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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 Lewisham, south-east London on 24 January 2017

I write to provide an update¹ on the action taken in respect of recommendation 3 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 recommendation. The status of recommendation 3 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 5 June 2020.

Yours sincerely,

Oliver Stewart

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

Recommendation 3

The intent of this recommendation is to ensure that excessive cant gradients are not inadvertently introduced into the track following renewal and heavy maintenance work.

Network Rail should determine the circumstances when cant gradient should be measured before handing back track into service following renewal, and other work likely to result in significant change to track geometry or the supporting ballast, and the limits that apply. It should update its process and guidance to include the requirement and associated limits, and brief its track teams (both in-house and those working for its suppliers and contractors) on changes made.

ORR decision

1. Network Rail have addressed the recommendation by issuing a revised version of TEF 3203, covering guidance and requirements around the installation of modular S&C, including checks before handing back into service. We note the improvements made by Network Rail are designed to reinforce and tighten existing standards, this coupled with the tightening of specification on management of modular S&C, will lead to the design seen at Lewisham will not being repeated in new layouts.

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
- has taken action to implement it.

Status: Implemented.

Previously reported to RAIB

3. On 22 February 2019 ORR reported the following:

Network Rail have begun addressing this recommendation by reviewing existing standards. We have asked Network Rail to provide us with feedback when the review stage has been completed (late February 2019), so we understand the findings of the review of current standards, processes and practices before new standard/documentation etc. are finalised.

Update

4. On 30 March 2020 Network Rail provided the following closure statement:



20200327 Lewisham
Rec 3 Signed Closures

5. Network Rail state the following:

Overview

In the event the recommendation has been directly addressed by changes to TEF3203 rather than by publishing a new Work Instruction. The suite of forms comprising TEF3203 are those used to certify that amended track infrastructure is fit for purpose prior to entry into service. It is therefore a more direct way of enforcing the necessary control than a Work Instruction.

Issues relating to the prevention of twist through safe by design principles have also been included in the new company standard NR/L2/TRK/3406 Module 1 – Design and Positioning of Bearer Joints in Modular Switch & Crossing Units. These requirements are additional to those directly required by the recommendations arising from the Rail Accident Report.

In revising NR/L2/TRK/2102 it is not proposed to amend design limits relating to cant gradient. These were not a factor in the derailment and there is a logical progression through the values relating to normal design, exceptional design, intervention limit and critical limit. It is also the case that the critical (immediate action) limit is known to be a value at which a vehicle within rolling stock maintenance limits will not derail. The limiting values used by Network Rail for cant gradient design, and for maintenance interventions and immediate actions in relation to twist faults, are directly extracted from Railway Group Standard GC/RT 5021 – Track System Requirements.

Changes to TEF3203

The principal change to TEF3203 in respect of the recommendation is to introduce new specific requirements and associated guidance for modular S&C. The following is now included in Appendix 1 Infrastructure Conformance – Guidance Notes:

- Modular Bearer joints are installed and torqued as detailed in NR/L3/TRK/3406. All screws torqued to 340Nm by an approved tool.*
- Modular panels only to be lifted as a single unit when being placed. 2 panels not be lifted whilst joined using the bearer tie.*
- Note: the term 'lift' used above is for placement of panels- not tamping.*
- A full twist check to be completed and documented through the length of any tied bearers.*

The first two checks are intended as a control against the inadvertent creation of a twist fault in a layout during the construction phase.

The latter requirement is a direct fulfilment of the recommendation and introduces a new explicit requirement to complete a check for twist throughout the area of modular tied bearers. This is essentially a reminder since adherence to the previous requirement would have resulted in a full check.

The applicable limits for twist are published elsewhere on the Form B. Although this is not a new feature the values have been updated to align with those contained in NR/L2/TRK/001 – Track Inspection & Maintenance Requirements.

Form B – System Components Check requires the track inspector to answer yes/no to the following prompts:

- Modular S&C specific: Modular Bearer Ties are correctly installed and torqued*
- Modular S&C specific: Track twist check documented through entire tied area*

The updated TEF3203 was published in June 2019 and briefed via the Quarterly Track Standards cascade process. This includes all suppliers to Infrastructure Projects. Documentation of those persons briefed is retained by all briefers. The compliance date was 7th September 2019.

NR/L2/TRK/3406

NR/L2/TRK/3406 is a suite of modular standards that have been introduced since the derailment and have specific controls to prevent the repetition of the modular bearer tie positions that were instrumental in creating the potential for the track twist at Lewisham.

Module 1 of the standard requires risk assessment and associated controls for all modular bearer layouts and explicitly bans the use of back to back spine panels such as existed at the point of derailment at Lewisham. This module was published in September 2019 with a compliance date of 7th December 2019. It has been briefed via the Quarterly Track Standards cascade briefing process.

