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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: Train struck and damaged by equipment case door in Watford tunnel,
26 October 2014**

I write to report¹ on the consideration given and action taken in respect of recommendations 1- 6 addressed to ORR in the above report, published on 13 August 2015.

The annex to this letter provides details in respect of each recommendation. The status of recommendations 3 and 5 is '**implemented**'; the status of recommendations 1, 4 and 6 is '**Implementation on-going**'; and the status of recommendation 2 is '**progressing**'. ORR will advise RAIB when further information is available regarding actions being taken to address these recommendations.

We will publish this response on the ORR website by 5 August 2016.

Yours sincerely,

Oliver Stewart

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

Initial consideration by ORR

Initial consideration by ORR

1. All 6 recommendations were addressed to ORR when the report was published on 13 August 2015.
2. After considering the recommendations ORR passed recommendations 1, 2, 4 and 6 to Network Rail; recommendation 3 to Siemens PLC; and recommendation 5 to Henry Williams Ltd, asking them each to consider and where appropriate act upon them and advise ORR of their conclusions. The consideration given to each recommendation is included below.
3. This annex identifies the correspondence with end implementers on which ORR's decision has been based.

Recommendation 1

The intent of this recommendation is for Network Rail to eliminate by design, or mitigate, the risk from lineside cabinets fouling the gauge.

Network Rail should mandate a requirement in its company standards for a design of cabinet that removes by design the risk of an open door infringing the gauge where the cabinet needs to be located in an area of limited clearance. Where this is not practicable, the design of cabinet should alert staff to an unsecured door.

ORR decision

4. Network Rail is taking appropriate action to implement this recommendation by addressing the risk of lineside cabinets fouling the gauge. We were concerned that Network Rail's initial response was addressing the recommendation by looking at the wider issue of cabinet siting, rather than focussing on cabinet design, as written in the recommendation. At a meeting on 13 May 2016, Network Rail confirmed that the revision of the appropriate standard (NR/L3/SIG/11303) will include requirements for the cabinet to have an open door that will not foul the gauge (module 2G05) when a cabinet must be located in an area of limited clearance. The updated standard – part of the installation handbook – is planned to be issued by December 2016. In the meantime, a 'Share with Pain' has already been circulated to spread awareness of the issue.
5. 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
 - is taking action to implement it by December 2016

Status: Implementation on-going. ORR will advise RAIB when further information is available regarding actions being taken to address this recommendation.

Information in support of ORR decision

6. On 9 March 2016, Network Rail provided the following initial response:

Network Rail will convene a joint review meeting with representatives from Signalling, Civils and Track to identify if there are deficiencies in the specifications, procedures and processes for the design and construction of signalling equipment housing in normal use states (including the requirements when cabinet doors are in the open position) in relation to:

- *The standard gauge requirements;*
- *The minimum gauge requirements in physically constrained circumstances and any special measures required address the risk of conflict.*

Following the review, Network Rail will update company standards to provide adequate specification and control for siting of lineside

signalling equipment cases, with definition of responsibilities for design co-ordination between disciplines.

7. ORR wrote back to Network Rail as we did not think the response properly addressed the recommendation as it was focused on the siting of lineside cabinets rather than their design specification. On 13 April 2016, Network Rail provided the following additional information:

The proposed action plan is intended to cover both the siting of equipment and the suitability of the equipment, particularly the inter-disciplinary issues. This review includes the process for design of application, which includes the selection of equipment case (and the design of site specific cases), the siting of equipment, the supporting foundations and where and who is responsible for structure clearance decisions. It is felt that to consider the equipment case design in isolation would not address the recommendation as written.

8. In a meeting on 13 May 2016, Network Rail advised ORR of the work being done to address the risk of line side cabinets fouling the gauge:

Revision of NR/L3/SIG/11303 (module 2G05) will include a requirement that removes by design the risk of an open door fouling the gauge when a cabinet must be located in an area of limited clearance. A meeting of the working group set up to resolve this issue is planned for the next month. The updated standard – part of the installation handbook – is planned to be issued by December 2016. In the meantime, a ‘Share with Pain’ has already been circulated to spread awareness of the issue.

