

Oliver Stewart
RAIB Recommendation Handling Manager



23 October 2024

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

Dear Andy,

RAIB Report: Collision between passenger trains at Salisbury Tunnel Junction, Wiltshire on 31 October 2021

I write to report¹ on the consideration given and action taken in respect of the recommendations addressed to ORR in the above report, published on 24 October 2023.

The annex to this letter provides details of actions taken in response to the recommendations and the status decided by ORR. The status of recommendations 1-7, 9 & 10 is '**Open**'. The status of recommendation 8 is '**Closed**'.

ORR will advise RAIB when further information is available regarding actions being taken to address these recommendations.

We will publish this response on the ORR website.

Yours sincerely,

Oliver Stewart

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

Initial consideration by ORR

1. All 10 recommendations were addressed to ORR when the report was published on 24 October 2023.
2. After considering the recommendations ORR passed recommendations 1–7 to Network Rail, recommendation 8 to South Western Railway, recommendation 9 to the Rail Delivery Group and recommendation 10 to ROSCOs asking them to consider and where appropriate act upon them and advise ORR of its conclusions. The consideration given to each recommendation is included below.
3. ORR also brought recommendation 8 to the attention of all TOCs and FOCs as it was concluded that that there are equally important lessons for them. ORR did not ask these organisations to provide a reply.
4. This annex identifies the correspondence with end implementers on which ORR's decision has been based.

Recommendation 1

The intent of this recommendation is for Network Rail to have autumn working arrangements that more effectively manage the low adhesion risk, as a result of leaf fall.

Network Rail should consider the findings from this report to inform a review of the processes, standards and guidance documents and supporting management arrangements relating to the management of leaf fall low adhesion risk. The review should result, where appropriate, in the creation or revision of documents suitable to support Network Rail staff in having an appropriate understanding of the risks when creating autumn working arrangements. It should also identify the necessary resource and competence required for their effective implementation.

The review should examine both the roles of operations and maintenance (track and off track) and specifically include consideration of:

- a. leaf fall risk assessments, including consistency in their implementation
- b. capture, sharing and tracking of data and planned mitigations, especially those related to vegetation management
- c. definition of responsibilities and necessary competences, including knowledge of the factors affecting leaf fall risk and low adhesion from contamination build-up and the effectiveness of mitigation measures
- d. required resource to effectively undertake the main roles
- e. alignment of the requirements and processes across all related departments to promote a co-ordinated approach and a common understanding of the risks and mitigations.

Network Rail should ensure that any revised processes, standards and guidance are produced to a timebound plan, and supported by appropriate training and briefing and that this includes any contracting staff involved in the process.

ORR decision

5. In response to the recommendation, Network Rail is implementing changes to a several processes, standards and guidance documents relating to the management of leaf fall low adhesion risk.

6. The Technical Authority is considering how the assessment in Standard NR/L2/OPS/095 (High Risk Sites for Wrong Side Track Circuit Failures in Leaf Fall areas and for Low Adhesion) can be standardised across all regions. The draft standard splits high risk of low adhesion and high risk due to leaf fall into separate categories. The content of a revision to National Operating Procedure NR/L3/OPS/045/3.17 is being finalised. Consultation is expected to begin in October 2024. Standard NR/L2/OPS/021 Level 2 (Business Process Weather-Managing the Operational Risk) will be updated to reflect changes in 095 and 3.17, with completion expected in March 2025.

7. In order to more clearly understand the justification for the actions taken, we have requested sight of the review that informed them. We will consider closure of the recommendation once we have evidence that each part is covered by one of the workstreams and an appropriate timescale is in place covering all elements of the recommendation.

8. 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 close it

Status: Open.

Information in support of ORR decision

9. On 20 December 2023 Network Rail provided the following initial response:

Action Plan

Please provide milestones with dates

Part a.

The National Weather Team in collaboration with the National Operations Risk Advisor within Technical Authority have undertaken a review of the process in identifying high risk sites for low adhesion. The review considered how the assessment can be standardised across all Regions to make it consistent and

how it aligns to the Route Vegetation Plans through the scoring of high-risk trees to falling on or near the line.

