recommendations can be found at paragraph 209. They relate to the following areas:

- COSS training and competency assessment;
- the causes of rule violation;
- monitoring compliance with track safety requirements;
- site management and access control arrangements within Carillion railway site operations;
- the management and operational interfaces internal and external to the Carillion organisation.

The recommendations are addressed to the infrastructure controller (Network Rail), the main contractor (Carillion) and subcontractor (Schweizer).

The Incident

Summary of the incident

24 A train travelling between Liverpool and Manchester struck and fatally injured a railway trackworker at Trafford Park West Junction, 2 miles to the west of Manchester, at 09:28 hrs on Wednesday 26 October 2005.

The location

25 A railway map of the area is shown in Figure 2. Trafford Park West Junction (grid reference SJ807962) is on the line from Manchester to Liverpool, 2 miles west of Deansgate Station. Mileage is measured from Liverpool along the route known as the CLC (Cheshire Lines Committee) and the site mileage is 31 miles 1452 yards. The *Engineer's Line Reference* (ELR) is MAJ.

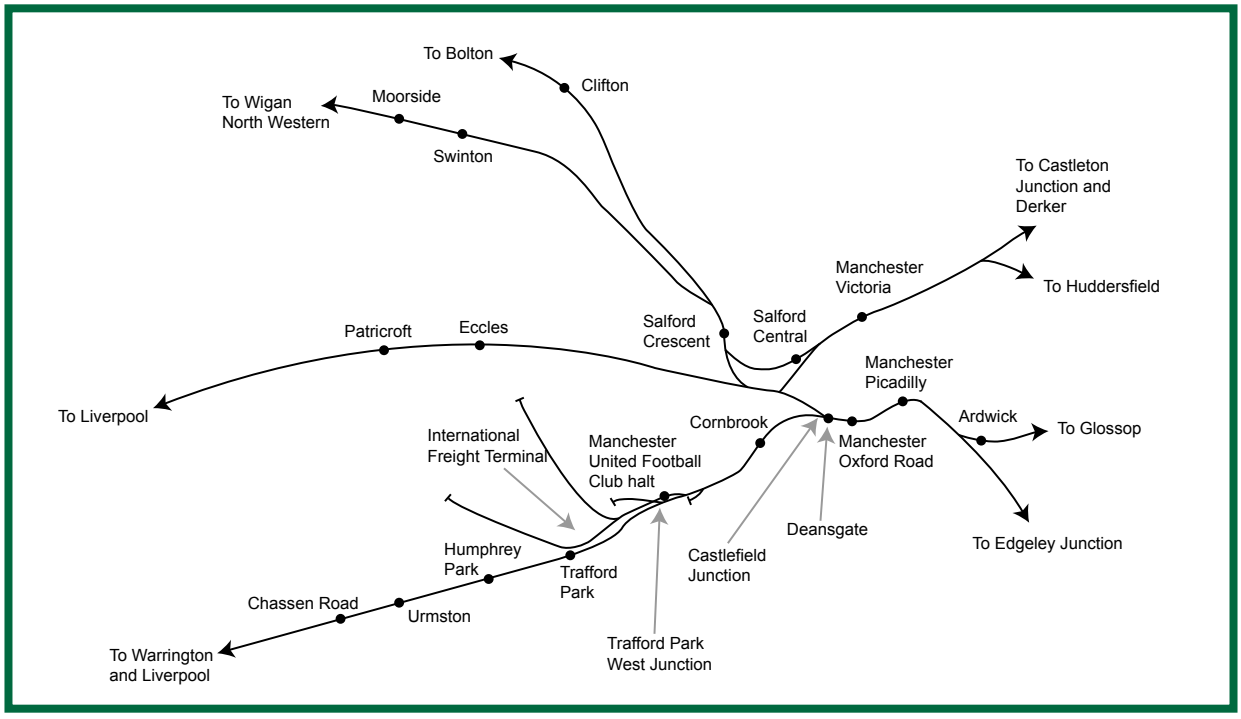

Figure 2: Railway map of the area

26 The track layout at the accident site is shown in Figure 3. There are two main running lines at Trafford Park West Junction – the Up Liverpool and the Down Liverpool. The Up direction is towards Manchester.

27 To the west and north of the main lines is the Trafford Park freight terminal complex. This is accessed via a double junction, which allows access to and from the Manchester direction.

28 To the east of the junction on the north side, is a single platform, the Manchester United Football Club Halt. This is accessed by a loop line from the Up Liverpool line which can also be used to provide an access to and from the freight complex.

29 The main lines from Manchester, as far as and into the freight terminal, including the loop line, are electrified on the 25 kV overhead line system.

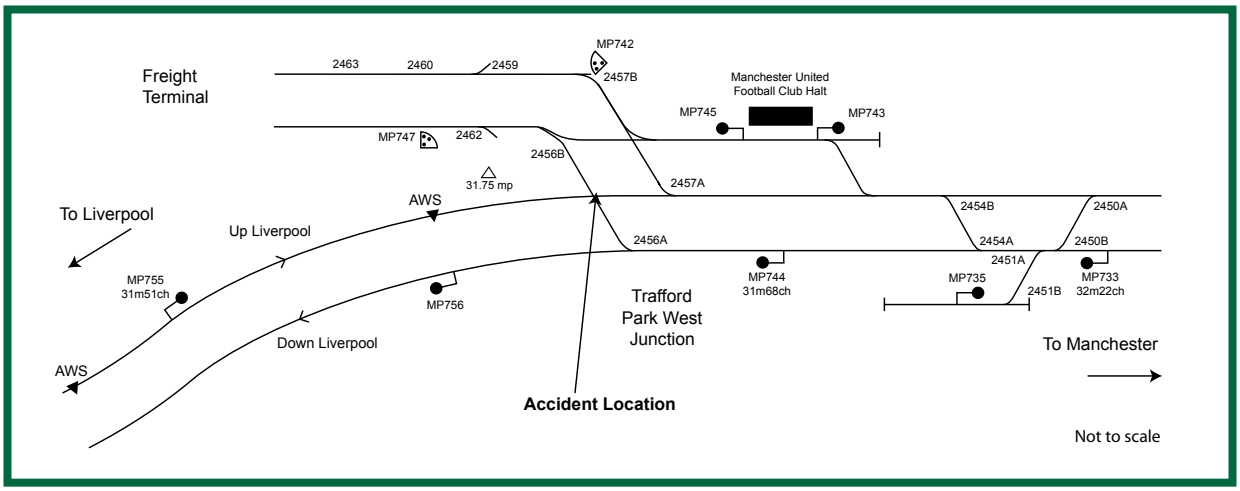

Figure 3: Track layout at the accident site

30 The line speed on both the Up and Down main lines is 85 mph (135 km/h) for diesel powered trains and 40 mph (64 km/h) for electric trains. All trains passing across the junction into and out of the freight complex are restricted to 15 mph (24 km/h).

31 The signalling is *track circuit block* with *four aspect colour-light signalling*. This is controlled from a *signalling panel* at Manchester Piccadilly signal box. The signallers are employees of Network Rail.

32 The lines at Trafford Park West Junction are in a shallow cutting. This cutting continues eastwards towards Castlefields Junction. The alignment is straight, with good visibility for approximately three quarters of a mile. To the west, the railway has a reverse curve initially turning southwards. To the south of the line there is a cutting slope and houses. To the north, the railway is bounded by the freight terminal and Manchester United football stadium. Between the railway and freight terminal is a metal palisade fence. A pedestrian bridge for football spectators spans across all of the railway lines at the site.

