



Rail Accident Investigation Branch

Rail Accident Report



**Tamper driver struck by a train at Torworth level crossing
8 January 2011**

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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Tamper driver struck by a train at Torworth level crossing, 8 January 2011

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Summary

At about 23:55 hrs on Saturday 8 January 2011, a tamper driver walking to a tamper in a work site on the East Coast Main Line, was struck a glancing blow by a passenger train travelling at 100 mph (161 km/h). The tamper driver took evasive action when alerted by the train's horn, and suffered minor injuries.

The investigation found that the tamper driver, who entered the railway in contravention of rules and his training, wrongly assumed that the line he was walking on was closed to normal traffic. The unsafe actions of the driver were found to have been a causal factor. However, the investigation also found that the driver did not have the information he needed to get to his tamper in safety.

Industry practices in which it was not uncommon for drivers to walk to trains in work sites without having first received a safety briefing were found to be an underlying cause of this accident. There were also deficiencies in the organisational arrangements for providing the tamper driver with information.

The RAIB has made a recommendation relating to the procedures followed by Network Rail and its contractors for providing train crews with safety briefings when accessing work sites.

Introduction

Preface

- 1 The sole purpose of a Rail Accident Investigation Branch (RAIB) investigation is to prevent future accidents and incidents and improve railway safety.
- 2 The RAIB does not establish blame or liability, or carry out prosecutions.

Key Definitions

- 3 All dimensions and speeds in this report are given in metric units, except speed and locations on Network Rail, which are given in imperial units, in accordance with normal railway practice. In this case the equivalent metric value is also given.
- 4 The report contains abbreviations and technical terms (shown in *italics* the first time they appear in the report). These are explained in appendices A and B.

The accident

Summary of the accident

- 5 At approximately 23:55 hrs on Saturday 8 January 2011, a *tamper driver* (tamper driver 1) walking to a *tamper*, reporting number 6U48, was struck by train 1D53, the 22:00 hrs service from London Kings Cross to Leeds. The accident occurred on the East Coast Main line (ECML) (figure 1).

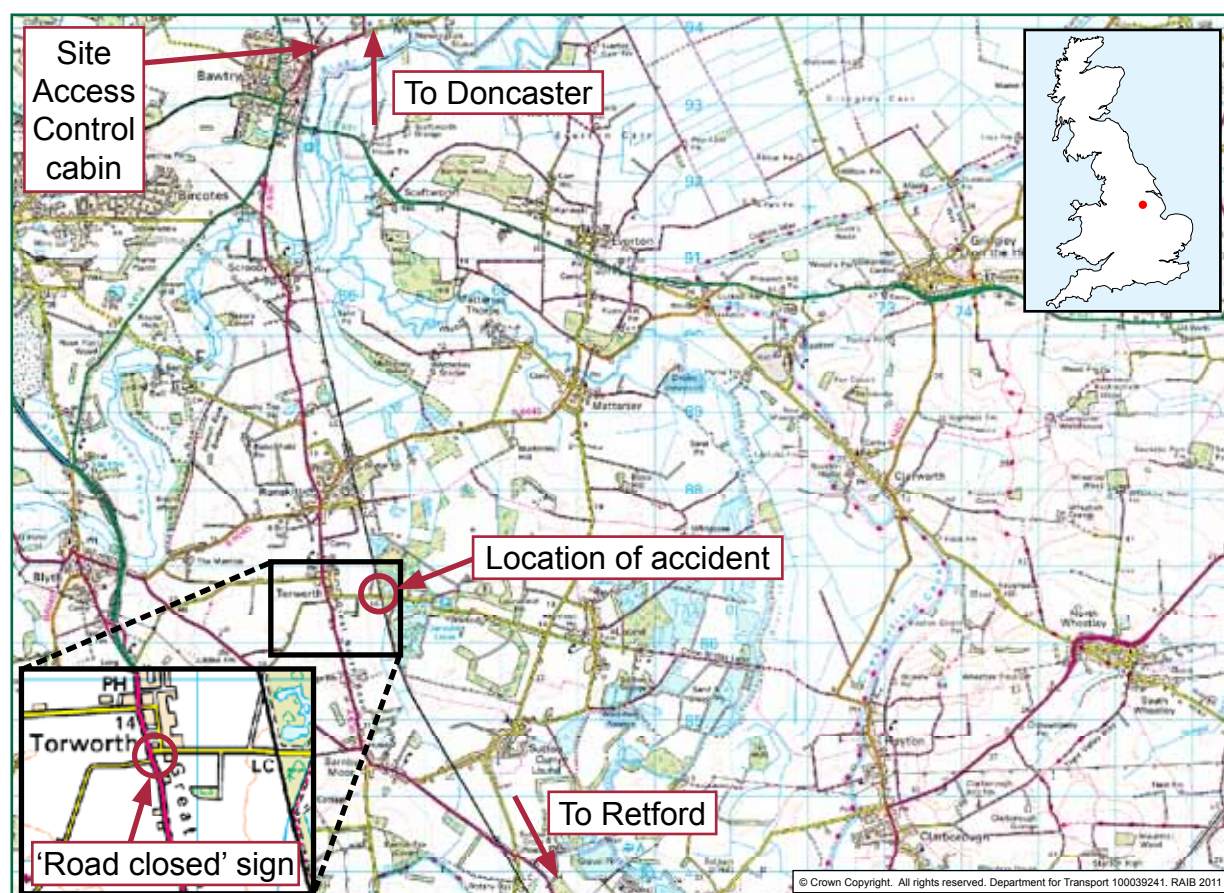


Figure 1: Extract from Ordnance Survey map showing location of accident

- 6 The tamper was stationary on the *up* main line, on the north side of Torworth level crossing (figures 2 and 5). Tamper driver 1 had accessed the *down* main line at Torworth level crossing and was walking toward the tamper in the *four-foot* of the down main line with his back to on-coming traffic.
- 7 He heard a train horn and turned to see train 1D53 approaching him at speed. He tried to get clear but was struck a glancing blow to the left side of his body. The train driver judged that tamper driver 1 had moved clear and did not stop his train or report a 'near miss'.
- 8 Tamper driver 1 was taken to hospital but not detained. He suffered severe bruising to his left upper leg from the impact and injuries to his right arm and shoulder from his fall. He was unable to work for 18 weeks.

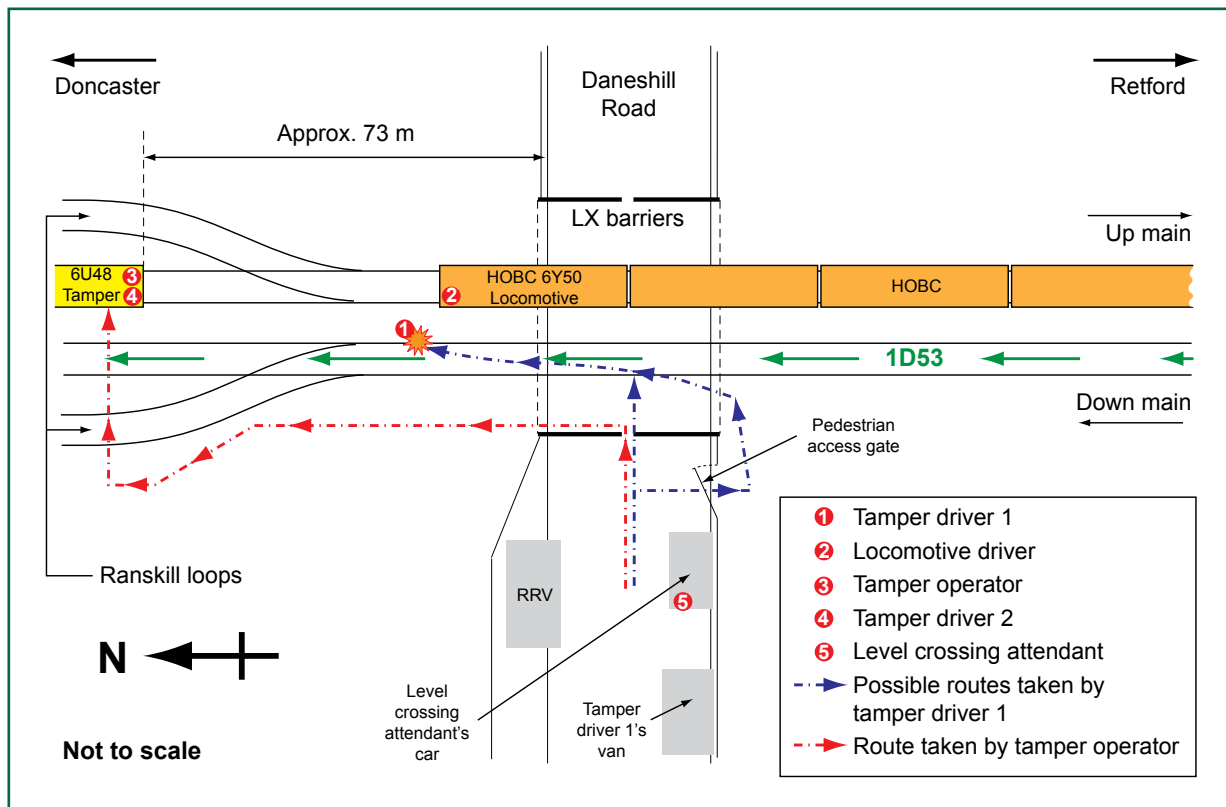


Figure 2: Plan showing locations of witnesses to accident and different routes taken from level crossing to tamper

Setting

Location

- 9 Torworth level crossing is at a mileage of 143 miles 374 yards¹ on the ECML. The accident occurred approximately 12 metres north of the level crossing, immediately before the start of the Ranskill loops, where the double track main line becomes four tracks (figures 2 and 5).
- 10 Torworth level crossing has full barriers, operated from Ranskill signal box. The crossing is monitored by the signaller using closed circuit television (CCTV). The crossing is on an unclassified road between the villages of Torworth and Lound. On the east (up) side of the level crossing there is an authorised *access point* to the railway and a parking area for vehicles. On the west (down) side of the level crossing there is a pedestrian access gate (figures 2 and 4).
- 11 The down main line is approximately level and straight on the approach to Torworth from the south. The line straightens from a right-hand curve approximately 530 metres before the level crossing.
- 12 The *permissible speed* for trains on this section of the down main line is 125 mph (200 km/h).
- 13 On the weekend of 8/9 January, engineering work had been planned on the up main line between mileages 141 miles 1320 yards and 142 miles 1640 yards, (described as Torworth to Barnby Moor). The work involved *ballast cleaning* and tamping of the track.

