Oliver Stewart
Senior Executive, RAIB Relationship and Recommendation Handling
Telephone 020 7282 3864
E-mail oliver.stewart@orr.gsi.gov.uk

OFFICE OF RAIL AND ROAD

3 December 2019

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 near Gloucester on 15 October 2013

I write to provide an update[1] on the action taken in respect of recommendations 5 & 7 addressed to ORR in the above report, published on 9 October 2014.

The annex to this letter provides details of the action taken regarding the recommendations. The status of recommendations 5 & 7 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 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 5

The intent of the recommendation is to ensure that when a vehicle's dynamic behaviour is assessed to identify whether its ride performance is compatible with the railway infrastructure in Great Britain (this may include infrastructure that does not comply with Technical Specifications for Interoperability), the susceptibility of its ride performance to track geometry with cyclic top is included in this assessment.

RSSB, in conjunction with Rolling Stock Standards Committee, should carry out a review to identify how a vehicle's response to regular changes in vertical track geometry should be assessed (i.e. a cyclic top assessment). RSSB should then propose changes to the standards which are used assess the compatibility of vehicle's ride performance with the railway infrastructure in Great Britain (at present this is Railway Group Standard GM/RT2141), which will implement the cyclic top assessment identified by the review. The proposed changes to the standards, as agreed by Rolling Stock Standards Committee, should then be implemented by RSSB by means of a time bound programme.

ORR decision

1. The revised version of GM/RT 2141 includes a requirement to demonstrate that vehicles are not susceptible to derailment due to cyclic top (section 3.6) for both bogie and two-axle wagons.

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
- has taken action to implement it.

Status: Implemented.

Previously reported to RAIB

3. On 7 October 2015, ORR reported the following:

RSSB has established a cross industry working group to consider issues around freight wagon/ track condition derailments. As well as Gloucester recommendations 5 and 7, the group is also looking at Primrose Hill/ Camden Junction recommendation 3. RSSB wrote to ORR on 27 May 2015 with information about the establishment of the group:

With regard to both the Gloucester and Camden Road RAIB report recommendations, RSSB has facilitated the formation of a cross-industry working group specifically to work on freight vehicle / track condition derailments. The group includes representatives from Network Rail, freight operators, academia, technical experts, ORR and RSSB. It will analyse in great detail the entire problem from a whole system perspective and any changes necessary to Railway Group Standards will form one of its recommendations.

The group's work is reported to the Infrastructure, Rolling Stock and Plant standards committees, who have indicated that they will accept any proposed standards changes from the group. The group is due to report back to the ORR in six months (although, as noted above, ORR is also member of the group.

The cross industry working group is planning to report progress to ORR by the end of October 2015.

Update

4. On 1 July 2019, RSSB provided the following update:

Issue 4 of GMRT2141 (Permissible track forces and resistance to derailment and roll-over of railway vehicles, published on 1 June 2019) now includes the following (quoted verbatim):

3.6 Cyclic top derailment

3.6.1 To demonstrate that vehicles are not susceptible to derailment due to cyclic top track features, one of the following two processes shall be used:

a) A comparison with an existing vehicle of similar design, as set out in Appendix C;

b) A simulation assessment of a validated model over track with a sinusoidal waveform, as set out in Appendix D.

Rationale

G 3.6.2 This requirement is for compatibility with the existing GB mainline railway.

G 3.6.3 GB mainline track can contain cyclic top where cyclic irregularities in the vertical track alignment can excite under-damped behaviour in the vehicle at particular speeds.

This behaviour can lead to complete loss of vertical wheel load and consequent derailment.

G 3.6.4 The infrastructure manager's (IM's) standards set the limit for the amplitude and length of cyclic top track features before maintenance or speed restrictions are required. Vehicles can encounter cyclic top track features anywhere on the GB mainline railway, including on continuous welded track.

Guidance

G 3.6.5 Guidance on the two available routes to demonstrate that a vehicle is not susceptible to cyclic top is given in Appendices C and D.

Taking the above into consideration, RSSB considers the recommendation to be closed.

Recommendation 7

The intent of the recommendation is to highlight the risk that a wagon may be susceptible to riding problems if it is designed with a bogie centre spacing distance that is the same as a wavelength commonly associated with cyclic top track defects.