Figure 4: Approach to Trafford Park West Juction from the east

Figure 5: The accident site from the east

Figure 6: Approach to Trafford Park West Junction from the west

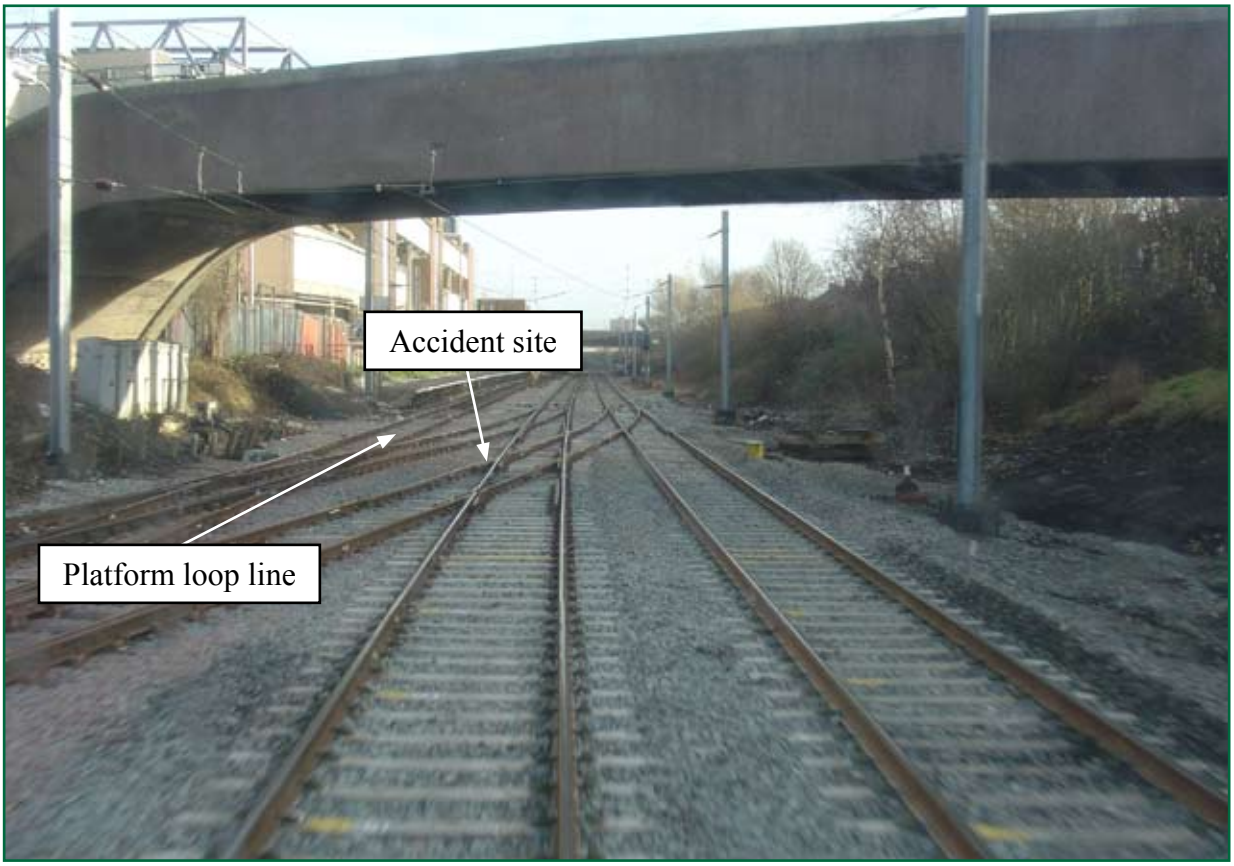

Figure 7: The accident site from west

Figure 8: Trafford Park West Junction

The Parties Involved

33 The persons involved in this incident were an operations manager and an ATWS installer from Schweizer UK, and a track renewals Supervisor from Carillion.

Background

Rules & regulations

34 The overarching requirements for railway operational and safety requirements are laid down in the Rule Book. This is Railway Group Standard GE/RT8000. This was reissued in modular format in December 2003 and there have been several amendments since then, the latest prior to this incident being in June 2005.

35 The following sections of the Rule Book identify the arrangements and conditions to be complied with when accessing or working '*on or near the line*':

- G2 'personal safety when walking on or near the line, or when on the lineside' (Issue 1 - June 2003);
- T6 'walking as a group and working on or near the line' (Issue 1 - June 2003);
- T7 'Safe systems of work when walking or working on or near the line' (Issue 2 - April 2005).

36 Network Rail is the infrastructure owner and controller. The arrangements for the effective planning of on-track activities is given in company standard NR/SP/OHS/019, 'Safety Of People Working On or Near the Line', (Issue 5 - August 2005).

The Works at Trafford Park

37 In 2004, Carillion were engaged by Network Rail as partners in an Integrated Management Team (IMT) to carry out infrastructure project and renewal works in the North West Region. The renewal of Trafford Park West Junction was one of the items scheduled within the IMT workscope.

38 Renewal works of the type required at Trafford Park West Junction can only be carried out during periods when no trains operate. These engineering works then take possession of the railway lines.

39 Train service timetables are agreed between Network Rail and train operators up to two years in advance of their commencement. Any *Outside Rules of the Route* (ORoR) possessions needed for renewal works need to be requested in advance of the timetable agreement. The possessions required for the junction renewal at Trafford Park had to be scheduled before the partnering contract was concluded in 2004. Network Rail had therefore previously arranged for a series of five 54-hour long possessions to be available over consecutive weekends commencing 22/23 October 2005.

40 The IMT arranged to resource these track renewal works using Supervisory resources and labour from another division of Carillion, Carillion S&C, who had experience of relaying switch & crossing assemblies from their involvement in Network Rail West Coast improvement works.

41 Carillion also have an in-house labour resource subsidiary, Sky Blue. Sky Blue provide most of the labour and some other staff resources for works carried out by other divisions of Carillion.

42 The track renewals were programmed for completion within the five booked weekend possessions and a method statement for the works was developed and agreed by Network Rail in August 2005. This method statement did not include ATWS use or installation.

43 The key steps of the programme were:

- the first weekend to be used for carrying out preparatory works, including drainage and placement on site of rail and other track materials;
- the second and third weekends to be used for taking away elements of the existing junction trackwork and replacing them with temporary *plain-line*;
- the fourth and fifth weekend to be used for the remediation of formation, placement of ballast and installation of new junction trackwork.

44 The specification for the junction renewal works required the railway lines to be normally operable for the weekdays between weekend possessions. It also required the renewals team to maintain the tracks in a good condition and avoid delays to trains from the imposition of *Temporary Speed Restrictions* (TSR).

45 During these works, access to and from the freight complex would be available via the platform loop line.

46 To ensure the safety and integrity of the railway at Trafford Park during these weekday periods, regular track inspections were scheduled and there would have been foreseeable minor remedial activities. These had to take place when normal train services were running. In order to provide a SSoW for these tasks, Carillion S&C decided to install a temporary ATWS on the site.

47 Carillion's experience in the use of ATWS resided in Carillion Ancillary Projects (CAP), a division of Carillion specialising in small project works. CAP had used the system on a number of occasions within its own worksites. CAP had utilised two subcontract suppliers of ATWS and Carillion had also had several of its own employees trained to operate installed systems. As a matter of company policy one or more of these Carillion ATWS Operators would be present during system installation.

48 CAP had developed a generic method statement for the installation, commissioning and operation of ATWS. This included reference to a Carillion staff member acting as COSS.

49 Schweizer UK is the British operation of Schweizer, a Swiss company specialising in the development, manufacture and operation of railway warning systems. Schweizer UK is one of the two subcontract suppliers of ATWS systems to CAP. The commercial arrangement used previously between Schweizer and CAP was based upon an agreed schedule of rates for equipment and resources.

50 To reduce the external cost outlay, CAP arranged for the provision of a mutually agreed level of Carillion labour to supplement the specialist expertise of Schweizer, during ATWS installation works.

51 Site safety and protection arrangements during ATWS installation works were made by CAP, who developed and provided the site-specific work plans. These plans stated that Carillion were responsible for the provision and management of site safety staff during ATWS installation.

The external circumstances

52 The weather on the morning of 26 October 2005 was overcast but dry. Visibility was good and not restricted by the weather.

Trains

53 The train involved in the collision was 1L13, the 08:52 hrs Liverpool Lime Street to Ely, and consisted of a three-car DMU of class 170/1 manufactured by Adtranz between 1998 and 2001, and operated by Central Trains.

54 The total weight of the train excluding passengers is approximately 132 tonnes.

55 Immediately prior to the incident a second train had passed the location travelling in the opposite, down, direction. This was train 1M10, the 07:37 hrs York to Liverpool Lime Street. This was formed of a three-car DMU of class 158 operated by TransPennine Express.

Events preceding the incident

56 In mid/late September 2005 Carillion S&C made a request of CAP, as Carillion's in-house experts, to develop an ATWS scheme to protect the site works at Trafford Park, together with costs for installation and operation. Information regarding the staging of the renewals works and the effect on the track layout was included with the request.

57 CAP approached Schweizer UK in early October 2005 to carry out the survey, develop the ATWS scheme plan and produce costings. Information in respect of the renewal work stages was not supplied to Schweizer.

58 On 12 October 2005, the Schweizer Operations Manager conducted the ATWS site survey at Trafford Park. This was not a prearranged or agreed attendance and it is believed that the SSoW was created by means of *lookout* protection, utilising Carillion staff who were already working at the site.

59 On 13 October, the Schweizer Operations Manager contacted CAP for technical information regarding the signalling system in the Trafford Park area in its normal mode of operation for timetabled rail traffic. This request was relayed to Carillion S&C, who obtained the requested information and responded directly to the Schweizer Operations Manager on 17 October.

60 The Schweizer Operations Manager then developed a scheme plan for the track layout and site of work at Trafford Park, with assistance from another Schweizer ATWS Installer. This was sent to Schweizer in Switzerland for independent validation, in accordance with their normal practice and Carillion requirements.

61 All of the previous ATWS systems provided by Schweizer to Carillion had been for CAP projects. CAP managed the commercial aspects of these schemes using the pre-agreed schedule of rates.

62 Trafford Park was being facilitated by CAP. However, the end user was Carillion S&C and their client required a total price for the ATWS scheme. Schweizer were not initially made aware of this requirement and consequently did not act to produce a total price figure.

63 After a few days the Schweizer commercial manager was made aware of the requirement for a total price. Using a copy of the ATWS scheme plan he was able to develop a resource schedule and, by applying the pre-agreed rates, produce a total price figure.

64 The final price figure was delivered to CAP on 19 October 2005.

65 The validated ATWS scheme system plan, together with location specific information and a site system test record and logbook, form a unique safety pack for the ATWS system installed for each site. This is kept on site in the ATWS system control unit cubicle for the duration of the installation.

66 It had been agreed between IMT, Carillion S&C, CAP and Schweizer UK that, subject to receiving authority from IMT/Network Rail, the ATWS installation would take place in the first of the scheduled possessions on 22/23 October 2005. No changes were to be made to the running line configuration during this weekend, the first of the 54-hour possessions, and therefore the ATWS system did not need to be complete and operational until after the first of the track renewal activity possessions, ie after 30 October.

