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

Dear Andrew,

RAIB Report: Freight train derailment at Eastleigh, Hampshire on 28 January 2020

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 4 March 2021.

The annex to this letter provides details of actions taken in response to the recommendations and the status decided by ORR. The status of recommendations 1 & 2 is **'Implementation on-going'.**

ORR will advise RAIB when further information is available regarding actions being taken to address these recommendations.

We will publish this response on the ORR website on 4 February 2022.

Yours sincerely,

Oliver Stewart

Initial consideration by ORR

1.   Both recommendations were addressed to ORR when the report was published on 4 March 2021.

2.   After considering the recommendations ORR passed both recommendations to Network Rail asking them to consider and where appropriate act upon them and advise ORR of its conclusions. The consideration given to each recommendation is included below.

3.   ORR also brought both recommendations to the attention of other infractructure managers as it was concluded that that there are equally important lessons for them. ORR did not ask these organisations to provide a reply.

4.   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 reduce the risk of failure of elevated cast iron shoulders, such as those on RT60 S&C layouts.

Network Rail should develop a strategy to assess and control the risk of failure of track fastening systems incorporating elevated shoulders in RT60 switch and crossing layouts. It should also confirm that the failure mode identified in these shoulders does not apply to other elevated designs of track fastening system

ORR decision

5.   Network Rail is reviewing designs of elevated shoulder currently used in S&C that are potentially vulnerable to a similar failure to that at Eastleigh. The review is aimed at improving understanding of the failure mechanism of track fastening systems incorporating elevated shoulders in RT60 switch and crossing layouts in order to make them more resilient.

6.   Depending on the outcome of the review, changes may be made to the existing design of elevated shoulders or a new product developed. The report will also consider possible change to how raised shoulders are installed on S&C.

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 April 2022.

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

Information in support of ORR decision

8.   On 21 April 2021 Network Rail provided the following initial response:

Action Plan

Please provide milestones with dates

Network Rail will undertake a wholesale review of the use of elevated shoulders in switch and crossing (S&C) layouts. This review will consider both the design applicable at the Eastleigh derailment as well as other shoulder types that could be susceptible to a similar failure. At this stage the only other variant of shoulder that is deemed applicable is that which is used on the Corus Cogifer RT60 (CCRT60) design. The review will investigate alternate solutions for sites that are susceptible to failure in addition to the use of enhanced maintenance techniques that will allow staff to identify failures before they become a safety risk. The focus for this action plan is on designing out the failure mode for the elevated shoulders. Adjustments to the inspection regime introduced following the derailment will be considered following the output of this review.

A series of five actions have been created to address this recommendation:

1. Undertake a design assessment of the Balfour Beatty RT60 (BBRT60) elevated shoulder and implement alternative design if necessary. **Target completion: April 2022**

2. Trial and implement use of NR60 equivalent bearers as an alternative design at failed sites (or as a proactive remedial measure during medium/heavy maintenance works). **Target completion: December 2021**

3. Undertake assessment of Corus Cogifer RT60 shoulders to determine if any failures have taken place on this design. **Target completion: May 2021**

4. Conduct a review into the use of drill-and-glue as a manufacturing method for the shoulders. **Target completion: April 2022**

5. Undertake feasibility study for non-destructive testing (NDT) technologies to identify failed elevated shoulders **Target completion**: **April 2022**

The results of the review and each specific action will be presented on an ongoing basis to the track engineering community.

All associated actions are expected to be complete by **April 2022**

Evidence required to support closure of recommendation

Evidence will be provided against each of the numbered actions in order to support closure of the recommendation:

1. A completed design assessment and, if deemed necessary, the introduction of a revised design of elevated shoulder for use in maintenance replacements of BBRT60 assets going forward. The task will include an assessment of the approval processes, engineering limits and testing programme undertaken for the original design. It will explore the possibility of minor alterations to the shoulder design to improve resilience

2. A trial is planned for an existing BBRT60 layout during Q2 2021. The trial site will be monitored for ease of installation and performance and resilience of the asset following modification. The trial will produce a series of updated design drawings for the implementation of this proactive measure. Benefits will be compared against those arising from action 1 as an improved shoulder design is likely to be a more suitable solution.

3. This assessment will review historical records in the Ellipse Asset and Workbank register. Feedback will be sought from local engineers maintaining this design of asset to bolster the Ellipse review. A

> comparative assessment will be made between the CCRT60 and BBRT60 shoulder designs to understand the difference in risk.
>
> 4. The review will determine the current and future mix of drill-and-glue concrete bearers in the supply chain, including an understanding of how the method could be limited in scope to manage areas known to be more susceptible to failure.
>
> 5. The use of NDT to identify failed shoulders that do not exhibit visual signs of deterioration is recognized as a key element of the risk reduction strategy. A technology identification exercise is ongoing with a series of trials planned soon after.

9. On 3 September 2021 Network Rail provided the following update:

Recommendation 2

The intent of this recommendation is that Network Rail considers how dynamic track gauge measurement is undertaken in the areas of its network that are not traversed by its track measurement trains.

Network Rail should review its arrangements for the dynamic measurement of track geometry on the parts of its infrastructure not covered by its track measurement trains. The review should include the identification of high risk locations where additional safeguards are required (such as those subject to high lateral forces, or where there is an increased risk of track geometry faults). Consideration should be given to the number and routing of track measurement trains and alternative ways of measuring track geometry under dynamic conditions. Any additional safeguards identified by this review should be implemented by means of a risk-based programme

ORR decision

10.   Network Rail has reviewed technological solutions for detecting unsafe track gauge and a number of different devices are now being trialled. In addition, Network Rail is aiming to improve monitoring of S&C by updating standards and making changes to training .

11.   From the initial response provided by Network Rail it was unclear if track geometry for S&C was only taken into consideration, or if it also covered plain line. The initial response from Network Rail only referred to S&C, but when challenged confirmed the recommendation would also be addressed in terms of plain line track geometry.

12.   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 April 2022.

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

Information in support of ORR decision

13.   On 21 April 2021 Network Rail provided the following initial response:

Action Plan
Please provide milestones with dates
Network Rail will conduct a review of its management of dynamic gauge, focussing specifically on the risk associated with S&C. The review will consider the controls currently in place to manage gauge (both static and dynamic) within S&C, as well as what technology could be deployed to support maintenance staff in managing the associated risk. A series of three actions have been created to address this recommendation: 1. Conduct a review of historic gauge spread derailments, including a review of the relevant bow-tie controls **Target completion: June 2021** 2. Undertake an assessment of existing technologies / devices to monitor gauge spread in S&C **Target completion: June 2021** 3. Conduct a review of the Network Rail standards and controls framework with respect to management and measurement of gauge **Target completion: April 2022** All associated actions are expected to be complete by **April 2022**
Evidence required to support closure of recommendation
Evidence will be provided against each of the numbered actions in order to support closure of the recommendation: 1. A catalogue of all previous gauge spread derailments will be produced, summarising causal factors and identifying relevant which of the track bow-tie controls are relevant to each failure. 2. Technologies will be evaluated in their ability to support detection of un-safe gauge at critical locations in S&C which have been identified through existing assessments. Where specific products

are identified, trial product acceptance will be undertaken in order to support a pilot in the railway environment.

3. Following on from the bow-tie review, each control measure will be assessed for effectiveness and potential for enhancement as required. Where controls are required to be enhanced / modified, or where new controls are needed, working groups will be established to deliver the necessary changes with the standards issued and briefed.

14. On 3 September 2021 Network Rail provided the following update: