

Oliver Stewart
Senior Executive, RAIB Relationship and
Recommendation Handling



13 February 2020

Mr Andrew Hall
Deputy Chief Inspector of Rail Accidents

Dear Andrew,

RAIB Report: Freight train derailment at Lewisham, south- east London on 24 January 2017

I write to provide an update¹ on the action taken in respect of recommendations 4 & 5 addressed to ORR in the above report, published on 28 February 2018.

The annex to this letter provides details of the action taken regarding the recommendations. The status of recommendations 4 & 5 is **'implemented'**.

We do not propose to take any further action in respect of the recommendations, unless we become aware that any of the information provided has become inaccurate, in which case I will write to you again.

We will publish this response on the ORR website on 14 February 2020.

Yours sincerely,

Oliver Stewart

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

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

1. Following the derailment at Lewisham, Network Rail have banned the use of 'back to back spine panels' (the arrangement of modular S&C in use at Lewisham that can increase the likelihood of twist faults).
2. In order to address the first part of the recommendation (reviewing the design of the standard bearer tie), Network Rail utilised the University of Southampton to conduct a series of tests comparing the modular bearer to a standard long bearer and other solutions used within the industry, identifying similar performance characteristics regarding settlement.
3. Following the tests, Network Rail have embarked on a project to design a 'flexible' joint (i.e. the other industry design style tested), as there are some applications where this could be beneficial (they allow some independent movement of tracks). This addresses the requirement of the first part of the recommendation.
4. In addition to the development of a flexible joint, a new standard consisting of three modules has been produced, providing guidance on the design and positioning of bearer joints; the installation; and the inspection and maintenance of modular S&C (NR/L3/TRK/3406). This addresses the second part of the recommendation.
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
 - has taken action to implement it

Status: Implemented.

Previously reported to RAIB

6. On 22 February 2019 ORR reported the following:
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.

Update

7. On 1 November 2019 Network Rail provided the following closure statement.



20191031 Lewisham
Rec 4 signed closure

8. Network Rail state in conclusion the following:

Despite the ongoing modular joint re-design, the design and validation and situations in which the modular joint has been used has been reviewed and following this review, guidance has been released in the form of the maintenance, installation and design standards to control the risk associated with the current joint. The risk is now better understood and the controls now in place have significantly reduced the risk, especially when factoring in the ban on back to back spine panels and existing layouts are being managed as a part of TME risk registers. In addition, university testing has shown that under the conditions that have been simulated, which would be the ideal installation and maintenance conditions, the joint performs similarly to a long bearer. Due to this increased understanding in conjunction with the controls in the form of the standards. This has made the residual risk lower. Network Rail considers the original intent of this recommendation, "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" to be addressed and as such the recommendation to be Closed.

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

9. Research undertaken by the University of Huddersfield has shown that the limits of lateral and longitudinal offset for container wagons outlined in T1119 are also applicable to bulk wagons. Non-compliance with the limits is identified by use of GOTCHA data, which is provided to FOCs to take remedial action.

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

- taken the recommendation into consideration; and

- has taken action to implement it

Status: Implemented.