67 Carillion S&C received the price for the ATWS system at Trafford Park from CAP on Thursday 20 October. Following discussion between IMT and Network Rail, a verbal instruction to proceed was given to CAP, and thereby to Schweizer UK, on 21 October.

68 IMT recognised that the late authority to proceed had potential implications for site safety and ATWS installation performance. They initiated a review of the method statement and work status to be carried out by Carillion safety professionals, to be assured that any additional risks were appropriately controlled. The review concluded that the inclusion of the ATWS work at this stage presented little additional safety risk. The planned work for the possession was the delivery of new rail using a *Long Welded Rail Train* (LWRT). This would take place during the night and although LWRT may be present on site at the start of the ATWS installation works, the two activities could be safely segregated.

69 A late instruction to proceed had been anticipated by CAP and Schweizer, and the necessary plans for the resourcing of the installation work had been developed.

70 On Thursday 20 October, in accordance with Network Rail procedure NR/PR/MTC/PL0056, the nominated *Person in Charge of Possession* (PICOP) for the weekend of 22/23 October chaired a PICOP briefing meeting with *Engineering Supervisor*s (ESs) for each of the worksites planned within that possession. The Carillion S&C Supervisor, who was nominated to be ES at the start of the possession on that weekend attended on behalf of the Trafford Park West Junction site.

71 The Supervisor was aware that the main activity within the worksite, the placement of new rail using a Long Welded Rail Train, might initially restrict physical access to the tracks within the site for the ATWS installation work on Sunday morning. At the PICOP briefing meeting he therefore requested a revision to the possession limits at Trafford Park to include the platform loop at the football stadium platform. This request was declined on the grounds of lateness, in accordance with Network Rail policy.

72 The detailed arrangements for the weekend ATWS installation work were finalised between the CAP ATWS Co-ordinator, CAP Project Manager and the Schweizer Operations Manager on Friday 21 October. A site-specific work plan was developed by CAP and six staff requested from Carillion, comprising two of the trained ATWS Operators plus four labourers from Sky Blue. The site-specific work plan was developed by the CAP *Rimini* Planner and was to be delivered to site by one of the Carillion ATWS Operators. Three staff from Schweizer were rostered for this work, although one was to leave early to obtain adequate rest for a Sunday night shift. The rostered shift was from 05:00 hrs to 17:00 hrs on Sunday 23 October.

73 On Sunday 23 October the installation staff arrived at Trafford Park at 05:00 hrs.

74 The Schweizer Operations Manager was the first to arrive and signed into the Carillion *Site Access Control* (SAC) as the COSS for the installation team.

75 The two other Schweizer Installers and the two Carillion ATWS Operators arrived a little later. No Sky Blue operatives arrived at site.

76 The presence of the LWRT precluded immediate access to the main lines preventing the use of a manual rail trolley for transporting equipment through the site. At 07:00 hrs the LWRT departed and a trolley was able to be used. Until that time the team carried material by hand.

77 The Schweizer equipment-carrying road vehicle had sustained a punctured tyre. This precluded relocation of the vehicle and resulted in an additional 200 metres of hand carriage being required for the ATWS equipment.

78 At approximately 07:30 hrs in the morning, a telephone conversation between one of the Carillion ATWS Operators on site and the CAP ATWS Co-ordinator revealed that Sky Blue had been unable to allocate any staff to Trafford Park, in response to the request made on Friday 21 October. The CAP Project Manager had been made aware of this resource shortage and, during discussion with a member of Carillion S&C staff, had been advised that there would be S&C labour available on site on Sunday 23 October who could assist. No one from S&C was able to corroborate this. None of this information was relayed to the Schweizer Operations Manager, the Schweizer Installers or the two Carillion ATWS Operators.

79 There was no Carillion S&C labour working on site on Sunday 23 October.

80 As a result of this new information, the planned work was reassessed by the Schweizer Operations Manager and the work divided between the five men on site. The initial priority was to mark-out the site and fix the 26 train-detection *treadles*. In addition cables were to be run to the extremities of the site.

81 The third Schweizer employee left the site shortly after midday, as planned (paragraph 72).

82 During the course of the afternoon, the ES declared that he required work to finish before 16:00 hrs to allow a safety inspection of the tracks in preparation for the hand back of the worksite to the PICOP before 17:00 hrs. This was not expected by the ATWS installation team and shortened the effective working shift by at least 1 hour. The ES reminded the team of the availability of the possession during the following weekend.

83 The installation team left site after 16:00 hrs.

84 The outstanding ATWS work involved installing a number of warning devices in the vicinity of the junction, placing and connecting link cables and the testing and commissioning of the system.

85 During the evening of 23 October the Schweizer Operations Manager reported to the CAP Project Manager that works were 80 per cent complete. The CAP Project Manager was not surprised or concerned at this position. He considered that there was ample opportunity to complete the installation work during the following weekend possession.

86 On Monday 24 October the Schweizer Operations Manager visited another ATWS system location. On Tuesday 25 October he worked from home.

87 During the course of both days there was telephone contact between the Schweizer Operations Manager, members of the Schweizer team and two of the CAP staff regarding system status at the current ATWS operational locations.

88 During Monday 24 October the Schweizer Operations Manager became aware, from comments made by the CAP ATWS Co-ordinator, of possible physical risks to the ATWS components because of the following weekends track renewal works.

89 He also deduced from this information that the track layout would be different following this work and that the revised track layout would have implications for train routing and hence the detection and control logic of the ATWS scheme. The initial ATWS scheme design might no longer be appropriate and it might be necessary to amend the ATWS scheme plan or the control logic to ensure the integrity of the system.

90 A discussion ensued regarding the possible need to remove some ATWS treadles and cables before the start of works and reinstate them before the ATWS system became operational on Monday 31 October. No conclusion was reached, and neither was an understanding reached regarding the mechanism for completing the outstanding ATWS installation work.

91 Late in the afternoon of Tuesday 25 October the Schweizer Operations Manager provided the customary status report to the CAP Project Manager, regarding the status of all ATWS sites.

92 At approximately the same time there was also a discussion between the Schweizer Operations Manager and the CAP ATWS Co-ordinator regarding the options for completing the ATWS system installation at Trafford Park. No clear conclusion was reached. There is no evidence to indicate that the Schweizer Operations Manager stated any intention to attend Trafford Park on the following day. Neither is there evidence that he made a request for Rimini documentation.

93 During the evening of Tuesday 25 October the Schweizer Operations Manager made arrangements with two Schweizer Installers to meet at the Trafford Park site at 09:00 hrs the following morning. Their understanding was that this attendance was to complete the outstanding installation work and that site safety staff would be available from Carillion.

94 On Wednesday 26 October the first Installer of the Schweizer three-man team arrived and signed in at the site access control at 08:30 hrs. The Schweizer Operations Manager arrived at 08:50 hrs. He signed into site, but also signed in as COSS, and as a consequence, in accordance with the Carillion Site Access Controllers understanding of Carillion procedures, he was given a Carillion S&C site Rimini safety pack for that day. The Schweizer Operations Manager put on a COSS armlet.

95 The two Schweizer staff walked back to the vehicle park, where the Schweizer Operations Manager described his work objectives for the day. There was no explanation or discussion regarding a Safe System of Work or any protection method to be employed. This would occur later in the presence of the third Schweizer team member. The Schweizer Installer present signed the briefing section of the Rimini document.

96 The third Schweizer team member was delayed in traffic. The two Schweizer men present walked towards the running lines with the intention of depositing the ATWS safety pack in the ATWS control cubicle. The Schweizer Operations Manager had stated that he intended to seek clarification regarding the effect of forthcoming weekend renewals work on the ATWS treadles. There was no intention to begin installation work.

97 Whilst crossing a road vehicle parking area, en-route to the ATWS control cubicle, they met the Carillion Supervisor. This Supervisor was known to the Schweizer Operations Manager, having been the ES at the start of the Sunday 23 October shift. The Carillion Supervisor did not challenge their presence or question their intentions.

98 The Schweizer Operations Manager asked him about the forthcoming weekend planned renewals work and the immediate risk to ATWS treadles from this work. His aim was to ascertain whether there would there be a requirement to disconnect and remove treadles for this activity. The Schweizer Operations Manager also asked for clarification regarding the amended track layout as a result of this renewal work and how this changed track layout would affect operational train movements. The Carillion Supervisor explained to the Schweizer Operations Manager the programme of works for the weekend possessions and the effect this would have on the track layout. The Schweizer Operations Manager had difficulty in understanding the explanation.

99 Access from the vehicle parking area was directly on to the trackside. The three men crossed over the freight terminal access lines and the Schweizer Operations Manager deposited a folder of ATWS technical documentation in the control cubicle. From there the three men moved towards and stood close to the double junction. There had been no discussion regarding any SSoW or safety protection. The Schweizer Installer noted that cables in the Down *cess* were lying in water and began to cross over to inspect them.

100 The Schweizer Installer had crossed all of the running lines to reach the Down Cess. En-route he had received a mobile telephone call, which he answered upon his arrival in the Down cess. He left the Schweizer Operations Manager and the Carillion Supervisor in the centre of the double junction discussing ATWS treadle locations and work programmes. A train approached on the down line. He recalls no warning, although the person at the other end of the telephone call did hear a train horn sound. He remained clear of the lines and the train passed. This was train 1M10, the TransPennine Express service. As the rear of the train cleared his location he noticed the rear of another train passing on the Up Line. He had not previously been aware of this train. This was train 1L13, the Central Trains service. When the rear of this train cleared he noticed the Schweizer Operations Manager and Carillion Supervisor lying on the ground.

