

Oliver Stewart
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Recommendation Handling

22 February 2019



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

Dear Andrew,

Freight train derailment at Lewisham, south-east London, 24 January 2017

I write to report¹ on the consideration given and action taken in respect of the recommendations addressed to ORR in the above report, published on 28 February 2018.

The annex to this letter provides details in respect of each recommendation. The status of recommendations 1, 2, 3 and 4 is '**implementation on going**'; and the status of recommendation 5 is '**progressing**'.

We will publish this response on the ORR website on 22 February 2019.

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

1. All 5 recommendations were addressed to ORR when the report was published on 28 February 2018.
2. After considering the recommendations ORR passed recommendations 1 – 4 to Network Rail and recommendation 5 to RSSB 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. RSSB have subsequently passed recommendation 5 to RDG for the implementation phase of the changes identified.
3. In order to promote engagement with the cross industry freight derailment working group, recommendation 5 was brought to the attention of the FOC community.
4. ORR also brought recommendation 1-3 to the attention of other infrastructure managers (TfL, HS1, Nexus and the HRA) as it was concluded that that there are equally important lessons for them.
5. This annex identifies the correspondence with end implementers on which ORR's decision has been based.

Recommendation 1

The intent of this recommendation is to limit the use of manual lifting and packing of track to such cases where it is sufficient to give adequate support to the track. Consideration of its use following renewal and heavy maintenance, where there has been significant disturbance to the track and ballast, is of particular relevance.

Network Rail should assess the suitability and limitations of manual lifting and packing following track renewal and other work likely to result in significant change to track geometry or the supporting ballast. It should update its process and guidance, as necessary, and brief its track teams (both in-house and those working for its suppliers and contractors) on changes made.

ORR decision

6. We are satisfied that the plan Network Rail have developed is capable of meeting the requirement of the recommendation, although we have identified three issues we want them to address:
 - clarify the scope of step two in the action plan (review current manual methods of lift and packing – Feb 2019) and to confirm if the review of current methods will include all sleeper/bearer types and cover plain line and S&C
 - define what Network Rail consider to be the scope of heavy maintenance and significant ballast disturbance is, as mentioned in the Rec intent

- provide feedback to ORR between steps 3 & 4 (March/April 2019), so we can understand the outcome of the review of current standards, processes and practices before any subsequent programme of work is finalised.

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
- is taking action to implement it by 30 April 2020.

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

Information in support of ORR decision

8. On 5 December 2018 Network Rail provided the following initial response:

Action Plan

The recommendation will be addressed by a review of current applicable standards and Track Work Information Sheets and determining a course which may consist of one or more of the following outcomes;-

- *Introduction of a new Track Work Information Sheet specific to the issue at hand;*
- *Revising current Track Work Information Sheets to make any points clearer;*
- *Revision of requirements and processes set out in current Standards;*
- *Formal re-briefing of the relevant content of Standards and Track Work Information Sheets.*

The timeline for this work will be as follows -

Step One – review RAIB report and link to any previous incidents – Dec 2018

Step Two – review current manual methods of lift and packing – Feb 2019

Step Three – review current standards, track work information sheets, regarding lift and packing – March 2019

Step Four – bring all information to a track working group to agree ways forward – April 2019

Step Five – If changes have been identified then update process and guidance where necessary – June 2019. Note the use of the standards Emergency Change process will be considered if an earlier issue of updated critical or baseline limits is needed.

Step Six – Either re-brief current processes and guidance or brief any changes that were identified. The requirements of any new or revised Standards will be

included within the corporate Functional Audit Plan and/or Engineering Verification regimes – Sep 2019

Step Seven – If changes to standards are introduced, conduct post-implementation review of business change – March 2020

Step Eight - Create and submit closure statement – March 2020

Step Nine – Close action – April 2020

The actions required to close out the recommendation will be overseen by the Track Standards & Control Group chaired by the Professional Head of Track.

The technical lead for the changes and chair of the working group(s) for production of revision of Standards/Track Work Information Sheets will be Tara Scott (Principal Engineer Track).

