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Mr Andrew Hall
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Dear Andrew,

RAIB Report: Derailment of an empty passenger train at Paddington station

I write to report[1] on the consideration given and action taken in respect of the recommendations addressed to ORR in the above report, published on 30 April 2015.

The annex to this letter provides details of the consideration given/action taken in respect of these recommendations. The status of recommendations 1, 2 and 5 is '**Implementation ongoing**' and recommendations 3 and 4 are '**Progressing**'. ORR will advise RAIB when further information is available regarding actions being taken to fully address these recommendations.

We will publish this response on the ORR website on 27 April 2016.

Yours sincerely,

Andrew Eyles

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

Initial consideration by ORR

1. All 5 recommendations were addressed to ORR when the report was published on 30 April 2015.

2. After considering the recommendations ORR passed recommendations 1, 2, 3 and 4 to Siemens PLC and recommendation 5 to Network Rail asking them to consider and where appropriate act upon them and advise ORR of their conclusions. The consideration given to each recommendation is included below.

3. In considering the response received, ORR would like to note the particular input from Siemens, whose informative responses have been provided on a regular basis, helping to drive the implementation of the recommendations and providing clarity on how this is being progressed.

Recommendation 1

The intent of this recommendation is for the load distribution to remain evenly spread across all wheels on Siemens Desiro vehicles following tyre turning or bogie replacement.

Siemens' procedure for setting the vehicle ride heights after tyre turning or bogie replacement should be revised to reflect the original design intent, including the function of the anti-roll bars and the risks associated with incorrectly setting the anti-roll bar links. The revised procedure should also include checks of the bogie setup post-intervention to ensure that the wheel load distribution is maintained within Siemens' acceptable limit. These checks could be direct wheel load measurements, measurements of other indicators such as the Z1 dimensions or any other checks which positively confirm that the wheel load distribution has been maintained within Siemens' acceptable limit.

ORR decision

4. The regular updates provided by the end implementer have given ORR confidence that the work being carried out will meet the intent of the recommendation by the timescales anticipated.

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

- taken the recommendation into consideration and
- is taking action to implement it by 29 April 2016.

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

Information in support of ORR decision

6. On 29 June 2015 Siemens provided the following initial response:

This Recommendation concerns the maintenance procedures in use on Desiro UK family vehicles which describe the method of adjusting the secondary suspension to achieve the correct carbody height and, additionally, a means of verifying the outcome in respect of wheel load distribution.

Siemens' overall objective surrounds establishing a robust 'factory setting' of the suspension system during significant maintenance events such as bogie overhaul, following which the level of intrusive adjustment during subsequent ongoing maintenance will be minimised (for example, in response to straightforward activities such as wheel re-profiling).

Siemens has established three maintenance scenarios in which it intends to apply differing approaches. These are:

a) Bogie overhaul, where a pair of as-new bogies are received in a known condition and installed beneath the carbody in accordance with new-build procedure in order to establish a new 'factory setting'.

b) Wheel re-profiling or wheelset exchange/renewal, where only the size of the wheel and, therefore, the ride height of the bogie has altered which must be compensated for by raising or lowering of the carbody height, without the need to make any adjustment to the anti-roll bar.

c) Bogie exchange on an ad-hoc basis, where it may be necessary to re-establish the 'factory setting' which creates a new pairing between the two bogies.

Due to the number of current and imminent bogie overhaul programmes among the Desiro UK family fleets, Siemens' current emphasis is on scenario a) above. In respect of this, it has already implemented some process improvements to the overhaul of SF5000 series bogies to give added assurance that they are returned to a more consistent standard in preparation for their installation.

In relation to all scenarios, it is considering other peripheral factors such as depot track geometry and the methods employed in the measurement of the carbody height.

The first milestone in this activity is to undertake trials of the proposed procedure to establish a new 'factory setting' on a number of vehicles and verify the outcome by weighing the wheel loads for each. Subject to establishing the necessary track geometry for a suitable fleet, Siemens expects to be in a position to commence these trials no later than the end of August 2015.