Recommendation 2

The intent of this recommendation is for Network Rail to make explicit its processes for handing back a work site to reduce the risk arising from the railway not being safe and clear for the passage of trains.

Network Rail should implement a means to meet the rule book requirement for the designated person (Engineering Supervisor or *Safe Work Leader*) to confirm to the PICOP that the railway is safe and clear for the passage of trains when that designated person is not present on site (paragraph 95a(iii)).

ORR decision

9. Network Rail has started to take appropriate action to implement this recommendation and address the risk of the railway being clear and safe to be put back into service following a possession. However, by focussing on the role of Safe Work Leader, Network Rail are focussing on a long term solution and are yet to say how they will address the risk in the short term before the wider introduction of SWL. Network Rail have not yet provided ORR with a time bound plan for the work they are planning.

10. ORR is not yet convinced that Network Rail is taking appropriate action (nor provided a time bound plan) to implement this recommendation and address the risk (particularly in the short to medium term) of the railway being safe and clear to be put back into service following a possession.

11. 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
- is taking action to implement it, but ORR has yet to be provided with a timebound plan.

Status: Progressing. ORR will advise RAIB when further information is available regarding actions being taken to address this recommendation.

Information in support of ORR decision

12. On 9 March 2016, Network Rail provided the following initial response:

Network Rail has reviewed the recommendation and the requirements of the rule book. We recognise the gap that is being highlighted by the rec as the COSS is not responsible for the task. Currently for the Engineering Supervisor to make the declaration that the railway is safe and clear for the passage of trains, requires the COSS and the Task leader to confirm that they have performed their jobs correctly ie for the COSS to declare the protection is no longer required AND for the task leader to confirm they have delivered and completed their task correctly. The

combination of confirmations would confirm to the ES that the railway is safe and clear for the passage of trains.

The solution to achieve the intent of the recommendation is the delivery of one controlling mind on site who can detail that the task has been completed correctly and the work has left the infrastructure safe for the passage of trains. This would be achieved by the role of Safe Work Leader.

The introduction of the role of Safe Work Leader is included in the programme Planning and Delivering Safe Work (PDSW) which is currently under review. The current situation with the PDSW Programme is:

Network Operations, Investment Projects and the PDSW programme agreed that on 18 December 2015 Network Rail would officially withdraw the mandated use of Proscient and associated Permits. This subsequently happened and Network Operations agreed a schedule by which it would move fully to the 'pause' by 15 January 2016. Operations entered the 'pause' on 18 December 2015 and Maintenance fully entered the 'pause' at 06:00 on 15 January 2016. Investment Projects have continued to use Proscient and Permits throughout and provision has been made for this within the 'pause' working arrangements. During this period a temporary variation to the PDSW standard (NR/L2/OHS/133/PDSW) has been applied for and agreed.

Secondly, a new PDSW Programme Director was appointed at the end of January 2016, joining the programme from Anglia Route and has a remit, from Network Rail's Executive Committee (Excom) to do a top to tail review of the programme and undertake optioneering on its future direction. The new Programme Director has been working with and listening to the feedback and views of staff, trade unions and stakeholders from across the business and supply chain to understand the strengths and weaknesses arising from the programme.

Excom remain committed to the vision of a single controlling mind for our work track side and as such, at the end of March Excom are due to review the options for progressing with Planning and Delivering Safe Work.

With regard to this recommendation Network Rail proposes to wait until a direction is known for Planning and Delivering Safe Work. If as is expected a programme that implements a single controlling mind is the decision then we will accept the recommendation and align it with the programme.

If for any reason Excom rejects their vision of implementing a single controlling mind then we will review the recommendation to determine what steps are required to implement the actions.

13. ORR has written to Network Rail as the response addresses the recommendation in terms of the introduction of SWL role as part of PDSW. This may be an appropriate long

term solution, but Network Rail have not made clear if there are any interim arrangements in place before the introduction of SWL (which the response states is under review) to address the risk of a line being fit to return to traffic.

Recommendation 3

The intent of this recommendation is for Siemens to arrange for an independent review of the way in which it manages the risk to safety critical staff working on infrastructure projects.