1. **NR/L2/OTK/5201 Lineside Vegetation Management Standard** is currently being updated to include requirements and guidance on actions to be taken when high risk leaf fall sites have been identified and includes definition of leaf fall risk scores. **Publication is planned for June 2024.**

A new **Leaf Fall Matrix** has been developed with clear responsibilities and accountabilities aligned to off track roles and operational roles within NR and its contractors undertaking vegetation management and it clearly sets out a co-ordinated approach to the alignment of general vegetation risk (identification of high risk (CAT 5 trees) and the process determining high risk sites for low adhesion. The matrix takes in systems risk including signalling breaking points, junctions, and regulation policies.

2. The **Leaf Fall Matrix** is already complete. The next step is to review with colleagues from Technical Authority as part of the review of **NR/L2/OTK/5201 Lineside Vegetation Management**.
3. A further step is to work with RSSB to align the process to safety critical documents especially in conjunction with SORA scores and building Driver feedback into the new risk assessment.

Part b

The Technical Authority Team have advised that they will be using LiDAR and Trainborne technology from mounted cameras for tracking purposes. **How and when this will begin is TBC.**

Part c and Part d

Lineside inspection courses are in development that will include training on how to undertake a leaf fall inspection. **Please refer to Recommendation 3.**

Part e

The review and update of the GB Rail Approach to Management Low Adhesion that outlines the mandatory and discretionary control measures for managing low adhesion promotes a consistent approach to ALL duty holders ensuring they are compliant. Any changes made following RAIB recommendations will be incorporated into the reviews once the actions have been embedded into agreed practices with the allocated accountable duty holders.

The following standards **NR/L2/OTK/5201 – Module 1**. Is planned to be published in **June 24** and **NR/L2/OPS/021 Level 2 Business Process Weather-Managing the Operational Risk** in **Sept 24**.

NOTE It is proposed that this action will also address Petteril Bridge Rec 1 and Llanharan Rec 1.

- NR/L2/OTK/5201 Lineside Vegetation Management Standard – June 2024
- New Leaf Fall Matrix document – June 2024
- GB Rail Approach to Managing Low Adhesion – June 2024
- NR/L2/OTK/5201 – Module 1 – June 2024
- NR/L2/OPS/021 Level 2 Business Process Weather-Managing the Operational Risk – September 2024
- Plans provided via Rec 3

10. On 16 September 2024 Network Rail provided the following update:

Work completed to date

The National Weather Team in collaboration with the working group for NR/L2/OPS/095 has considered how the assessment can be standardised across all Regions to make it consistent. Technical Authority have undertaken a review of their process, NR/L2/OTK/5201 in lineside vegetation management.

A tool using the existing Adhesion Risk Matrix has been developed by Route Services in coordination with East Midlands Route, detailing every quarter mile section on the Route and scoring each of the currently standardised risk factors. Work will proceed, nationally, on phase 2 of this project to build in additional risk factors, such as category 4 trees, SORAT and compound risk. Once completed, this will be written as a process in NR/L2/OPS/095..

Work has also been undertaken to enhance the draft relating to driver feedback in identifying sites of high risk due to low rail adhesion. The work on Route Services Adhesion Risk Matrix tool is expected to embed SORAT scores.

NR/L2/OTK/5201/01 - changes already embedded in draft of 095 – to move away from two risks WSTCF and Low adhesion – dropping the low adhesion risk into its own category (third category) of high-risk site for leaf fall risk clarifies 3076. Changes are still planned for March 2025.

The review and update of the GB Rail Approach to Management Low Adhesion that outlines the mandatory and discretionary control measures for managing low adhesion promotes a consistent approach to all duty holders ensuring they are compliant was completed in May 2024. Any changes made following RAIB recommendations will be incorporated into further reviews once the actions have been embedded into agreed practices and standards with the allocated accountable duty holders.

Work to do

Following conversations with Technical Authority the changes expected to be made to NR/L2/OTK/5201/01 'Lineside Vegetation Management' Standard have been embedded within the draft of NR/L2/OPS/095 'High Risk Sites for Wrong Side Track Circuit Failures in Leaf Fall areas and for Low Adhesion'. The draft of NR/L2/OPS/095 does split high risk of low adhesion and high risk due to leaf fall into separate categories.

