

Recommendation Status Report: Derailment of a passenger train at Carmont, Aberdeenshire

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

The status of the recommendation(s), as reported to us, are described by the following categories:

Key to Recommendation Status

Open (replaces Progressing and Implementation On-going)	Actions to address the recommendation are ongoing.
Closed (replaces Implemented, Implemented by alternative means, and Non-implementation)	ORR consider the recommendation to have been taken into consideration by an end implementer and evidence provided to show action taken or justification for no action taken.
Insufficient response:	The end implementer has not provided sufficient evidence that the recommendation has been taken into consideration, or if it has, the action proposed does not address the recommendation, or there is insufficient evidence to support no action being taken.
Superseded:	The recommendation has been superseded either by a newer recommendation or actions have subsequently been taken by the end implementer that have superseded the recommendation.
Awaiting response:	Awaiting initial report from the relevant safety authority or public body on the status of the recommendation.

RAIB concern over the way that an organisation has responded to a recommendation are indicated by one of the following:

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

Blue – RAIB has concerns that the actions taken, or proposed, are inappropriate or insufficient to address the risk identified during the investigation.

White – RAIB notes substantive actions have been reported, but the RAIB still has concerns.

Recommendation Status Report



Report Title	Derailment of a passenger train at Carmont, Aberdeenshire
Report Number	02/2022
Date of Incident	12/08/2020

Rec No.	Status	RAIB Concern	Recommendation	RAIB Summary of current status
02/2022/01	Closed - I	None	<p>This recommendation recognises the evolution of Network Rail’s processes since the Carmont 2011/12 drainage scheme was constructed and is intended to ensure that current processes ensure works are appropriately constructed and transferred into maintenance regimes with the records needed for safe future management of the asset.</p> <p>Network Rail should review its contractual and project management arrangements to identify effective measures to: a) substantially reduce the risk of contractors modifying an approved design during construction without the appropriate approvals from the designer, the client and any other body affected by the change b) ensure the timely provision of the accurate records needed for future management of the asset. The review should include consideration of:</p> <ul style="list-style-type: none"> ●contractual conditions and penalties for non-compliance with mandated process ●assurance and quality control requirements ●change management procedures ●appropriate client checks during construction ●the timely preparation and hand-over of ‘as-built’ drawings and health and safety files ●the requirements of the Construction (Design and Management) Regulations 2015 ●ways of guaranteeing access to asset records should a contractor go out of business ●current levels of compliance and reasons for any significant levels of non-compliance. 	<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>

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			The measures identified by the review should be incorporated into Network Rail's contractual and project management systems, and those tasked with implementing the improved arrangements should be provided with clear guidance and suitable briefing (paragraphs 611b, 612a, 612b, 612c).	
02/2022/02	Open	None	<p>The intent of this recommendation is to identify and correct instances where new works have not been incorporated into appropriate maintenance processes (at present these include Ellipse and Maintenance Scheduled Tasks).</p> <p>Network Rail should:</p> <ul style="list-style-type: none"> a) take steps necessary to ensure that all elements of infrastructure constructed in Scotland since 2012 that require routine inspections and maintenance are included in the appropriate asset management processes b) dependent on findings from the above activity, extend the timeframe, to an extent determined on the basis of safety risk, to include work constructed before 2012 c) determine, based on safety risk, the extent to which similar steps are required on Network Rail infrastructure outside Scotland and, if necessary, implement these steps d) conduct an audit review covering the implementation of existing arrangements to identify, report and correct asset database management and data quality issues. <p>(paragraphs 612b, 614b, 614c)</p>	ORR has reported that Network Rail has a proposed action plan and timescale for delivery to be taken in response to the recommendation. Further engagement between ORR and Network Rail is ongoing
02/2022/03	Open	None	<p>The intent of this recommendation is for Network Rail to use learning from events at Carmont and the subsequent investigation of this to improve the design of drainage systems.</p> <p>Network Rail should review and update its drainage-related procedures so that the output from the design process takes full account of likely impacts on railway safety due to flooding and/or debris washed from drains and/or surrounding ground. The review should take account of:</p>	ORR has reported that Network Rail has a proposed action plan and timescale for delivery to be taken in response to the recommendation. ORR will advise when the status of this recommendation changes.