¹ The mileage is measured from a datum point at London Kings Cross.

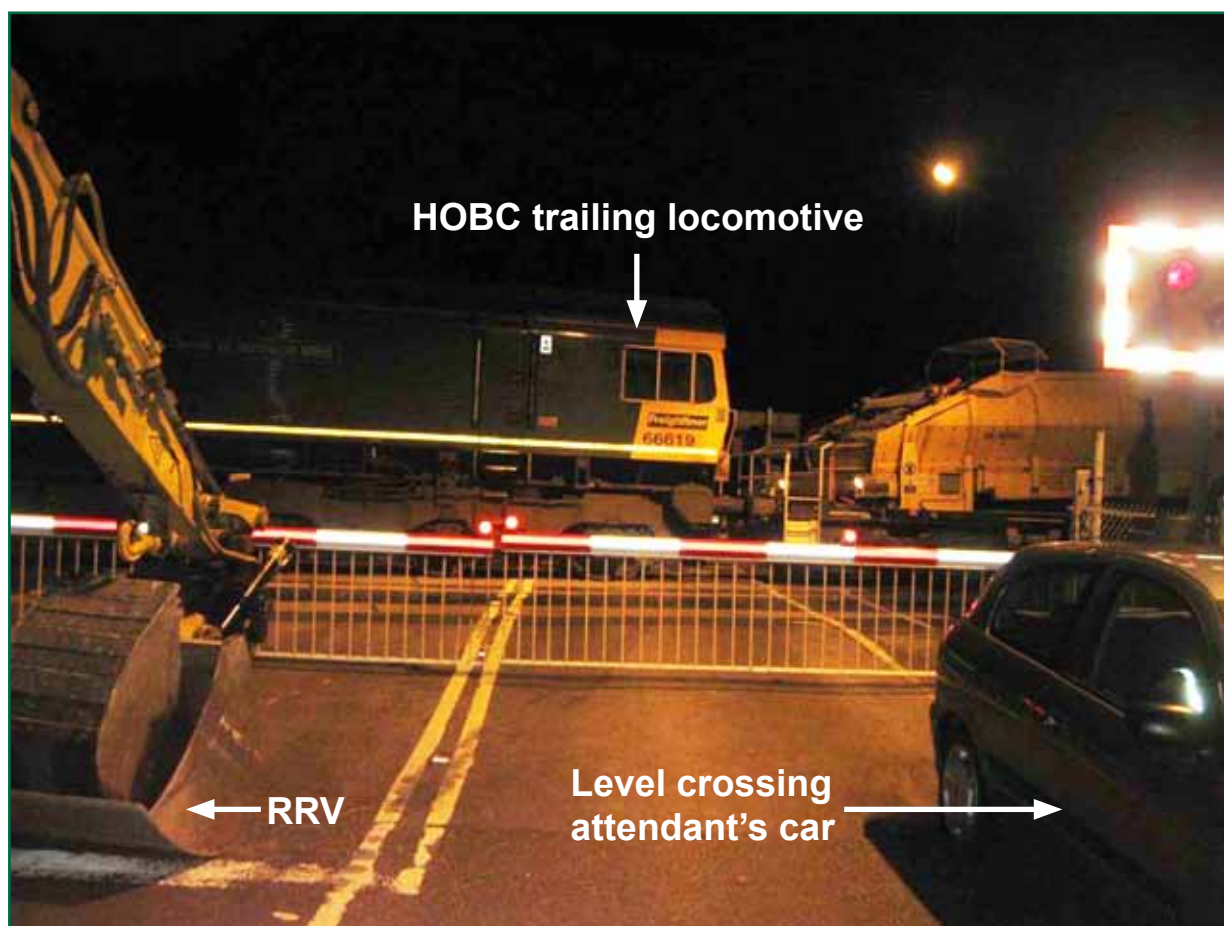


Figure 3: Torworth level crossing on the night of the accident (photograph courtesy of Network Rail)

Organisations involved

- 14 The infrastructure was owned and maintained by Network Rail. Network Rail also owned the tamper and the ballast cleaning system, known as a *high output ballast cleaner* (HOBC). Network Rail contracted with a freight operating company for the supply of the locomotives and drivers to haul the HOBC.
- 15 AmeyCOLAS is a joint venture between Amey and Colas Rail. The joint venture is managed by a board consisting of representatives of both companies. Persons working in the joint venture are employed by their respective parent company.
- 16 In 2010 ameyCOLAS entered into a contract with Network Rail for track renewal work involving the operation of Network Rail's HOBC systems and tampers. At the time of the accident ameyCOLAS had three track renewals operations, known as System 2, based in Taunton, System 3, based in Doncaster and System 4, based in Willesden (London). The accident occurred during work being carried out by System 3.
- 17 East Coast operated train 1D53 and employed its driver.
- 18 Network Rail and ameyCOLAS freely co-operated with the investigation. East Coast assisted with the provision of recorded information from the train but has not had any significant involvement in the investigation.

Trains involved

- 19 Train 1D53 was the 22.00 hrs East Coast service from London Kings Cross to Leeds. It was running 14 minutes late on departure from Retford, its previous station stop, before passing through Torworth. It was travelling at about 100 mph (161 km/h) on approach to the crossing.
- 20 The HOBC, train 6Y50, consisted of 45 vehicles comprising the ballast cleaning system, and a locomotive at each end of the train. The train, which was approximately 760 metres long, had been formed at Doncaster Wood Yard depot and departed around 21:00 hrs for the *work site*. At 23:22 hrs it was brought to a stand in the work site on the up main line with the trailing locomotive on Torworth level crossing (figure 3).
- 21 Tamper 6U48, which had been *stabled* at Doncaster Wood Yard, followed the HOBC to the work site, departing the yard at around 21:15 hrs. The tamper arrived in the work site and came to a stand approximately 73 metres north of the HOBC train (figures 2 and 5).
- 22 The RAIB has found no evidence that the design, maintenance or driving of these trains contributed in any way to the accident.

Staff involved

- 23 Tamper driver 1 was employed by Colas Rail. He first qualified as a train driver in 2001 and held a licence and authorisation from Colas Rail to drive trains and several types of *on-track machine* including tampers. Tamper driver 1 was also a qualified assessor and trainer and was licensed by Colas Rail as an instructor on the operation of on-track machines.
- 24 As a train driver, tamper driver 1's driving competence and knowledge of the Railway Group Standard GE/RT8000 Rule Book² was subject to periodic assessments by his driver standards manager. His last formal driving assessment had been in July 2010 and last 'rules' assessment had been in October 2009. In November 2010 he attended a refresher course in *personal track safety* (PTS) and held a PTS card issued by Sentinel³.
- 25 Tamper driver 1 was employed to work with System 4 (based at Willesden) but was working an overtime shift with System 3 (based at Doncaster) when the accident occurred. Apart from one previous occasion when work did not proceed, this was tamper driver 1's first experience of working in System 3.
- 26 The tamper was driven to the work site from Doncaster Wood Yard by another tamper driver, tamper driver 2.
- 27 A *tamper operator* from System 4 joined the tamper at Torworth level crossing about 25 minutes before the accident. His job was to operate the tamper's on-board computer. The tamper operator was also working an overtime shift for System 3.

² The Rule Book, published by the Rail Safety and Standards Board Limited, details the procedures to be used for operating and working on the railway. It is available at www.rssb.co.uk.

³ Sentinel is a scheme operated by the National Competency Control Agency and is the brand name for a competency control system based on photographic identity cards. The scheme is used to ensure that persons who work on railway infrastructure are medically fit and competent in personal track safety. The Sentinel PTS card is only valid if the holder's PTS training and medical certificates are in date, they have a sponsoring company and are working for that company.

- 28 A site access controller (SAC), working under contract to ameyCOLAS, was located in a SAC cabin at Bawtry old station⁴ (figure 1). The SAC operated a computerised system for booking staff into and out of the work site and his job included verifying that work site personnel held a valid PTS card, to record their travelling time to site, and to check that they had appropriate personal protective equipment (PPE). The SAC's duties were also to provide a basic site briefing to staff new to the work site on matters such as welfare and first aid facilities. The SAC cabin contained a large 'whiteboard' displaying the names and contact details of the key site management staff. There was also a diagram available with the line nomenclature and access points.

External circumstances

- 29 The weather on the night was cold and clear. Torworth level crossing was illuminated by floodlights and side lights on the HOBC were lit for the length of the train. The tamper had its headlights on including its high powered headlight known as a 'cyclops' light.
- 30 The engine on the trailing locomotive at Torworth level crossing was shut down and the HOBC was not cleaning ballast when tamper driver 1 arrived at the crossing.

