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Ms Carolyn Griffiths
Chief Inspector of Rail Accidents
Cullen House
Berkshire Copse Rd
Aldershot
Hampshire GU11 2HP

Dear Carolyn,

RAIB Report: Partial failure of a structure inside Balcombe Tunnel, West Sussex

I write to provide an update¹ on the action being taken in respect of recommendations 1 and 3 addressed to ORR in the above report, published on 15 August 2013.

The annex to this letter provides details of the action being taken in respect of each recommendation where the status of recommendation 1 is 'in-progress' and recommendation 3 is 'implementation on-going'.

It is ORR's view that Network Rail has not fully met the requirements of recommendation 1, to *develop an appropriate regime to detect loose fixings including tactile testing where appropriate*, and will continue to engage with Network Rail and will update RAIB by 3 April 2015.

We do not propose to take any further action in respect of recommendation 3 unless we become aware that any of the information provided becomes inaccurate, in which case I will write to you again².

We will publish this response on the ORR website on 31 December 2014.

Yours sincerely,

Chris O'Doherty

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

² In accordance with Regulation 12(2)(c)

Recommendation 1

The intention of this recommendation is to identify fixings at risk of failure based on current knowledge.

Network Rail should, where failure could result in risk, identify where polyester resin anchors have been used to support structures (including overhead electrification and signalling equipment), and develop an appropriate regime to detect loose fixings including tactile testing where appropriate.

Brief Summary on what was previously reported to RAIB on 18 August 2014

Tunnels with ancillary structures similar to the failed structure at Balcombe will be identified. Appropriate management actions will be put in place to manage risk through the examination regime with specific examination and testing requirements identified with the tunnel management strategy.

All other assets it is intended to evaluate whether standards across different asset types adequately clarify the responsibility for the examination of fixings and the scope of the exam by undertaking a technical review. Following the review, guidance will be issued across all disciplines, to ensure that no ambiguity exists in the examination, testing and maintenance of fixings.

Completion Date: 30th September 2014.

Update

1. On 13 October 2014, Network Rail provided ORR with its 'Closure Statement':

Tunnels with ancillary structures similar to the failed structure at Balcombe have been identified.

To enable appropriate management actions for these assets to be identified and included in the relevant Tunnel Management Strategies (TMS) a pro -forma has been produced and supplied to the Routes to complete and then append to the TMS.

3) All routes have completed updating applicable TMS's. Network Rail has completed a review of examination standards to ensure that the responsibility for the examination of support fixings fixed to or within structures assets and believes that the requirements for their examination are now clearly defined. The scope of examinations is defined in The Handbook for the Examination of Structures (NR/L3/CIV/006) Part 1B 'The Examination Regime'. The previous issue (now withdrawn) noted the requirements for the examination of ESS (Equipment Support Structures) as follows:

NR/L3/CIV/006 part 1B Issue 1 (WITHDRAWN) Examination Regime, Clause 4.4.2 Parts of Structure to be examined.

This clause states that:-

"Where an ESS is attached to a Structure, the connection and interface of the ESS shall be included in the examination of the Structure or ESS as applicable. The examination shall identify any detrimental effect of the ESS on the Structure and vice versa".

The clause stated that the fixings were to be included in the examination of the structure or the ESS. This statement was ambiguous and could lead structures and

other disciplines to both assume the other party was responsible for examination. NR/L3/CIV/006 part 1B was republished in January 2014. The revised issue (Now Issue 2) now contains a reworded clause clarifying the requirements for examination of ESS Fixings. Clause 5.4.2 'Parts to be examined in a Detailed Exam' now mandates that the connection and interface between an ESS and Structures asset shall be included in the scope of the detailed examination of the structure.

NR/L3/CIV/006 part 1B Issue 2 (Dated 17th January 2014) Examination Regime, Clause 5.4.2 Parts of Structure to be examined.

Where an Ancillary Structure (such as an ESS) is attached to a Structure, where practicable the connection and interface between them shall be included in Detailed Examinations of:

- a) The Structure; and
- b) The Ancillary Structure (where such an Examination is undertaken).

These examinations shall identify any detrimental effect of the Ancillary Structure on the Structure, and vice versa.

Note: It can be cost-effective to undertake an examination (Visual or Detailed) of the Ancillary Structure when undertaking a Detailed Examination of the Structure. Where OLE is attached to the Structure, the examination of the Structure shall include any protective screening.