NR/L2/OPS/095 - Waiting for tool, Product 2, for risk scoring every 1/8th mile based on existing risk. East Midlands complete and Wales have adopted (new tool) being developed with compound risk meeting at SMT (18th September) – working group. No date yet. Timeline to be asked at SMT. Still needs to be standardised once tool is ready. 095 waiting on tool development

The work on Route Services Adhesion matrix tool was expected to have SORAT scores embedded - SORAT can be covered in the tool.

NR/L3/OPS/045/3.17 - work through section 15 about the CAT tool had to be reviewed and re-written – tables need to go into the document and references are being checked. Expected to go to stakeholder review feedback from the 1st October 24. Variation to standard 3.17 to movements through flood water.

NR/L2/OPS/021 – Plan and resource required to write the plan. Currently awaiting a plan to be agreed including resource.

Lineside inspection courses are in development that will include training on how to undertake a leaf fall inspection. Please refer to Recommendation 3.

Recommendation 2

The intent of this recommendation is for Network Rail to have seasons delivery specialists that are more effective in managing Network Rail's seasonal risk.

Network Rail, building on the work that has already started in this area, should develop an appropriate competency framework for the role of the seasons delivery specialist. This framework should include:

- a. a job description that accurately reflects the responsibilities of the role
- b. the necessary technical skills required to undertake the role effectively
- c. the necessary non-technical and management skills needed to undertake the communication and co-ordination required of this role
- d. appropriate training material
- e. arrangements to confirm that staff have achieved, and continue to have, the required level of competence.

Network Rail is to arrange for provision of the necessary staff to fulfil the roles and develop a time-bound programme for implementation of the associated training, supported by suitably qualified assessment staff

ORR decision

11. Network Rail has issued the Seasonal Development Specialist (SDS) competence framework and is developing the associated competence management arrangements and eLearning. We have requested confirmation of the completion

date for the actions outlined and how they will align with Slingshot rec 5. Significant number of staff will need to be in post, or recruitment sufficiently advanced, before we consider closure of the recommendation.

12. 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 close it

Status: Open.

Information in support of ORR decision

13. On 20 December 2023 Network Rail provided the following initial response:

Action Plan
Please provide milestones with dates
<p>We have developed the first version of a Seasons Delivery Specialist (SDS) competence framework launched as a pilot in November 23. This will be finalised and published as a National Operations Procedure in June 24 which will detail the arrangements for initial training, confirming competence and continuous professional development.</p> <p>Work has also started on developing an associated learning journey for SDS's focussing on a weather fundamentals programme and an SDS induction programme. It is envisaged that the learning journey will be complete by December 24.</p> <p>The review of the JD will form part of a wider organisation design workstream designed to explore what resource and expertise is needed across the business to manage and mitigate the impact of seasonal and weather events. This will start in 2024.</p> <p>It is proposed that this Recommendation is aligned with Carmont DJS AP19 - Rec 5.</p>
Evidence required to support closure of recommendation
<ul style="list-style-type: none"> • National Operations Procedure - June 24 • Learning Journey - December 24.

14. On 29 May 2024 Network Rail provided the following update:

Work Complete To Date

*We have developed the first version of a Seasons Delivery Specialist (SDS) **competence framework** - launched as a pilot in **Nov 23**. This was due to be published as a National Operations Procedure in **Jun 24**. However, initial feedback is that the framework needs additional work and an extensive change management exercise to facilitate uptake of the arrangements. Combined with different management arrangements for SDSs some challenging questions arise*

about who is competent to assess SDS competence. This links to the actions relating to the organisation design and job.

To mitigate delay in the first instance we will focus on establishing the learning journey, which is designed around the competence framework, and then agree the competence management arrangements as part of the organisational design work

*Work has started on the SDS Induction. Learning resources have been published including **The Weather Fundamentals Programme** (a suite of e-learning programmes covering how weather works, hazards, forecasting, climate change, resilience)*

A study (undertaken by CAS) to further explore the non-technical skills needed by SDSs – the outputs of which form the basis for a training needs analysis and scope of works for a training delivery supplier.

An SDS job description that accurately reflects the responsibilities of the role.

The work undertaken to define the SDS competence framework is completed and highlighted a number of areas of inconsistency and where clarity was required. This includes the organisational position and competence of the SDS's manager.