Events preceding the accident

- 31 In early December 2010, System 3 identified that it would have a shortage of tamper staff for the weekend of 8/9 January and offered overtime work to tamper staff in System 4. Tamper driver 1 and the tamper operator volunteered for this work.
- 32 On 5 January 2011 tamper driver 1 and the tamper operator were sent an email from System 3 containing the following information relating to their overtime shifts on 8/9 January:
- the address of, and directions to, the SAC cabin at Bawtry old station⁵;
 - their booking-on time (between 23:00 and 23:30 hrs); and
 - the mobile telephone number of the tamper driver who had been rostered to drive the tamper to the site (see paragraph 34).
- 33 The intention was that tamper driver 1 and the tamper operator would book on at the SAC cabin and subsequently join the tamper in the work site by walking to it from a work site access point. The telephone number for the rostered tamper driver bringing the tamper into the work site had been provided to tamper driver 1 and the tamper operator so that they could find out directly from the driver where the tamper was located. Further information about work site access points was available at the SAC cabin. Both tamper driver 1 and the tamper operator were unfamiliar with the area and had not been given any prior information on the designated work site access points.

⁴ Bawtry station closed in 1971.

⁵ The SAC cabin was sited at Bawtry old station because there is a compound there with fixed facilities and it was within the mileage of the possessions, close to the northern end.

- 34 On 6 January the rostered tamper driver, a new employee, had been unable to obtain a PTS card updated for his new employer in time for the weekend working and was replaced by another tamper driver, tamper driver 2. Tamper driver 1 and the tamper operator were not told of this change.
- 35 There were also changes to the planned role of tamper driver 1 on the night; initially his planned role was only to operate the tamper in the work site but when his weekly roster was issued around midday on 6 January, he was shown to be driving the tamper from Doncaster Wood Yard to the work site. Tamper driver 1 was not qualified to drive unaccompanied on the ECML and had understood from his line manager that the rostered tamper driver would be accompanying him as a *conductor*.
- 36 On 7 January tamper driver 1 telephoned the rostered tamper driver to make arrangements for meeting the following night. He learned of the change of drivers and was given the telephone number of tamper driver 2. Tamper driver 1 then made contact with tamper driver 2 and was advised that tamper driver 2, who was qualified to drive on the ECML, was to drive the tamper from Doncaster Wood Yard to the work site. Also, as there was no longer a need for tamper driver 1 to go to Doncaster Wood Yard, he was told he could revert to his original reporting arrangement as stated in the email of 5 January.
- 37 On 8 January tamper driver 1 left his home in Bristol around 14:00 hrs and drove in his van to Doncaster, arriving around 17:00 hrs. He had been booked into a hotel in Doncaster by his company so that he could rest before and after his shift.
- 38 Tamper driver 1 reported that he experienced a number of difficulties at the hotel. There was a problem with his booking and he had to make a number of telephone calls to sort it out. There was a noisy wedding party at the hotel and he was unable to get as much sleep before his shift as he had planned, managing only two hours. Also, he was delayed when leaving the hotel because food he had ordered for his night shift had not been prepared and he had to wait for it.
- 39 He left the hotel at around 23:00 hrs and drove to Bawtry, a journey of approximately 15 minutes. From the email containing his joining instructions he had made a written note of 'Bawtry old station' as the address of the SAC cabin, believing he would be able to find it using his satellite navigation system or from road signs to the station. The email gave an incomplete postcode for the SAC cabin making it difficult to use with a satellite navigation system. Tamper driver 1 had been unable to print a copy of the email giving directions to the SAC cabin because his home printer was not working. The access point to the SAC cabin was located about 600 metres along one of the roads leading from Bawtry town centre (figure 1). Tamper driver 1 drove around Bawtry looking for the SAC cabin but was unable to find it and at around 23:20 hrs telephoned tamper driver 2 for guidance.
- 40 By this time, the tamper was at a stand in the work site, north of Torworth level crossing awaiting the start of work. Tamper driver 2 established tamper driver 1's location on the road between Doncaster and Retford and considered it was easier to direct tamper driver 1 to Torworth level crossing than to Bawtry old station, which he thought would be difficult to find by someone unfamiliar with the area. Around this time, the tamper operator also telephoned tamper driver 2 to find out where the tamper was located and subsequently joined the tamper at Torworth level crossing without booking on with the SAC.

- 41 Tamper driver 1 was unable to follow the directions and got lost, finding himself in Retford, about 8 km beyond Torworth. He telephoned tamper driver 2 again for further directions and finally arrived at Torworth level crossing at around 23:50 hrs.
- 42 Tamper driver 1 parked his van on the roadway with other vehicles on the west (down) side of the level crossing and put on his PPE, including an orange overall and a hard hat with a head torch. He set off towards the level crossing carrying a shoulder bag on his right shoulder (figure 4).

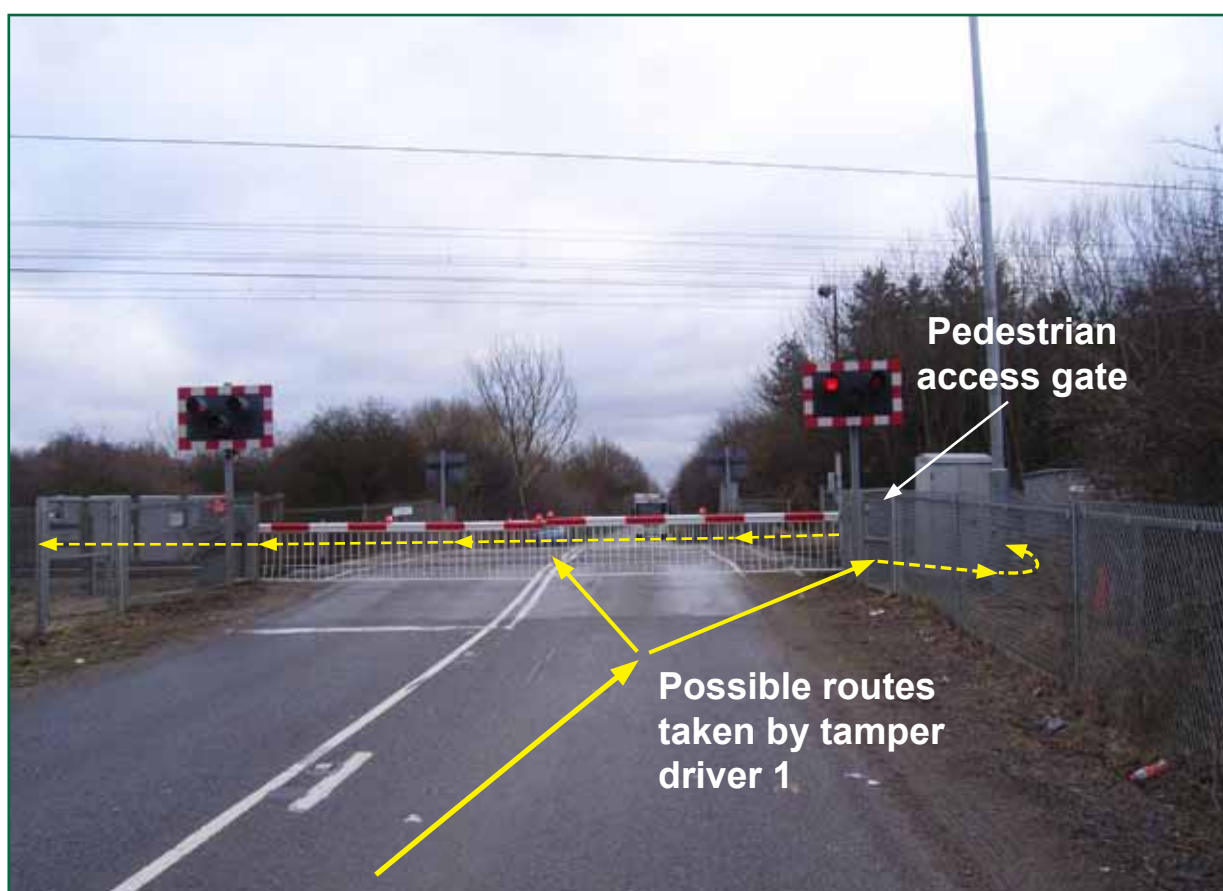


Figure 4: Torworth level crossing viewed from the west, showing location of access and route of tamper driver 1

- 43 He passed persons sitting in their vehicles, including the level crossing attendant (LXA) who was sitting in his car adjacent to the level crossing, but facing away from it (figures 2 and 3). The LXA's duties were to manually operate the barriers under instruction from the signaller controlling the crossing in Ranskill signal box. When tamper driver 1 arrived at the crossing the barriers were under the control of the signaller. The barriers were in the down position and the red road light signals were flashing.
- 44 The LXA has stated that he did not see tamper driver 1 approach the crossing.

Events during the accident

- 45 At around 23:55 hrs tamper driver 1 accessed the railway on the down side, either via an open access gate on the right-hand side of the level crossing or by pushing the barriers apart where they met in the middle of the road (accounts differ on this point). He first checked that there were no trains approaching from either direction before walking northwards on the level crossing and then in the four-foot of the down main line. He had walked about 2 metres beyond the rear of the trailing locomotive of the HOBC train and was preparing to step out of the four-foot towards the up main line when he heard a train horn. He turned to see train 1D53 approaching him and tried to get out of the way.
- 46 Tamper driver 1 was struck a glancing blow by the train to his left side. His shoulder bag was taken away by the train and its contents scattered on the track. Tamper driver 1 was projected forward and landed sideways in the four-foot of the up main line, behind the trailing locomotive of the HOBC train.
- 47 The driver of train 1D53 sounded the train horn because he observed the HOBC train stationary on the curve in the track and considered it necessary to issue a warning of the train's approach to any track workers who might have been in a position of danger and unsighted around the bend.
- 48 The driver of train 1D53 did not see tamper driver 1 on the track until the train was approximately 90 metres from him, around two seconds running time. He was unaware that tamper driver 1 had been struck.