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			<ul style="list-style-type: none"> ●water flow return periods and climate change allowances appropriate for both normal operation of the drain and for assessment of drain performance during more extreme events ●the extent to which site-specific information about topography and ground conditions should be obtained, taking into account the extent to which modern technology (such as LiDAR) can assist this ●the full range of drain types available, including those recently developed ●the circumstances in which each type of drain should be used and the detailed specification necessary to suit particular locations ●potential failure modes such as blocked pipes and catchpits ●preventing flooding and/or material displaced from a drain endangering the safety of train movements, allowing for potential exacerbating factors such as the use of gravel-filled drains on steep slopes. <p>(paragraph 611a) This recommendation may also apply to other infrastructure managers in the UK.</p>	
02/2022/04	Closed - I	None	<p>The intent of this recommendation is to evaluate the way that examinations of mixed cuttings are being conducted to ensure that the approaches adopted across the network meet with the intent of the relevant standard.</p> <p>Amey and Network Rail should jointly review the way that they are implementing the requirements of standard NR/L3/CIV/065 (and the associated module 02) that relate to mixed cuttings and the reporting of incomplete examinations in order to establish any improvements that are required to working practices during examinations. The review should consider the extent to which working practices are compatible with the intent of the standard, consistent with best practice elsewhere and appropriate for effective management of risk.</p> <p>The areas for improvement identified by the review shall be implemented</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>

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			by means of a timebound plan (with reference to any improvements to the standard arising from implementation of Recommendation 5). (paragraph 618c)	
02/2022/05	Closed - I	None	<p>The intent of this recommendation is to reduce the risk that incomplete examinations are not reported to Network Rail.</p> <p>In parallel with the implementation of Recommendation 4, Network Rail's Technical Authority should evaluate the adequacy, and ways of improving the clarity, of standard NR/L3/CIV/065 (and the associated module 02) requirements that relate to the examination of mixed cuttings. Steps should then be taken to improve the clarity of the standard and to incorporate any necessary changes into the examination process. (paragraph 618c)</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>
02/2022/06	Closed - I	None	<p>The intent of this recommendation is that the railway industry should review extreme weather processes and ensure that these adequately address rainfall-related risk at earthworks and drainage assets. The recommendation effectively requires a review of the changes introduced shortly after the accident and an assessment of their effectiveness.</p> <p>Network Rail should review and, where necessary, improve its processes for mitigating rainfall-related threats to the integrity of its earthworks and drainage infrastructure which could potentially affect the safe operation of trains. This review should include:</p> <ul style="list-style-type: none"> a) identification of any additional mitigation measures to manage the risk to assets, including those that are not considered to be at particular risk of failure in extreme rain-fall, and the circumstances in which these measures should be applied b) identification of enhanced methods for the monitoring and measurement of extreme rain-fall and thresholds for applying and disapplying mitigation measures c) consideration of resource availability during extreme events (allowing for any mobilisation time) d) a plan for ongoing review of the mitigation measures taking account of 	<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>

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			<p>technological improvements and changing circumstances e) possible extension of learning to other weather conditions and/or other types of asset.</p> <p>Any improvements to existing processes that are identified by this review should be implemented throughout the network. (paragraphs 613a, 613b, 613c, 614d, 615a.i, 615a.iii)</p>	
02/2022/07	Open	None	<p>This recommendation is intended to enhance the ability of route control staff to contribute to the safe operation of a modern railway by making good safety decisions in difficult circumstances based on a holistic assessment of the most relevant information. It is intended to build on the work already undertaken as part of Network Rail's 21st Century Operations programme.</p> <p>Network Rail, in conjunction with train operating companies, should review the capability of route control rooms to effectively manage complex, widespread and unusual situations such as abnormal weather conditions and multiple infrastructure failures. This review should consider the steps needed to ensure that route controls have sufficient staff with appropriate skills (technical and non-technical), experience and knowledge, all with clearly defined responsibilities and accountabilities. The review should therefore examine how Network Rail ensures that route control staff are provided with appropriate training, learning and professional development for their roles, supported by means of a comprehensive competence management system, that enables them to feel confident and empowered to make difficult decisions.</p> <p>As part of this review, Network Rail should also compare its railway control safety-related decision-making frameworks with those in other organisations (such as off-shore exploration and air traffic management) to determine if good practices can be imported into the railway environment.</p> <p>The review should be used to inform the development of a timebound programme for the implementation of the measures that are needed to</p>	<p>ORR has reported that Network Rail has a proposed action plan and timescale for delivery to be taken in response to the recommendation. Further engagement between ORR and Network Rail is ongoing.</p>

