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11 January 2017



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

Dear Andrew,

**RAIB Report: Landslips affecting Network Rail infrastructure, 2 April 2014**

I write to provide an update<sup>1</sup> on the action taken in respect of recommendation 5 addressed to ORR in the above report, published on 2 April 2014.

The annex to this letter provides details of the action taken regarding this recommendation, the status of which is now '**Implemented**'. We do not propose to take any further action in respect of this recommendation, unless we become aware that any of the information provided becomes inaccurate, in which case I will write to you again.

We will publish this response on the ORR website on 12 January 2017.

Yours sincerely,

A handwritten signature in black ink, appearing to read 'Oliver Stewart', written in a cursive style.

Oliver Stewart

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

## Recommendation 5

*The intent of this recommendation is for Network Rail to formalise the process for dealing with the rare circumstances when the mitigation normally provided in response to a red warning would be inadequate. This requires consideration of additional mitigation for locations on the 'at risk' register and consideration of mitigation for locations which are not normally considered to be at risk during extreme weather conditions.*

Network Rail should formalise the process for implementing additional mitigation if very extreme rainfall conditions mean that the mitigation normally provided in response to a red warning is inadequate for earthworks on the 'at risk' register and/or there is a significant likelihood of landslips at locations not included on this register.

### ORR decision

1. Network Rail has implemented a four-stage process they detailed in their initial response for further mitigation measures to take in the event of extreme weather.
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 20 June 2014, Network Rail provided the following information in their initial response:

*Network Rail will review this recommendation as part the Adverse Weather Topic Verification to be delivered by a combination of the Weather Resilience & Climate Change (WRCC) Programme's activities and Technical Services projects "T01190 CP5 Interim Geotechnical Business Plan Development - Civils Adjustment Mechanism March 2015" and "T00978 Corporate Engineering Verification Civils (Geotechnical)".*

*This recommendation has been interpreted to relate to real-time monitoring of rainfall to facilitate rapid responses to control the dynamic risk posed by short, high-intensity showers that the predictive models have "disguised". Even if a red or equivalent warning is in place in such circumstances the baseline mitigation may need to be supplemented by additional control measures.*

*Network Rail's Extreme Weather Action Team (EWAT) will consider how the process for implementing additional mitigation can be formalised.*

*Timescale: 31 December 2014*

4. On 5 August 2014, ORR wrote to Network Rail asking it to clarify the actions it is taking to formalise its processes. On 26 August 2014, Network Rail provided the following information:

*It is Network Rail's intention to consider this scenario as part of the EWAT process review described above and the Adverse Weather Topic Verification. The EWAT process review is scheduled to be completed and an enhanced EWAT process implemented by 28 November 2014. As shown in the attached programme NWER is strengthening Network Rail's weather warning capability. In accordance the EWAT process will be further updated as the Future Weather Warning System is rolled-out.*

5. At the time of reporting to RAIB (31 March 2015), Network Rail had yet to provide evidence of completion of its review or implementation of changes to its process for mitigation of very extreme rainfall conditions.

## Update

6. Following some timescale extensions Network Rail provided the following closure statement and supporting evidence on 6 July 2016:



RAIB Landslips Class  
Inv Rec 5 closure sigr



021 and 7.1  
Awareness Briefing.p



021 and 7.1 COM  
Briefing.pptx



021 and 7.1 NOC  
Briefing.pptx



021 and 7.1 OM  
Briefing.pptx



021 and 7.1 RCM  
Briefing.pptx



021 and 7.1 SDS  
Briefing.pptx



021 and 7.1 TOC  
FOC Briefing.pptx



Standard Briefing  
TOC Version.docx

7. Network Rail state in summary the following:

*This recommendation has been interpreted to relate to real-time monitoring of rainfall to facilitate rapid responses to control the dynamic risk posed by short, high-intensity showers that the predictive models have "disguised". Even if a red or equivalent warning is in place in such circumstances the baseline mitigation may need to be supplemented by additional control measures. Network Rail's Extreme Weather Action Team (EWAT) has considered how the process for implementing additional mitigation can be formalised and has responded to four specific requirements, as follows:*

1) It should be confirmed that the FWS supports improved forecasting of short duration and intense rainfall - COMPLETE: The FWS went live on 1<sup>st</sup> October 2015. The new Met Desk delivered service includes an increased number of observation points (e.g. those of Highways England) and provides an hourly forecast.

