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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: Freight train derailment at Angerstein Junction on 2 April 2014

I write to provide an update¹ on the action taken in respect of recommendation 2 addressed to ORR in the above report, published on 12 August 2015.

The annex to this letter provides details of the action taken regarding the recommendation. The status of recommendation 2 is '**implemented**'.

We do not propose to take any further action in respect of the recommendation, 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 4 December 2019.

Yours sincerely,

Oliver Stewart

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

Recommendation 2

The intention of this recommendation is to manage the contribution that diagonal wheel unloadings, due to twisted bogie frames or other defects, make to derailment risk. The RAIB notes that action taken in response to this recommendation could be informed by work undertaken as part of the railway industry's response to the ORR's letter of 5 December 2014 (paragraph 163).

RSSB, in conjunction with freight wagon operators, freight operating companies and entities in charge of maintenance for freight wagons, should review the extent to which diagonal wheel unloadings are present within freight wagon bogies that are operating on Network Rail infrastructure, and the contribution that this makes to derailment risk. This review should consider:

- identifying the magnitude and prevalence of diagonal wheel unloadings caused by bogie frame twist (and other possible causes);
- proposing criteria for acceptable levels of diagonal wheel unloading, or for bogie frame twist; and
- proposing proportionate measures for identifying, and then managing, unacceptable diagonal wheel unloadings

ORR decision

1. Working through the Cross Industry Freight Derailment Implementation Group (XIFDIG, formerly the Cross Industry Freight Derailment Working Group),² RSSB have identified risks associated with asymmetrically loaded freight wagons and changed relevant standards accordingly. Limits for diagonal wheel unloading and bogie twist will be included in the guidance document GM/GN 2688 rather than the standard, GM/RT 2141.

2. Implementation of the revised standard is being taken forward by individual duty holders through the Cross-Industry Freight Derailment Implementation Group (XIFDIG), under the aegis of the Rail Delivery Group rather than RSSB.

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

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

Status: Implemented.

² The change of the group's name reflects the change in the focus of the working group from analysis and research to the implementation of risk controls.

Previously reported to RAIB

4. On 6 July 2016 ORR reported that whilst noting RSSB's plans to address this recommendation through the XIFDWG, it was not clear to ORR whether any other types of wagon other than hopper and container wagons may be subject to asymmetrical loading and therefore fall within the scope of this recommendation. RSSB was asked to comment on this.

Update

5. RSSB provided the following update on 1 July 2019:

*As previously reported, the findings of research project T1119 (Investigating the effects of offset loading in containers on risk of derailment on twisted track) were used to inform RSSB's update to the freight derailment risk assessment. Further details on this work may be found [here](#); one result of this was that Issue 4 of GMRT2141 ([Permissible track forces and resistance to derailment and roll-over of railway vehicles, published on 1 June 2019](#)) now notes that '[t]he conditions under which the vehicle assessments are carried out [as defined and recorded in the test report – Appendix A] include taking into account the effects of: [...] **a) Inter-vehicle connections on wheel unloading performance (for example, in certain articulated trains where the design can have a significant effect on this performance); and f) Any other design feature or in-service condition that might significantly affect the wheel unloading performance [...]**' (3.1.1).*

Section 3.2 considers low-speed flange climb derailments, section 3.3 considers the same in relation to ISO container carrying vehicles (etc)

Coupling this work with the fact that the Cross-Industry Freight Derailment Implementation Group is now under the aegis of the Rail Delivery Group and that the actual risk is owned by the duty holder, RSSB considers the recommendation to be closed.

T1119 project abstract:

This project aimed to understand the impact that uneven loading of containers has on the likelihood of derailment, when travelling on twisted track. It used accepted simulation methods commonly applied in the rail industry. This project carried out VAMPIRE® simulations in two work packages. The first work package (WP1) simulated thousands of combinations of unevenly loaded containers to the test criteria outlined in Appendices A and C of GMRT2141 (Resistance of Railway Vehicles to Derailment and Roll-Over), including derailment case studies. The second work package validated real track conditions where incidents have occurred, on a subset of the scenarios simulated in WP1. Consequently, changes to GMRT2141 to include eccentric loading scenarios are expected to be key enablers for reducing the risk of freight derailments across the network.

Previously reported to RAIB

Recommendation 2

The intention of this recommendation is to manage the contribution that diagonal wheel unloadings, due to twisted bogie frames or other defects, make to derailment risk. The RAIB notes that action taken in response to this recommendation could be informed by work undertaken as part of the railway industry's response to the ORR's letter of 5 December 2014 (paragraph 163).

RSSB, in conjunction with freight wagon operators, freight operating companies and entities in charge of maintenance for freight wagons, should review the extent to which diagonal wheel unloadings are present within freight wagon bogies that are operating on Network Rail infrastructure, and the contribution that this makes to derailment risk. This review should consider:

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- proposing criteria for acceptable levels of diagonal wheel unloading, or for bogie frame twist; and
- proposing proportionate measures for identifying, and then managing, unacceptable diagonal wheel unloadings

ORR decision

1. Whilst noting RSSB's plans to address this recommendation through the XIFDWG, it is not clear to ORR whether any other types of wagon other than hopper and container wagons may be subject to asymmetrical loading and therefore fall within the scope of this recommendation. RSSB has been asked to comment on this.

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

3. On 10 November 2015 RSSB provided the following initial response: *With reference to Recommendations 2 and 6 of RAIB's investigation report on the Angerstein Junction derailment of 2 April 2014, having already agreed to consider the derailment risk caused by asymmetrically loaded hopper wagons (due to residual loads), as well as asymmetrically loaded container wagons, the Cross Industry Freight Derailment Working Group also agreed (at its meeting of 23 September 2015) that Recommendations 2 and 6 fell within its scope. The*

recommendation will therefore be considered as part of the working group's programme.

4. ORR met with the chair of the XIFDWG (RSSB Safety Director), on 19 April 2016, to review progress in the Group's production of, amongst other things, its programme and workstream scopes as referenced in its letter dated 14 March 2016. ORR noted that the Group has a number of workstreams under way, some of which will potentially provide information which supports responses to RAIB recommendations. ORR agreed with XIFDWG's approach to RAIB recommendations, in that whilst the Group will endeavour to provide relevant information to support group members address their particular recommendations, it is for those individual members to ensure that their own recommendations are addressed and reported to ORR. This is line with the Railways (Accident Investigation and Reporting) Regulations 2005. ORR also noted that for this approach to be fully effective, the Group should define within its programme and supporting workstreams the boundaries of the workstreams so that Group members can consider what gaps to recommendation requirements might remain that they need to consider. ORR noted that the RSSB, on behalf of the Group, is developing a recommendation mapping tool for this purpose.

5. The XIFDWG met again on 16 May 2016 where the group's programme plan, remit and RAIB recommendations mapping outcome were discussed.