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			develop the incident management capability of route controls (paragraphs 613a, 613b, 614d).	
02/2022/08	Open	None	<p>The intent of this recommendation is to improve the effectiveness of Network Rail’s management assurance processes related to safety critical functions of route control rooms, so that it provides a more realistic assessment of the extent to which mandated safety systems are being correctly applied, and the overall level of safety performance.</p> <p>Network Rail, in consultation with staff representatives, should undertake a project to improve the way its management assurance system operates in areas directly affecting the safety critical functions of route control rooms. This project should include an in-depth management review to identify gaps or weaknesses in route control management arrangements and the underlying reasons for any areas of noncompliance that are identified.</p> <p>The output of this project should include a structured and validated programme, endorsed by the Network Rail board, for implementing the necessary improved management assurance arrangements, and briefing the changes to those on the front line (paragraph 615a.ii).</p>	<p>ORR has reported that (Network Rail has a proposed action plan and timescale for delivery to be taken in response to the recommendation. ORR will advise when the status of this recommendation changes.</p>
02/2022/09	Closed - I	None	<p>This recommendation is intended to ensure that Network Rail makes effective use of safety learning from previous events.</p> <p>Network Rail, in consultation with the Office of Rail and Road, should review the effectiveness of recent changes to its processes for ensuring that appropriate action is taken in response to safety recommendations. The review should aim to identify current obstacles to the thorough implementation of lessons learned from the investigation of previous events, and any additional measures that are needed to address them. As a minimum, the review should consider:</p> <p>a) the business process and cultural change needed to ensure that agreed responses to recommendations are implemented in an appropriate and timely manner</p>	

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			<p>b) ways of encouraging the open and accurate reporting of progress with implementation of agreed action plans</p> <p>c) the monitoring and senior management review of the extent to which closed recommendations have been effectively implemented and embedded at a working level.</p> <p>(paragraph 615b)</p>	
02/2022/10	Open	None	<p>The intent of this recommendation is to identify and address any further areas of weakness in the mitigating controls that relate to weather-related failures of earthworks, drainage and structures (that is, the right-hand side of Network Rail’s ‘bow-tie’ analyses).</p> <p>Network Rail, in conjunction with RSSB, should undertake a detailed and systematic risk assessment of the mitigating controls, including operational responses, that relate to weather-related failures of earthworks, drainage and structures. The purpose of the review shall be to rigorously assess the robustness of each control and to identify any further areas of weakness that warrant further examination.</p> <p>The output of this risk assessment should then be used to devise a timebound programme to address the areas of weakness identified, so far as is reasonably practicable (paragraphs 615a)i, 615a)iii).</p>	<p>ORR has reported that Network Rail has a proposed action plan and timescale for delivery to be taken in response to the recommendation. ORR will advise when the status of this recommendation changes.</p>
02/2022/11	Closed - I	None	<p>The intent of this recommendation is to provide a consistent risk-based approach for establishing when trains are to be run to prove a line is safe for normal use by subsequent services, and the procedures, including the operating speeds, applicable to these trains. Implementation should consider all types of route proving, including if required after engineering works and after a prolonged period when train services are not operated.</p> <p>Network Rail, assisted by RSSB and the Rail Delivery Group (RDG) should:</p> <p>a) determine the objectives of the operation of route proving trains, including consideration of the risks which the operation of such trains is expected to mitigate, and the risk posed to the operation of route proving</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>