Siemens UK should commission an independent review of the implementation of those aspects of its safety management system relating to the welfare of safety critical staff working on infrastructure projects, including its arrangements for managing fatigue, and take action as appropriate to rectify any deficiencies found.

ORR decision

14. Siemens commissioned Eversheds to carry out a review of their health, safety and fatigue management and have provided ORR relevant sections of the report. The review uncovered a number of weaknesses in how Siemens manages the risks to safety critical staff working on infrastructure projects..

15. ORR's own review identified what appeared to be excessive working hours by Siemens staff, although this may actually have been inputting errors. These errors were brought to the attention of Siemen's management.

16. Subsequently, ORR carried out further visits to Siemens' sites and offices to monitor and assess a range of fatigue management procedures. This assurance work included analysis of a range of onsite signing in sheets. ORR are also aware that Siemens are currently trialling biometric Fatigue Management Systems (FMS) for utilisation at their sites. This will significantly increase Siemens' capacity for ensuring that fatigue is robustly managed. ORR are therefore content that Siemens RAH have achieved fatigue control which satisfies that requirement of the RAIB recommendation.

17. The inspector with responsibility for Siemen's Rail believes that, as a company, it has energetically pursued policies and strategies which are aimed at making Siemen's a leader within the rail industry in the area of fatigue management. Significant resources and talent have been committed to this aim and the situation with regard to fatigue management is palpably improved from that which pertained at the time of the RAIB investigation.

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

- taken the recommendation into consideration; and
- is taking action to implement it but has not yet provided a time bound plan

Status: Implemented

Information in support of ORR decision

19. On 26 October 2015, Siemens provided the following initial response:

Siemens have commissioned an independent review by the Legal firm, Eversheds which commenced on September, 15, 2015 and was completed on the 19th October 2015. The review looked at the welfare of Safety Critical staff especially fatigue management. The outcome is not yet fully known but we will be expecting this by the end of November 2015 when the executive team will be briefed by Eversheds. Any relevant recommendations for improvement will be actioned in a timely manner and I will be happy to inform you of any significant findings.

In order to provide further assurance to RAIB and the ORR, I have summarised our meeting on the 20th October 2015 in which I explained our fatigue management journey since the incident:

- *Yearly Business Unit targets, focusing on Health & Wellbeing (four year strategy)*
- *Executive policy- A minimum of twelve hours rest at a place of rest between shifts and adoption of FRI tool as primary method for managing the risk*
- *Culture Survey, which highlighted that our policy was not user friendly enough. This resulted in a redrafted flowchart version*
- *National Fatigue Management workshops to train and imbedded Fatigue risk management*
- *Consultation with other signalling companies in an attempt to influence the way forward and to provide a level of consistency throughout the signaling industry*
- *Internal audit programme which now incorporates the management of fatigue as a specific audit protocol with six such audits carried out in 2015. Two external audits have been conducted of our major supply chain partners.*

20. ORR approached Siemens and requested to see the independent review carried out by Eversheds as the initial response does not provide enough information (nor an appropriate time bound plan) on how they will implement the recommendation. Siemens were not prepared to release the full report on the basis of legal privilege, but did agree to share with ORR the sections of the report relating specifically to Siemens Rail Automation Ltd (SRA).

21. The relevant sections of the report were sent to ORR on 11 April 2016 and is repeated below:

Summary report following Siemens Rail Automation Health, Safety & Fatigue Management Review

In May 2015, Eversheds LLP was retained by Siemens Plc to review under legal privilege the health and safety arrangements across its UK organisations. The output of that review was a series of legally privileged reports, which for the avoidance of doubt we do not waive privilege over by virtue of this note

As part of our review, we considered and looked at the operations of Siemens Rail Automation (“SRA”), including both the factory operations (primarily at Chippenham) and the field service operations.

When reviewing SRA, we looked at the issue of fatigue management.

The Eversheds’ review of SRA primarily took place between August and October 2015.

Approach

We adopted the following approach to this review exercise:

1. **Scoping** – initial scoping meeting with Julien Gandemer in London. The meeting was used to review and discuss the business activities of SRA, the history of the business and the high level management structure.
2. **Document Review** – a range of documents were provided by SRA and reviewed.
3. **Site Visits** – we visited the Chippenham site (factory and offices), the Euston office, the York office, sat in on an SLT2 meeting (in York), visited the Swanley depot and the Thameslink project including a visit to London Bridge.
4. **Witness Interviews** - we interviewed a range of individuals from SRA across different levels in order to capture a proper breadth of experience and opinion.

For the purposes of this note, we do not propose to cover our findings in respect of the Chippenham factory, save to observe that in general terms, we were of the opinion that SRA had both identified and adequately controlled all relevant risks.

Fatigue management

In respect of fatigue management, we were made aware of the RAIB Report 12/2015 issued in August 2015. We considered and reviewed Siemens’ document “Management of Working Time and Fatigue”. Rather like the RAIB report, we concluded the Siemens document incorporated good practice and was fit for purpose. We also reviewed the subsequently published rules applicable to all employees and contractors, including a rule that there should be no more than 12 hours (door to door) to be worked per turn of duty/shift.

We note that the Siemens Fatigue Management process introduces shorter working time than Network Rail's own policy (14 hours).

We conclude that subject to its adequate implementation and enforcement, SRA has an adequate process for the management of the risk of fatigue.

We visited the Thameslink project in September 2015 and witnessed teams of contractors working on the project under rail arches near London Bridge train station. We were accompanied during the visit by Neil Akehurst, SRA regional EHS manager.

Upon arrival we spoke with one four man team working on the project. All four were contractors. We asked each of them in turn how long they were working on site and where they were travelling from. The men would travel from home (Canterbury; Dagenham) and meet at a facility in New Cross before travelling from there to site. They worked on site at London Bridge from around 6:00 am to

5:30 pm, then drove back to New Cross, before then independently travelling home. It was plain each of the four contractors would be working for longer than 12 hours door to door.

When we raised this non-conformance at the time we identified it, an SRA manager on site sought to justify the breach on the basis that the extended hours had been pre-agreed. In fact whilst there are "exceptional circumstances" which could justify longer hours than the 12 hours in the rule, these extended hours cannot be pre-planned. Examples of exceptional circumstances justifying extended hours included emergency, possession overrun and additional cover due to illness.

We were impressed with the actions of Neil Akehurst, the regional EHS Manager, who listened to what was being said, considered all the detail and then emphatically stated to the manager that this was not an exceptional circumstance and the hours being worked breached the 12 hour rule. In our opinion he delivered that message in a firm manner and did not "fudge" the issue.

We have subsequently been provided with an internal note which was prepared following an internal investigation into how the breach of working hours at London Bridge had occurred. The internal note stated:

"The works on site had been instructed by the Siemens Construction Manager who was unaware of the 12 hour rule and was still assuming the previous, Network Rail limit of 14 hours door to door. The works had been on-going under this shift pattern for approximately one week, with the irregularity going unnoticed by Siemens staff.

HSE and project management functions were not aware of the breach, as the works had not been on-going for a significant period of time, no exceedence of hours had been notified and the works had not formed part of regular monthly Site Safety Tours. The Site Supervisor and Construction Manager, when questioned, were not aware of the Siemens policy and had assumed the old Network Rail policy was still current. It was confirmed that the Regional Construction Manager had failed to brief his staff that the policy had changed and that this is the root cause of the breach of Policy."

Subsequent to our discovery at London Bridge at the end of September 2015, it is our understanding that SRA:

- *carried out an investigation with disciplinary action taken against individuals;*
- *reinforced through written communication and verbal briefings the need to ensure that the fatigue management policy was and is rigorously adhered to;*
- *retained Eversheds to train over 100 senior leaders and managers in the business on health and safety legal obligations which included significant coverage of the issue of fatigue. This training took place in March 2016; and*
- *has stopped work on one project where a further exceedence of working hours was identified.*

It is plain that the SRA fatigue management policy will only be effective if it is properly communicated, policed and enforced and where non-compliances are identified, action must be taken. We are satisfied that through a combination of actions by SRA and training from Eversheds that all relevant leaders and managers within the business understand both the contents of the SRA fatigue management process and the need for it to be followed. We are satisfied that to date, since the London Bridge non-conformance was identified, SRA has put in place a rigorous assurance programme. We have advised the business that such an assurance programme must continue.

