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Mr Andrew Hall  
Deputy Chief Inspector of Rail Accidents  
Cullen House  
Berkshire Copse Rd  
Aldershot  
Hampshire GU11 2HP

Dear Andrew,

**RAIB Report: Collision between a stone-blower and ballast regulator near Arley, Warwickshire, 10 August 2012**

I write to provide an update<sup>1</sup> on the action taken in respect of recommendations 1 and 2 addressed to ORR in the above report, published on 8 August 2013.

The annex to this letter provides details of the action taken regarding these recommendations, the status of which is now **'Implemented'**. We do not propose to take any further action in respect of the recommendations, unless we become aware that any of the information provided becomes inaccurate, in which case I will write to you again.

We will publish this response on the ORR website on 11 December 2017.

Yours sincerely,

Oliver Stewart

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<sup>1</sup> In accordance with Regulation 12(2)(b) of the Railways (Accident Investigation and Reporting) Regulations 2005

## Recommendation 1

*The purpose of this recommendation is to point Network Rail to areas identified in this investigation for potential inclusion in its planned review of the management of engineering possessions and worksites and to encourage a fundamental assessment of the fitness for purpose of current arrangements. The recommendation is intended to achieve an improvement in the means for controlling the risk of collision between trains (and with plant) when travelling to and from their sites of work, and to gain assurance that arrangements for controlling the risks of collision are effectively planned and followed.*

Network Rail should:

- a. Review potential systems of work, and/or technical solutions, for reducing the risk of collision between trains when travelling to and from their sites of work. This review should include consideration of the following options:
  - i. greater use of the signalling system during engineering work for controlling the movement of trains;
  - ii. means for detecting the position of trains when normal signalling is suspended; and
  - iii. planning arrangements for engineering work that address the issue of simultaneous movements of trains travelling to and from their sites of work and which minimise the potential for such moves to bring trains in close proximity.
- b. Review (in consultation with RSSB as appropriate) permitted train speeds applying to movements in sections of line that are closed to normal traffic for engineering work, taking account of human factors affecting a driver's ability to judge the distance they can see to be clear, the stopping distance that can be achieved by their train's braking performance, the limitations of headlight illumination in darkness and a driver's route knowledge.
- c. Seek an understanding of the reasons for, and scale of, local unauthorised deviations from possession plans, the effectiveness of the planning process to avoid such changes, as well as the suitability of procedures and managerial arrangements for identifying, and subsequently reviewing, unauthorised changes.

The measures identified to further reduce the risk of collisions during engineering work should then be implemented in accordance with a time bound programme.

## ORR decision

1. Network Rail has addressed the points made in the recommendation as part of a wider review of engineering possessions and worksites in line with the key points identified by RAIB in the recommendation.
2. After reviewing the information provided ORR has concluded that, in accordance with the Railways (Accident Investigation and Reporting) Regulations 2005, Network Rail has:
  - taken the recommendation into consideration; and

- has taken action to implement it

**Status: Implemented.**

### Previously reported to RAIB

3. On 8 January 2014 we reported that Network Rail, in its initial response to ORR on 28 November 2013, advised that:

*Network Rail will discharge Recommendation 1 through its Track Worker Safety Group (TWSG), specifically under POD 6 - Reviewing Engineering Worksites, and will consider this recommendation within its scope of an industry review.*

*As recommendation 1 is made to 'point Network Rail to areas identified in this investigation for potential inclusion in its planned review' – the TWSG will review the specific elements of Recommendation 1, a) i-iii to c), and an action plan will be developed detailing the subsequent actions required, owners and timescales.*

*Following the review, additional action may be necessary involving other industry partners.*

4. We stated that we would update RAIB when we had details of the resulting action plan.

### Update

5. Following timescale extensions, Network Rail provided a closure statement on 11 September 2017 detailing in turn how they addressed each of the five key points in the recommendation:

*Network Rail should:*

*a. Review potential systems of work, and/or technical solutions, for reducing the risk of collision between trains when travelling to and from their sites of work. This review should include consideration of the following options:*

*i. greater use of the signalling system during engineering work for controlling the movement of trains (paragraph 163);*

*Closure narrative: - Greater use of the signalling system is being achieved by a variety of means. These include shorter possessions and worksites, which is now mandated following the comprehensive review and update of business process NR/L2/OPS/202 "Principles, Timescales and Functional Responsibilities for Engineering Work, Access and Heavy Resource Planning. Additionally, this business process document also requires movements to be planned based on a maximum speed of 5mph in worksites and 15mph in*

*PICOP controlled areas. This is driving down the size of possessions with the benefit that trains are traversing greater distances under normal signalling.*