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			<p>trains themselves</p> <p>b) identify the hazards which staff operating such trains are expected to identify, and the responsibilities for reporting any identified hazards</p> <p>c) identify the circumstances (including those not related to weather conditions) in which route proving trains should be operated</p> <p>d) identify how route proving trains should be operated (considering factors such as train speed and the effect of reduced visibility)</p> <p>e) introduce documented processes for implementing these findings. (paragraph 618a)</p>	
02/2022/12	Open	None	<p>The intent of this recommendation is to take account of learning from the Carmont accident in the development of a coherent long-term strategy for derailment mitigation. It is anticipated that implementation of this recommendation will be informed by work, including RSSB project T1143, already undertaken by the rail industry as a result of Recommendation 3 of RAIB's investigation of the Watford derailment.</p> <p>RDG and Network Rail, in conjunction with RSSB, should consider and incorporate all relevant learning from the Carmont accident into the assessment of rolling stock and infrastructure design features that can provide guidance to trains when derailed. Particular features to be taken into account include:</p> <p>a) the risk of derailment from relatively small landslips and washouts</p> <p>b) position of track relative to adjacent ground on which derailed wheels may run (that is, features that can affect the deviation of a derailed train)</p> <p>c) proximity to features with the potential to increase the consequence of an accident (bridge parapets, tunnel portals etc)</p> <p>d) topography likely to increase the extent of vehicle scatter.</p> <p>The above-mentioned assessment should then be used to develop a systemic, risk-based strategy for the provision of additional measures for the guidance of derailed trains that takes into account the appropriate balance between infrastructure-based mitigation and vehicle-based</p>	<p>ORR has reported that Network Rail has a proposed action plan and timescale for delivery to be taken in response to the recommendation. ORR will advise when the status of this recommendation changes.</p>

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			mitigation. The strategy should also include a plan for implementation of changes to the appropriate industry standards (paragraph 617g).	
02/2022/13	Open	None	<p>The intent of this recommendation is to enhance the processes for implementing infrastructure-mounted derailment containment devices (such as guard rails and kerbs) at high-risk locations, including bridges and tunnels (currently covered by standard NR/L2/TRK/2102).</p> <p>Network Rail should review and improve its processes linked to the installation of guard rails and containment kerbs so that such derailment containment is available at high-risk locations until such time, if any, when rail vehicles carry onboard devices to perform a similar function. This review should include:</p> <ul style="list-style-type: none"> a) risk-based criteria for selecting sites for the fitting, or enhancement, of guard rails and containment kerbs, taking into consideration relevant learning from the accident at Carmont b) the criteria used to determine the distance guard rails or kerbs should extend on the approach to a risk feature (for example, bridges and tunnels) c) the criteria used to determine whether derailment containment should be retrofitted as soon as possible or installed during planned asset renewal. <p>(paragraph 617g)</p>	<p>ORR has reported that Network Rail has a proposed action plan and timescale for delivery to be taken in response to the recommendation. ORR will advise when the status of this recommendation changes.</p>
02/2022/14	Closed - I	None	<p>The intent of the recommendation is to reduce the derailment risk of HST power cars caused by running into obstacles on the track.</p> <p>Owners of HST power cars should:</p> <ul style="list-style-type: none"> a) investigate the feasibility of enhancing the strength of the bogie mounted lifeguards to a level as close to modern standards as reasonably practicable b) if appropriate, develop a timebound programme for carrying out modifications identified in a). (paragraph 614a) 	<p>ORR has reported that Owners of HST power cars have 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>

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02/2022/15	Closed - I	None	<p>The intent of this recommendation is to minimise the risk of serious cuts and lacerations to passengers caused by broken glazing in any future accidents.</p> <p>RSSB should:</p> <ul style="list-style-type: none"> a) investigate the performance of the bodyside windows on the leading coach of train 1T08 to understand the detachment of large shards of glass into the vehicle interior (including the effects of bodyside deformation) and how this relates to the requirements of relevant standards regarding spalling and passenger containment, and disseminate the findings to owners and operators of both mark 3 coaches and any other relevant rolling stock b) in the light of findings from (a), review the current acceptance tests and criteria in railway glazing standards to determine if there are practicable improvements (including retrofit options) that should be made to minimise the quantity and size of broken glass that could enter vehicle interiors in future accidents, without adversely affecting the passenger containment performance of the glazing c) where appropriate, integrate practicable improvements into revised standards for railway glazing. (paragraph 617e) 	<p>ORR has reported that RSSB 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>
02/2022/16	Open	None	<p>The intent of this recommendation is to minimise the risk of serious injury arising from secondary impact with the vehicle bodyside mounted folding tables fitted at some positions on the ScotRail HST mark 3 coaches.</p> <p>Angel Trains, in conjunction with ScotRail, should:</p> <ul style="list-style-type: none"> a) review the design of the bodyside mounted folding tables fitted to train 1T08 with respect to minimising the risk of secondary impact injury in the folded position, and its compliance with the requirements of applicable standards b) develop a timebound plan for the modification or replacement of similar tables in trains leased by Angel Trains to a design which does not feature potentially injurious edges. 	<p>ORR has reported that Angel Train has a proposed action plan and timescale for delivery to be taken in response to the recommendation. ORR will advise when the status of this recommendation changes.</p>