Timescale: 30 April 2020

Recommendation 2

The intent of this recommendation is to ensure suitable confirmation that the track is adequately supported, or where this is not possible, that suitable mitigation measures are put in place, in particular following renewal and heavy maintenance, where there has been significant disturbance to the track and ballast.

With respect to hand back into service following track renewal, and other work likely to result in significant change to track geometry or the supporting ballast, Network Rail should:

- assess and define the criterion (for instance degree of track bed disturbance) for which it is expected that the vertical track geometry should be confirmed under load, and
- define the specific mitigation measures that need to be applied when this is not possible.

It should then update its process and guidance to include objective limits and mitigation measures, as necessary, and brief its track teams (both in-house and those working for its suppliers and contractors) on changes made.

ORR decision

9. The RAIB report identified soft spots in the track bed as a potential factor in the incident. The recommendation refers to track bed disturbance, but the response is framed in the terms of ballast disturbance. We have asked Network Rail to confirm that the scope of the review (and any subsequent action) covers both ballast stiffness and track bed stiffness.

10. As with Rec 1, we have asked Network Rail for feedback after step 1 (March/April 2019) in order to understand the outcome of the review of current standards, processes and practices before any subsequent programme of work is finalised

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 by 30 June 2020.

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

Information in support of ORR decision

12. On 5 December 2018 Network Rail provided the following initial response:
Network Rail will review the processes concerning handback into service following ballast disturbance that may result in significant change to track geometry or the supporting ballast.

1. The process to be applied to the review/consideration

- 1.1. *Review the guidance currently provided within Network Rail standards and Track Work Information sheets (by March 2019);*
- 1.2. *Providing an overview of available dynamic testing methodologies;*
- 1.3. *Consider the need to provide a form of risk based approach to inform concerning the hand back of track after significant disturbance & failure of OTM (by March 2019);*
- 1.4. *Consider how dynamic track geometry can be continually monitored on disturbed ballast sites until the track bed is deemed settled (by March 2019);*
- 1.5. *Confirming the criteria which should be used to determine whether disturbed Track should be monitored dynamically (by March 2019).*

2. The rigor to be applied to understanding potential issues

- 2.1. *Do the current standards & existing bow ties to date provide clarity on the risks associated with disturbed ballast sites in respect to the management of track geometry? If found inadequate revise Standards & Bow ties;*
- 2.2. *What are the current methodologies available & any alternatives? Are they effective in notifying the responsible party of the risk of derailment from dynamic geometry irregularities due disturbed ballast sites still requiring settlement.? What alternatives measures are available & the practicality of employing such?*
- 2.3. *What are the additional factors that contribute towards the risk of derailment for disturbed ballast sites, e.g.*
 - *Frequency of measurement / monitoring*
 - *Duration of measurement / monitoring*
 - *S&C*
 - *Line speed*
 - *Axle load*
 - *Component type*

- *Competence*

3. The person proposed to be involved in the review/considerations

3.1. *STE, Principal Track Engineer Ian Dean leading a workshop of other STE members with members of RAM track & IP teams.*

4. How the outcomes of the review/consideration will be documented

4.1. *If adequate, summarise the salient points in the closure statement. (April 2019). If inadequate, set a programme to undertake an update to the standards / bow ties as appropriate. (October 2019). Note the use of the standards Emergency Change process will be considered if an earlier issue of updated critical or baseline limits is needed.*

4.2. *Summarise in a report the current state of the art & found deficiencies. Set a programme to conduct any improvements as appropriate (October 2019).*

4.3. *Undertake dissemination at quarterly Standards briefing as appropriate. The requirements of any new or revised Standards will be included within the corporate Functional Audit Plan and/or Engineering Verification regimes (December 2019).*

4.4. *Standards compliance date - March 2020.*

4.5. *Post-implementation review of standards change (June 2020).*

Timescale: 30 June 2020

Recommendation 3

The intent of this recommendation is to ensure that excessive cant gradients are not inadvertently introduced into the track following renewal and heavy maintenance work.