*Furthermore, Network Rail has implemented a Flexible Train Arrival Point process. This system not only allows the possession to be taken around a train, it actually allows the possession to be taken with the train at the site of work, removing transit movements.*

*Rule Book T3 was also altered in December 2016 to allow possessions to be given up around multiple trains. Previously, possessions could only be given up around a single train. This procedure is limited to TCB areas controlled by track circuits. However, the adoption of this procedure, dramatically reduces the distances multiple trains would otherwise have travelled to exit the possession without full signal protection.*

*Rule Book module TW1 section 40 – Train requiring to stop in section already permitted engineering trains to work on a running line which is not under possession. Rule Book Module TW7 issue 6, clause 1.1 lists the ten occasions when a signaller may authorise the driver to make wrong direction movements for which a signal is not provided. To allow Network Rail to use of an On-Track Machine (OTM) such as an MMT outside of a T3 possession there is a requirement to add an OTM returning to the start mileage of its site of work when working in section; to the occasions when a wrong direction movement can be authorised without the authority of a signal. This procedure is currently available through a national variation pending standards change. Rule Book module TW7 is being updated accordingly with effect from December 2017.*

*The examples above demonstrate that Network Rail has not only reviewed how to optimise greater use of the signalling system during engineering, but has also championed with industry engagement changes to standards to enable this to happen.*

*ii. means for detecting the position of trains when normal signalling is suspended; and*

*Closure narrative: - The opportunities to use the signalling system to detect the position of trains within possessions are extremely limited, almost to the point where it is non-existent. The majority of the time multiple vehicles occupy the same track circuit. In axle counter areas plant may be on-tracked without being detected by an axle counter. For this reason the current signalling system was discounted as being an effective means of detecting the position of trains in a possession.*

*Network Rail in partnership with Colas, did review and explore opportunities to fit collision avoidance equipment in to driving cabs. A system was trialled on the Dean Forest railway, which showed promise. However, this equipment was battery operated and offered no fail-safe facility if the battery failed. In failure mode the driver could be led to believe the line immediately ahead is clear, when there is actually an obstruction. This was considered to introduce*

*new risks. Furthermore, the cost of hard wiring the equipment in to every driving cab including each item of on-track plant was considered to be grossly disproportional to the risk. Part of this consideration included the numerous other actions the industry has implemented to reduce collision risk. Network Rail would reconsider the fitment of collision avoidance equipment if a cost effective system became available.*

*iii. planning arrangements for engineering work that address the issue of simultaneous movements of trains travelling to and from their sites of work and which minimise the potential for such moves to bring trains in close proximity (paragraphs 162a and 163).*

*Closure narrative: - Simultaneous movements of engineering trains are not permitted within the rules and regulations. However, during the review it was identified that this requirement was not clear in the PICOP handbook (HB11) for trains leaving the worksite and moving towards the Possession Limit Board (PLB). The Handbook was quite specific in that it defined the conditions that must be in place before a second train is allowed to proceed from the PLB towards a Worksite Marker Board (WSMB). However, there were no conditions stipulated before a second train was allowed to proceed from a WSMB towards the PLB. This gap was closed at the same time the rules were changed in December 2016 to allow possessions to be given up around multiple trains. The rules change allowing possessions to be given up around multiple trains prevents trains coming within close proximity, being separated by one or more signal sections.*

*Furthermore; NR/L2/OPS/202 Network Rail's business process "Principles, Timescales and Functional Responsibilities for Engineering Work, Access and Heavy Resource Planning has comprehensively been reviewed and updated in conjunction with Network Rail level 3 work instruction NR/L3/OPS/303, Possession of the Line for Engineering Work Delivery Requirements. The requirement for the length of possessions to be kept as short as possible has been added to this business process. Along with requirement to plan movements based on a maximum speed of 5mph in worksites and 15mph in PICOP controlled areas.*

*b. Review (in consultation with RSSB as appropriate) permitted train speeds applying to movements in sections of line that are closed to normal traffic for engineering work, taking account of human factors affecting a driver's ability to judge the distance they can see to be clear, the stopping distance that can be achieved by their train's braking performance, the limitations of headlight illumination in darkness and a driver's route knowledge (paragraphs 162a and 164a).*

*Closure narrative: - The Rule Book has been amended as has the training materials so that the instructions given to a driver are to proceed at caution. The maximum speed in a possession has been reduced from 40mph to 25mph in the Rule Book from December 2017. However, these speeds have*

already been implemented through Codes of Practice (CoP). The Rule Book is simply catching up with new controls already in place. This new method of working was briefed to Network Rail employees over a six-week period prior to implementation at 12:00, 2nd June 2017. It should be noted that through CoP, M&EE Networking Group have additional restrictions in place, limiting maximum speeds in worksites to 15mph (required for measuring runs etc.) and 25mph in PICOP controlled areas. Rail Freight Operations Group has also implemented a CoP which mandates a maximum speed of 5mph in worksites and 15mph in PICOP controlled areas for all engineering trains. Both the CoP are being monitored by the operators for compliance.