In respect of verification of the post-adjustment wheel load distribution, it is Siemens' intention to provide the necessary assurance through application of a systematic procedure accompanied by evidence that a predictable outcome will be secured without the need for weighing to be undertaken on each occasion. Nevertheless, it is engaged with suppliers of weighing equipment in order to explore its options should this prove unavoidable.

7. On 27 August 2015 Siemens provided the following update:

Siemens had proposed that it would undertake trials of the procedure to establish a new 'factory setting' on a number of vehicles and verify the outcome by weighing the wheel loads no later than the end of August 2015.

This did indeed take place in August 2015 on all four vehicles of a Class 450 Desiro UK EMU (ie, the installation of a total of eight freshly overhauled bogies), and that the trial was successful in achieving cross-axle loading to its new build standard, which is well within the permissible service limits emerging as "Siemens' acceptable limit" as referred to in the Recommendation.

Siemens is in the process of documenting the results obtained during the trial in support of publishing the revised procedure for adoption into its maintenance manuals.

In parallel, it is now preparing to carry out similar trials in relation to scenario c) in an attempt to restore a 'factory setting' involving bogies which have been previously installed (ie, not fresh from overhaul). It aims to commence these trials no later than the end of September 2015.

Once these two procedures are implemented, this will allow the execution of scenario b) – the ongoing maintenance of carbody heights without adjustments to the anti-roll bar – to take place through a simplified procedure.

8. On 30 October 2015 Siemens provided the following further update:

Siemens' engineering colleagues in Siemens Graz, Austria, have completed their assessment of a suitable separate value for "Siemens acceptable limits" as referred to in the Recommendation and, as planned, Siemens has conducted further trials of a procedure in relation to scenario c) in an attempt to restore a 'factory setting' involving bogies which have been previously installed (ie, not fresh from overhaul) on a Class 350/1 Desiro UK EMU. These trials were also successful in that they achieved the "Siemens acceptable limit" specified and a further attempt is planned within the next week on a Class 360/1 Desiro UK EMU to further demonstrate the repeatability of this procedure. Should this also prove to be successful, it is anticipated that Siemens will be in a position to declare the procedure to be valid and commence an implementation plan.

However, during the course of its investigations and in conducting its trials, it has examined the track geometry at its maintenance sites and identified that some improvements are required in order to support the intended methods of measurement and adjustment on designated "level roads". Siemens is in the process of establishing the options available to it and the timescales involved.

9. On 11 December 2015 Siemens provided the following further update, which included a response to ORR's request that it also provide indicative timescales for the completion of each recommendation and an explanation of how the delivery of actions to implement the recommendations is being monitored and managed at a senior level within Siemens:

Siemens Rail Systems in the UK has three levels of safety management process. On a day-to-day level, it operates a "Management of Safety Related Defects and Information" procedure which deals with individual events within Siemens or elsewhere in the industry (including, for example, responses to

National Incident Reports). The Paddington derailment event entered this procedure once it became evident that the train was likely to have been a contributory factor.

At management level, an "Operational Safety Panel" takes place at four-weekly intervals chaired by the Service Director and comprising representatives from Engineering, Fleet Management, Projects & HSQE teams. The intended actions in response to each of the RAIB's Recommendations were endorsed by this forum.

At top level in Rail Systems, a "Safety Executive Management Meeting" also takes place at four-weekly intervals chaired by the Managing Director and comprising selected members of the Executive Management Team plus a representative of Siemens plc and an independent advisor. A status report concerning each of the RAIB's Recommendations is discussed at this forum and further directives made where necessary.

In respect of recommendation 1*, following an internal review of the evidence obtained from trials undertaken to prove that Siemens' intended procedural revisions perform as their theory suggests and are able to deliver a consistent and predictable outcome, Siemens has concluded that this is, indeed, the case and has begun finalising the documentation and supporting evidence for submission through its Engineering Change process. This is the means by which Siemens will secure formal review and acceptance of revisions to its Maintenance Plans by interested parties, including the relevant Duty Holders.*

There are currently three variants of the procedures relating to carbody height setting within the Desiro family:

- *Desiro UK Classic EMU product group comprising Classes 350/x, 360/x, 444 & 450, all of which share a combined maintenance manual;*
- *Desiro UK Classic DMU, which is exclusively Class 185;*
- *Desiro UK Express EMU, which is exclusively Class 380.*

The procedures as they apply to the Desiro UK Classic EMU and Desiro UK Express EMU (which is a separate document, but with similar content) will be released into the Engineering Change process by 31 January 2016. There then ensues a period of formal internal review which, given their extensive consultation throughout their development, Siemens expects will result in the documents being released for external review and acceptance by 21 February 2016.