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			<p>(paragraph 617d)</p> <p>This recommendation may apply to owners of other types of rail vehicles on the UK main line network featuring similar table designs.</p>	
02/2022/17	Closed - I	None	<p>The intent of this recommendation is to reduce the risk of injury to drivers due to secondary impact during accidents.</p> <p>RSSB should:</p> <p>a) review its previous research on fitting secondary impact protection devices for train drivers (including seatbelts) in light of the circumstances of Carmont, future train accident risk (including derailment) and the capabilities of current technology</p> <p>b) in consultation with relevant stakeholders, evaluate the case for fitting specific secondary impact protection devices into new and existing trains</p> <p>c) where justified by a) and b), incorporate requirements for improved protection measures into standards for train driving cabs.</p> <p>(paragraph 617a)</p>	<p>ORR has reported that RSSB 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>
02/2022/18	Open	None	<p>The intent of this recommendation is for corrosion limits in maintenance and overhaul plans to be based on an adequate engineering analysis so that ageing rail vehicles retain their structural integrity to original design standards.</p> <p>Owners of mark 3 coaches and other rail vehicle fleets susceptible to significant levels of corrosion and operating on the mainline network, should develop and implement a timebound plan to:</p> <p>a) Review vehicle maintenance and overhaul plans to check there are clear criteria in place for the allowable extent of corrosion in safety critical areas. These criteria should be supported by an adequate engineering assessment that takes into account the intervals between corrosion inspections, so that vehicles maintain compliance with their original structural design load cases throughout their service life.</p> <p>b) Amend vehicle maintenance and overhaul procedures as necessary to take account of findings from the review in a) and any practical issues with</p>	<p>ORR has reported that Owners of mark 3 coaches have a proposed action plan and timescale for delivery to be taken in response to the recommendation. ORR will advise when the status of this recommendation changes.</p>

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			inspection of areas which are not normally readily accessible. (paragraph 617b)	
02/2022/19	Open	None	<p>The intent of this recommendation is to evaluate the additional risk to train occupants associated with the continued operation of HSTs, which entered service before modern crashworthiness standards were introduced in July 1994. This will enable the future planning of HST deployment to be informed by a fuller understanding of any additional risk and the costs and safety benefits of any potential mitigation measures. This learning should also inform thinking about the mitigation of similar risks associated with the operation of other types of main line rolling stock.</p> <p>Operators of HSTs, in consultation with train owners, ORR, DfT, devolved nations' transport agencies and RSSB should do the following:</p> <p>a) Assess the additional risk to train occupants associated with the lack of certain modern crashworthiness features compared to trains compliant with Railway Group Standard GM/RT2100 issue 1 (July 1994), also taking account of age-related factors affecting condition (such as corrosion). This assessment should include a review of previous crashworthiness research (including driver safety), a review of previous accidents, consideration of future train accident risk, the findings presented in this report and any relevant engineering assessments.</p> <p>b) Based on the outcome of a) and cost benefit analysis, identify reasonably practicable measures to control any identified areas of additional risk for HSTs, and develop a risk-based methodology for determining whether, and if so when, HSTs should be modified, redeployed or withdrawn from service.</p> <p>c) In consultation with operators of other pre-1994 passenger rolling stock, develop and issue formalised industry guidance for assessing and mitigating the risk associated with the continued operation of HSTs and other types of main line passenger rolling stock designed before the introduction of modern crashworthiness standards in 1994. (paragraphs 617c, 617f)</p>	<p>ORR has reported that Operators of HSTs have a proposed action plan and timescale for delivery to be taken in response to the recommendation. ORR will advise when the status of this recommendation changes.</p>

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02/2022/20	Closed - I	None	<p>The intent of this recommendation is to reduce the risk from train fires originating in or around batteries fitted to passenger vehicles, recognising the trend towards increased use of battery systems to store energy for motive power. To address this recommendation, it is envisaged that RSSB will investigate the fire-related properties of products used in other transport sectors.</p> <p>RSSB should investigate alternative designs of batteries, and their casings, which may offer improved fire-related properties compared to those currently fitted to rolling stock. The output from this investigation should be shared with the UK train and tram industry (paragraph 617h).</p>	<p>ORR has reported that RSSB 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>
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