*c. Seek an understanding of the reasons for, and scale of, local unauthorised deviations from possession plans, the effectiveness of the planning process to avoid such changes, as well as the suitability of procedures and managerial arrangements for identifying, and subsequently reviewing, unauthorised changes (paragraph 162d). The measures identified to further reduce the risk of collisions during engineering work should then be implemented in accordance with a timebound programme.*

*Closure narrative: - Network Rail had a very similar recommendation from its formal investigation report in to this incident. Recommendation 8.1 a(iii) stated:- A review of the planning rules and arrangements, including NR/L2/NDS/202, around possessions to design out operational risk. In particular this review should cover: changes to the possession and worksite plans and how the change control process links in with front line briefings.*

*Network Rail recognise that changes have an impact on the worksite, physical work plan and resource arrangements already in the possession plan that have the potential to increase risk and efficient delivery of the possession. Network Rail adopted the principle that if the plan was correct; it would remove the temptation for unauthorised deviations. The NR/L2/NDS/202 standard review included this recommendation within its remit. Clause 8 of NR/L2/NDS/202 has a mandatory requirement to have a change control process in place. This includes identifying and recording the root cause of the change, together with the requirement to demonstrate the benefit of making the change and the implications of the request being declined. These records must be retained for audit purposes and learning etc. Each and every week, late changes are monitored through the visualisation process.*

*Furthermore, NR/L3/OPS/303 (clause five) stipulates that the Operations Delivery Manager is informed, consulted and responsible for the management of any late change. Each Route Business has its own short notice process, which must follow the principles of NR/L2/NDS/202. Note:- Each Route has its own process due to slight differences in role accountabilities.*

*Part C of this recommendation has therefor been addressed by the review and implementation of two standards mentioned above. It should also be noted that these standard changes were briefed at roadshows over a number of weeks at various locations throughout the network.*



## Recommendation 2

*The purpose of this recommendation is to achieve effective communications between those managing engineering possessions and train drivers (and others working in the possession) so that the potential for miscommunication is reduced to a minimum and that communications take place only when it is safe to do so.*

Network Rail should:

- a. Review the equipment and protocols used by those managing possessions for communicating with train drivers to ensure that:
  - i. Drivers are provided with all the information they need to carry out movements safely. The review should consider the use of a standardised format so that any missing information can be readily identified and queried by the driver. In addition to information such as the authorised maximum speed of travel and the driver's treatment of signal aspects, the format could also include confirmation that there are no vehicles obstructing the line to the driver's authorised stopping point.
  - ii. Communications with drivers are made in a manner which does not risk distracting the driver from the driving task.
- b. Network Rail should define when it may be necessary and appropriate to use competent persons as intermediaries when communicating instructions on vehicle movements to drivers. It should then further consider the formal competencies and non-technical skills required of a competent person and the means by which their competency and non-technical skills may be assured. Consideration should also be given to the practicalities of relaying instructions to drivers in ways that do not risk distracting drivers from their driving task.

Any resulting actions should be implemented as soon as possible.

## ORR decision

6. Network Rail, in conjunction with FOCs that operate engineering trains, have revised their processes for communications involving train drivers working in possessions and briefed the new arrangement to relevant staff.

7. After reviewing the information provided ORR has concluded that, in accordance with the Railways (Accident Investigation and Reporting) Regulations 2005, Network Rail has:

- taken the recommendation into consideration; and
- has taken action to implement it

**Status: Implemented.**

## Previously reported to RAIB

9. On 8 January 2014 we reported that Network Rail, in its initial response to ORR on 28 November 2013, advised that:

*Network Rail will discharge Recommendation 2 through the same delivery mechanism for Recommendation 1. The Track Worker Safety Group (TWSG), specifically under POD 6 - Reviewing Engineering Worksites, will consider this recommendation within its scope of an industry review.*

*TWSG will review the specific elements of Recommendation 2 and an action plan will be developed detailing the subsequent actions required, owners and timescales.*

*The internal Network Rail investigation into the Arley collision recommends similar activity (Recommendation A.5.3 and 5.4 particularly). A consolidation workshop will be held by January 2014 to consider each component part of linked recommendations, and identify the most appropriate work stream to discharge it.*

*Timescale: 31 March 2014*

10. ORR stated that we awaited the results of the Network Rail consolidation workshop and would update RAIB when this was received.