Concerning the Desiro UK Classic DMU, the same procedural content applies, but an open technical query remains in respect of variations in the permissible heights with changes in fuel load. Siemens is awaiting a response from its colleagues in Siemens AG, but as this will not fundamentally change the adjustment process itself, it is currently anticipating that the same timescales will apply.

Due to the number of stakeholders involved in the external review, Siemens anticipates the Engineering Change process to last a number of weeks, but are

currently planning for the revised procedures to finally be made operational by 31st March 2016, subject to resolution of a compliance related matter in respect of the permissible cross-axle loading calculations on which it is currently seeking advice.

10. On 5 February 2016 Siemens provided a further update:

Siemens has prepared all the change documentation associated with implementing the revised procedures which has now entered its Engineering Change process and a period of formal review by internal stakeholders as planned. The query concerning the Desiro UK DMU in respect of the effects of variable fuel load has been resolved and some adjustments made to the associated requirements.

In respect of the post-intervention checks specifically mentioned in the Recommendation, Siemens has selected a method involving monitoring of the Z1 dimensions in order to confirm the absence of asymmetric wheel loads arising from such adjustments.

The changes include the revised tasks, plus accompanying Siemens Technical Bulletins for each of the three product groups involved. This process allows the subsequent implementation to take place independently from formal releases of the Maintenance Manuals, although the changes will be included at the next available opportunities, following which the Technical Bulletins shall be withdrawn.

Siemens still expects the changes to be released for external review and acceptance by 22nd February 2016 and anticipate the revised procedures to finally be made operational by 31st March 2016 as previously advised.

11. On 1 April 2016 Siemens confirmed that the Engineering Change Packs for each of the three product groups had been circulated for internal review as planned, but that further clarification was required prior to the documents being released externally. Publication of the Siemens Technical Bulletins is now expected by 29 April 2016.

Recommendation 2

The intent of this recommendation is for Siemens' maintenance staff to fully understand the role and importance of anti-roll bars.

Siemens' training materials and competence assessments for technicians and supervisors should be revised to capture the function of anti-roll bars, their method of adjustment and the risks associated with incorrectly setting the anti-roll bar links. Siemens should also make this information available to maintenance and overhaul contractors working on its behalf.

ORR decision

12. The regular updates provided by the end implementer have given ORR confidence that the work being carried out will meet the intent of the recommendation by the timescales anticipated.

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

- taken the recommendation into consideration and
- is taking action to implement it by 6 May 2016.

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

Information in support of ORR decision

14. On 29 June 2015 Siemens provided the following initial response:

This Recommendation concerns improvements to Siemens training and competence assessment materials in order to ensure that information pertaining to the function and adjustment of the anti-roll bars on SF5000 series bogies is systematically communicated to staff undertaking maintenance of that system.

Siemens has undertaken a review of its training material and identified a number of documents which require revision.

Its priority is to revise the training notes and presentation material which accompany its "Vehicle Basic Technical" (VBT) courses to include the function of the suspension as a complete system and identify the role of the critical components therein, including the anti-roll bar. Siemens estimates that this will be completed during August 2015.

Concurrently, as the revised content of the training material emerges, related assessment questions will be devised for implementation from September 2015.

The means by which the need to communicate this information to non-Siemens personnel is systematically identified and executed is currently under review in association with its existing procedures to manage contractors and its supply chain.

15. On 27 August 2015 Siemens provided the following update:

Working with its Training Team, Siemens has identified the technical requirements which require insertion in the training material for its VBT courses, including not just the anti-roll bar, but all the major suspension components, their role in the complete system and key points to observe regarding their maintenance and inspection.

The necessary revisions, as a result, are more in depth than had originally been planned for and Siemens has yet to complete this task. It is Siemens intention to now complete this during September 2015 concurrent with the related assessment questions to which it previously committed.

