

## Recommendation(s) Status: Derailment due to a landslip, and subsequent collision, Watford

This report is based on information provided to the RAIB by the relevant safety authority or public body.

The status of implementation of the recommendations, as reported to us, has been divided into eight categories:

### Key to Recommendation Status

<b>Implemented:</b>	All actions to deliver the recommendation have been completed.
<b>Implemented by alternative means:</b>	The intent of the recommendation has been satisfied in a way that was not identified by the RAIB during the investigation.
<b>Implementation ongoing:</b>	Work to deliver the intent of the recommendation has been agreed and is in the process of being delivered.
<b>Insufficient response:</b>	The end implementer has failed to provide a response; or has provided a response that does not adequately satisfy ORR that sufficient action is being taken to properly consider and address a recommendation.
<b>Progressing:</b>	The relevant safety authority has yet to be satisfied that an appropriate plan, with timescales, is in place to implement the recommendation; and work is in progress to provide this.
<b>Non-implementation:</b>	Regulation 12(2)(b)(iii) = recommendation considered and no implementation action to be taken.
<b>Closed - carry forward:</b>	ORR intends to take no further action as it has been superseded by another recommendation.
<b>Awaiting response:</b>	Awaiting initial report from the relevant safety authority or public body on the status of the recommendation.

RAIB concerns on actions taken by organisations in response to recommendations are reflected in this report and are indicated by one of the following:

**Red** – RAIB has concerns that no actions have been taken in response to a recommendation.

**Blue** – The blue triangle shows recommendations where the RAIB has concerns that the actions taken, or proposed, are inappropriate or insufficient to address the risk identified during the investigation.

**White** – The white triangle shows recommendations where the RAIB notes substantive actions have been reported, but the RAIB still has concerns.

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<b>Report Title</b>	Derailment due to a landslip, and subsequent collision, Watford
<b>Report Number</b>	11/2017
<b>Date of Incident</b>	16/09/2016

Rec No.	Status	RAIB Concern	Recommendation	RAIB Summary of current status
11/2017/05	Implemented	None	<p>The intent of this recommendation is to enable a prompt response by fire and rescue and ambulance services following an accident on Network Rail infrastructure. It is envisaged that liaison with the British Transport Police will be required to achieve part (a) and liaison with representatives of the fire and rescue services will be required to achieve part (b).</p> <p>Network Rail should improve emergency arrangements for its infrastructure by:</p> <p>a. reviewing with relevant organisations and, where appropriate, improving its processes in order to minimise the time taken during emergencies to contact organisations providing fire and rescue and ambulance services (paragraph 135b); and</p> <p>b. considering and, where necessary, implementing liaison with the local fire and rescue service including participation in joint site inspections at access gates which may need to be used by the emergency services where appropriate (paragraph 135c).</p>	<p>ORR has reported that Network Rail has reported that it has completed actions taken in response to this recommendation. ORR proposes to take no further action unless they become aware that the information provided becomes inaccurate.</p>
11/2017/06	Implemented	None	<p>The intent of this recommendation is to support the completion of a full survey of drainage assets required to mitigate safety risk on Network Rail infrastructure.</p>	

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			<p>Network Rail should develop and commit to a time bound plan to complete its planned survey of drainage assets to provide sufficient asset knowledge to adequately manage risk. This should include a desk study of archive records and current records, together with inspections on site (paragraph 142).</p>	
11/2017/01	Implemented	None	<p>The intent of this recommendation is to mitigate the risk of a future slope failure at this historically vulnerable location. Effective implementation of the drainage work described in paragraph 144 is likely to contribute to implementation of this recommendation.</p> <p>Network Rail should implement measures to improve surface drainage (eg by provision of a suitable drainage system encompassing the crest), in the vicinity of the 2016 Watford tunnel landslip. It should also investigate whether it is necessary to take steps to manage sub-surface flows which were observed during this accident and could reoccur during a future event (paragraph 128).</p>	<p>ORR has reported that Network Rail has reported that it has completed actions taken in response to this recommendation.</p> <p>ORR proposes to take no further action unless they become aware that the information provided becomes inaccurate.</p>
11/2017/02	Implemented	None	<p>The intent of this recommendation is to determine whether other Network Rail locations have an unrecognised washout risk for reasons found at the accident site. Implementation is expected to comprise verification that the current processes identify risk at locations similar to the accident site and a check to find any other sites omitted from washout studies for reasons similar to those at Watford.</p> <p>Network Rail should review, and if necessary, improve its process for identification of localised water concentration features which can channel significant amounts of water onto the railway with the consequent risk of slope failure. This review should include:</p>	

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			<p>a. using current Network Rail processes to analyse the washout and earthflow risk for the slow lines cuttings at Watford to determine whether this correctly identifies the landslip site as a high risk location; and</p> <p>b. verifying that the process has been applied to all relevant track alignments including those such as at Watford where there are closely spaced multiple alignments (paragraph 129).</p>	
11/2017/03	Implemented	None	<p>The intent of this recommendation is to identify and assess the effectiveness of design features that provide guidance to trains when derailed, so limiting the deviation of trains from the track and reducing the risk of collision with trains approaching on other lines. This could be achieved by the retention or strengthening of features already forming part of the bogie structure, or infrastructure measures such as guard rails. It is also intended that the learning from research in this area is used to derive meaningful design requirements.</p> <p>The Rail Delivery Group (RDG), in conjunction with RSSB, should:</p> <p>commission research into the ways in which guidance can be provided to derailed trains. This should include consideration of:</p> <ul style="list-style-type: none"> <li>I how the design of bogies and bogie mounted equipment can assist in limiting the lateral deviation of passenger trains during a derailment;</li> <li>I practice in other countries (eg Japan);</li> <li>I how specially installed infrastructure features can achieve the same effect at high risk locations;</li> <li>I potential design requirements for the retention or enhancement of such</li> </ul>	

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			<p>features on new trains or infrastructure; and</p> <p>the potential benefits and drawbacks of such measures.</p> <p>If such features, whether existing or additional, are shown to have a net beneficial effect in reducing risk by limiting lateral deviation, RDG/RSSB should:</p> <p>share this information with the relevant Standards Committees; and</p> <p>record and disseminate the design requirements with a view to their incorporation into future standards.</p>	
11/2017/04	Implemented	None	<p>The intent of this recommendation is to manage the risk caused by displaced emergency equipment located in the driving cabs of the class 350 and other classes of Desiro train, identified as a result of this accident.</p> <p>Siemens, in conjunction with the relevant rolling stock owning companies (ROSCOs), should review and improve the physical security and/or location of emergency equipment (eg track circuit clips and detonators) carried in driving cabs. This is to minimise the risk of secondary injury to cab occupants during a collision (paragraph 134).</p>	<p>ORR has reported that Siemens, in conjunction with the relevant rolling stock owning companies (ROSCOs) has reported that it has completed actions taken in response to this recommendation.</p> <p>ORR proposes to take no further action unless they become aware that the information provided becomes inaccurate.</p>