101 Train 1L13 was proceeding from Liverpool to Manchester. It had departed Liverpool on time and was running 3 minutes early.

102 Train 1M10 had departed Manchester Oxford Road station at approximately 09:26 hrs en-route to Liverpool. After passing through the 30 mph (48 km/h) *Permanent Speed Restriction* (PSR) at Castlefield Junction, the Driver accelerated towards Trafford Park.

Events during the incident

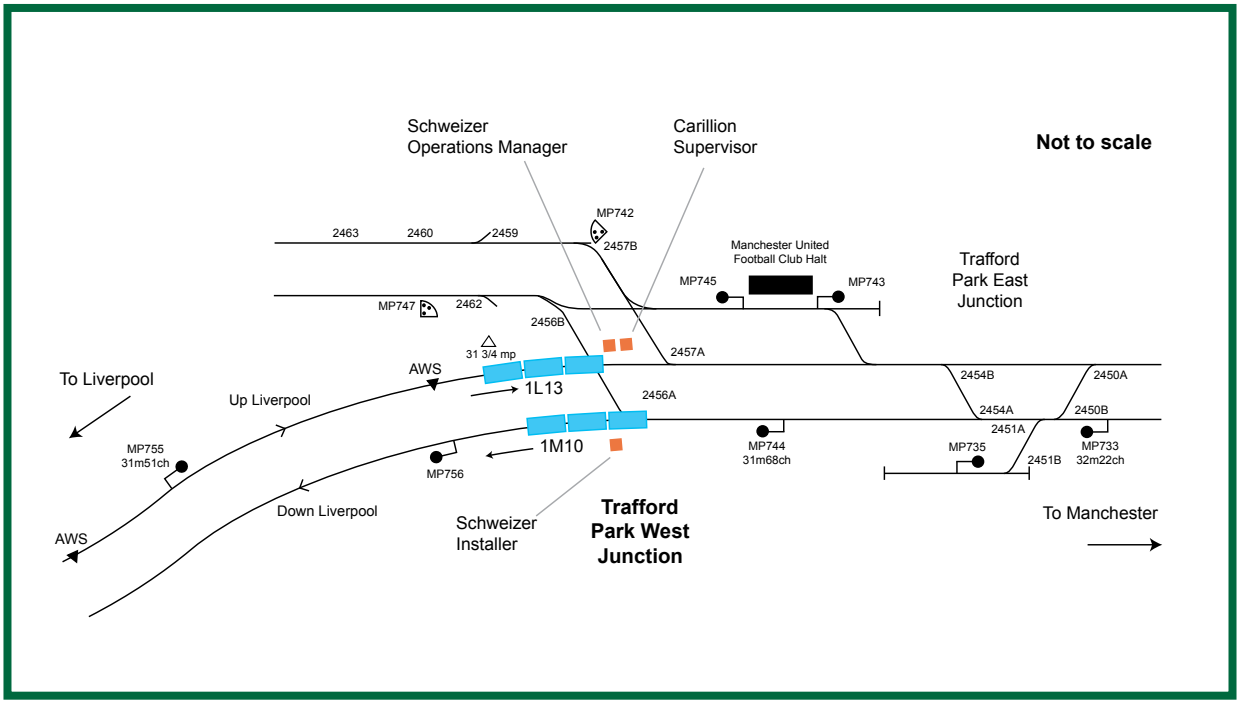

Figure 9: The location of people and trains during the incident

103 As train 1M10 travelled along the straight section of line towards Trafford Park East Junction, the Driver observed men in the four foot of his line ahead, in the vicinity of Trafford Park West Junction. One of the men moved into the Down cess. At a distance estimated by the Driver to be 300 metres to 400 metres from the group, the Driver sounded the warning horn. There was no acknowledgement from any of the three men. The two men standing in the *four-foot* moved from the Down line, across the Up line and stood in the space between the Up line and the platform loop, as shown in Figure 9. They were however still close to the cess rail of the Up line.

104 As train 1M10 reached Trafford Park West Junction it's speed was approximately 65 mph (104 km/h). The Driver noted that the two men on the up side were facing each other, in conversation, side-on to the line, and the larger man was holding a clipboard, drawing or similar item.

105 The Driver of train 1M10 noted that the third man remained in the Down cess.

106 As train 1M10 passed the two men on the track the Driver remarked, to his colleague in the cab, that the two men were standing close to the line in a potentially dangerous position.

107 At that point the Driver observed an oncoming Central Trains DMU; train 1L13. Having concern for the men's safety, the Driver of train 1M10 sounded the high tone of the warning horn with a long blast.

108 The Driver of train 1L13 had received a bell for the *Automatic Warning System* (AWS) at MP755 signal. Shortly afterwards the Drivers *vigilance device* activated. This failed to reset at the first attempt. The Driver glanced down and a second attempt was successful, but simultaneously with the resetting of the vigilance device, the AWS horn sounded as a precursor to the advance PSR *warning board* for Castlefield Junction. The Driver acted to reset this.

109 At this point train 1L13 was travelling at a speed of 82 mph (135 km/h), as determined from the *On Train Monitoring Recorder* (OTMR) data.

110 As the Driver completed these tasks and looked forward, he immediately saw the two men ahead close to his left hand side. He sounded the horn briefly and immediately applied the brake. He noted that the man with his back to the train was a large man and that there was a smaller man who was initially obscured by him. The Driver had not observed any lookout(s).

111 Train 1L13 struck the larger man with a glancing blow. The larger man bowled the smaller man over and both ended up a distance from the Up Line close to the nearest rail of the Platform loop line.

112 The brake application brought train 1L13 to a stand within 650 metres: the train stopping close to MP732 signal.

Fatalities, injuries and material damage

113 The Schweizer Operations Manager was pronounced dead at the scene by emergency paramedic services. The Carillion Supervisor was bruised and shocked, but otherwise uninjured.

114 No one on the train was injured.

115 There was no identifiable damage to the train.

Events following the incident

116 At 09:29 hrs the Driver of train 1L13 made an emergency call to Manchester signal box on his train cab NRN telephone. The Signaller made arrangements to block all lines to rail traffic.

117 The Carillion Supervisor used his mobile telephone to call the emergency services at 09:31 hrs.

118 Arrangements were made to move train 1L13 to Platform 5 at Oxford Road station, without appropriate reference to RAIB, arriving there at 09:44 hrs. Here, passengers were detrained and the train was stabled and secured for subsequent examination and recovery of OTMR data.

119 At 09:46 hrs a member of the Carillion staff made a call from signal MP745 to advise the Signaller at Manchester Piccadilly and request all traffic to be stopped.

120 At approximately 10:00 hrs Carillion staff left site, travelling by road transport, to place protection for both running lines.

121 Between 10:00 hrs and 10:10 hrs Carillion initiated routine *'for cause' Drug and Alcohol* (D&A) screening process in respect of the staff involved.

122 Carillion instructed all staff not directly involved in the incident to leave site.

123 The Driver of train 1L13 travelled to Nottingham by taxi, arriving at 12:45 hrs. He filed an incident report and, without reference to the RAIB, was interviewed by the Driver manager. The Driver was then routinely 'for cause' D&A tested.

124 The 'for cause' D&A testing of the Schweizer Installer and the Carillion Supervisor was completed at approximately 15:15 hrs.

The Investigation

Sources of evidence

125 Evidence was gathered from a variety of sources, including:

- an examination of the track layout and surrounding railway environment at Trafford Park West Junction;
- photographs taken by the *Accredited Agent* (AA);
- interviews with relevant persons;
- records of staff working hours;
- site access control records;
- telephony records;
- signalling voice recordings from Manchester Piccadilly signal box;
- competency records of staff involved;
- an examination of the train involved in the collision;
- data taken from the On Train Monitoring Recorder (OTMR);
- the results of the post-incident tests carried out on the train;
- data from the Trackwatch signalling data recording system;
- the signalling layout plans of the vicinity;
- cab rides over the route in trains of a similar type to those involved;
- method statements and operational procedures relating to the track renewal works at Trafford Park and the installation of ATWS systems;
- The results of the D & A testing and the postmortem.

Train performance and train handling

126 The train directly involved, 170108, was subjected to post-incident brake test and visual examination at Manchester Oxford Road station. The unit was subsequently taken to Central Maintrain's depot at Tyseley where it underwent full post-incident testing in accordance with Group Standard GM/RT2273 requirements (Vehicle Maintenance Procedure VMP 6.1.003 MPT 03 Parts 1 to 21). Central Maintrain report CTL/2005/003 documents the results of this testing.

127 Two parameters measured within the testing on vehicle 50108, the trailing vehicle, did not meet their respective specified values. One related to emergency braking brake cylinder pressure and one to deflated air suspension brake cylinder pressure.

128 No deficiencies were found in respect of the windscreen, windscreen wipers, lights or warning horn. The tests did not identify any defects with the vigilance device.

129 The train approached Trafford Park West Junction at a speed of 82 mph (131 km/h). This is below the linespeed of 85 mph (136 km/h).