In respect of communicating this information to non-Siemens personnel, it has completed the review of the current competence management arrangements for contract labour and identified some potential improvements. Siemens aims to draft these changes during September which will then require consultation with internal stakeholders.

16. On 30 October 2015 Siemens provided the following further update:

The necessary revisions, as a result, were more in depth than had originally planned for and were taking longer to implement than first envisaged. Work on this aspect of the Recommendation continues, involving a complete restructuring of the training and assessment material for the Desiro bogie and inclusion of new information and guidance.

Siemens recognises the delay to its original timescales regarding delivery of this particular recommendation and is taking steps to ensure that the necessary priority is maintained regarding completion of this activity.

17. On 11 December 2015 Siemens provided the following further update:

Siemens has now made significant progress on substantial revision of the training material for the complete Desiro bogie.

Working in conjunction with its in-house training team, Siemens will be piloting the revised material on the next scheduled 'Vehicle Basic Training' course commencing on 22 February 2016 [subsequently notified by Siemens as being revised to 9 February 2016]*. Following any final amendments which may arise, Siemens plans to complete the final implementation of both this and the associated competence assessment questions by 31 March 2016.*

18. On 1 April 2016 Siemens reported that the revised bogie training material had been piloted on 9 February 2016 as intended. Further consideration has concluded that the intended material must be presented later in the training process and as a separate supplement to the Vehicle Basic Training once candidate have secured a further level of practical experience on the product. Siemens expects that this will now be concluded by 6 May 2016.

Recommendation 3

The intent of this recommendation is to ensure that other safety critical procedures used by Siemens to maintain its vehicles operating in the UK embrace the original design intent.

Siemens should complete its review of the safety critical procedures used to maintain its vehicles operating in the UK to confirm that they meet the original design intent and are capable of being implemented by competent staff. Based on the findings of this review, Siemens should make any necessary changes to the procedures and re-brief its maintenance staff.

ORR decision

19. The regular updates provided by the end implementer have given ORR confidence that the work being carried out will meet the intent of the recommendation.

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

- taken the recommendation into consideration and
- is taking action to implement it but has yet to provide a firm timebound plan for doing so.

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

Information in support of ORR decision

21. On 29 June 2015 Siemens provided the following initial response:

The investigation reported that information concerning the design of the suspension system and, in particular, the anti-roll bar, had not been adequately captured in the associated maintenance procedures. This Recommendation seeks to confirm that similar omissions of 'design intent' do not exist elsewhere in other existing "safety critical" maintenance documentation.

It is Siemens' intention to first confirm that "safety critical" tasks among the 3322 documents contained within Siemens maintenance manuals have been correctly identified. This will be by means of a risk-based desktop review to categorise each procedure based on ROGS Regulation 23 and associated guidance.

This process will begin with its "Desiro EMU Maintenance Manual", which is shared between its Desiro UK Classic EMU fleets. Whilst this comprises around just 35% of the total content of all its maintenance manuals, it covers eight of the twelve Siemens fleets currently in service. Siemens' aims to have completed this review by the end of September 2015, whereupon it will continue with each of the remaining four maintenance manuals in turn.

In parallel, as it completes its assessment of each of the train systems, suitably competent engineering personnel will be identified in order to conduct a review of those tasks which are categorised "safety critical".

22. On 27 August 2015 Siemens provided the following update:

Siemens has now adapted its existing risk assessment processes in order to provide a framework for carrying out this review which will be undertaken by a combination of experienced engineering and production staff, beginning shortly with its "Desiro EMU Maintenance Manual", as expected, during September.

In parallel, as it completes its assessment of each of the train systems, suitably competent engineering personnel will be identified to conduct a more detailed review of those tasks which are categorised "safety critical" in an attempt to ensure that the design intent has been captured. Where required, the necessary amendments will subsequently be made and submitted through Siemens' usual change management processes.