Other Work Arising from Working Group Considerations

Further related controls will be included in NR/L2/TRK/2500 Issue 4 scheduled for publication in September 2020. This will introduce an assurance process in relation to changes to the detail shown on RE/PW series drawings during the design phase in order to create a site specific solution.

The new text will give the technical thresholds and approval levels that apply to such changes. This is a safe by design control intended to reduce the risk associated with any form of geometrical fault arising from change to corporately assured designs.

There will also be new controls introduced in relation to Recommendation 2 and these cover the remainder of the findings of the working groups that considered Recommendation 3.

There were two situations identified as potentially analogous to the loss of geometry suffered by the modular bearer at Lewisham:

- incorrect configuration of two levelled baseplates within S&C*
- distortion of a poorly supported steel sleeper*

In the first instance the resulting geometrical feature would not be prone to further degradation following entry into service. It was therefore considered that the requirement to conduct a twist check through the disturbed length of track prior to entry into service remained sufficient. In any case the risk of installing two levelling incorrectly when using modern renewal techniques is greatly reduced and design best practice documentation published by Network Rail discourages its use where not necessary in any case.

No evidence could be found of steel sleepers being distorted by the running of trains including in one case of the derailment of a tamper on unsupported sleepers within a possession. It was considered that individual sleepers display elastic material properties and the control on the risk of twist in steel sleepers is related to ballast preparation. There will be a specific control introduced in relation to Recommendation 2 to cover planned and execution of on-track machine activity with actions to be taken in the event of failure that pertains to this risk.

The considered response of the Chief Track, Switches & Crossings Engineer is that the above provision for the recommendation is sufficiently addressed. The intent of this recommendation has been met and therefore considered CLOSED.

Previously reported to RAIB

Recommendation 3

The intent of this recommendation is to ensure that excessive cant gradients are not inadvertently introduced into the track following renewal and heavy maintenance work.

Network Rail should determine the circumstances when cant gradient should be measured before handing back track into service following renewal, and other work likely to result in significant change to track geometry or the supporting ballast, and the limits that apply. It should update its process and guidance to include the requirement and associated limits, and brief its track teams (both in-house and those working for its suppliers and contractors) on changes made.

ORR decision

1. Network Rail have begun addressing this recommendation by reviewing existing standards. We have asked Network Rail to provide us with feedback when the review stage has been completed (late February 2019), so we understand the findings of the review of current standards, processes and practices before new standard/documentation etc. are finalised.
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 March 2020.

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

The recommendation will be addressed by a review of current applicable standards (NR/L2/TRK/2102 and TEF3203) and determining a course which may consist of one or more of the following outcomes:-

- *Introduction of a new Standard (likely to be in the form of a Track Work Instruction) specific to the issue at hand*
- *Revision of requirements and processes set out in current Standards, additional guidance if required.*
- *Formal re-briefing of the relevant content of Standards*

The actions required to close out the recommendation will be overseen by the Track Standards & Control Group chaired by the Professional Head of Track.

The technical lead for the changes and chair of the working group(s) for production of revision of Standards will be Jonathan Pegg (Principal Engineer).

Key timescales are set out below.

<i>Introduce remit to TSCG</i>	<i>18th December 2018</i>
<i>Convene Working Group</i>	<i>January 2019</i>
<i>Report findings to TSCG</i>	<i>12th February 2019</i>
<i>Draft Standard(s)</i>	<i>March/April 2019</i>
<i>Stakeholder Consultation</i>	<i>May 2019</i>
<i>TSCG Approval of material</i>	<i>4th June 2019</i>
<i>Quarterly Standards Brief</i>	<i>12th September 2019</i>
<i>Cascade Briefings</i>	<i>September/October 2019</i>
<i>Post Implementation Review</i>	<i>31st March 2020</i>

The working group will include representatives of the following positions;-

- Principal Engineer (STE) (Chair)*
- Engineering Expert (STE)*
- Head of Discipline (IP)*
- Route Asset Manager (Route Businesses)*
- Construction Manager (IP)*

The review shall consider the appropriateness of the twist limits for new installation detailed in NR/L2/TRK/2102 in light of the Lewisham derailment. It shall then examine the links between those published limits and how they are applied on site including both the processes that trigger measurement of twist and the understanding of the importance of such measurements by technical staff. The working group will specifically determine if a new Work Instruction is required or whether existing processes can be used and the extent to which re-issue and re-briefing is required.

A specific theme to the review will be the application of the published Standards to complex geometrical scenarios such as were present at Lewisham and exist at other S&C layouts. For example designed two levelling, the lack of squareness of bearers in turnout routes, and the inaccuracy naturally induced in measurements by the lack of parallel alignment to the plane of the chainage datum.

The requirements of any new or revised Standards will be included within the corporate Functional Audit Plan and/or Engineering Verification regimes. The use of the Emergency Change process will be considered throughout this action plan, and used if required.

Timescale: 31 March 2020