Contractors

SRA has a well-established process for the vetting, take on and monitoring of contractors. In our opinion that process is fit for purpose.

Contractors to SRA are subject to audit which is both comprehensive and readily understandable. Audit reports produced by SRA are of a model standard.

Evidence was provided of individual contractors being removed from site by SRA for sub-standard safety performance.

Looking at the rail sector overall (so not limited to SRA), we would observe that too much reliance is placed on contractors. We have encouraged SRA to review its arrangements relating to contractors and in particular contracted supervisors.

SRA Senior Leadership Team

Having reviewed all operations across the Siemens operations in the UK and Ireland (most of which are non-rail), we are of the opinion that the SRA Senior Leadership Team is one of the most safety focused and conscious across the Siemens businesses.

Delivery Directors and Project Managers

Our review identified a training need for this population in health and safety legal obligations. This training has now been fulfilled by the delivery by Eversheds of the health and safety legal obligations training referred to above.

Wellbeing

SRA has carried out impressive work on the issue of wellbeing when benchmarked across other divisions and business units of Siemens. The employment of a full time occupational

health and wellbeing specialist is strong evidence of the Senior Leadership Team's commitment to this area.

During our review we witnessed numerous examples of good practice in the wellbeing sphere. These included availability of free fresh fruit at all locations, raised desks for office working and blood pressure testing.

Incident investigation

The SRA incident investigation reports we were provided with were of a high standard incorporating strong narratives, logical conclusions, clear actions and well thought out recommendations.

22. ORR carried out a number of checks in order to gain assurance Siemens had a fully developed fatigue management system. This included a review of a range of Fatigue Risk Index outputs to exhibit their understanding and operation of the process. The review identified what appeared to be excessive working hours, although this may actually have been inputting errors. These errors were brought to the attention of Siemens' management. ORR has expressed disappointment that they were not detected during their in-house reviewing procedures as they could be exceedances rather than inputting errors. ORR asked Siemens to investigate these failures, report back their findings and put in place a process to ensure that all rosters are reviewed in future.

23. ORR carried out further visits to Siemens' sites and offices to monitor and assess a range of fatigue management procedures, including analysis of a range of onsite signing in sheets. Siemens are also trialling biometric Fatigue Management Systems (FMS) for utilisation at their sites which should significantly increase their capacity for ensuring that fatigue is robustly managed.

24.

Recommendation 4

The intent of this recommendation is for Network Rail to reduce the risk arising from equipment that has the potential to foul the gauge.

Network Rail should establish a policy and guidance on managing the risk from lineside equipment that can foul the gauge, with specific consideration of the siting of equipment in areas of limited clearance and, for example, the use of refuges in tunnels for that purpose.

ORR decision

25. Network Rail is taking appropriate action to address the risk arising from equipment that has the potential to foul the gauge and has realistic timescale for completing the work. Network Rail is carrying out HAZID and HAZOP reviews to inform guidance that should address the risks arising from equipment that has the potential to foul the gauge.

26. 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
- is taking action to implement it by 31 August 2016

Status: Implementation ongoing. ORR will advise RAIB when actions to address this recommendation have been completed.

Information in support of ORR decision

27. On 9 March 2016, Network Rail provided the following initial response:

Network Rail will convene a HAZID and HAZOP involving representatives from Engineering disciplines, occupational risk, Operations and the safety and risk team. The HAZID/HAZOP will aim to inform the policy setting and preparation of guidance for managing the risk from lineside equipment that can foul the gauge, with specific consideration of the siting of equipment in areas of limited clearance situations where physical restrictions require additional gauge clearance considerations.

Following the HAZID/HAZOP work, Network Rail will update policy and guidance documentation to describe the intentions for managing the risk from lineside equipment that can foul the gauge, particularly the intended use of legacy refuges in tunnels and on viaducts, which are within red zone restricted areas.