Events following the accident

- 49 Tamper driver 1 was immediately aided by persons in the vicinity who had witnessed the event, including tamper driver 2 and the locomotive driver in the trailing cab of the HOBC train. The signaller in Doncaster signalling centre was contacted and arrangements made for an ambulance to attend. The ambulance arrived at approximately 00:15 hrs and tamper driver 1 was able to walk to it. He was taken to hospital but discharged around 03:30 hrs.
- 50 The driver of train 1D53 was informed on his arrival at Doncaster that his train had been involved in a 'near miss' but that the individual was unharmed. The driver confirmed that he was fit to continue his journey to Leeds, where he was met and told of the accident.
- 51 After train 1D53 arrived at Leeds, tamper driver 1's shoulder bag was found caught around the right-hand (in the direction of travel) driver's foot step on the leading cab of the train.
- 52 The accident was reported to Network Rail and to Colas Rail's control centre. The site was immediately closed down for investigation and at 01:45 hrs the planned work for the weekend was abandoned. The ECML was re-opened to normal traffic at 08:35 hrs on Sunday 9 January.

The investigation

Sources of evidence

53 The following sources of evidence were used:

- interviews with witnesses;
- recordings of voice communications with the Network Rail signaller in Doncaster signalling centre and Colas Control;
- logs from the Doncaster signalling centre and Colas Control;
- *on-train data recorder* output from train 1D53;
- CCTV recordings taken from train 1D53;
- site photographs and observations;
- ameyCOLAS procedures and internal documents relating to the operation of the HOBC and site access control;
- the ameyCOLAS work package plan for the engineering work and task briefing sheet;
- ameyCOLAS documentation relating to the engineering work on 8/9 January;
- tamper driver 1's training records;
- information from freight operating companies on drivers' practices for joining and leaving trains in an engineering site;
- the Rule Book (Railway Group Standard GE/RT8000);
- Network Rail's company standards and guidance;
- industry documents on PTS training and competence;
- code of practice on site briefing for train crew provided by the Infrastructure Safety Liaison Group⁶ (COP/001 dated December 2006); and
- a review of previous RAIB investigations that had relevance to this accident.

⁶ The Infrastructure Safety Liaison Group is an industry body representing infrastructure contractors within the heavy rail industry. The Group operates under the auspices of the Rail Safety and Standards Board.

Key facts and analysis

Background information

Possession arrangements

- 54 The planned *possession* arrangements for the track renewal work on 8/9 January were published in the *Weekly Operating Notice* (WON) for week 41. These arrangements were for the up main line to be blocked to traffic from 21:15 hrs to 10:00 hrs, and the down main line to be blocked to traffic from 23:50 hrs to 08:20 hrs.
- 55 Possession of the up main line was taken as planned and two *line blockages* of the down line were taken between the passage of trains to allow various preparatory works to take place prior to the HOBC starting work. Information regarding the status of the line was conveyed by mobile telephone to the work site *controllers of site safety* (COSSes) by the *protection controller* who was located in Doncaster signalling centre. The protection controller confirmed with the COSSes that all persons were clear of the line before the line blockages were given up. The second line blockage was given up at 23:46 hrs, around four minutes before tamper driver 1 arrived at Torworth level crossing.
- 56 At 23:35 hrs the ameyCOLAS *site supervisor*, who was in charge of the work site, had been informed by the protection controller that the last train, 1D53, was still expected on the down main line and that the signaller would grant the possession after it had passed. The site supervisor stood down the crew of the HOBC and other workers on the site, to a *position of safety* in the up main cess, pending permission to start work once the possession had been granted. In the event, the down main line could not be blocked to traffic at 23:50 hrs as planned because 1D53 was running late. The possession of the down main line was later granted by the signaller at 00:07 hrs (after the accident).
- 57 The Rule Book permits *engineering trains* (which include on-track machines), and on-track plant such as *road rail vehicles* (RRVs), to operate at a maximum speed of 40 mph (64 km/h) on a line under possession.

Controlling access to the operational railway for tamper drivers

Rule Book - train drivers

- 58 Rule Book module G1 'General safety responsibilities and personal track safety for non-track workers' (April 2010) contains the rules that apply to train drivers (and other non-track workers) when going on the operational railway, including a line under possession.
- 59 In summary, the Rule Book permits train drivers to walk to trains (which could be in a work site) subject to certain conditions, such as observing rules on personal safety while walking and having local knowledge.
- 60 To be deemed to have local knowledge a driver must, as a minimum, know the maximum speed of the line, the normal direction of trains, locations where there is *limited clearance* and areas to which access is prohibited when trains are running.

- 61 When going on to the operational railway train drivers are not required by the Rule Book to hold any certification in personal track safety providing their regular assessments include track safety rules. However, RSSB guidance note GE/GN8511 'Guidance for railway undertakings on track safety' recommends that train drivers carry certification from their employer confirming their competence in personal track safety. Drivers of on-track machines, unlike some other train drivers, are required by Network Rail to hold 'Sentinel' PTS certification due to the nature of their work activities on Network Rail's infrastructure.

PTS Handbook

- 62 As a PTS card holder, tamper driver 1 would have been issued with a PTS handbook (RT3170) when he undertook his PTS refresher training in November 2010. The PTS handbook contains guidance on personal track safety that supplements the Rule Book.
- 63 Section 4.5, which deals with walking alone *on or near the line*, states that in the absence of an authorised walking route or proper pathway persons should walk in the cess or if necessary, in the four-foot. Also, it states that where possible, persons should face oncoming trains and try to stay in a position of safety.
- 64 There was no authorised walking route or pathway on the down side, north of Torworth level crossing. The cess on the down main line side is approximately 1.7 metres wide and continues around the down loop line. There is a points machine and cabling in the cess approximately 22 metres north of the level crossing (figure 5).

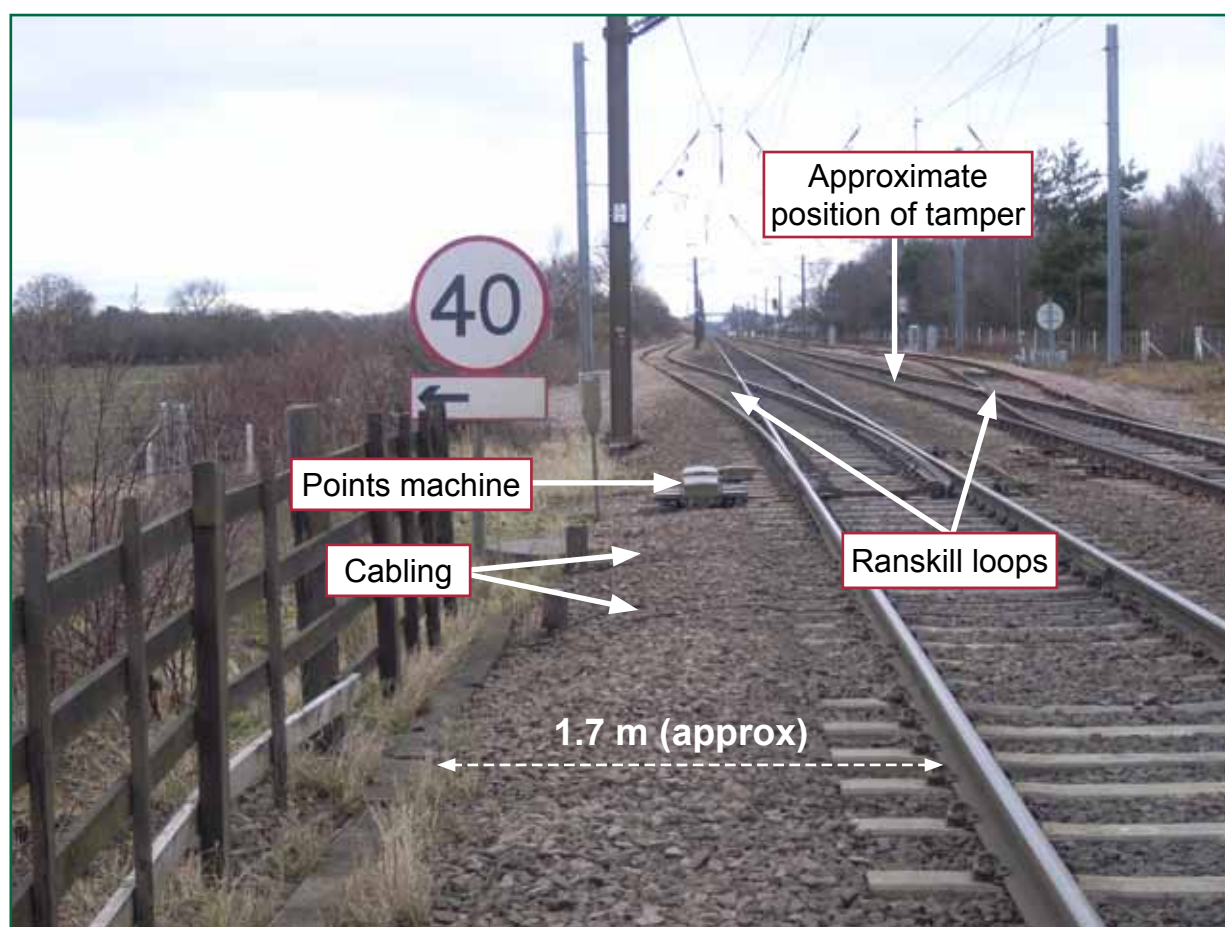


Figure 5: Photograph showing down main cess on north side of Torworth level crossing

Construction (Design and Management) Regulations 2007

- 65 The track renewal work between Torworth and Barnby Moor was part of a larger campaign of work and was defined as construction work, subject to the Construction (Design and Management) Regulations (CDM Regs). AmeyCOLAS was the principal contractor for the work and had duties under the CDM Regs relating to the control of access to the construction site. Principal contractors are required to take reasonable steps to prevent access by unauthorised persons to the construction site and to ensure that every worker carrying out the construction work is provided with a suitable site induction and further health and safety information to enable them to do the work without undue risk to health or safety.
- 66 The ameyCOLAS generic procedure on site access control at work sites imposed a requirement to sign in and out of a site. The procedure stated that contractors, visitors and new employees (to that location), were to be given a basic induction on health, safety and environmental issues for that particular location, which would include arrangements for first aid, fire and evacuation, before they started work. Additionally, new employees to the site and visitors were to be briefed on the works that they would do, including the hazards and control arrangements associated with the activities at that location. The generic procedure contained no information on accessing a worksite where the SAC was remote from the work site.