130 Signal MP755 located at 31 miles 1125 yards displayed a green proceed aspect. The AWS magnet on the approach to the signal generated a correct AWS bell response in the driving cab of train 1L13.

131 The AWS magnet located at 31 miles 1294 yards correctly initiated an AWS horn in the cab of 170108, in connection with the warning board for the PSR at Castlefield Junction.

132 A test was conducted to determine the sighting distance available to the Driver of the approaching train 1L13. A person in high visibility clothing standing at the point of the collision could be seen from a position above the cess rail of the Up Line at a distance of 253 metres.

133 At this location and at a train speed of 82 mph (131 km/h), the Driver would have a maximum of 7 seconds visibility of the two men before reaching their location.

134 Calculations show that from the initiation of the AWS horn to time of impact was less than 3 seconds. The Driver of train 1L13 did not observe the two men in the track until the point at which the AWS was sounded. In this time the train travelled 100 metres. The reduced period of time reflects the Driver's two attempts to reset the vigilance device (paragraph 108).

Previous occurrences of a similar character

135 Trackworker fatalities have occurred and continue to occur in the railway industry. There has not been a year free of fatalities since 1997. In recent years the Railway Group Safety Plan has focused on workforce safety and objectives to reduce the number of fatalities to zero.

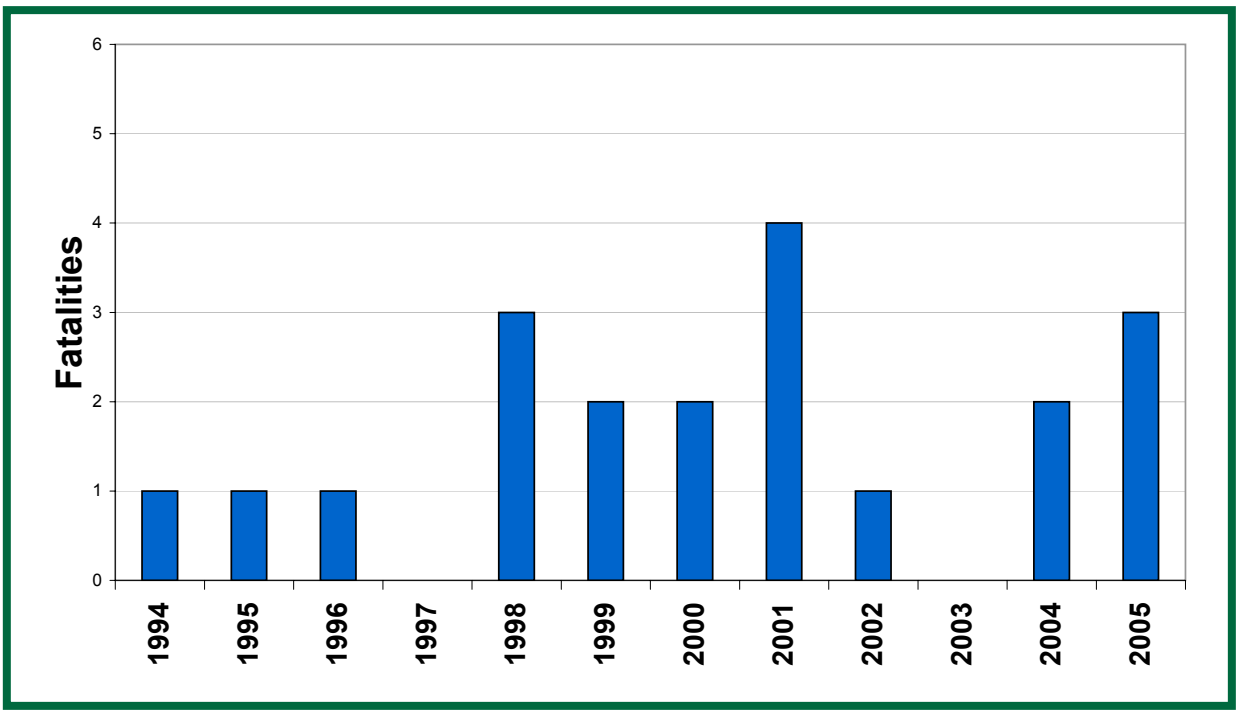

Figure 10: Trackworker fatalities (struck by trains)

136 Appendix D shows a table of all trackworker fatalities from 1994 to 2005. Figure 10 shows the numbers by year where these fatalities resulted from being struck by trains. In all of these instances, a major contributor to the cause of the accident was non-compliance with rules and instructions forming part of track safety certification by the individuals concerned.

137 RSSB continues to drive forward industry initiatives regarding workforce and trackworker safety. Track Safety Strategy Group is a cross industry advisory group, working with RSSB, concerned with the safety of personnel who work for all or part of their duties on the track (Appendix E - Reference 1).

138 RSSB have initiated research programmes into safety critical rule compliance and the management of safety culture in the UK rail industry. An output from the safety critical rule compliance programme was the development of a Toolkit to enable rail organisations to identify types of non-compliance found during incident investigations and give guidance on development of appropriate strategies for prevention (Appendix E - References 2 and 3).

139 Further information is available on RSSB's website, www.rssb.co.uk.

140 Other duty holders have instigated independent research programmes, recognising the significance of the issue (Appendix E - Reference 4).

Analysis

Identification of the immediate cause

141 The evidence available from the Drivers of the two trains, the additional Driver in the cab of train 1M10, and the two surviving members of the group on track confirms that at the time of impact, the two trackworkers, who were involved in the accident, were not aware of the approach of train 1L13, and therefore took no action to move towards a position of safety.

Identification of causal and contributory factors

142 The Rule Book sections G2, T6 and T7 explain clearly the arrangements to be made before going 'on or near the line'. For a group of staff consisting of 'two or more persons' a COSS must be appointed. This person takes responsibility for determining the relevant safety arrangements to be provided.

143 For Network Rail controlled infrastructure the assessment process is further defined in Company Standard NR/SP/OHS/019, 'Safety Of People Working On or Near the Line'. This is also known as Rimini.

144 PTS training requires staff, who go onto the railway, to ensure that they are briefed by the COSS on the operational circumstances prevailing and any arrangements made to provide a safe system of work for their protection.

145 All three staff involved in the incident held current valid PTS and COSS certification in compliance with the requirements of the Rule Book. Track safety medical requirements in accordance with Group Standard GE/RT8067 were in place and there were no track access limitations imposed upon any of the three.

146 On Sunday 23 October the Schweizer Operations Manager had signed into the possession at Trafford Park as COSS for the installation team. The Site Specific Work Plan 'WP/ATWS/001TRA/Rev 01' dated '21-10-2005' designates a Carillion ATWS Operator to be COSS for the installation work. This was not challenged by the Carillion ES or the person nominated to be COSS.

147 The Carillion site access control procedure links to the method statement and SSoW requirements by providing pre-assessed and proposed safety arrangements for each COSS. Each uniquely dated and pre-printed Rimini safety pack recognises the programmed activities for that date, taken from the method statement, and the determined safe system of work to provide the necessary safety controls. Each person signing into the site and declaring a COSS role is provided with a Rimini pack for that day.

148 The Carillion S&C Supervisor had knowledge of the site activity planned by Carillion for 26 October. These were clearly stated in the site Rimini pack for that day. He understood the type of activities to be undertaken by the Schweizer Operations Manager, having been involved with him on Sunday 23 October. He did not challenge the unexpected presence of the Schweizer Operations Manager, his purpose in being on-site, or check on the availability of relevant safety documentation. The activities proposed by the Schweizer Operations Manager for 26 October were not listed in the Carillion method statement for that day. However, there was no challenge by site access control in respect of their presence. **This is considered to be a contributory factor**.

149 The Schweizer Operations Manager had been permitted to sign into site access control as a COSS, and he also put on a COSS armlet. He was then provided with a site Rimini pack for that day. However, neither the activity taking place at the time of the incident, nor the remaining ATWS installation work, planned by him for the remainder of the day were covered in the Rimini pack. There was no check by site access control or site management regarding his planned activities and safety arrangements with the Method Statement and Rimini documentation. **This is considered to be a contributory factor.**

150 The Schweizer Operations Manager had given a verbal description of the day's planned installation activities to the Schweizer Installer. The Schweizer Operations Manager stated that a full safety briefing would be provided after the arrival of the third Schweizer employee. There was no reference to any safe system arrangements for protection or warning. Neither was this questioned. The Schweizer Installer signed the briefing confirmation section of the Rimini plan. There is no value in signing a briefing document with incomplete safety information and for stated activities which had no relevance to the day's plan.

151 Independent witness evidence identified previous occasions where the Schweizer Operations Manager had operated outside the prescribed procedures and rules. These issues had not been reported to Network Rail, the main contractor or Schweizer.

152 The Schweizer Operations Manager had been a certificated COSS since 1997, the Schweizer Installer since 2004 and the Carillion Supervisor since 1998. During this period they had all been refresher trained and assessed without any issues of performance being identified and recorded.

153 The incidents highlighted above indicate a history of rule infringements by the Schweizer Operations Manager and also a mindset by the others present in not challenging the SSoW deficiency. Previous research work has concluded that rule violation tends to be a habitual trait and not limited to isolated occurrences (see references - Appendix E).