28. The Network Rail response set a deadline of 31 August 2016 for completion of the work.

Recommendation 5

The intent of this recommendation is for Henry Williams Ltd to conduct a review of its railway industry products to assure itself that it has current, appropriate and complete certification.

Henry Williams Ltd, in conjunction with Network Rail as necessary, should review its current range of railway products to ensure that it has full details of the certification associated with each item, and take action as appropriate to rectify any deficiencies found.

ORR decision

29. Henry Williams Ltd have carried out a review of the certification of the cabinets they produce for the railway industry and taken appropriate action to ensure they have the

appropriate certification when they are ordered by the customer. The review prioritised items currently on order and all items ordered in the last two years. Henry Williams Ltd have also introduced a new procurement process that automatically alerts them when an older design of cabinet is ordered where the certification may need to be checked.

30. After reviewing the information provided ORR has concluded that, in accordance with the Railways (Accident Investigation and Reporting) Regulations 2005, Henry Williams Ltd has:

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

Status: Implemented.

Information in support of ORR decision

31. On 27 November 2015, Henry Williams Ltd provided the following initial response:

Further to the RAIB report 12/2015 and specifically recommendation five; Henry Williams Ltd propose to take the following actions in order to satisfy the aforementioned recommendation:

- 1. To conduct a review of all orders received within the last two years that have been supplied by Henry Williams Ltd in to the rail industry and confirm the approval status of each product. Target date for completion End December 2015.*
- 2. Orders received in excess of two years ago will be reviewed, as new orders are received, on an "as and when" basis. This will be captured as part of an amended contract review procedure. Target date for completion (of the amended procedure) end December 2015.*

32. ORR wrote to Henry Williams Ltd accepting their proposal to address the recommendation and request some further details about the review, the number of orders being reviewed and how this information was briefed to relevant staff.

33. Henry Williams Ltd wrote back to ORR on 10 February 2016 providing the following information:

The sales team have carried out a review of historical orders and the attached list provides the approval status of the products that have been supplied. This review is complete and new enquiries/orders will follow the revised contract review process.

The contract review process has been amended (attached) to confirm the approval status for the products being quoted or supplied. The new contract review process has been communicated internally to those people within our sales team who administer new product enquiries/orders.

34. Henry Williams Ltd clarified that the items in the catalogue contain products currently being ordered as well as historical products. Location cabinets listed as having “Grandfather Rights” are historical and should they be ordered, the new company process would identify to the customer that they do not have current approval status and this would be needed prior to filling the order.

Recommendation 6

The intent of this recommendation is for Network Rail to take action to reduce the risk of equipment being installed without contractors being aware of existing limitations on, or conditions of, its use.

Network Rail should, in consultation with its suppliers, make improvements to its systems for product acceptance to ensure that all relevant information associated with those products, such as risk assessments, is accessible to potential users. The exercise should consider including a facility to enable each user to include information on its own application of the product that may be beneficial to future users.

ORR decision

35. ORR are content with the Network Rail response and the timescale they have provided. We have informed them that we will need evidence that their review includes all the elements in the recommendation.

36. 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
- is taking action to implement it by 30 June 2016

Status: *implementation on-going.* ORR will advise RAIB when actions to address this recommendation have been completed.

Information in support of ORR decision

37. On 9 March 2016, Network Rail provided the following initial response:

Network Rail will undertake a review of specifications for undertaking and managing product acceptance applications. Particular consideration will be on controls in place for application restrictions imposed by the acceptance process, to ensure that all relevant information associated with those products, such as risk assessments, is accessible to potential users and can be clearly understood by Network Rail and suppliers considering application

of the product. This may include inclusion of product and applications specification in the acceptance information.

The review will be led by the STE product acceptance engineers, with support from an Investment Projects representative and suppliers.

Following the review, Network Rail will update the product acceptance procedures and specifications to adequately control the risks identified.

38. On 13 April 2016 Network Rail wrote to ORR to confirm that the review had been undertaken on 31 March 2016 and the agreed actions were expected to be completed by the end of June 2016.