Control of health and safety on the track renewal construction site

- 67 A work package plan and an associated task briefing sheet⁷ had been prepared by ameyCOLAS for the track renewal work between Torworth and Barnby Moor. These documents were required by Network Rail's standard NR/L3/INI/CP0044 'Work Package Planning' for the planning and management of projects to which the CDM Regs apply. The purpose of the work package plan and task briefing is to ensure that sufficient information is provided to on-site staff to enable them to manage the risks of the work activity. The task briefing is used by the *engineering supervisor* (ES) to brief the COSSes on the site-specific hazards and control measures, and by COSSes to cascade the briefing to their work groups. (This is in addition to the *safe system of work* packs that are required by Network Rail's company standard NR/L2/OHS/019 for the safety of people working on or near the line (paragraph 72).) Safety briefings by a COSS are mandatory for work groups before they go on or near the line. However, the Rule Book does permit a PTS holder to go on to the railway alone without a COSS under certain conditions in the same way as a train driver (paragraph 60).
- 68 The ameyCOLAS work package plan was formally approved by Network Rail on 17 December 2010. It contained a list of hazards related to the activities on site and the control measures to be adopted. The hazard of staff accessing or egressing across a live running line with the risk of being hit by a passing train was identified. The control measure specified was for staff to be fully briefed by a COSS that the safe means of access to and from the up main line was by having both the up main and down main lines blocked.

⁷ A work package plan and an associated task briefing sheet are equivalent to a 'method statement' for carrying out the works. A method statement is broadly a document that combines information about significant risks from a risk assessment and the specification for the work.

- 69 The work package plan identified Torworth level crossing as an authorised access point to the up main line for workgroups. It also included a statement that staff who failed to sign in with site control (ie with the SAC) would be prohibited from site. There was, however, no indication of how this was to be achieved and it has been taken to mean that persons who did not sign in with the SAC had a prohibited (unauthorised) status.
- 70 The work package plan referred to a 'whiteboard meeting' as one of the means of conveying information about possession management to on-site staff. This was a meeting at which the health and safety arrangements for the forthcoming weekend's work were briefed out to key staff. The whiteboard meeting for the work on 8/9 January was held on Thursday, 6 January. It was led by the site supervisor and attended by safety critical work site personnel including the ES and the ameyCOLAS COSSes for the HOBC. The meeting may have been attended by plant managers with responsibility for tamper operation but evidence could not corroborate this. The meeting generally appears to have followed a disciplined procedure for communicating the relevant information. However, arrangements for the deployment of two tamper staff from System 4 were not discussed.
- 71 The safe system of work pack prepared by ameyCOLAS for the work of 8/9 January was planned and authorised in accordance with Network Rail's company standard referenced in paragraph 67. The pack comprised the prescribed documents, including the 'COSS record of arrangements and briefing form' which detailed the planned possession and line blockage arrangements. Following the accident this paperwork was checked and found to be complete. Each of the COSS forms had been correctly prepared and all those working under the relevant COSS had signed to confirm that they had received and understood the briefing.

Custom and practice of engineering train (locomotive) drivers accessing and leaving their trains in work sites

- 72 The actions of tamper driver 1 took place within a wider industry context. It was not custom and practice for train drivers to receive a safety briefing before accessing a work site on foot. Engineering train (locomotive) drivers, driving standards managers and other industry representatives spoken to during the investigation gave evidence that drivers would often walk directly to their trains in work sites as is permitted by the Rule Book. This meant that, in such cases, they did not sign in or out of work sites with a SAC. Also, at the time of the accident train drivers did not routinely receive a safety briefing when arriving in a work site on a train.
- 73 The arrangements for procuring locomotives to haul the HOBC are made directly between Network Rail and a freight train operating company. There is no contractual relationship between the freight operating company providing the haulage service and the principal contractor. At the time of the accident there was also no formal system to ensure that locomotive drivers were provided with contact information for the principal contractor's on-site staff so that locomotive drivers arriving at a work site on foot, for example when relieving another driver, could seek safety information about additional hazards introduced to the railway by the construction work, such as RRVs operating, or missing lids from cable troughs.

- 74 In order to drive on a particular line or section of line, a train driver is required to 'sign the route' which means that they are trained to drive on that route and therefore possess the local knowledge required by the Rule Book for entering and leaving an operational railway on foot. Their competence in personal track safety is assessed as part of the normal assessment process for a train driver, which includes the provisions of the Rule Book (paragraph 61). The training and assessment process of engineering train drivers did not normally include any additional requirements for accessing and working in sites subject to the CDM Regs on the need to obtain a prior safety briefing.

Identification of the immediate cause⁸

75 **Tamper driver 1 was walking in the path of train 1D53 as it approached on the down main line.**

- 76 Witnesses saw tamper driver 1 walk in the four-foot of the down main line from Torworth level crossing.
- 77 Footage from train 1D53's forward facing CCTV footage shows tamper driver 1's illuminated head torch in the four-foot of the down main line and records its movement towards the up main line.

Identification of causal factors⁹

The route taken by tamper driver 1

78 **Tamper driver 1 went on an operational railway and then walked in the four-foot in contravention of the Rule Book and his PTS training. This was a causal factor.**

- 79 Tamper driver 1 had not been trained to drive trains on the ECML and was unfamiliar with the location. He therefore did not have the local knowledge that the Rule Book requires of a train driver when going on to the operational railway. In particular he was unaware of the speed and normal direction of trains (paragraph 60).
- 80 Tamper driver 1 believed that the line he was walking on was already under possession. Despite being aware that the Rule Book permits trains under possession to approach from either direction at speeds of up to 40 mph (64 km/h) (paragraph 57) tamper driver 1 elected to walk in the four-foot of the down main line. Although the Rule Book and PTS handbook do not specifically prohibit walking in the four-foot they outline a hierarchy of options which direct people to use the safest route available. Both documents refer to the need to keep a look out for trains.

⁸ The condition, event or behaviour that directly resulted in the occurrence.

⁹ Any condition, event or behaviour that was necessary for the occurrence. Avoiding or eliminating any one of these factors would have prevented it happening.

81 The down main cress at 1.7 metres wide was wide enough to provide a safer walking route than the four-foot. However, tamper driver 1 chose to take a more direct route to the tamper. He stated that he considered it necessary (paragraph 63) to walk in the four-foot because of the points machine and cabling in the cress (figure 5) which, with only the light from his head torch, he assessed to be tripping hazards. In contrast, the tamper operator had earlier walked in the down main cress and down loop cress before crossing directly to the tamper (figure 2).

Actions of tamper driver 1

82 Witness evidence indicates that tamper driver 1 was regarded by his line managers as a safety conscious employee and was not considered a 'rule breaker'.

83 Tamper driver 1 assumed that the down main line was already under possession and therefore closed to normal traffic. This was due to a combination of the following factors:

- there were a number of visual 'cues' that suggested to him that the down main was already under possession (paragraph 85); and
- it is possible that his decision making performance was impaired (paragraphs 89 to 92).

Visual cues

84 Tamper driver 1 assumed that the down main line was under possession. This was a causal factor.

85 On arrival at Torworth level crossing tamper driver 1 saw a number of cues which collectively caused him to think that work had already started and that there was a possession on the down main line:

- The road leading to the down main side of the level crossing was closed at the junction with the A638 (figure 1).
- Vehicles, including an RRV, were parked on the road in front of the level crossing barriers. It looked to tamper driver 1 as if it was a parking area for access to the railway (figure 3).
- The rear locomotive of the HOBC train was standing on the level crossing (figure 3), the barriers were closed and the road lights were flashing.
- Whilst he was putting on his PPE, he saw two men go to vehicles parked on the roadway, having apparently walked from the railway; these are likely to have been the LXA and the RRV machine operator who had been standing on the road-side of the barriers.
- There was an open pedestrian access gate on the right-hand (south) side of the level crossing barriers with no-one standing at the gate, suggesting to him that the gate was being used as an access point to the railway and that there was no risk from using it (figure 4).
- The side lights of the HOBC were illuminated for the length of the train as would be the case when it was working.

86 In addition tamper driver 1 had arrived at the level crossing at least 30 minutes after his scheduled signing on time which further led him to believe that he had missed the start of work.

87 Tamper driver 1 had not seen the relevant WON and was not aware of the planned possession times.

Factors relating to decision making

88 Tamper driver 1 may have been unsettled by events leading up to his arrival at Torworth level crossing which could have affected his decision making. This is a possible factor.