Work to do

*Publish the SDS competence framework as a pilot document on the SDS sharepoint page. **June 24***

Continue with review of competence management arrangements. Dec 24

Complete the parts 2 and 3 of the e-learning programme for the weather academy which includes additional modules relevant to the SDS (e.g. How Weather Works in NR, Managing Extreme Weather events, Weather Tools and running effective table top exercises). Sept and Dec 24

Complete SDS Induction. Sept 24

Draft a learning journey. Oct 24

Finalise tender for NTS training for SDSs. Aug 24 (delivery from Dec 24)

Undertake an organisational design activity with key stakeholders from across the Routes Date TBC

Agree revised SDS JD and management arrangements with Routes Date TBC

Recommendation 3

The intent of this recommendation is that Network Rail off track staff are sufficiently competent and confident to undertake the tasks assigned to them by Network Rail standards.

Network Rail should produce a time-bound programme to train and assess the competence of off track maintenance staff in the requirements of standard NR/L2/CIV/1000/01 Module 01, 'Competence Management for Drainage and Lineside'

ORR decision

15. Network Rail is developing 31 new training courses around drainage, vegetation and boundary lifecycle activity. A shortage of staff to deliver drainage training means a focus on train the trainer. Network Rail have reported a positive take up of eLearning, which has generally been well received. A centre of excellence for drainage and lineside is being developed at Tuxford. Publication of OTK/5201 has been delayed from June 2024 to March 2025. Network Rail aim to provide regional action plans to ORR by November 2024 and a closure statement by December 2025.

16. 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 close it by December 2025

Status: Open.

Information in support of ORR decision

17. On 20 December 2023 Network Rail provided the following initial response:



[N221-13] Salisbury
Rec 3.pdf

18. On 25 June 2024 Network Rail provided the following update slide:

- *This recommendation is strongly aligned to Carmont Action Plan 5 (training and competence) therefore actions plans are similar.*
- *Creation of e-learning and practical face to face training modules is underway with pilots estimated for May 2024.*
- *National e-learning will go live in summer to enable Level 1 – Awareness proficiency*
- *Regional practical training will go live based on sign up and available local funding to enable Level 2 – Understanding proficiency.*
- *Training will cover inspection, maintenance, specification and management of vegetation and trees, including specific focus on leaf fall assessment.*

Updates to both OTK/5201 Vegetation Management Manual and CIV/1000/01 Drainage and Lineside Competence Management are estimated to be published in March 2025 followed by business briefings

Recommendation 4

The intent of this recommendation is for Network Rail to be able to make more effective decisions regarding the management of emerging and potential low wheel/rail adhesion conditions.

Network Rail, working in co-operation with train operators, Rail Safety and Standards Board and other relevant stakeholders, should undertake research into real-time data that could be used to give an indication of the wheel/rail adhesion conditions on its network and how this could be used to support operational decisions to implement mitigation measures.

This review should include consideration of the following:

- a. monitoring data, including that drawn from on-train data recorders, wheel slide protection activity, and records of wrong side track circuit failures
- b. reports of low adhesion from train drivers and staff
- c. weather and low adhesion forecasts.

This review should take account of good practice in other parts of the rail sector both in the UK and abroad

ORR decision

19. Network Rail, in cooperation with RSSB and other stakeholders has commissioned research projects aimed at improving understanding of low wheel/rail adhesion and how to mitigate the consequences.

20. The research projects are summarised as follows:

- VTG wheel flat prevention – iwagon (RSSB, VTG, Knorr-Bremse)
- High Speed Cryogenic Rail Head Blasting to Alleviate Low Adhesion (Sheffield University/Cryogrip)
- Notus wheel slip (SWR - also applicable to rec 8)
- Trialling Low Adhesion Estimation through Image Machine Learning (Sheffield University/RSSB)
- Adhesion Monitoring and Treatment (Network Rail)
- 'Real Time' Low Adhesion Data (RSSB)
- Adhesion Research Group (ARG) – minutes of 6 Feb 2024 meeting (RSSB)
- Adhesion management for the operators (Encompass Engineering)
- High Pressure Water using Abrasive Suspension (LNT Solutions)
- Water-Trak NTL fleet fitment project report (Water-Trak)

21. Network Rail concluded the research highlights many technical options for recording low adhesion in real time to manage emergent low wheel rail adhesion conditions and the information has been provided to practitioners in the routes. Before closing the recommendation, we are considering if the research will enable Network Rail to make more effective decisions regarding the management of emerging and potential low wheel/rail adhesion conditions.