23. On 30 October 2015 Siemens provided the following further update:

Having previously adapted its existing risk assessment processes in order to provide a framework for carrying out the afore mention desktop review, Siemens has commenced as planned with the "Desiro EMU Maintenance Manual" and also the separate manual for its Class 333 fleet. Having held four workshops involving a combination of experienced engineering and production staff (including, where possible, its Representatives of Employee Safety), it has further developed the approach to consider the likelihood of an error or omission based on five criteria involving the complexity of the task, the requirement for special tools or equipment, the accessibility and environment in the which the task is undertaken, the criticality of the materials required and whether the presence of an error would be immediately obvious to the Technician.

This method has now become established and further workshops are planned.

In readiness for the next stage of the process involving the detailed review of those tasks which are categorised "safety critical", Siemens has opened discussions with its engineering colleagues in Germany and Austria in order to identify suitably competent engineering personnel to ensure that the design intent has been captured. Where required, the necessary amendments will subsequently be made and submitted through its usual change management processes.

24. On 11 December 2015 Siemens provided the following further update:

The activity to conduct a more systematic assessment of the 3322 documents contained within Siemens maintenance manuals to determine those which are "safety critical" based on the likelihood of error and the potential consequences is now 40% complete for Siemens' Desiro EMU maintenance manual (covering 8 of the 12 current fleets) and 50% complete for the Class 333 maintenance manual, both of which will be concluded by 29th January 2016. It is anticipated that much of this work can then be transferred onto the remaining maintenance manuals which it aims to have completed during February 2016.

In the meantime, for those tasks which have already been identified as "safety critical" in accordance with Siemens' new criteria, since the last update it has secured the support of colleagues in Germany and Austria and the reviews for "design intent" will begin in earnest from the beginning of January 2016.

Until the full extent of this large project materialises, it is extremely difficult to confidently declare a completion timescale, but since the initial aspiration was to have all Recommendations concluded within 12 months of publication of the RAIB's report, Siemens does not wish this process to extend beyond April 2016.

25. On 5 February 2016 Siemens provided a further update:

The systematic document re-assessment is now complete for Siemens' Desiro UK Classic EMU maintenance manual (covering 8 of the 12 current fleets) as planned and following this review a total of 294 (26%) tasks have been categorised as Safety Critical either by virtue of the score they have attracted from the assessment or by falling within the scope of guidance published in Railway Safety Publication 4.

The process of transferring the relevant information to the Desiro UK Classic DMU and assessing the remaining product-specific tasks has already begun with the aim of completion by the end of February 2016. Additionally, Siemens is examining the similarities with the Desiro UK Express Class 380, however, it also awaits confirmation concerning its responsibilities here with regard to categorization of Safety Critical tasks, as it is not the maintainer of this product.

Siemens has also concluded, as planned, the assessment of its Class 333 maintenance manual. It is anticipated that much of this work can be transferred onto the Class 332 maintenance manual which it aims to have completed during February 2016.

Regarding review of the procedures themselves to confirm adequate capture of the design intent, Siemens has agreed a structure with its German colleagues and tentative arrangements are in place in anticipation of the imminent allocation of the relevant experts.

Whilst it remains difficult to declare the timescales until the full extent of this large project materialises, it is anticipated that amendments may only be required to a modest quantity of documents and since Siemens' initial aspiration was to have all Recommendations concluded within 12 months of publication of the RAIB's report, Siemens still does not wish this process to extend beyond April 2016.

26. On 1 April 2016 Siemens provided the following update:

Siemens had previously completed the systematic re-assessment of its Desiro UK Classic EMU maintenance manual (covering 8 of the 12 current fleets) and following this review based on the requirements of its risk assessment process and Railway Safety Publication No.4, 26% of the tasks had been categorised as Safety Critical.

Since then, it has also completed this evaluation for the Desiro UK Classic DMU (Class 185) fleet where a similar figure of 25% has been categorized as Safety Critical.

The process of reviewing the procedures themselves to confirm adequate capture of the design intent has commenced. By way of example, the review for the Desiro UK Classic EMU Transmission System was conducted by a drivetrain specialist from Siemens Mechanical Integration department of Krefeld, Germany. Based on experience of manufacturer's manuals and other Siemens projects, 28 observations or queries were fed back to Siemens which it is considering for potential inclusion. However, none of these would be considered fundamental errors or omissions in design intent which must be addressed in the context of the Recommendation.