154 Despite the ability of the three individuals to reach a satisfactory level of achievement during the training and assessments in the COSS skill, the evidence suggests that their natural behaviour was different and tended towards rule violation. **This is considered to be the underlying cause.**

155 The two surviving trackworkers confirm that at no time was the lack of an appointed COSS, defined safety arrangements or safety briefing discussed or challenged in any way. **This is considered to be a causal factor.**

156 On Monday 24 October the Schweizer Operations Manager became aware, during a conversation with the CAP ATWS Co-ordinator, that there might be a conflict between the renewals work planned for the weekend of 29/30 October and some of the ATWS track treadles which had been installed by Schweizer and Carillion staff during the possession on the 23 October. The Schweizer Operations Manager was clearly concerned as a result of this new information and wished to more fully appreciate the detailed activities, their extent and the likely implications.

157 If the track layout changes arising from the track renewal works, had been made available to the Schweizer Operations Manager initially, the ATWS planning process may have been carried out differently, with a series of scheme plans to recognise the stages of the track renewals programme.

158 The Schweizer Operations Manager had received no information from CAP, during the planning of the ATWS scheme, regarding the track renewal works programme. The Schweizer Operations Manager had limited personal experience of permanent way work and he realised that there was a need for him to understand the effect of the work stages on the logic of the ATWS system and any alteration or redesign that might result. **This is considered to be a contributory factor.**

159 In their efforts to reach a clear understanding of the issues the two men moved and stood within or close to the double junction layout. Their preoccupation with the discussion and technical assessment inhibited their consideration of an appropriate Safe System of Work. **This is considered to be a causal factor.**

160 The presence of the Schweizer team on site on the 26 October was driven by two key factors; the failure to complete the installation as originally envisaged during the previous weekend possession and the Schweizer Operations Manager's perception of pressure to complete the installation in advance of the following weekend possession.

161 Several factors had an effect on the work during the previous weekend, including the Schweizer vehicle problem and the LWRT/possession limitiations. However, the critical issue during the previous weekend work had been the shortage of Sky Blue resources. This had only become apparent to the installation team upon arrival at site and a rapid reappraisal of the shift programme had taken place to ensure that the most critical activities had been completed during the possession. Nevertheless, this had generated a residual workload which had not been anticipated and which was a factor in the team's presence at Trafford Park on the 26 October. **This is considered to be a contributory factor.**

162 Evidence regarding the reason for attempting the completion of ATWS installation work on a weekday is conflicting. The CAP Project Manager had identified the possession on the 29/30 October as an opportunity to complete the works and considered the failure to complete during the first weekend as not important.

163 This was the first ATWS scheme where CAP had been a facilitator for another Carillion end-user client. There may have been a drive to make a good impression to Carillion S&C and IMT by completing work before their first renewal work weekend. Witnesses confirmed that there had certainly been suggestions to Schweizer UK that a good performance was important. **This is considered to be a contributory factor.**

164 There is independent witness evidence that during a telephone conversation, late on the afternoon of Sunday 23 October and following the conclusion of work on that day, the Schweizer Operations Manager proposed to return to site during the following weekend possession to complete the ATWS installation. This proposal appears to have been rejected.

165 What is not known is whether the rejection was a result of known specific access limitations or resource issues or whether a second possession visit was construed as presenting an unacceptable image to the client, Carillion S&C and IMT, indicating a failure of the delivery process during the first weekend. It has not been possible to determine the other party to this conversation. **This is considered to be a contributory factor.**

166 What is certain is that early in the week commencing Monday 24 October the Schweizer Operations Manager decided that the completion of the installation work before the next weekend was an imperative.

Severity of consequences

167 The Driver of train 1L13 was distracted by the activation of the vigilance device and the AWS as the train approached the point where the two trackworkers would have first been visible. At the train speed of 82 mph (131 km/h), the maximum elapsed time between a first sighting and reaching the location of the men would have been 7 seconds. Due to the distraction this was reduced to less than 3 seconds. The train warning horn was initiated only 1.7 seconds before the impact.

168 Calculations show that the warning given by train 1M10 whilst passing in the down direction was initiated at precisely the same time as that from train 1L13 due to the sighting of the two men. It is therefore probable that the brief horn warning from train 1L13 was completely masked by the tone from train 1M10.

169 Neither survivor recalls hearing any warning horn at this time. It is considered that the delay in the warning and the masking of it by the warning from train 1M10 did not affect the response of the individuals and the severity of the incident.

170 The Driver on train 1L13 made an emergency brake application simultaneously with the impact. The first recorded speed reduction did not occur for a further 3 seconds.

The response of Carillion staff following the incident

171 The Carillion Supervisor initially telephoned a colleague on the site who advised him to call the emergency services via 999. He did this.

172 It was some 18 minutes after the incident occurred before a Carillion member of staff from the site called the Signaller to inform him of the incident and request that all line be blocked to traffic.

173 Thirty two minutes after the incident occurred Carillion despatched staff by road to place protection for the site.

174 It is not considered that these actions contributed to the severity or consequential effect of the incident. However, it is recognised that the timing, procedure and implementation of these actions was not in accordance with the requirements of the Rule Book or recognised practice.

Response of others

175 British Transport Police and paramedic services responded to the incident in a rapid and appropriate manner. The Schweizer Operations Manager was pronounced dead at the scene. No other medical services were required. It is believed that a different response would not have saved the Operations Manager.

176 Network Rail despatched a Rail Incident Officer (RIO) to site. He arrived at 10:05 hrs. From 10:41 hrs, this individual acted as AA for RAIB, being replaced as RIO by another member of Network Rail staff.

Other factors for consideration

177 Carillion initiated routine 'for cause' D&A testing as a consequence of the incident. The initial request was made between 10:00 hrs and 10:05 hrs. The supplier contracted by Carillion was not able to provide resources locally and a team was deployed from Nottingham. Carillion were not advised of this issue at the time and only became aware when confirming the estimated time of arrival on site. The testing team arrived at 14:35 hrs and testing was completed by 15:15 hrs. During this extended period the two surviving witnesses welfare was managed by Carillion and Network Rail. There was no suggestion of impairment or influence and the results were negative.

Conclusions

Immediate cause

178 The immediate cause of the accident was that the staff who were on the track did not respond to the approach of the train and move out of its path.

Causal and contributory factors

The causal factors were as follows:

179 The three persons involved were able to gain access and went onto the line in an unplanned and uncontrolled manner (Recommendation 1, 2, 3).

180 A COSS was not appointed. There was not a defined, appropriate and adequate Safe System of Work for the inspection task being undertaken (Recommendation 1, 2, 3, 5, 9).

181 None of the three staff involved, who were all COSS certificated, challenged the inadequate safety arrangements (Recommendation 1, 2, 3, 8, 9).

182 The three staff were preoccupied with the technical tasks to the exclusion of other considerations (Recommendation 1, 2, 3, 9).

The contributory factors were as follows:

183 A lack of understanding by the Operations Manager of the sequence of the main track renewal works and the consequential effect upon the ATWS components and the system configuration (Recommendation 6).

184 Carillion did not provide the Operations Manager with relevant information on the programme of renewals work or the various track layout present during the progress of the works (Recommendation 6).

185 The ability of the Schweizer personnel to gain access to the site without challenge regarding the content of their work activity (Recommendation 4).

186 The ability of the Operations Manager to sign in to the site in the capacity of a COSS without the availability of an appropriate safety (Rimini) plan (Recommendation 5).

187 Perception by the Operations Manager of pressure to complete the installation of the ATWS system (Recommendation 6).

188 The possibility that the Operations Manager's request to complete the ATWS installation during the following weekend's possession was refused (Recommendation 6).

189 A shortage of manpower to complete the ATWS installation works as planned during the previous weekend possession (Recommendation 6).

Additional observations

Driver

190 On the approach to Urmston the Driver of train 1L13 had not reduced power or applied the train brakes at the warning board for a 50 mph (80 km/h) TSR. When he observed the commencement board for the TSR the Driver applied the brake and had reduced speed to 66 mph (105 km/h) by the time the train arrived at the board. After passing the termination board the Driver applied power and the train accelerated, reaching 82 mph (132 km/h) by Trafford Park West Junction. Central trains have managed this issue through their normal procedures.

Hours of work

191 In the months prior to the accident, there is evidence of Schweizer and Carillion staff exceeding the working time limits specified in Group Standard GH/RT 4004.

192 Timesheet records for Schweizer staff were incomplete. Those that were available demonstrated regular, although infrequent, site shifts approaching 12 hours in duration and this was sometimes combined with travelling time of 2 hours or longer. Timesheets for the Schweizer Operations Manager were rarely completed and those that were demonstrated a higher proportion of exceedence than the remainder of the team. There is evidence that the Schweizer Operations Manager was informally managing the working hours of the other Schweizer staff. There is no evidence that any monitoring was carried out regarding the working hours of the Operations Manager.

193 The above is corroborated by independent witness evidence of excessively long hours and double-shift working.

194 The site access records for Trafford Park also contain a significant number of shifts exceeding 12 hours on site for Carillion employees.

Quality of documentation

195 The following issues were noted in the Carillion documentation examined during the investigation:

- Carillion document 'WP/ATWS/001TRA/Rev 01' is the Site Specific Work Plan 'Installing 'Schweizer ATWS' for the protection of staff working at Trafford Park between 31m 1100yds and 31m 1570yds'. This is dated '21-10-2005' and has signatures for 'Author' and 'Reviewer'. The 'Authorised' signature is a 'pp'. The front sheet details are correct for 'Description', 'Location', 'Date' and specify 'Shift Times' as '05:00 – 17:00'. However, section 7 of the document refers to a date of 11/09/05 and shift times of 00:01 to 12:00 hrs.