RSSB, in conjunction with Rolling Stock Standards Committee, should propose that guidance on the design of freight wagons in document GM/GN2688 is amended, to explain that as well as two-axle wagons, if a wagon is designed with a bogie centre spacing that matches a wavelength commonly associated with cyclic top, it may be susceptible to poor ride on jointed track and cyclic top.

ORR decision

5. GM/GN 2688 has not been amended as described in the recommendation, but we consider the risk of a wagon being designed with a bogie centre spacing that matches a wavelength commonly associated with cyclic top to be widely understood and has been appropriately captured in GM/RT 2141 Appendix C.

6. 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.

Previously reported to RAIB

7. On 7 October 2015, ORR reported the following:
As detailed in the response to recommendation 5, RSSB has established a cross industry working group to consider issues around freight vehicle/ track condition derailments. This will include amendments to GM/RT 2141 to accommodate longitudinal and lateral asymmetric loading.

Part of the revision of GM/RT 2141 will be to harmonise the requirements and methodologies of some of the content of it to be more compatible with the Euro Norm EN 14363.

EN14363 uses a different 'assault course' as to the typical track geometry components (curve radii, over speed etc) needed to be negotiated to enable safe traverse. The review will seek to ascertain that any requirements don't impose any additional burden to GB practise. Conversely, a revised version of GM/Rt 2141 needs to ensure that any non-GB wagon entering into UK should be subject to sufficient scrutiny so that it can negotiate GB track without risks that wouldn't be expected from domestic wagons.

GM/RT 2141 also applies to passenger vehicles and other vehicles such as MPV and plant in travelling mode and the amendments of GM Rt 2141 will be extended to those types of vehicles to a wider consulted audience via rolling stock standards.

Update

8. On 1 July 2019, RSSB provided the following update:

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3.6.1 To demonstrate that vehicles are not susceptible to derailment due to cyclic top track features, one of the following two processes shall be used:
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b) A simulation assessment of a validated model over track with a sinusoidal waveform, as set out in Appendix D.

Rationale

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Guidance

G 3.6.5 Guidance on the two available routes to demonstrate that a vehicle is not susceptible to cyclic top is given in Appendices C and D.

***[Appendix C]** G C.1.1 For a new vehicle to be exempt from a cyclic top assessment**, it is considered best practice for it to be similar in design to an existing vehicle with a documented history of safe operation**. For the comparator vehicle to be classed as similar, it is important to consider the following vehicle parameters:*

a) Bogie pivot centres / axle spacing;

b) Bogie wheelbase;

c) Primary and secondary suspension types;

d) Vertical damper rates or percentage of friction damping;

e) Natural frequencies.

Taking the above into consideration, RSSB considers the recommendation to be closed.

Previously reported to RAIB

Recommendation 5

The intent of the recommendation is to ensure that when a vehicle's dynamic behaviour is assessed to identify whether its ride performance is compatible with the railway infrastructure in Great Britain (this may include infrastructure that does not comply with Technical Specifications for Interoperability), the susceptibility of its ride performance to track geometry with cyclic top is included in this assessment.

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Steps taken or being taken to address the recommendation

1. RSSB has established a cross industry working group to consider issues around freight wagon/ track condition derailments. As well as Gloucester recommendations 5 and 7, the group is also looking at Primrose Hill/ Camden Junction recommendation 3. RSSB wrote to ORR on 27 May 2015 with information about the establishment of the group:

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ORR decision

2. The cross industry working group is planning to report progress to ORR by the end of October 2015.

3. ORR, in reviewing the information received from Network Rail has concluded that, in accordance with the Railways (Accident Investigation and Reporting) Regulations 2005, it has:

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

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

Recommendation 7

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Steps taken or being taken to address the recommendation

4. As detailed in the response to recommendation 5, RSSB has established a cross industry working group to consider issues around freight vehicle/ track condition derailments. This will include amendments to GM/RT 2141 to accommodate longitudinal and lateral asymmetric loading.

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6. EN14363 uses a different ‘assault course’ as to the typical track geometry components (curve radii, over speed etc) needed to be negotiated to enable safe traverse. The review will seek to ascertain that any requirements don’t impose any additional burden to GB practise. Conversely, a revised version of GM/Rt 2141 needs to ensure that any non-GB wagon entering into UK should be subject to sufficient scrutiny so that it can negotiate GB track without risks that wouldn’t be expected from domestic wagons.

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