89 The series of difficulties presented to tamper driver 1 (paragraphs 38 to 41) may have compounded to unsettle him and make a thinking error more likely. His perception that he was late for work and his desire to get to the tamper may also have influenced his choice of route. However, tamper driver 1 did not report being affected by these prior events or feeling hurried.

90 Tamper driver 1 had been on leave before the week leading up to the accident. He returned to work on 4 January and worked four consecutive day shifts, finishing on Friday 7 January, during which he had been training new recruits to System 4. His shift on Saturday 8 Jan was his first night shift.

91 The fatigue score derived from the HSE Fatigue and Risk Index (F&RI)¹⁰ for the time of the accident was 12.4 with a risk index of 0.53. These values are well below the thresholds for which fatigue may be considered a risk factor¹¹. However, the recent RAIB report following a runback incident at Shap in August 2010 (15/2011) concluded that the F&RI may under-predict the level of fatigue experienced on a first night shift.

92 Although fatigue cannot be discounted, it was unlikely to have been a factor on this occasion because:

- tamper driver 1 stated that he did not feel fatigued at the time;
- the accident occurred at the beginning of the shift, about one and a half hours after tamper driver 1 had awoken from two hours sleep; and
- the accident occurred at a time when tamper driver 1's circadian rhythm would not have been significantly disrupted.

¹⁰ The F&RI is a mathematical model designed to predict fatigue, which is widely used in the railway industry for shift planning. Fatigue scores of 0 to 100 represent the probability that a person is experiencing high levels of fatigue (defined as a value of 8 or 9 on the Karolinska Sleepiness Scale, a nine point scale ranged from one extremely alert to nine extremely sleepy, fighting sleep). A score of 50 is the probability that one in every two people would be fatigued to this extent. Risk scores represent the relative risk of a fatigue related event; a score of one represents the average risk on a two-day, two-night, four-off schedule of 12-hour shifts starting at 08:00 hrs or 20:00 hrs, and a score of two represents a doubling of risk.

¹¹ The Health and Safety Laboratory report RSU/08/03 (2008), 'The Evaluation of the UK Rail Sector Initial Fatigue and Risk Index Thresholds', proposes day and night shift thresholds for scores predicted by the F&RI. The night shift thresholds are 40 to 45 for fatigue and 1.6 for risk. The report suggests that shift patterns producing scores below these thresholds represent good practice.

Information for going on to a live railway

93 **Tamper driver 1 did not have the information he needed to safely access his tamper. This is a causal factor and occurred because:**

- he missed an opportunity to obtain safety information because he did not report to the SAC (paragraphs 95 to 99);
- he had not received a verbal safety briefing (paragraphs 100 to 106); and
- his employer had not provided him with written information to enable him to make direct contact with anyone who could provide a safety briefing (paragraphs 108 to 110).

Site access control

94 **Tamper driver 1 missed an opportunity to obtain safety information because he did not report to the SAC.**

- 95 It is possible, had tamper driver 1 attended the SAC's cabin, that he might have been provided with information to avert the accident. It was not the role of the SAC to provide a safety briefing. However, the SAC stated that he would usually ask a person if they knew where they were going and if not, would offer to contact the ES or site supervisor on their behalf. Also, tamper driver 1 could have made telephone contact with a member of site staff listed on the whiteboard or arrangements made to put tamper driver 1 in touch with the tamper COSS.
- 96 Although tamper driver 1 had tried to find the SAC cabin to comply with his booking on instructions, there was no practical imperative to attend there. Several persons spoken to during the investigation expressed the view that tamper crews did not receive anything from the SAC which was necessary for them to do their work. This is demonstrated by the fact that when they were tamping without the HOBC (for example, during 'follow-up' tamping) there would not generally be a SAC provided. Also tamper crews did not need to report to the SAC to book on for work because they booked on for work by telephoning Colas Control.
- 97 It was not routine custom and practice for tamper staff to sign in with a SAC. The tamper operator had also not signed in with the SAC and tamper driver 2 reported that, apart from one occasion on which he had reported to a SAC but been unable to book on because of a computer issue, he had never signed in with a SAC. This was because of the way in which tamper crews operated. A driver bringing a tamper into a work site from a stabling point would not normally leave the tamper to sign in with a SAC, which (as in this case) could be several kilometres from the work site. Similarly, a tamper driver arriving at a work site on foot to relieve another driver and who would be driving the tamper back to the stabling point at the end of the shift, would not sign in with the SAC because this would mean having to return to the SAC from the (potentially very distant) stabling point to sign out. In these circumstances it was the custom and practice of drivers and operators to rely on the provisions of the Rule Book which permitted them to go on to the operational railway on foot.

- 98 AmeyCOLAS had not actively enforced the requirement in their procedure for tamper staff to sign in with the SAC although it was known by ameyCOLAS staff, who managed safety on the work site, that this was happening. This was because of a perception that the Rule Book undermined their authority to do so. A member of senior work site staff interviewed during the investigation expressed frustration about his inability to control access to the work site by tamper and engineering train drivers because drivers were permitted by the Rule Book to access the work site to walk to trains.
- 99 A number of staff in System 3 had made an assumption that tamper driver 1 would be provided with safety information, including information about which lines were open to traffic, at the SAC cabin. The SAC reported that he would not give information on which lines were open or closed to normal traffic because he could not be certain that the information he had was accurate and that the possession status would not change before the person got to site.

COSS Briefing

100 Tamper driver 1 normally received his COSS briefing on the tamper.

- 101 Tamper driver 1's experience was that he would normally receive his COSS briefing when on the tamper. This was because, as a driver, he would mostly drive the tamper from the stabling point. In many cases the COSS would either join the tamper at the stabling point or meet the tamper in the work site. This was also the experience of the tamper operator who stated that in System 4 the tamper COSSes were the *tamper technicians* who would join the tamper in the work site and deliver the briefing on the tamper as a matter of course. Tamper driver 1 had previously walked to a tamper in a work site when working in System 4 but on those occasions the COSS had been stationed at the access point to the railway to meet on-coming tamper crew.

Rostering of COSS and tamper crew

102 There was no formal arrangement for tamper driver 1 (or the tamper operator) to receive a safety briefing from a COSS prior to starting work.

- 103 Network Rail company standard NR/L2/OHS/019 'Safety of people working on or near the line' gives responsibility for protecting the safety of persons in a workgroup to the COSS. The responsibility includes the safety of the group while walking to and from their place of work in the work site.
- 104 The tamper COSS had been rostered to commence work at 00:01 hrs on Sunday 9 January, at least half an hour after the booking on time for tamper crew (paragraph 32). This was because the rostering of the tamper COSS and the tamper crew was done by different people. The tamper was not timetabled to commence work until 02:00 hrs and a start time of 00:01 hrs would allow sufficient time for the COSS to be briefed by the ES and, in turn, for the COSS to brief his workgroup.
- 105 The tamper COSS had not attended the 'whiteboard meeting' because he worked for a sub-contractor to ameyCOLAS and sub-contractors did not attend these meetings. He had received the generic safe system of work pack the day before but did not know before his arrival for work at the SAC cabin that he was to be the COSS for the tamper. He also did not know that two members of his workgroup were from System 4 and were joining the tamper in the work site.

106 The tamper COSS had booked on early for his shift at 23:14 hrs but at the time of the accident he had not been given his safety briefing by the ES and was not on the work site.

Information provided to tamper driver 1 by ameyCOLAS

107 Tamper driver 1 had not been provided with written information to enable him to make direct contact with anyone who could provide a safety briefing.

108 The only information tamper driver 1 had in relation to his work for System 3 on 8/9 January was contained in the email (paragraph 32) from System 3. In particular, he did not have contact details for on-site staff in System 3, such as the ES or the tamper COSS, whom he could ask for a safety briefing.

109 When working in System 4 tamper driver 1 received what was known as a 'race card' for each job; this is a document giving the names and contact details of key staff such as the site access controller, engineering supervisor and site supervisor who will be working on the site.

110 System 3 provided similar information to their own staff. However, it was not their practice to provide it to staff from other systems when working in System 3 but relied on them obtaining these contact details when they went to the SAC cabin.

Identification of underlying factors¹²

Custom and practice of engineering train drivers and on-track machine crews

111 Engineering train drivers and on-track machine crews often access work sites without having received a safety briefing and this is not prevented by the Rule Book.

112 Evidence from drivers of engineering trains and senior staff from freight operating companies supports the conclusion that train drivers did not routinely ask for, or receive a safety briefing when entering a work site either on a train or on foot.

113 Similarly, when crews of on-track machines travelled into a worksite without a COSS on board, safety briefings were provided when a COSS joined the machine. Crew members walking to their machines in a work site, did not routinely contact the COSS for a safety briefing before going on to the railway.

Resourcing

114 AmeyCOLAS did not have sufficient trained on-track machines staff available in System 3 to avoid a local shortage of staff and did not have a system in place for identifying and providing the information a driver or operator of an on-track machine from another system required for working out of area.

¹² Any factors associated with the overall management systems, organisational arrangements or the regulatory structure.

- 115 A number of witnesses stated that there was a shortage of tamper drivers and operators in all three track renewal systems during 2010. In August 2010 ameyCOLAS had identified that it needed to increase the number of on-track machines staff to meet its current and future contractual obligations. Although recruitment of around 20 staff had subsequently taken place (taking the total number of on-track machines staff to around 50), at the time of the accident many of the new staff had not been fully trained and were not available to be rostered for work.
- 116 In the interim, when systems were unable to fulfil the need for on-track machines staff from their own resources, it was usual to either move staff from other systems to provide temporary cover, or hire in machines and staff from an external supplier.
- 117 In January 2011 System 3 was experiencing a particular staffing shortage. The on-track machines supervisor had recently transferred to another system and System 3 was operating two tampers most weekends with only three or four tamper operators. This made it very difficult to cover absences. As a result, tamper driver 1 and the tamper operator were rostered to work overtime shifts in System 3 for four out of five weekends, starting with 8 January.
- 118 AmeyCOLAS had not assessed what information a person working out of their own system (or in unfamiliar locations within their own system) should be provided with or what additional support they would need.