- Carillion proforma document 'SELECTION OF SAFE SYSTEM OF WORK ON OR NEAR THE LINE' incorporates 'COSS RECORD OF ARRANGEMENTS AND BRIEFING FORM (RT9909 equivalent)'. This structured document includes a mechanism to select the SSoW to be used for railway sites. The selection process takes account of a number of factors including circumstances at site and the type(s) of activity being undertaken. Wherever possible, the safety systems to be used on site should be pre-planned using relevant information and only amended at site if it is not possible to comply with the designated system. Any change to the pre-planned proposed system which reduces the level of protection given requires a re-authorisation of the document;

  Document 'TRA/WK30/T3/RIM/210' is a pre-completed version of the above. 'Date' is specified as 'WEEK 30'; 'Duration' as '10 hours' and 'planned work times' as '07:30 to 16:30'. The pre-selected SSoW is shown as 'Safeguarded Green Zone' 'T3 Available'. However, the 'SAFE SYSTEM OF WORK' within the Record of Arrangements section is pre-completed as 'Red Zone with Lookouts';

- 'TRA/WK30/RZW/RIM/213' and 'TRA/WK31/ATWS/RIM/214'. Both are dated 28/10/05 and signed 'prepared' and 'authorised'. These documents were prepared on 21 October 2005 and post-dated for the week following. Both documents have a different Job Reference on the third page compared with their covers.

196 All of the above documentation contains erroneous and potentially misleading information. It is not considered that these errors had any effect on this accident.

Level of support for the Schweizer Operations Manager

197 The Schweizer Operations Manager had a wide range of responsibilities within the recently formed UK business. He was enthusiastic and committed to the success of the venture. His personal style was to ensure that his team were able to deliver their obligations and, to that end, he regularly went to site and became physically involved in the work. He also kept in regular contact with his staff and client's representatives and mobile telephony records show frequent calls from early morning to late evening on most days.

198 There is evidence which demonstrates the Operations Manager had a significant workload. The issues included:

- Schweizer sent an email in October 2005 changing the technical support arrangements provided to him;
- the Operations Manager was unable to take time away from work and had to change his family holiday in August 2005;
- in September or October 2005, he made a verbal request to the Schweizer UK commercial manager to not take any more ATWS work in the immediate future because of resource limitations;
- he was managing some HR and employment issues for the remaining employees without assistance.

Familiarity with all types of Safe System of work

199 The Carillion Supervisor had been a COSS and ES since 1998. During the period to 2005 he had acted as ES and COSS on numerous occasions but had never needed to arrange a *T2* or *T12* for his or others protection. These would be appropriate to provide protection for track inspections. He was uncertain with regard to the relevant procedures.

Actions already taken or in progress

200 The Schweizer Installer has been retrained in PTS and COSS.

201 Schweizer have carried out a formal safety briefing of all of their staff with respect to the requirements for the appointment of a COSS, planning of a SSoW and briefing requirements before work commences.

202 Carillion have taken disciplinary action against the Supervisor for failure to ensure a SSoW was in place.

203 Carillion have set up a Safety Task Force, headed by the deputy managing director of Carillion Transport. Evidence gathered by the Task Force has been used to generate action plans to address the issues found. Changes have been made in the area of site access control and identification and authority of the Supervisor in charge of site.

204 Procurement of ATWS systems within Carillion is now direct from the user division, not via CAP. This is to remove the 'middle man' and convoluted internal linkages with the risk of miscommunication.

205 Carillion have established an ATWS steering group to ensure best practice is employed together with improved supplier accreditation and monitoring. The steering group comprises representatives of production, procurement and safety disciplines.

206 The Rimini process within Carillion has been changed to ensure that assessments reflect changing site circumstances and avoid the use of generic plans.

207 Carillion have, as a result of their investigation and internal review, addressed those issues raised in Recommendations 4, 5 and 6.

208 Network Rail are progressing action plan - SAF7, which addresses some of the issues raised in Recommendations 8 and 9.

Recommendations

209 The RAIB's recommendations are directed at those parties who the RAIB believes are best placed to mitigate the identified risks (the implementers). When these parties have considered the recommendations they should establish their own priority and timescale for the necessary work, taking into account their health and safety responsibilities and the safety risk profile and safety priorities within their organisation. [1]

1 Network Rail should, through their Sentinel System, withdraw the Personal Track Safety and Controller of Site Safety certification of the two staff involved and not reissue them until the individuals have been retrained (paragraphs 142, 144, 150, 155).

2 Schweizer should develop and implement a procedure to monitor the compliance of all their staff with main contractor and Network Rail track safety requirements (paragraphs 147, 148, 150, 151).

3 Schweizer should brief all COSS certificated staff to comply with NR/SP/OHS/019 (Rimini) when working on Network Rail infrastructure (paragraphs 143, 144, 150).

4 Carillion should review, and amend as necessary, their procedures and arrangements for site access to ensure that only those persons who are relevant to planned activities are able to access site. Appropriate monitoring arrangements should be made (paragraph 148).

5 Carillion should review, and amend as necessary, their procedures and arrangements for site management to ensure that only those staff nominated as COSS within Method Statements are able to act as such. Appropriate monitoring arrangements should be made (paragraph 149).

Continued

[1] The RAIB addresses its recommendations to the ORR (HMRI), the safety authority, in accordance with Article 25(2) of the European Railway Safety Directive 2004 (the Directive) and Regulation 12(2)(a) and (b) of the Railways (Accident Investigation and Reporting) Regulations 2005) (RAIR). The RAIB does this to enable the ORR (HMRI) to discharge its responsibilities under Article 25(2) of the Directive and Regulation 12(2)(a) of the Regulations, namely that they must ensure that all RAIB recommendations addressed to it are duly taken into consideration and where appropriate acted upon by the end implementer.

The end implementer is required under Regulation 12(4)(b) of the Regulations, to provide the Safety Authority with the full details of the measures/actions they intend to take to implement the recommendation and the timescales for securing that recommendation. The timeliness of this response to the Safety Authority is dictated by the Safety Authority's duty under RAIR Reg 12(2)(b) to report to the RAIB, without undue delay or within such other period as may be agreed with the Chief Inspector.

6 Carillion should review, and amend as necessary, procedures for client/internal client/supplier communication and specifically that between S&C, CAP and Schweizer.

This should specifically consider how specialist activity method statements are to be integrated and visible to S&C site managers and how specialist suppliers are to be informed of main work programmes (paragraphs 156, 157, 158, 159).

7 Carillion should re-brief their site staff regarding emergency procedures (paragraphs 172, 173).

8 Network Rail must ensure the selection, training and performance assessment regime achieves and maintains the prescribed standard of performance required of the COSS.

A review is required which should consider:

- at the selection stage, an assessment of the individuals's personal attitudes to safety, adherence to rules and inter-relational personal skills;
- an assessment prior to qualification, and if appropriate, post-qualification, to more accurately reflect the performance required in the workplace;
- the development of a new robust monitoring process to ensure that an individual's on-the-job performance routinely achieves the prescribed level.

This work should also consider the circumstances where the normal working environment permits COSS to use some protection methods infrequently, and whether there is therefore a need to sub-categorise the skill, within COSS competency training and certification.

The principles established may have application in the competency management process for other track safety skills; this should be looked into (paragraphs 146, 148, 149, 150, 151, 152, 153, 154, 155).

9 Network Rail should consider further work and the expansion of the current programme of research into understanding the causes of rule violation, in direct contravention to the training people have received to include track safety skills (paragraphs 146, 148, 149, 150, 152, 153, 154, 155).

Appendices

Glossary of abbreviations and acronyms — Appendix A

AA	*Accredited Agent* (RAIB)
ATWS	*Automatic Track Warning System*
AWS	*Automatic Warning System*
BTP	British Transport Police
CAP	Carillion Ancillary Projects
CLC	Cheshire Lines Committee
COSS	*Controller of Site Safety*
D&A	Drugs & Alcohol
DMU	*Diesel Multiple Unit*
ES	*Engineering Supervisor*
HMRI	Her Majesty's Railway Inspectorate
IMT	Integrated Management Team (Network Rail & Carillion)
LWRT	*Long Welded Rail Train*
NCCA	*National Competency Control Centre*
NRN	*National Radio Network*
ODM	*Operations Deliver Manager* (Network Rail)
OROR	*Outside Rules of the Route*
OTMR	*On Train Monitoring Recorder*
PICOP	*Person in charge of Possession*
PSR	*Permanent Speed Restriction*
PTS	*Personal Track Safety*
RAIB	Rail Accident Investigation Branch
RIO	*Rail Incident Officer* (Network Rail)
RSSB	Rail Standards & Safety Board
S&C	*Switch & Crossing*
SAC	*Site Access Control*
SSoW	*Safe System of Work*
TPE	TransPennine Express
TSR	*Temporary Speed Restriction*

Glossary of terms — Appendix B

Accredited Agent	A member of rail industry staff who has been trained and certificated by RAIB and who acts on behalf of RAIB at an incident site until an inspector arrives.
Automatic Track Warning System	A form of *Track Warning System* with train detection provided by detection devices. ATWS is typically used to provide a suitable warning for work exceeding one day in duration.
Automatic Warning System	A device to relay the indication of signals to the driving cab of a train. A bell is sounded for green aspects and a horn for all other aspects.
Cess	The area to either side of the railway, immediately away from the ballast.
Controller of Site Safety	Person responsible for organising Safe Systems of Work on Network Rail infrastructure.
Diesel Multiple Unit	A train configuration in which most vehicles are powered by diesel engines and mechanical drive.
Double Junction	A configuration of track work whereby both running lines diverge simultaneously.
Engineering Supervisor	A person who takes control of a worksite within a possession during engineering operations.
Engineers Line Reference	A code used to identify a specific line of route.
'for cause' Drug & Alcohol (testing)	The testing of persons involved in an incident in accordance with designated procedures, to determine their compliance with the drug and alcohol limits specified in Group Standards.
Four Aspect (colour light) Signalling	A form of colour light signalling system comprising consecutive signals each of which can display Red, Yellow, Double Yellow or Green indications. These are controlled in such a way as to permit trains to move in an efficient and safe manner.
Four foot	The area between the running rails.
Linespeed	The maximum permitted speed at which trains may run when not subject to any other instruction or restriction.
Long Welded Rail Train	A specialised train for the delivery and/or collection of long lengths of running rail.
Lookout	A designated role within Rule Book procedures to warn staff on site of the approach of trains.
National Competency Control Agency	Operator of the *Sentinel* system on behalf of Network Rail.
National Radio Network	A network wide railway radio system.