The definition of an ESS (Equipment Support Structure) is as stated on **NR/L3/CIV/006 Part 1A Purpose, Scope and Definitions** as:-

"A post, pole, stanchion, mast, tower, cantilever, portal, gantry, or platform, which supports equipment such as signals, overhead line electrification equipment (OLE), CCTV and DOO cameras or screens, radio, telecommunications, hoists or drives, lighting, cameras, mirrors, location boxes, feeder stations or equipment boxes. The term generally excludes posts or poles less than 1 metre high, but includes posts less than 1 metre long fixed to the crown of Tunnels which support OLE or GSM -R aerials at Tunnel Portals."

In order to share lessons learnt from this incident, and specifically this recommendation, a 'Shared Learning from a RAIB Report' bulletin was issued to the structures community via the scheduled periodic RAM Community meetings.

ORR Decision

2. ORR is concerned with the phrase 'where practicable' within its statement: 'Where an Ancillary Structure (such as an ESS) is attached to a Structure, where practicable the connection and interface between them shall be included in detailed examinations of...'

3. ORR is specifically concerned with the adequacy of inspecting hidden critical elements. This was also a concern in RAIB report: Derailment of a freight train near Stewarton, Ayrshire 27 January 2009. This concluded that: *no arrangements had been made to inspect the hidden parts of the east and centre main girders ...*

Status: In-progress.

It is ORR's view that Network Rail has not fully met the recommendation to *develop an appropriate regime to detect loose fixings including tactile testing where appropriate.*

ORR will continue to engage with Network Rail and will update RAIB by 3 April 2015.

Recommendation 3

The purpose of this recommendation is to promote additional investigation prior to specifying materials where performance is critical.

Network Rail should review, and if necessary amend its processes, such that designers of structures are required to positively confirm the compatibility of materials with their intended application and environment, including fixing metallic structures to masonry, if the application is safety critical.

Brief Summary on what was previously reported to RAIB on 18 August 2014

Network Rail had completed the review of processes governing the assurance of designs for civils assets and a number of improvements had been identified for control documentation that needs revising to ensure robust closure of recommendation 3.

Following the review and identification of the relevant control standards requiring revision a robust time-bound action plan can be outlined

Timescale: 31 October 2014

Update

4. On 3 November 2014, Network Rail provided ORR with its justification for an extension of the timescale to complete its actions to address this recommendation:

Original philosophy for closure

Originally Network Rail believed that the requirement for designers to positively affirm the compatibility of materials and fixings in the context of specific designs should be stated as an "Engineering Deliverable".

It was originally envisaged that "Engineering Deliverables" should be initiated in the "Project Requirement Statement" (PRS); their content is specified within the requirements of Standard NR/L2/INI/CP0069. Therefore the original action for closure was to write a letter of instruction against this standard to include the positive affirmation of the compatibility of materials and fixings in specific designs within the specification. It was therefore also understood that these requirements would then be included in Contract Requirements – Technical.

As part of progressing this action, a number of stakeholder consultation meetings were undertaken both with the owner of standard NR/L2/INI/CP0069 and the end users in Network Rail Infrastructure Projects (IP) - Design Management to evaluate the practicalities and impact of this approach.

Justification for change in approach

It appears that NR/L2/INI/CP0069 is undergoing major change to improve its functionality. This change has partly invalidated the original approach as the PRS will no longer exist in their present form. This together with the uncertainty of the status

of change to that standard from its stakeholder consultation puts the closure of the recommendation at risk.

In consultation with the standard owner and IP Design management it is believed that this risk can be mitigated by directing the Letter of Instruction to the Civil Engineering Design Assurance Standard NR/L2/CIV/003 stating that the positive affirmation of the compatibility of materials and fixings in designs should be made in the form F001 (Approval in Principle stage) of that standard. This means that the affirmation will be made when the outline design is submitted for approval; however it would not necessarily be stated in the PRS or CR-T [Contracts Requirement Technical].

However it is believed that this is a lesser risk and represents better mitigation; it will satisfy the intent of the recommendation quicker than waiting for the rewrite and acceptance of NR/L2/INI/CP0069

Revised completion date: 30th January 2015

ORR Decision

5. After reviewing all the information received from Network Rail, ORR 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. Completion date: 30th January 2015

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