Working arrangements for tamper staff

119 There was a level of informality and lack of co-ordination in the ameyCOLAS organisational arrangements for the work of tamper staff.

- 120 The tamper staff from System 4 were not informed of the late change of tamper driver and were not given the new driver's contact details. Neither tamper driver 1 nor his line manager, was officially informed of the change to tamper driver 1's duties from being a driver to an operator, or that tamper driver 1's reporting location and time had been changed back to the original instruction. The COSS did not know prior to his arrival for work that he was the COSS for the tamper and did not know who was to be in his workgroup, or where he was to meet them.
- 121 There was also a lack of co-ordination in the shift start times of the tamper crew and tamper COSS to facilitate a COSS briefing before they accessed the work site and a lack of clear understanding on where tamper staff accessing the work site on foot were to receive their COSS briefing.

Factors affecting the severity of consequences

Use of the train horn

- 122 The warning given by the driver of train 1D53 by the sounding of the train horn probably saved tamper driver 1 from fatal injury; this is supported by the train's CCTV recording which shows tamper driver 1 taking swift evasive action in the two seconds before the train passed him.

- 123 Rule Book module TW1 'Preparation and movement of trains – general', contains requirements for train drivers on the use of the warning horn. The horn must be sounded in defined situations, which include to warn anyone who is on or near the line on which the train is travelling, and at any other time the driver considers it necessary.
- 124 The driver of train 1D53 had not seen tamper driver 1 when he sounded the horn. However, he considered it necessary to use the train horn because his assessment of potential risk to track workers was based on his own experience as a former engineering train driver. Another driver may or may not have sounded the horn in the same circumstances because it is not mandatory.

Observations¹³

Site access control

- 125 The use of a SAC for controlling the access to and egress from work sites by crews of on-track machines was frequently circumvented because of the inconvenience caused by persons having to travel, sometimes many miles out of their way, to attend. Also, there was no practical imperative to attend because the information provided to them at the SAC cabin was not regarded as necessary for their work and there was no perceived sanction applied if they did not attend. In contrast, track workers routinely book into a work site with a SAC. The SAC is also where track workers tend to meet other members of their workgroup and their COSS.

Implications of the CDM Regs on the practices of train drivers

- 126 Freight operating companies spoken to during the investigation reported that prior to the accident, their industry had not taken concerted action to address the implications of the CDM Regs relating to the control of site access, on the practices of train drivers within engineering possessions and work sites. This may be due to a perception that engineering train (locomotive) drivers are not party to the construction work because there is no contractual relationship between the freight operating companies providing the haulage and the contractor managing the site.
- 127 Information on how Network Rail applies the CDM Regs to railway work sites is contained in Network Rail company standard NR/L2/INI/CP0047 'Application of the Construction (Design and Management) Regulations to Network Rail construction works'. This states that the principal contractor holds the primary responsibility for controlling access to the work site. The standard also states that where Network Rail engages suppliers as part of its support to the delivery of a project, there should be direct communication between the principal contractor and the supplier's nominated representative. While this would appear to apply to principal contractors and haulage contractors engaged by Network Rail, in practice there was no direct communication between the principal contractor and haulage companies providing locomotives and drivers for engineering work in work sites.

¹³ An element discovered as part of the investigation that did not have a direct or indirect effect on the outcome of the accident but does deserve scrutiny.

Previous occurrences of a similar character

- 128 In July 2006 there was a fatal accident to an engineering train driver near Deal, Kent, when, while on the track checking the train's brakes, the driver was electrocuted by the live *conductor rail*.
- 129 Although not causal to the accident, the RAIB's report ('Fatal accident involving a train driver, Deal, 29 July 2006' 14/2007) observed that the driver had not been given a safety briefing. This was because the driver had chosen to go straight to his train, which was standing three miles from the main access point where safety briefings were being conducted.
- 130 It was further noted that 'the physical separation of engineering trains from areas of main work activity is a common feature of possessions. For this reason it is often the case that drivers will not access work sites by the designated main access points and may therefore bypass any safety briefing process'.
- 131 The report made a recommendation which is relevant to this investigation (see paragraph 146).

Summary of conclusions

Immediate cause

132 The immediate cause of the accident was that tamper driver 1 was walking in the path of train 1D53 as it approached on the down main line (**paragraph 75**).

Causal factors

133 The causal factors were:

- a. Tamper driver 1 went on an operational railway and then walked in the four-foot in contravention of the Rule Book and his PTS training (**paragraph 78, Recommendation 1**).
- b. Tamper driver 1 assumed that the down main line was under possession (**paragraph 84, Recommendation 1**).
- c. Tamper driver 1 may have been unsettled by events leading up to his arrival at Torworth level crossing which could have affected his decision making. This is a possible causal factor (**paragraph 88**).
- d. Tamper driver 1 did not have the information he needed to safely access his tamper (**paragraph 93, Recommendation 1**).

Underlying factors

134 The following underlying factors were identified:

- a. Engineering train drivers and on-track machines crews often access work sites on foot without having received a safety briefing and this is not prevented by the Rule Book (**paragraph 111, Recommendation 1**).
- b. AmeyCOLAS did not have sufficient trained on-track machines staff available in System 3 to avoid a local shortage of staff and did not have a system in place for identifying and providing the information a driver or operator of an on-track machine from another system required for working out of area (**paragraph 114, Recommendation 1**).
- c. There was a level of informality and lack of co-ordination in the ameyCOLAS organisational arrangements for the work of tamper staff (**paragraph 119, Recommendation 1**).

Factors affecting the severity of consequences

135 A factor that mitigated the consequences of the event was the train driver's discretionary use of the train horn.

Additional observations

136 Although not directly linked to the accident on 8 January 2011, the RAIB observes that:

- a. For train drivers and on-track machines staff, reporting to a SAC was seen as both impracticable and irrelevant to their work activity (**paragraph 125, Recommendation 1**).
- b. The safety provisions of the Rule Book are not always sufficient to protect those entering a work site (**paragraph 126, Recommendation 1**).

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

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

- 137 AmeyCOLAS is actively enforcing the instruction to its staff to sign in with a SAC and will take disciplinary action for non-compliance. This requirement has been briefed out to all staff during special safety events which were held following the accident (**paragraph 98**).
- 138 AmeyCOLAS reports it has provided a 'script' for its SACs to ensure that they deliver necessary information to persons reporting to sign in. This is designed to address misunderstandings as to the role and function of the SAC (**paragraph 99**). The script details what has to be said by the SAC on a list of topics which include general safety arrangements, exclusion zones around plant movements and hazardous activities, and welfare, first aid and emergency arrangements. For example, to COSSes, the SAC is required to say 'you must sign in with the Engineering Supervisor' and for others, 'you must not go on or near the line until you have signed in with a COSS'.
- 139 Since the accident crews of ameyCOLAS on-track machines have reportedly been provided with contact details for key on-site staff as part of their 'work orders' which are sent out with the weekly roster. These enable staff accessing a work site on foot to make contact with either the ES or their COSS to obtain a safety briefing prior to going on to the track (**paragraph 118**).
- 140 Network Rail has agreed and documented a process for train drivers, ground crew and on-track machine operators entering work sites to receive a safety briefing. The agreement has been reached with freight operating companies who provide haulage for Network Rail's engineering trains, and with track renewals contractors who operate or work with on-track machines. The process, which takes the form of a flowchart, was issued on 27 June 2011 by means of an email from Network Rail to its contractors. Recipients were requested to distribute the flowchart within their organisations (**paragraph 126**).
- 141 The process is for train drivers, ground crew and on-track machine operators entering a worksite via a SAC to receive their safety briefing there. If entering a worksite via a remote location, persons will be provided in advance with the contact details for the ES (or a nominated briefer) so that they can seek a safety briefing before accessing the track. Train crews entering a work site on a train are now provided with a safety briefing by the ES (or a nominated briefer) at the entrance to the work site.
- 142 The process also provides guidance on what action an individual or their company should take in the event of them not receiving a sufficient briefing. For example, if a person does not have the contact details of the ES, Network Rail's Asset Management Control Centre holds key contact details for each worksite and can provide these on request to train crews' control centres.
- 143 Individual freight operating companies report that they have issued operating notices or instructions to their own employees to advise them of the process and the actions they are required to take to obtain a safety briefing.

- 144 Network Rail reports it is monitoring the operation of the process to reinforce compliance. It has also set up a mechanism for contractors to report instances of non-compliance with the process by train locomotive drivers so that Network Rail can take these up with the haulier through contractual means.
- 145 In the light of these actions addressing factors and observations identified in the report, the RAIB has decided not to issue further recommendations in these areas.