The expectation of a modest quantity of amendments has been supported, and Siemens' aspiration to conclude this process by the end of April 2016 remains.

Recommendation 4

The intent of this recommendation is for Siemens to ensure that safety critical maintenance and overhaul procedures do not undermine the design intent and import a risk.

Siemens should review the effectiveness of its recently developed processes for ensuring that all necessary information from the design process is correctly incorporated in maintenance procedures and training materials. If found necessary, Siemens should update its processes and continue to monitor their effectiveness.

Note: this recommendation may also apply to other suppliers and manufacturers of rolling stock.

ORR decision

27. The regular updates provided by the end implementer have given ORR confidence that the work being carried out will meet the intent of the recommendation by the timescales anticipated. ORR did not refer this recommendation to other suppliers and manufacturers but would expect that they consider the findings of the report and its recommendations and take appropriate steps that they consider relevant to their duties under health and safety law.

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

- taken the recommendation into consideration and
- is taking action to implement it but has yet to provide a firm timebound plan for doing so.

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

Information in support of ORR decision

29. On 29 June 2015 Siemens provided the following initial response:

This Recommendation is related to Recommendation 3, but concerns measures to ensure that relevant design information continues to be incorporated into maintenance documentation (thus it is its interpretation that Recommendation 3 relates to ensuring that the design intent is, where necessary, reflected in existing documentation, whereas Recommendation 4 concerns future documentation).

The "recently developed processes" referred to in the Recommendation concern the maintenance review procedures adopted for the new Desiro City product in the Thameslink project. Based on this, it is Siemens' intention to develop a generic standard for Siemens maintenance documentation in the UK which will apply to both creation of material associated with new projects, as well as amendment of existing documentation. This standard will incorporate the

requirements for categorising and validating "safety critical" procedures as defined in relation to Recommendation 3.

In the meantime, it is finalising its proposed arrangements for checking the effectiveness of these procedures which it intends to have completed by the end of August 2015.

30. On 27 August 2015 Siemens provided the following update:

Siemens previously reported that it was making arrangements for checking the effectiveness of the "recently developed processes" referred to in the Recommendation. Since that time, its internal audit team has completed an evaluation of its implementation on the Thameslink project as proposed.

This reported that the process "was found to be implemented in accordance with its requirements", but also that some practical improvements could be made in the light of experience.

These improvements will be incorporated into the development of the generic standard for Siemens maintenance documentation in the UK. This process is already underway, having previously commenced to capture some unrelated changes to other areas of the business, and a draft is expected for review during October 2015.

31. On 30 October 2015 Siemens provided the following further update:

This action to develop a generic standard for Siemens maintenance documentation in the UK remains ongoing and will now also include the more specific risk assessment process in respect of Safety Critical tasks which has emerged during Siemens work on Recommendation 3.

32. On 11 December 2015 Siemens confirmed its intention to publish this standard by 29 February 2016, incorporating lessons learned from its activities in pursuit of Recommendation 3.

33. On 1 April 2016 Siemens reported that the compilation of its proposed generic standard for maintenance documentation in the UK had progressed to describe both the risk assessment process for categorisation of Safety Critical tasks and the method of undertaking technical reviews to capture design intent in parallel with Recommendation 3. Siemens considers that these processes have, in general, emerged in the manner anticipated although finalisation is now expected to be concluded concurrently with Recommendation 3 at the end of April 2016.

Recommendation 5

The intent of this recommendation is for Network Rail to establish the reasons why the West Ealing depot failed to comply with Network Rail's own processes.

Network Rail should review the supervision and self-assurance arrangements in place at West Ealing depot to identify any shortcomings which led to the non-compliances with mandated standards going unnoticed. Network Rail should then include any lessons learnt into its revised assurance framework.

ORR decision

34. Network Rail's formal response and the outcome of ORR's subsequent meeting with Network Rail has provided ORR with confirmation that it has identified shortcomings in how the supervision and self-assurance arrangements were being implemented, addressed them locally, and that it is reviewing whether the lessons learnt should be mandated nationally through its self-assurance framework. ORR is awaiting the outcome of this review.