22. 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 close it

Status: Open.

Information in support of ORR decision

23. On 20 December 2023 Network Rail provided the following initial response:

Action Plan

Please provide milestones with dates

Several routes have engaged in the development of train mounted camera systems to observe and report rail head contamination in real time. Such observations support a more targeted approach to managing low adhesion areas as they manifest in real time.

Additionally, there has been active engagement between operators and NR Routes in enhancing Reports of Low Adhesion (ROLAs) and sharing the benefits of using ROLA information in real time to proactively manage low adhesion.

The leading indicators used in Autumn 2023 can be used to measure all interventions, with Routes providing analysis and evidence of benefit to safety and train performance during the leaf fall period.

There are also many research and development programmes in place with RSSB under the Adhere Programme which is managed through the Adhesion Research Group (ARG). The programmes have been used to determine the methodology to investigate the properties of low adhesion in the lab and on the live rail network, including the environmental and meteorological conditions.

- a) By **April 2024** a concise overview will be provided of all the current deployment of technology. This will be done in collaboration with RSSB.
- b) ROLAs are in operation now.
- c) Review of adhesion forecasting model with NRs weather service provider MetDesk- **March 2024**

Evidence required to support closure of recommendation

- Route reports on benefit of real time adhesion monitoring (as per a.)
- Route reports on changes and extent of contamination emerging in real time and its impact of train safety and performance (as per b.)
- Outcome of the Review of the adhesion forecasting model (as per c.)

24. On 20 May 2024 Network Rail provided the following updated action plan:

Action Plan

Please provide milestones with dates

A number of Routes are engaged with Train Operators in the development of WSP systems that can map low adhesion conditions on real time, train mounted camera systems (including AIVR) to observe and report rail head contamination in real time as well as other technologies to predict low adhesion that supports a more targeted approach to managing low adhesion areas as they manifest in real time.

Active engagement between operators and NR Routes in enhancing ROLAs and sharing the benefits of using ROLA information in real time to proactively manage low adhesion – also utilise and build on the adoption of leading indicators used in autumn 2023 that can be used to measure all interventions with Routes providing analysis and evidence of benefit to safety and train performance during the leaf fall period.

There are also many research and development programmes in place with RSSB under the Adhere Programme managed through the Adhesion Research Group (ARG) that have been used to determine the methodology to investigate the properties of low adhesion in the lab and on the live rail network, including the environmental and meteorological conditions.

Update: Following a meeting between NR and RSSB on 11.04.24 and a report received from RSSB that illustrates the various technologies and products for real time reporting of low adhesion. Shows evidence of the processes, methods, and technologies available for monitoring adhesion levels in real time. (April 24).

Evidence to changes made in operational documents include the new process for identifying new high-risk sites for low adhesion (New Adhesion Matrix – developed as part of Rec 1 Salisbury) based on WSP and ROLA and forward facing cameras from class 158 (One Big Circle).

Evidence required to support closure of recommendation

- RSSB Report identifying all the current systems, processes, methods, and products in place to monitor and reporting of real time low adhesion. June 2024
- Route reports on benefit of real time adhesion monitoring - [ROLA information and data from current WSP mapping systems as well as forward facing camera footage mounted for adhesion purposes \(One Big Circle Data sets\)](#)
- Route reports on changes and extent of contamination emerging in real time and its impact of train safety and performance ([ROLA forms and train performance data](#))
- Evidence to changes made in operational documents based on the learning from real time monitoring – [New Adhesion Matrix used to determine new high risk sites for low adhesion which takes into account real time information of conditions and specific sites.](#)
- Evidence provided by Routes on enhanced safety and train performance in using intervention metrics – [interventions versus real train service performance \(as supplied by Wessex in Leaf Fall 2023 and adopted by Routes in Leaf Fall 2024\)](#)

25. On 20 May 2024 Network Rail provided the following closure statement:



Rec 4 Salisbury Close
Out Statement.docx

26. On 16 September 2024 Network Rail provided the following update:

Work completed to date

A number of Routes (Wessex, Wales and Anglia have engaged in the development of train mounted camera systems to observe and report rail head contamination in real time that supports a more targeted approach to managing low adhesion areas as they manifest in real time. Complete