Previous RAIB recommendations relevant to this investigation

- 146 The RAIB has previously made a recommendation to Network Rail and freight operating companies relating to the provision of a safety briefing for train crew following the fatal accident to a train driver at Deal on 29 July 2006 (Recommendation 7, RAIB report 14/2007). The RAIB recommended that Network Rail and freight operators should jointly establish a regime for ensuring that all train crew working to and from engineering possessions are given a suitable safety briefing.
- 147 In December 2007 Network Rail reported to the ORR that a regime had been established between the freight operators and Network Rail's major contractors to provide train crews with a suitable safety briefing. The regime's arrangements were contained in a code of practice on site briefing for train crew that had been issued by the Infrastructure Safety Liaison Group (ISLG) in December 2006. The ORR also received responses from two freight operating companies on actions proposed to implement the recommendation.
- 148 The ISLG code of practice instructed train crew and other freight operations staff entering possessions or work sites on foot to report to the SAC where they would be given a briefing which, as a minimum, would include the route to be taken to access the train.
- 149 In November 2009 the ORR confirmed to the RAIB that it had accepted the responses from duty holders to whom the recommendation was addressed and would not be pursuing the recommendation further. The recommendation was therefore closed.
- 150 The investigation has established that the code of practice was circulated to the (then) members of the ISLG, including Amey but not Colas Rail. It was not made publicly available. Some representatives of freight operating companies spoken to during the investigation were not aware that the code of practice existed and had no recollection of it being implemented.
- 151 The code of practice had not been successful, partly because drivers deferred to the Rule Book which did not require them to obtain a safety briefing before going on to the railway, but more importantly because no mechanism had been put in place to ensure that a safety briefing was provided.

Recommendations

152 The following recommendation is made¹⁴:

- 1 *The purpose of Recommendation 1 is to bring about a sustainable change to how engineering train drivers, ground staff and on-track machine crews access work sites by implementing measures to support industry processes for providing them with a safety briefing.*

Network Rail and its contractors who operate trains in engineering possessions should jointly review the means by which engineering train drivers and on-track machine crews (and associated ground staff) can best be provided with sufficient information relating to both railway and construction risk before walking to, or entering, a work site.

This review should address:

- the validation, and incorporation in a suitable safety standard, of arrangements agreed between Network Rail and its haulage suppliers and contractors operating on-track machines, relating to the provision of a safety briefing before entering a work site;
- the preparation of explanatory briefing material and additional training on the procedures to be followed to obtain safety briefings;
- explicit consideration of the risks associated with access to site, including safety briefing issues, at an appropriate stage in the planning process for engineering activities; and
- the need for clarification or amendment of the relevant rules and procedures relating to walking to trains and on-track machines when these are in possessions and work sites.

The outcome of this review, and any appropriate additional measures identified, should then be implemented by Network Rail and a procedure put in place to monitor their effectiveness (paragraphs 133a, 133b, 133d, 134a to 134c, 136a and 136b).

¹⁴ Those identified in the recommendation, have a general and ongoing obligation to comply with health and safety legislation and need to take the recommendation 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, this recommendation is addressed to the Office of Rail Regulation 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.raib.gov.uk.

Appendices

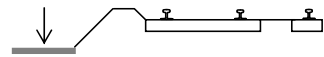
Appendix A - Glossary of abbreviations and acronyms

| | |
|------|---|
| CCTV | Closed Circuit Television |
| CDM | Construction (Design and Management) Regulations 2007 |
| COSS | Controller Of Site Safety |
| ECML | East Coast Main Line |
| ES | Engineering Supervisor |
| F&RI | Fatigue and Risk Index |
| HOBC | High Output Ballast Cleaner |
| ISLG | Infrastructure Safety Liaison Group |
| LXA | Level crossing attendant |
| ORR | Office of Rail Regulation |
| PPE | Personal Protective Equipment |
| PTS | Personal Track Safety |
| RAIB | Rail Accident Investigation Branch |
| RRV | Road Rail Vehicle |
| SAC | Site Access Controller |
| WON | Weekly Operating Notice |

Appendix B - Glossary of terms

All definitions marked with an asterisk, thus (*), have been taken from Ellis's British Railway Engineering Encyclopaedia © Iain Ellis. www.iainellis.com.

| | |
|-----------------------------|--|
| Access point | A designated point along a railway at which entry to railway property may be made safely.* |
| Ballast cleaning | Generally, a process using any machine that excavates the ballast from under the track, discards the dirt, undersize and oversize pieces, and then returns the good ballast to the track.* |
| Cess | According to the Rule Book, the space alongside the line or lines. It can provide space for a cess path but is not always a position of safety.* |
| Conductor | Where the train driver is unfamiliar with either the route or the controls, a driver who is familiar with such things accompanies the train, to ensure that both are correctly driven.* |
| Conductor rail | An additional rail used to convey and enable collection of electrical traction current at track level.* |
| Controller of site safety | A person certified as competent and appointed to provide a safe system of work to enable activities to be carried out by a group of persons on Network Rail railway infrastructure in accordance with the requirements of GE/RT8000 Rule Book. |
| Down | The track on which trains run away from London. |
| Engineering supervisor | The person nominated to manage the safe execution of works within an engineering worksite. This includes authorising movements of trains in and out of the work site and managing access to the site by controllers of site safety (COSS).* |
| Engineering train | A train used in connection with engineering works. |
| Four-foot | The area between the rails on which trains on the national network run. |
| High output ballast cleaner | A ballast cleaner designed for high productivity and generally self contained within a single line. |
| Limited clearance | An area where there is insufficient space to stand safely during the passage of trains on the adjacent line. These areas are normally marked by a red and white chequered sign.* |
| Line blockage | A section of line that is blocked, according to defined rules, so that engineering work affecting the safety of the line can be carried out on the railway. |
| Loop | A short length of track connected to another line at both ends. |



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| On or near the line | <p>As defined in the Rule Book Handbook 1 (GE/RT8000/HB1): “You are on or near the line if you are:</p> <ul style="list-style-type: none"> • within 3 metres (10 feet) of a line and there is no permanent fence or structure between you and the line; or • on the line itself. <p>You are not on or near the line if you are on a station platform unless you are carrying out engineering or technical work within 1.25 metres (4 feet) of the platform edge.”</p> |
| On-track machine | <p>Any piece of specialist railway plant which moves only on the rails and is normally self propelled, eg ballast cleaners, dynamic track stabilisers, pneumatic ballast injection machines stoneblowers, rail cranes, regulators, tamping and lining machines (tamperers) and track relaying machines.</p> |
| On-train data recorder | <p>Equipment fitted on-board a traction unit which records train speed and the status of various controls and systems relating to the unit’s operation.</p> |
| Permissible speed | <p>The maximum speed at which conventional trains may safely negotiate a section of track, as published in the Sectional Appendix (SA).*</p> |
| Personal track safety | <p>An awareness of the rules and practices relating to the safety of staff when on or about the railway track, which is proven by an examination following training, repeated every two years.</p> |
| Position of safety | <p>A place far enough from the track to allow a person to safely avoid being struck by passing trains. For example, on Network Rail infrastructure this is 1.25 m (4 feet) where trains approach at speeds of up to and including 100 mph, 2 m (6 feet 6 inches) at speeds of up to 125 mph, and 2.75 m (9 feet) at speeds of over 125 mph.*</p> |
| Possession | <p>A period of time during which one or more lines are blocked to trains to permit work to be safely carried out on or near the line. A possession taken for an agreed period without the facility to run trains in the area during that period until such time as the holder of the possession decides to relinquish it. Currently called a T3 possession.*</p> |
| Protection controller | <p>A nominated competent person whose duties are to arrange and manage the possession arrangements where two or more controllers of site safety (COSS) are working under the same protection.*</p> |
| Road rail vehicle | <p>Any vehicle adapted to operate equally well on road and rail.*</p> |

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| Safe system of work | An arrangement of precautions which ensure that workers are exposed to least possible risk. This can include COSS briefings, provision of special equipment, possessions and isolations. The latter arrangements are the responsibility of a controller of site safety (COSS) or protection controller (PC).* |
| Site supervisor | Person designated by the contractor to manage the delivery of the planned work and be responsible for the site management of health, safety and environmental matters. |
| Stabled | Leaving a vehicle in a safe condition unattended. |
| Tamper | An on-track machine that can generally lift and slew the track and simultaneously compact the ballast under the sleepers. A tamper is defined as a train. |
| Tamper driver | A tamper driver means a person competent to drive and operate a tamper both inside and outside of a possession. |
| Tamper operator | A person competent to operate a tamper inside a possession but not competent to drive a tamper outside of a possession. |
| Tamper technician | A person who ensures that the track is tamped to achieve required track quality parameters. |
| Up | The track on which trains run towards London. |
| Weekly operating notice | A document published by Network Rail on a region by region basis, providing information about engineering work, speed restrictions, alterations to the network and other relevant information to train drivers.* |
| Work site | The area within a possession that is managed by an engineering supervisor (ES). A work site is delimited by marker boards when engineering trains are present. It may contain many work groups, each controlled by a controller of site safety (COSS).* |

Appendix C - Key standards current at the time

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| Report RSU/08/03 (2008) 'The evaluation of the UK rail sector initial Fatigue and Risk Index thresholds' | Health and Safety Laboratory |
| Code of practice 'Site Briefing for Train Crew', COP/001, Issue 1, Dec 2006 | Infrastructure Safety Liaison Group |
| Personal Track Safety Handbook, RT3170 Version 1.1, Issue 7, Jan 2009 | Network Rail |
| NR/L3/INI/CP0044 'Work Package Planning', Issue 4, 5 June 2010 | Network Rail |
| NR/L2/INI/CP0047 'Application of the Construction (Design and Management) Regulations to Network Rail Construction Works', Issue 4, 6 March 2010 | Network Rail |
| NR/L2/OHS/019 'Safety of People Working On or Near the Line', Issue 8, 4 September 2010 | Network Rail |
| GE/RT8000/G1 Rule Book, Issue 4, April 2010 | Rail Safety & Standards Board |
| GE/RT8000/TW1, 'Preparation and movement of trains – general', Issue 8, October 2008 | Rail Safety & Standards Board |
| Guidance note GE/GN8511 'Guidance for railway undertakings on track safety', Issue 2, December 2009 | Rail Safety & Standards Board |

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