35. After reviewing information received 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 ongoing. **ORR will advise RAIB when actions to address this recommendation have been completed.**

Information in support of ORR decision

36. In its response of 15 October 2015 Network Rail provided the following information:

TME West Ealing along with the RAM (T) Support Engineer have reviewed the supervision and self-assurance arrangements at West Ealing depot in order to identify the shortcomings that led to the non-compliances with mandated standards going unnoticed.

At the time of the derailment the supervision levels within the West Ealing TME area were double the required 2B/C organisational complement. Therefore, with the correct self-assurance arrangements in place, it is acknowledged that there is adequate managerial and supervisory resources to manage this section.

The self-assurance arrangements as West Ealing Depot have been enhanced

- *The mandated Management Self Assurance (MSA) question sets have been amended so that both the Section Manager (SM) and Engineer check that the TG codes have been inputted into Ellipse as per L3/TRK/3202. (This check previously only formed part of the Infrastructure Maintenance Engineer (IME) MSA question set.)*
- *Across Reading DU there is greater support and mentoring from the RAM T Support Engineer at periodic IME Track Quality meetings and at mandated Section Trace Review meetings.*
- *The periodic IME Track Quality meeting agenda now includes a review of MNT, MPV, TRV and Amber Trolley inspections to ensure a compliant foot print. The requirement for mitigation or dispensation is agreed immediately.*

Additionally the following procedural changes have been implemented to reduce the risk of human error leading to a similar situation:

- *Amber Trolley patrols are now entered into Ellipse as MSTs and the West Ealing Technical Team have been briefed not to close Work Orders until the IA (Immediate Action) report is sent to the SM.*
- *Track is now measured with the MPV (not just manual track recording) which allows a greater level of assurance and highlights to all whether the work has been entered into Ellipse.*

A review will be undertaken of the changes made to the Western route MSA question sets to determine whether it is appropriate to mandate these nationally. This work will happen alongside the review of the MSA question sets for track being undertaken as part of the Business Critical Rules implementation.

37. Network Rail has indicated that this work is expected to be completed by 30 June 2016.

38. Further to this response ORR met with Network Rail to with the intention of:

(a) exploring what the scope of its review was; the review findings, and specifically the shortcomings it identified;

(b) obtaining a better understanding of the link between shortcomings and proposed actions so as to confirm the actions address the shortcomings;

(c) confirming that the proposed June 2016 timescale remains valid and that the BCR enabled MSA review will be completed within that timescale and includes refreshing, enhancing and adding to the existing MSA question set as necessary; and

(d) clarifying the process requirement around not closing an Ellipse work order until the IA fault report has been sent to the SM(T).

39. At this meeting Network Rail was unable to provide evidence that it had identified the root cause of West Ealing's failure to comply with standards and ORR has concerns that the review referred to in the initial response had been documented. Network Rail did, however indicate that it had had identified the specific failings as being due to:

- underperformance by the IME;
- a cultural issue whereby all parties failed to appreciate the significance of the data from the Amber Trolley and manual recording as they regarded it as being less important than that provided by the NMT or TRV which received priority attention; and
- the Technical team who were involved in the use of the Amber Trolley in effect worked independently from the SM who did not appreciate or undertake his role of monitoring their activities.

40. Since the derailment Network Rail has taken the following steps:

- overall staff competence has been increased by the transferring in of new staff;

- a procedure has been adopted whereby the reports from the Amber Trolley (and manual recording) are not filed unless accompanied by an Ellipse printout showing that the correct TG codes have been assigned. It was agreed that this process could be incorporated in future as a means of control under BCR;

- the IME and TME have been consulted on the national review of MSA question sets and have recommended additional questions regarding the processing of non-TRV data to ensure that all TG Faults entered into Ellipse have the correct codes attached to them. This ensures that failure to close out would result in a non-compliance being flagged up. It is not known whether these recommendations have been accepted;

- monthly Track Quality Review Meetings chaired by the IME are held which encourage the technical and managerial development of attendees (inc SMs and TMEs) and promote ownership of track problems;

- visualisation, extended in Reading DU down to SM level now gives greater visibility of track performance; and

- *a*n NCAP audit carried out by LNW and an Engineering Verification Audit of Management Inspections since the derailment apparently show the DU as performing well.