Active engagement between operators and NR Routes in enhancing ROLAs and sharing the benefits of using ROLA information in real time to proactively manage low adhesion through the adoption of leading indicators was used in autumn 2023. These were used to measure all interventions with Routes providing analysis and evidence of benefit to safety and train performance during the leaf fall period. Complete and shared as part of the NWT outputs for Leaf Fall 2023

There are also many research and development programmes in place with RSSB under the Adhere Programme managed through the Adhesion Research Group (ARG) that have been used to determine the methodology to investigate the properties of low adhesion in the lab and on the live rail network, including the environmental and meteorological conditions. Complete – Methodology document shared with Industry through ARG 2023

The adhesion forecast in agreement with Met Desk can now be extended for any Route wishing to do so. We have also agreed with Met Desk that the Long Range Forecast will be used to support decisions within the Route to extend the

treatment of the season if they feel it is required using the LRF on the Tactical Autumn Teleconference (TAT) calls. Complete (March 2024)

Work to do (include dates)

The work for part a has been completed and shared with all Routes with a request that SDS/SDMs discuss these opportunities with all their Operators through their JSMGs. The close out statement was completed in May 2024 and provided to the ORR.

Routes need to work with their TOCs and FOCs through their JSMGs to manage the flow of Adhesion Forecast information to drivers in advance of low adhesion conditions. Routes and ROCs also need to manage on train borne data in real time through their Adhesion Controls as part of their standard seasonal preparations in managing Leaf Fall (August – September 2024)

Routes need to agree on how they are going to proactive interventions for WSCTF through RCM and brief Adhesion Controls on the agreed process for each ROC (as part of the seasonal preparation for Leaf Fall 2024)

Recommendation 5

The intent of this recommendation is for Network Rail to improve wheel/rail adhesion conditions through the application of improved understanding of the effectiveness of railhead treatment regimes.

Network Rail should undertake research to better understand:

- a. the factors that affect the rate of build-up of leaf fall contamination, for instance, the environment, meteorological conditions, topography, tree species and railway operations
- b. the relationship between different types of contamination and low railhead adhesion
- c. the effectiveness and longevity of currently available alternative railhead treatment regimes.

The findings from this research are to be used to support the seasons delivery specialist in decision-making relating to the necessary frequency of railhead treatment and understanding the impact of missed or delayed treatment

ORR decision

27. RSSB has produced a draft Knowledge search summarising the findings of more than 60 other reports into the causes of low wheel/rail adhesion. The draft report has been provided to ORR and is being peer reviewed. Network Rail expect the finalised version of the report to be circulated to routes and regions in November 2024. To close the recommendation, we have asked Network Rail to explain the

changes that will be made to railhead treatment systems and approach as a result of the research.

28. 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 close it

Status: Open.

Information in support of ORR decision

29. On 20 December 2023 Network Rail provided the following initial response:

Action Plan

Please provide milestones with dates

- a.) There is a wealth of information available regarding the factors that affect the rate of build-up of leaf fall contamination, the environment, meteorological conditions, topography, tree species and railway operations. Network Rail in partnership with the Adhesion Research Group will develop a summary document that describes the learning and implementation from previous R & D. This document will be drafted by **June 2024**.
- b.) The document referred to above will demonstrate the relationship between different types of contamination and low railhead adhesion and will be supported by evidence from laboratory tests undertaken at Sheffield and Huddersfield Universities respectively. It will also be supported by data provided from historic real world low adhesion trials (see below). The draft document will be available in **June 2024**.
- c.) The effectiveness and longevity of current available alternative rail head treatment regimes were tested in trials undertaken by Supply Chain Operations at East Lancs Railway in autumn 2022, and at RIDC Melton in January 2023. (Details and results of the trials are below).

Trials undertaken by Supply Chain Operations at the East Lancs Railway in autumn 2022, and at RIDC Melton in January 2023 assessed what were considered the two most advanced alternative technologies to water jetting (Laser and Plasma treatments). The trials used various contaminations (such as oils and leaves) and measured coefficient of friction consistently using tribometer trolleys, and abundance of contamination using chemical analysis of swabs. The trials concluded that the water jetting system currently in operation throughout the leaf fall period is the optimal developed solution to cleaning the rail head. Removal of contamination and effect on railhead friction far outperformed the alternatives, with the report noting it *“consistently excelled in lowering the quantity of abundance found on the railhead. Indicating the effectiveness of displacing railhead contaminants”*

The table below shows the coefficient of friction improvements and reduction in contaminants delivered by water jetting.