Network Rail should determine the circumstances when cant gradient should be measured before handing back track into service following renewal, and other work likely to result in significant change to track geometry or the supporting ballast, and the limits that apply. It should update its process and guidance to include the requirement and associated limits, and brief its track teams (both in-house and those working for its suppliers and contractors) on changes made.

ORR decision

13. Network Rail have begun addressing this recommendation by reviewing existing standards. We have asked Network Rail to provide us with feedback when the review stage has been completed (late February 2019), so we understand the findings of the review of current standards, processes and practices before new standard/documentation etc. are finalised.

14. 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 March 2020.

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

Information in support of ORR decision

15. On 5 December 2018 Network Rail provided the following initial response:

Action Plan

The recommendation will be addressed by a review of current applicable standards (NR/L2/TRK/2102 and TEF3203) and determining a course which may consist of one or more of the following outcomes:-

- *Introduction of a new Standard (likely to be in the form of a Track Work Instruction) specific to the issue at hand*
- *Revision of requirements and processes set out in current Standards, additional guidance if required.*
- *Formal re-briefing of the relevant content of Standards*

The actions required to close out the recommendation will be overseen by the Track Standards & Control Group chaired by the Professional Head of Track.

The technical lead for the changes and chair of the working group(s) for production of revision of Standards will be Jonathan Pegg (Principal Engineer).

Key timescales are set out below.

<i>Introduce remit to TSCG</i>	<i>18th December 2018</i>
<i>Convene Working Group</i>	<i>January 2019</i>
<i>Report findings to TSCG</i>	<i>12th February 2019</i>
<i>Draft Standard(s)</i>	<i>March/April 2019</i>
<i>Stakeholder Consultation</i>	<i>May 2019</i>
<i>TSCG Approval of material</i>	<i>4th June 2019</i>
<i>Quarterly Standards Brief</i>	<i>12th September 2019</i>
<i>Cascade Briefings</i>	<i>September/October 2019</i>
<i>Post Implementation Review</i>	<i>31st March 2020</i>

The working group will include representatives of the following positions:-

- *Principal Engineer (STE) (Chair)*
- *Engineering Expert (STE)*
- *Head of Discipline (IP)*
- *Route Asset Manager (Route Businesses)*
- *Construction Manager (IP)*

The review shall consider the appropriateness of the twist limits for new installation detailed in NR/L2/TRK/2102 in light of the Lewisham derailment. It shall then examine the links between those published limits and how they are applied on site including both the processes that trigger measurement of twist and the understanding of the importance of such measurements by technical staff. The working group will specifically determine if a new Work Instruction is required or whether existing processes can be used and the extent to which re-issue and re-briefing is required.

A specific theme to the review will be the application of the published Standards to complex geometrical scenarios such as were present at Lewisham and exist at other S&C layouts. For example designed two levelling, the lack of squareness of bearers in turnout routes, and the inaccuracy naturally induced in measurements by the lack of parallel alignment to the plane of the chainage datum.

The requirements of any new or revised Standards will be included within the corporate Functional Audit Plan and/or Engineering Verification regimes. The use of the Emergency Change process will be considered throughout this action plan, and used if required.

Timescale: 31 March 2020

Recommendation 4

The intent of this recommendation is to minimise the likelihood of vertical track geometry features that are hazardous to the safe passage of trains, from forming in modular S&C layouts.

Network Rail should review the design and validation of the standard bearer tie that it uses on modular S&C layouts, taking into account the applications in which it is being used and how its mechanical behaviour promotes the formation of track twist faults and unintended cant gradients. It should use its findings to determine the validity of requirements and guidance defined in its technical standards and on its standard design drawings, and amend and brief designers, suppliers, installers and others as appropriate.

ORR decision

16. We have asked Network Rail to provide us with feedback when item 3 on the action plan is complete (April 2019) so we understand the outcome of the review and any proposed modifications.

17. 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 October 2019.