Previously reported to RAIB

11. On 22 February 2019 ORR reported the following:

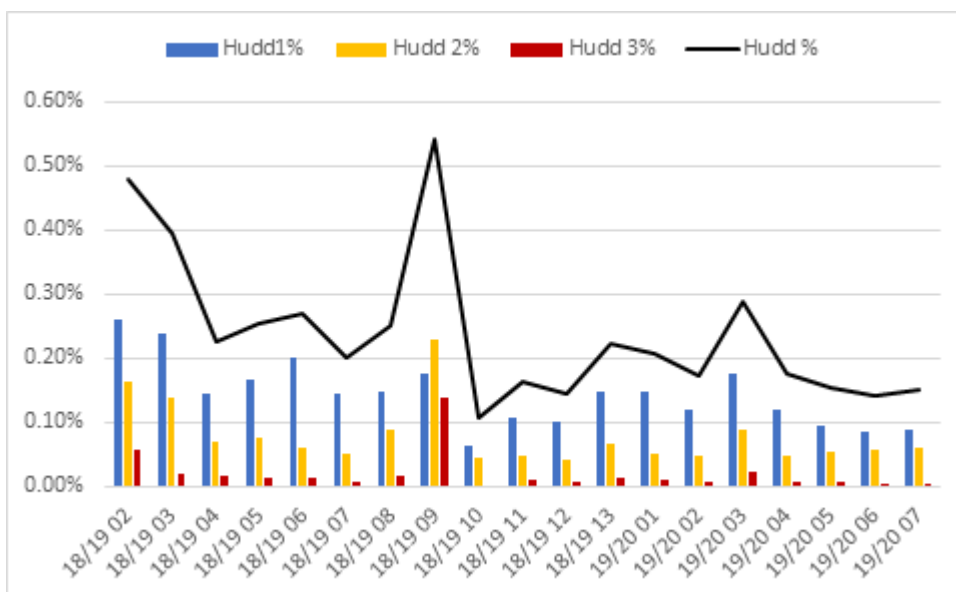
RSSB, through the Cross Industry Freight Derailment Working Group (XIFDWG), have completed the initial phase of work to consider the interaction between track, vehicle and loads for hopper wagons and identified gaps in current risk controls. Risk controls to prevent asymmetrically loaded wagons travelling 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.

Update

12. On 27 November 2019 RDG provided the following update:

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

- 1. UoH has completed a study on bulk wagons. The final report was reviewed and accepted for publication at the meeting of the XIFDPG on 22nd October 2019. This report reviews the performance of bulk wagons equipped with the most common suspension types on twisted track. The analysis has shown that the limits of lateral and longitudinal offsets of loads determined for container wagons (T1119 limits) are also applicable to bulk wagons. The results of the report have also been used to determine the limits set in the ACOP described below. The report shows the relative capability of different wagon types which the FOC's are now using to inform decisions on which wagons to deploy of particular flows.*
- 2. Gotcha data continues to be used to by the FOC's and other parties to identify problem flows and to prioritise actions. The development of limits and the risk scores for bulk wagons have been incorporated into the weekly reports and are supporting the process of identifying problem flows and evaluating the results of actions being taken. Recent examples of FOC activity are DB Cargo at Cardiff tidal and Freightliner on Iron Ore flows. The most recent Gotcha trend report up to end P7 2019 shows a significant reduction in the risk due to bulk wagons since the start of the report period in Period 2 18/19 with the most severe exceedances showing the largest reduction.*



Gotcha Trend Bulk wagons exceeding Huddersfield Limit

3. *As previously reported Gotcha shows 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 of NR throughout 2019 having met on five occasions. Actions taken include improvement in training for loading staff at MHD's, operators of High Output equipment, introduction of checks on wagons returning from possessions to MHD/AMD and creating 'Close calls' for offset loaded wagons. SCO has also commissioned UoH to carry out investigations on the offset loading of autoballast wagons to determine whether offloading from one side only in possessions is a safe practise. Results are expected in December 2019. The training delivered to users of High Output equipment has resulted in these wagons no longer activating the Gotcha sites for offset loading. SCO now attend the XIFDPG and there is strong engagement between SCO, the FOC's and XIFDPG.*

4. *The ACOP on bulk wagon loading was issued at the end of July, this has been shared with operators and users and with third parties such as the RFG. AI has produced a tool box talk based on the ACOP which has also been shared widely. The XIFDPG will continue to follow up to obtain evidence that the ACOP has been widely disseminated and it is being followed.*

Previously reported to RAIB

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

1. 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.
2. After reviewing the information provided ORR has concluded that, in accordance with the Railways (Accident Investigation and Reporting) Regulations 2005, Network Rail has:
 - taken the recommendation into consideration; and
 - 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

3. 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.

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

4. 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.

5. 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

6. 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).

7. 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.

8. 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.*