60mph Multi-Layered Testing								
Contamination	Run Number	Rail	Friction Coefficient			Contamination Abundance - Oil		
			Plasma	Laser	Water Jetting	Plasma	Laser	Water Jetting
Natural	Run 1	North	-0.15	-	0.04	-	-	-7%
		South	-0.08	0.06	-0.04	-	-52%	-4%
Engine Oil	Run 2	North	-0.04	-	0.29	679%	-	-82%
		South	0	0.01	0.29	147%	-51%	-99%
Engine Oil/Vegetation	Run 3	North	-0.04	-	0.24	92%	-	-12%
		South	0.04	-0.01	0.03	173%	-5%	-57%
Engine Oil/Vegetation/Bearing Oil	Run 4	North	-0.01	-	0.70	-9%	-	-31%
		South	0.01	-0.02	1.25	-64%	129%	-84%
Weather		Overcast	Overcast	Passing Clouds				
Temperature (Celsius)		12.9	13.6	3				
Humidity (%)		63	61	75				
Wind Speed (mph)		13	8	10				

From these and other trials the optimal frequency of cleaning is site specific as contamination can build up relatively quickly between current treatments – keeping the rail head clean and free of contamination would require cleaning between every train – or cleaned by every train (in some circumstances).

These findings have provided the industry with several options to support Seasonal Delivery Specialists making good decisions in the timely planning and application of additional mitigation measures when sites are missed by the rail head treatment trains. The findings also suggest that alternative and targeted deployment of rail head treatment more frequently based on real time low adhesion information rather than running large pre-planned circuits would be optimal. The current deployment of rail head treatment is not reactive and covers large areas of the network that is not always affected by low adhesion issues.

A paper is being drafted with cross industry input that proposes a number of options for the longevity of current available treatment and how we adapt so that new technology, currently under trial will reach a maturity level to be applicable for future rail head treatment. The proposed plan is to develop a business case and appropriate contract and procurement strategy for testing through CP7 and for adoption in CP8 if successful. The contracts for Railhead treatment are up for renewal and the new tender will include provision for adoption of new technology when ready for deployment.

Evidence required to support closure of recommendation

- A document that provides information on the learning and implementation from previous R & D. This document will be drafted by **June 2024**.
- A document that will demonstrate the relationship between different types of contamination and low railhead adhesion and will be supported by evidence from laboratory tests. This document will be drafted by **June 2024** and will be supplementary to the document referred to above.
- East Lancs Trial paper on RHTT efficacy (**available now**)
- Draft paper developed on future options of rail head treatment outlining the business case and the C & P strategy with milestones across CP7 **June 2024**

30. On 16 September 2024 Network Rail provided the following update:

Work completed to date

The effectiveness and longevity of current available alternative rail head treatment regimes were tested in trials undertaken by Supply Chain Operations at East Lancs Railway in autumn 2022, and at RIDC Melton in January 2023. (Details and results of the trials or shown below).

Trials undertaken by Supply Chain Operations at the East Lancs Railway in autumn 2022, and at RIDC Melton in January 2023 assessed what were considered the two most advanced alternative technologies to water jetting (Laser and Plasma treatments). The trials used various contaminations (such as oils and leaves) and measured coefficient of friction consistently using tribometer trolleys, and abundance of contamination using chemical analysis of swabs. The trials concluded that the water jetting system currently in operation throughout the leaf fall period is the optimal developed solution to cleaning the rail head. Removal of contamination and effect on railhead friction far outperformed the alternatives, with the report noting it “consistently excelled in lowering the quantity of abundance found on the railhead. Indicating the effectiveness of displacing railhead contaminants”

The document referred to above has been shared with the industry

Work to do (include dates)

There is a wealth of information available regarding the factors that affect the rate of build-up of leaf fall contamination, the environment, meteorological conditions, topography, tree species and railway operations contained within 60 x documents that have now been reviewed. Network Rail in partnership with the Adhesion Research Group are developing a summary document that describes the learning and implementation from previous R & D. This document is currently being drafted between NR and RSSB and will be ready in draft form in September 2024. Once the draft is complete it will be shared with Prof Roger Lewis at Sheffield University for expert review in October 2024.