## Update

11. Following timescale extensions, Network Rail provided a closure statement on 11 September 2017 detailing in turn how they addressed each of the three key points in the recommendation:

*RAIB Recommendation 2 stated that Network Rail should:*

*a. Review the equipment and protocols used by those managing possessions for communicating with train drivers to ensure that:*

*i. Drivers are provided with all the information they need to carry out movements safely. The review should consider the use of a standardised format so that any missing information can be readily identified and queried by the driver. In addition to information such as the authorised maximum speed of travel and the driver's treatment of signal aspects, the format could also include confirmation that there are no vehicles obstructing the line to the driver's authorised stopping point (paragraph 162b).*

*Closure narrative: - The PICOP (HB11 clause 8.1) and ES/SWL (HB12 clause 6.1) are already mandated by the Rule Book to record the instructions given to a driver. The XIWG reviewed whether or not the driver should also record the instructions. A form was developed by DRS and offered as good practice for all other operators to also adopt. XIWG concluded after review that no additional action was required for this element.*



*Closure narrative continued: - An ES/SWL or PICOP are not competent to specify a maximum safe speed to travel at; they simply don't know what the braking capabilities or safe stopping distances are for an engineering train or OTM etc. The Rule Book has been amended as has the training materials so that the instructions given to a driver are to proceed at caution. The maximum speed in a possession has been reduced from 40mph to 25mph in the Rule Book from December 2017. However, these speeds have already been implemented through Codes of Practice. The Rule Book is simply catching up with new controls already in place. This new method of working was briefed over a six week period prior to implementation at 12:00, 2nd June 2017.*

*Closure narrative continued: - Confirmation that there are no vehicles obstructing the line to the driver's authorised stopping point was considered by the XIWG to actually create additional risk rather than remove it. Reason - A driver should be controlling their train, travelling at caution with the mind-set that the line ahead could be obstructed. To state that the line ahead is clear of an obstruction contradicts the instruction to travel at caution, being prepared to stop within the distance the line ahead can be seen to be clear. Such confirmation could lull the driver into a false sense of security that the line ahead is clear, when in fact it may not be.*

*ii. Communications with drivers are made in a manner which does not risk distracting the driver from the driving task (paragraphs 162c and 164c).*

*Closure narrative: - Safety critical communications protocols require all instructions to be given safely before any movement commences. Network Rail level 3 work instruction NR/L3/OPS/303 – Possession of the Line for Engineering Work Delivery Requirements has been comprehensively reviewed and updated. This standard includes the requirements of ES/SWL and PICOP to comply with all safety critical communications protocols.*

*Additionally, operators have professional driving policies which mandate that mobile devices are not used in the driving cab. Furthermore the contract to suppliers has had an additional clause included, which mandates that all PICOPs and Possession Support Staff are issued with recordable mobile phones. The mobile phones should be fitted with a system capable of remotely listening to and recording conversations, viewing text messages and viewing photos for the purposes of monitoring safety conversations and assisting with investigations and which can be audited by Network Rail at any time for these purposes. This auditing process has the ability for Network Rail to assure itself that safety critical communications protocols are being followed.*

*b. Network Rail should define when it may be necessary and appropriate to use competent persons as intermediaries when communicating instructions on vehicle movements to drivers. It should then further consider the formal competencies and non-technical skills required of a competent person and the means by which their competency and non-technical skills may be assured. Consideration should also be given to the practicalities of relaying instructions*

*to drivers in ways that do not risk distracting drivers from their driving task (paragraphs 162b, 162c and 164c). Any resulting actions should be implemented as soon as possible.*

*Closure narrative: - Elements of this part of the recommendation are partly linked to 2a(ii) above. NR/L2/OPS/202 business process "Principles, Timescales and Functional Responsibilities for Engineering Work, Access and Heavy Resource Planning was also comprehensively reviewed and updated in conjunction with NR/L3/OPS/303 above. The requirement for the length of possessions to be kept as short as possible has been added to this business process. Along with requirement to plan movements based on a maximum speed of 5mph in worksites and 15mph in PICOP controlled areas. These two elements are aimed at reducing worksite length, increasing the occasions that the ES is in the immediate vicinity of any train movement. This in turn reduces the need for competent people to relay messages. Additionally, good practice has been adopted across the network in that competent people are passing a communications device to the driver so that the ES can speak directly with the driver. The policy adopted is that there is a hierarchy of communication methods. First option is face to face between the ES and driver. Second option is directly via a mobile communications device and only if neither of the first two options are possible, via a competent person of equivalent competence. This briefing is being recorded in Sentinel as a competence management event*

*The briefing is titled "T3 Possession Speed Brief.*

*"<https://safety.networkrail.co.uk/safety/the-rule-book/>*