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

Information in support of ORR decision

18. On 5 December 2018 Network Rail provided the following initial response:
Action Plan

Status	Item	Task Description	Due Date	Owner
Complete	1	Investigate alternative joints used by other railway authorities.	17-Sep-18	IB
Open	2	Review design through testing at University of Southampton to gain better understand of how joints and bearers behave and compare.	31-Dec-18	IB
Open	3	Review test results and evaluate the designs to determine whether we modify existing, adopt an approved alternative or require the need for a complete new solution.	30-Apr-19	IB
Open	4	Provide requirements and guidance for bearer joints being included in new track standard:		
Open	4a	<i>Scheme design and implementation</i>	30-Jun-19	IB
Complete	4b	<i>Installation of modular S&C - work instructions</i>	31-Aug-18	IB
Complete	4c	<i>Inspection and maintenance of bearer joints - work instructions</i>	30-Sep-18	IB
Open	5	Draft closure statement	30-Sep-19	IB
Open	6	Closure	31-Oct-19	SF

The recommendation is being addressed in two ways. Initially by reinforcing the controls around the specification of joint positions; the installation method; and inspection and maintenance requirements. A design review will bench mark the current design with existing products that are used on other railway networks. This will be supported by testing to deepen understanding of how the existing bearer joint behaves under different conditions.

The actions required to close the recommendation are detailed above.

Each of the actions will be undertaken and managed by members of the Network Rail STE, S&C Engineering team, supported by external parties where required. Progress will be monitored by the Progress Manager and reviewed by the Project Managers.

The output will be in the form of:

1. *The Track Engineering Standard NR/L2/TRK/3406: modules 1, 2 and 3. This will control the configuration of bearer joints (supported by the relevant RE/PW drawings), the installation method and the maintenance requirements (including minimum actions. Compliance will be monitored by the standard verification and audit protocols.*
2. *Standard RE/PW drawings of the bearer joint design or product acceptance documentation of an alternative supplier specific product. This will control the product design and configuration of the bearer joint. Compliance will be monitored by the Materials Quality Team in Network Rail, Route Services.*

Network Rail Recommendations, from the Formal Investigation Report will also be addressed by the action plan detailed above.

A11.2

The Head of Switches and Crossings, STE, should undertake testing of the split bearer tie in various states of construction in order to compare its deformation behaviour with conventional long bearers, and consider revising the instruction as to their use (see section A6.4 of this report).

Intention: to better understand the behaviour of split bearers and to validate whether the assumption that they act as a single bearer is valid.

This will be addressed by Items 2 & 3 of the action plan

A11.4

STE Head of Track should revise standard NR/L2/TRK/2102 to provide more detailed guidance on the design and use of split bearer plates (see section A6.3 of this report).

Intention: To make sure there is no dubiety concerning the use - or design - of split bearer plates on Network Rail managed infrastructure.

This will be addressed by action 4a in the action plan above. More specifically a module of NR/L3/TRK/3406 (module 1) is being written to cover this in more detail. The requirements in NR/L2/TRK/2102 will be reviewed and amended as required.

Timescale: 31 October 2019

Recommendation 5

The intent of this recommendation is to hasten the establishment of a practical means of preventing bulk hopper wagons travelling on the national network with a significant laterally-offset payload.

In its role of managing the development programme of the Cross-industry Freight Derailment Working Group, the RSSB should expedite work to define an acceptable limit for the lateral offset of the payload carried by bulk hopper wagons permitted to operate on the national network. The working group should additionally research and propose how compliance with this limit can be managed.

ORR decision

19. RSSB, through the Cross Industry Freight Derailment Working Group (XIFDWG), have completed the initial phase of work to consider the interaction between track, vehicle and loads for hopper wagons and identified gaps in current risk controls. Risk controls to prevent asymmetrically loaded wagons travelling on the mainline network have been identified and the freight operating companies, collaborating through the Cross Industry Freight Derailment Implementation Group (XIFDIG) are working on a programme to implement those changes.