On or Near the Line	A definition given within the Rule Book. Any location closer that 3 metres to a running rail.
On Train Monitoring Recorder	A data recorder fitted to traction units, collecting information about the performance of the train.
Operations Delivery Manager	A Network Rail employee who acts in a mobile Supervisory role to manage the operation of the main line network.
Outside Rules Of the Route	A possession which is not routine. Needs to be booked considerably in advance, maybe even years, to allow for rerouting or cancellation of timetabled trains.
Permanent Speed Restriction	A section of line where the permissible maximum speed is less than the linespeed.
Person in Charge of Possession	A person who takes control of a section of line during engineering operations.
Personal Track Safety	The duties, responsibilities and conduct of persons when they are on or near the line. Subject to a formal training and certification process.
Plain-line	Straight or curved track which contain no switches or crossings.
Possession	A period when normal service train operation is suspended and engineering operations take place.
Rail Incident Officer	A person, usually a Network Rail employee, who represents the industry at the scene of a significant incident.
Red Zone Prohibited	A section of line into which persons must not enter in the course of their duties, during the normal operation of trains.
Rimini	An industry name for NR/SP/OHS/019. This Network Rail Company Standard stipulates the safety considerations and arrangements to be implemented for work on or near the line. The standard requires that non-urgent tasks are preceded by an assessment to identify the most appropriate Safe System of Work (SSoW).
Safe System of Work	An agreed method of undertaking defined tasks which minimises the risks to employees and the public.
Sentinel	A competency database operated by NCCA on behalf of Network Rail. The system records designated personal safety and technical skills and issues Sentinel cards to authorised persons following training events carried out by approved training providers.
Signalling Panel	Equipment in a signal box used to control and display the position of trains.
Site Access Control	A mechanism to record and control who enters the site of work.
Switch & Crossing	Machined rails and their associated fittings which permit trains to move from one track to another.

T12 (-Protection)	A defined procedure within the Rule Book of preventing trains from entering a section of line whilst access, inspection or other non-intrusive activities are carried out.
T2 (-Protection)	A defined procedure within the Rule Book of preventing trains from entering a section of line whilst minor engineering works are carried out.
Temporary Speed Restrictions	A restriction of speed imposed over a section of line for a short of time.
Trackworker	Employee within the rail industry who for a significant part of their working time works '*on or near the line*'.
Track Circuit Block	A form of signalling where the position of trains is continuously detected and input into the control system.
Track Renewals	Engineering process by which life expired or ineffective track is removed and replaced by new components. This may also involve the renewal of ballast and/or drainage.
Track Warning System	A system that warns people who are on or near the line of an approaching train. The system may be temporarily or permanently installed. The train detection function may be undertaken automatically (ATWS) or manually.
Treadle	A wheel-operated detection switch.
Vigilance Device	A system in a drivers cab which monitors driver activity and requires the driver to respond to an alarm, via a foot pedal, if he has been inactive for a period of time.
Warning Board	A permanent or temporary sign positioned in advance of a reduced speed to provide advance warning to drivers.

Key standards current at the time — Appendix C

The Rule Book. Railway Group Standard GE/RT8000. This was reissued in modular format in December 2003 and there have been several amendments since then, the latest prior to this incident being in June 2005.

Group Standard GC/RT3358 Issue Two August 2000 defines the responsibilities for protection of persons working on or near the line and the competence and fitness requirements for persons required to carry out those responsibilities.

Network Rail operates a competency record system, through the *National Competency Control Agency* (NCCA), known as *Sentinel*. This comprises of a records database of specified accredited personal competencies from which each individual within the rail industry is issued a secure ID card. This card lists the applicable competencies, medical information and the expiry dates for each element. The database can be interrogated by sponsors and site controllers. The system is updated by authorised training providers to recognise new or refreshed competencies.

NR/SP/OHS/019, Safety Of People Working On or Near the Line, issue 5 August 2005.

London North western IMT 'Method Statement RPTR002/BH'is a comprehensive method statement and safety plan for the work at Trafford Park.

Carillion 'West Coast Switch & Crossing Alliance Management Plan' W075-108-SA-HSP 000001 Issue A02, is a generic health and safety plan for works undertaken by Carillion S&C as part of the S&C Alliance for Network Rail West Coast improvement works.'

Carillion Method statement AP/MS/ATWS002/Rev 001, 'The Installation, Commissioning and De-Commissioning of ATWS systems' is the Carillion ancillary Projects general method statement for ATWS systems.

Carillion Work Plan WP/ATWS/001TRA/Rev 01, is the site specific work plan for the ATWS system installation at Trafford Park.

Trackworker fatalities 1994 - 2005 Appendix D

Event Date	Location	Fatality type	Location	Mode of death
12/12/1994	Trent South	Working on line	Trackside	Struck by train
31/03/1995	Colwich	Working on line	Trackside	Struck by train
25/07/1995	Charlton Jnc	Working on line	Trackside	Electrocuted 3rd rail
19/09/1996	Sproughton (Ipswich)	Walking on line	Trackside	Struck by train
10/03/1998	Ebbw Jcn	Working on line	Trackside	Struck by train
10/03/1998	Ebbw Jcn	Working on line	Trackside	Struck by train
16/09/1998	Tollerton	Working off track	Off Track	Overturned plant
19/10/1998	Ranskill	Working on line	Possession	Electrocuted OHL
03/11/1998	Darlington North rd	Working on line	Trackside	Struck by train
09/05/1999	Edge Hill East Jcn	Working on line	Possession	Struck by train
20/05/1999	Stafford	Working on line	Trackside	Struck by train
09/10/2000	Vauxhall	Working on line	Trackside	Struck by train
10/10/2000	Bradford Mill Lane Jcn	Working on line	Trackside	Struck by train
18/07/2001	Purley Oakes	Working on line	Trackside	Struck by train
10/08/2001	Desborough	Working on line	Possession	Struck by train
28/10/2001	Waterloo West Crossing	Working on line	Trackside	Struck by train
19/12/2001	Hitchin	Working off track	Off track	Struck by train
23/06/2002	Cheddington	Crossing line	Trackside	Struck by train
08/09/2002	East Croydon	Working on line	Possession	Electrocuted 3rd rail
14/11/2002	Finnieston	Unloading lorry with HIAB	Depot	Crushed by load
23/02/2003	Chelford	Working on train	Possession	Struck by plant jib
28/03/2003	Westenhanger, CTRL	Working on train	Construction	Electrocuted OHL
07/08/2003	Oakley	Working on line	Trackside	Electrocuted 3rd rail
30/09/2003	Stafford Salop Sdgs	Stoneblower	Sidings	Crushed by machinery
15/02/2004	Tebay	Runaway trolley	Possession	Struck by RRV trailer
15/02/2004	Tebay	Runaway trolley	Possession	Struck by RRV trailer
15/02/2004	Tebay	Runaway trolley	Possession	Struck by RRV trailer
15/02/2004	Tebay	Runaway trolley	Possession	Struck by RRV trailer
06/03/2004	Ancaster	Plant collision	Possession	Injured in collision
14/03/2004	Fareham No 2 Tunnel	Fell down Tunnel Shaft	Possession	Head injuries from fall
28/09/2004	Cannock	Plant collision	Possession	Struck by RRV
28/09/2004	Cannock	Plant collision	Possession	Struck by RRV
05/04/2005	Newbridge Jct	Working on line	Trackside	Struck by train
11/06/2005	Acton	Working on line	Trackside	Struck by train
26/10/2005	Trafford Park	Working on line	Trackside	Struck by train

Type of Accident	No. Fatalities
Struck by train	20
Electrocuted	5
Plant accident	9
Fall from height	1
	35

References Appendix E

1 The Railway Strategic Safety Plan, RSSB, 2006

2 T145: Safety Critical Rule Compliance, RSSB

3 T506: Safety Critical Rule Compliance - toolkit pilot, RSSB

4 Why Do Good Staff (Sometimes) Work Unsafely?, Serco Rail and the Institute of Occupational Ergonomics, April 2002.

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