**Oliver Stewart**
**RAIB Recommendation Handling Manager**

1 August 2024

Mr Andy Lewis
Deputy Chief Inspector of Rail Accidents

Dear Andy,

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

I write to provide an update[1] on the action taken in respect of recommendation 1 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 recommendation and the status decided by ORR. The status of recommendation 1 is **'Closed'.**

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.

Yours sincerely,

Oliver Stewart

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

**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**

1. Network Rail assessed the level of risk from track fastening systems incorporating elevated shoulders using a Special Inspection Notice 151 (SIN). The findings of the SIN were reported in NR/TA/SC/RP/052 – Report – CCRT60 Risk assessment. Network Rail have developed a strategy to improve detection of potential failures and for more robust repairs, where detected.

2. Network Rail have updated standard NR/L2/TRK/001 Module 5 and provided staff briefings to increase awareness and understanding of the issues associated with elevated housings. All BBRT60 sites are now reported to be captured within Track Maintenance Engineers' risk registers and receive a themed visual and tactile inspection at either 12 or 24 monthly frequency, based on risk (curvature). This is in addition to targeted visual inspections on BBRT60 assets at every Basic Visual Inspection. In addition, the following has been considered:

a) Trials of the BBRT60 re-design have been ongoing. NR60 Mk1 has been established as a suitable retrofit solution.
b) BBRT60 design is obsolescent and not installed since c. 2006. Evidence that some of these layouts have already been renewed or planned for renewal in the coming Control Periods. Population will naturally reduce over time.
c) Non-destructive alternative to tactile testing has been assessed. Further roll-out being considered with regions.

3. In terms of the second part of the recommendation, only one other elevated shoulder design (Corus Cogifer (CC) RT60) was identified by Network Rail and it was found to not have the same issues as the RT60.

4. 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 close it

***Status: Closed.***

**Previously reported to RAIB**

5. On 3 February 2022 ORR reported the following:

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.

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.

**Update**

6. On 3 November 2022 Network Rail provided the following closure statement:


Eastleigh Rec 1.docx

7. On 26 June 2023 Network Rail provided the following updated closure statement and supporting Strategy Paper:


Draft Closure Statement Eastleigh R


Eastleigh Recommendations TS

**Previously reported to RAIB**

**Recommendation 1**

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**ORR decision**

1. 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.

2. 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.

3. 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**

4. 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.<br><br>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.

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

# Current Progress – Recommendation 1

| Undertake design assessment of BBRT60 elevated housing and implement alternative design if necessary | NR60 equivalent bearers as an alternative design at failed sites (or as a proactive remedial measure during medium/heavy maintenance | Undertake assessment of CC RT60 housings to understand if any failures have taken place at these sites | Conduct a review into the use of drill-and-glue as a manufacturing method for the shoulders | Undertake feasibility study for NDT technologies to identify failed elevated housings |
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| • Remit completed and submitted for quotation<br>• Contract commenced with Progress Rail<br>• Work ongoing<br>• Challenges around identifying exact mechanism of failure<br>• FE analyses being used to predict known failure – these will then be valid against a modified variant | • Trial is planned for Eastleigh<br>• Design work currently underway<br>• Layout is somewhat non-standard so required additional design over and above what a standard plain lead would | • Engineering assessment completed<br>• Findings indicate the risk to CCRT60 layouts is low<br>• No known failures of this kind at CCRT60 layouts | • Initial review completed with Cemex<br>• April 2021 – 40% bearers still use drill & glue<br>• Challenges around notice period and subsequent production of templates<br>• Will be a programme of gradual improvement<br>• Future 3rd bearer supplier will be 100% templated | • Continuing work with MTC on this development<br>• Trials of UT equipment conducted at Farnborough and Wrawby<br>• Final report due in the next few weeks<br>• Wider rollout of trial equipment planned in Wessex thereafter |

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