2) Evidence should be provided that the revised EWAT process requires a dynamic risk assessment to be conducted. - COMPLETE: Dynamic Risk Assessment inherent in the responsibilities of Route Asset Management as defined in the up-issue (published 5 March 2016) of NR/L2/OCS/021, *Weather-Managing the Operational Risks*, p. 10, viz.

'Route Asset Managers shall:

a) Prepare and communicate Route and local adverse and extreme weather plans in accordance with NR/L2/CIV/086-4 and NR/L3/TRK/1010 respectively.

b) Distribute asset-specific response guidance based on the weather hazard and its impact on specific assets.

c) Check that adverse and extreme weather plans are reviewed regularly and that they cover all Route asset groupings, vulnerable assets and high risk areas.

d) Check that adverse and extreme weather plans and response plans are rehearsed at regular intervals.

e) Confirm their inclusion on conference standing invitee lists and attend the relevant extreme weather response conference.

f) Provide input to contingency and disruption plan reviews and exercises.'

3) Confirmation that the dynamic process evaluates the impact of the changes in predicted weather on,

i). 'at risk' assets that require additional mitigation measures and ii). assets which were not formally at risk but which now require some form of mitigating

action. - COMPLETE: This relates to NR/L2/OCS/021,p.10, 'Route Asset Managers shall... b) Distribute asset-specific response guidance based on the weather

hazard and its impact on specific assets.' In addition, p. 18 (Section 7.2.2) describes the process by which Delivery Conferences shall operate in preparation for the event,

'The Infrastructure Maintenance Delivery Manager shall convene a Delivery Unit (DU) conference to outline the impact of the impending weather conditions, and to allocate resources accordingly. As well as Delivery Unit staff, the conference shall involve Asset Management and Operations staff. The conference agenda shall include, but is not limited to:

Current weather forecast conditions and confidence

Key risks in the area

*Staff and equipment deployment, which may include changes to rosters, postponement of works and the mobilisation of additional staff*  
*Additional asset checks prior to or during the weather event*

*Potential timetable alterations*

*The necessity of route-proving after the event and how this shall take place (for example, staff on service trains or by helicopter)*

*Summary of actions*

*The agreed actions shall be shared with the Route Control Manager*

*4) The EWAT process has been deployed to the Routes. - COMPLETE: The revised Standard was published on 5th March and briefed to Routes.*

## Previously reported to RAIB

### Recommendation 5

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Network Rail should formalise the process for implementing additional mitigation if very extreme rainfall conditions mean that the mitigation normally provided in response to a red warning is inadequate for earthworks on the 'at risk' register and/or there is a significant likelihood of landslips at locations not included on this register.

### Steps taken or being taken to address the recommendation

1. On 20 June 2014, Network Rail provided the following information:

*Network Rail will review this recommendation as part the Adverse Weather Topic Verification to be delivered by a combination of the Weather Resilience & Climate Change (WRCC) Programme's activities and Technical Services projects "T01190 CP5 Interim Geotechnical Business Plan Development - Civils Adjustment Mechanism March 2015" and "T00978 Corporate Engineering Verification Civils (Geotechnical)".*

*This recommendation has been interpreted to relate to real-time monitoring of rainfall to facilitate rapid responses to control the dynamic risk posed by short, high-intensity showers that the predictive models have "disguised". Even if a red or equivalent warning is in place in such circumstances the baseline mitigation may need to be supplemented by additional control measures. Network Rail's Extreme Weather Action Team (EWAT) will consider how the process for implementing additional mitigation can be formalised.*

*Timescale: 31 December 2014*

2. On 5 August 2014, ORR wrote to Network Rail asking it to clarify the actions it is taking to formalise its processes. On 26 August 2014, Network Rail provided the following information:

*It is Network Rail's intention to consider this scenario as part of the EWAT process review described above and the Adverse Weather Topic Verification. The EWAT process review is scheduled to be completed and an enhanced EWAT process implemented by 28 November 2014. As shown in the attached programme NWER is strengthening Network Rail's weather warning capability. In accordance the EWAT process will be further updated as the Future Weather Warning System is rolled-out.*

### ORR decision

3. Network Rail has yet to provide evidence of completion of its review or implementation of changes to its process for mitigation of very extreme rainfall conditions.

**Status: In-progress.** ORR will update RAIB by 28 August 2015 on the action being taken to address this recommendation.