20. After reviewing the information provided ORR has concluded that, in accordance with the Railways (Accident Investigation and Reporting) Regulations 2005, RSSB/XIFDIG have:

- taken the recommendation into consideration; and
- is taking action to implement it, but have not yet provided ORR with a time-bound plan for the work for implementing revised risk controls

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

21. On 24 April 2018 RSSB provided the following initial response:

I am pleased to be able to announce formally that the Cross-Industry Freight Derailment Working Group (XIFDWG) has agreed to start a workstream to consider unevenly loaded bulk commodities. In anticipation of the group expanding the remit of this work to consider Recommendation 5 in full, RSSB formally accepts said recommendation on its behalf (subject to formal agreement at the next XIFDWG meeting in May).

22. On 17 December 2018, RSSB notified us that ownership of the recommendation was transferring to RDG as the focus of the risk reduction initiatives moved to the implementation of specific control measures by individual duty holders:

The Cross-Industry Freight Derailment Working Group (XIFDG) referenced in the recommendation was established and set about working to:

1. *Define the current track, vehicle and load system*
2. *Define how these three elements interact*
3. *Describe the current risk controls in place*
4. *Detail the gaps in those risk control systems*
5. *Specify the measures required in the short, medium and long term to reduce those risk gaps so far as is reasonably practicable*
6. *Implement those measures*

It was also agreed that the group should:

- a. *Guide the development of a programme of work intended to deliver objectives 1 to 5, and*
- b. *Encourage and support the delivery of objective 6.*

In November 2017, members of the XIFDWG agreed that objectives 1 to 5, had been substantially completed and agreed to move the programme to encouraging and supporting the delivery of objective 6, the implementation phase. Good progress has been made to reduce the overall system risk of freight trains derailing, including;

- *Adaptation of the Network Rail GOTCHA wheel health monitoring system to provide data to freight companies on offset loads,*
- *Development of limits for offset loading with University of Huddersfield,*
- *Examination of the use of Container Weighing Systems to identify imbalanced containers, and*
- *Working with loading locations to reduce offset loads on bulk wagons.*

As the focus of the risk reduction initiatives has now moved towards the implementation of specific control measures by individual Duty Holders, it was agreed that the Rail Delivery Group (RDG) is now best placed to take over the oversight of the cross-industry programme of work. This was confirmed at the XIFDWG meeting on 29 November 2018, which was the first to be chaired by the RDG Project Manager for this work, Jim Macfadyen. To reflect these changes the group is to be renamed the Cross-industry Freight Derailment Implementation Group (XIFDIG). With this in mind, and bearing in mind that the XIFDWG formally accepted the recommendation at its 15 May 2018, RSSB suggests Lewisham Recommendation 5 be re-directed to RDG.

23. On 14 January 2019, RDG provided us with an outline of the work streams they were pursuing through the XIFDIG:

In response to Lewisham freight derailment RAIB report - Recommendation 5, I detail below the actions that the XIFDIG has underway.

1. *UoH commenced a study on bulk wagons at the start of December 2018 following the work of a sub group set up to finalise the scope. UoH will continue to update the group on progress and the report is due to complete at the end of February 2019. The key output from this work will be limits of offset loading for the variety of bulk wagon types. The risk score that has been developed for Container wagons will also be developed for bulk wagons.*
2. *Gotcha data is being used to by the FOC's to identify problem flows and to prioritise actions, two recent examples being GBRf work with Cemex Peak Forest and DB Cargo work at Margam. The development of limits and the risk scores will further refine the process of identifying problem flows and evaluating the results of actions being taken.*

3. *Gotcha has shown that a significant number of the bulk wagons showing lateral load offsets are wagons coming from NR possessions. The group has engaged with SCO group within NR, who manage these activities, and a meeting has been set up for 23rd January to identify the root cause of these offset loads and agree actions to address these. The scope of the bulk wagon study was extended to include the vehicle types commonly used in possessions.*
4. *A joint XIFDIG/RFOG sub group has been set up to finalise the bulk wagon loading standard which is planned to be introduced by NFSG via the ACOP route. This group will meet on 14th January and will report back to the next XIFDIG meeting on 22nd January. This bulk loading standard provides more guidance how to avoid laterally offset loads in bulk wagons by providing a limit on how far the peak of the load can be from the centre line of the wagon.*