Once reviewed the document will be available for all rail industry managers, stakeholders and practitioners.

Recommendation 6

The intent of this recommendation is to enable the effective assessment by Network Rail of the risk of overrun at signals which have HRLA sites on their approach.

Network Rail should review its signalling standard NR/L2/SIG/14201/Mod04, ‘Signalling Risk Assessment Handbook’ to ensure that signal overrun risk assessments appropriately consider the impact of any high risk of low adhesion sites on approach to the signal. Network Rail should also consider if the reassessment of signal overrun risk is required when a new high risk of low adhesion site is identified on approach to any signal capable of displaying a red aspect.

Any revised standard or process should be suitably briefed to all relevant parties and consideration should be given to whether a revised overrun risk assessment against the new standard should be required where existing signals capable of displaying a red aspect have a high risk of low adhesion site on their approach

ORR decision

31. A request for help was sent to RSSB and as a result the draft issue 2 of RIS-0386 (Rail Industry Standard on Signal Overrun Risk Evaluation and Assessment) will contain new guidance on the management of low railhead adhesion. Publication of the revised RIS is planned for December 2024.

32. Network Rail are planning an R&D project to determine what the new RIS means for the signalling risk assessment standard (NR/L2/SIG/14201/Mod04) and SORAT, although this may not be applicable to closure of the recommendation. The start of the R&D project has been delayed until at least April 2025.

33. 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 close it

Status: Open.

Information in support of ORR decision

34. On 25 March 2024 Network Rail provided the following initial response:

Action Plan

Please provide milestones with dates

1. The NR/L2/SIG/14201/Mod04 Signal Overrun Risk Assessment is designed to comply with RIS-0386-CCS. Therefore Network Rail will raise a Request for Help (RFH) to RSSB asking for a review of whether RIS-0386-CCS appropriately considers the impact of any high risk of low adhesion sites. RIS-0386-CCS is already subject to an update with publication expected in March 2025. The RFH will be submitted early December 2023.
2. If the review in step 1 results in changes then Network Rail will plan the appropriate way to incorporate those changes into the standard, NR/L2/SIG/14201, and the risk assessment tool (SORAT) as appropriate. Timescales for this step will be dependent on further planning once the outcome from step 1 is known.
3. In addition to the above work, an R&D project is planned to commence in April 24 to review the SORAT system and look for opportunities for improvement. The outputs of this work will link with point 1.

Evidence required to support closure of recommendation

1. Outcome from the review / updated RIS-0386-CCS.
2. Updated standard and/or risk assessment tool if the review proposes it and confirmation of relevant briefings.

35. On 16 September 2024 Network Rail provided the following update:

As a result of the RFH to RSSB, RIS-0386 iss 2 draft contains new guidance on the management of low railhead adhesion. Publication of the RIS is expected in Dec.

An R&D project is planned to take that forward and determine what the new RIS means for NR/L2/SIG/14201/Mod04 and SORAT. The start of the R&D project has been delayed until an estimated April 25.

The SORAT steering group has created an action to ask RSSB to do some validation of the autumn risk scoring already used in SORAT. A meeting is currently being arranged with RSSB for during October.

Recommendation 7

The intent of this recommendation is to reduce the risk of overrunning signals at danger where there is a line speed change on the approach after the preliminary caution signal.

Network Rail should review the decision not to retrospectively apply technical instruction TI022 'Provision of TPWS at signals' issue 4 to existing signals. Should retrospective application of TI022 be found appropriate, Network Rail should implement the required changes to existing Train Protection and Warning System equipment.

ORR decision

36. Network Rail has closed the recommendation on the basis that a network-wide programme of retrospective application of TI022 would not be reasonably practicable. Retrospective application of TI 022 is done where reasonable opportunity arises, typically as part of wider renewal scheme.

37. We challenged Network Rail to explain the conclusion that the costs of a programme of retrospective fitment to TI 022 would be grossly disproportionate. Network Rail have engaged consultants to establish the gross disproportion factor (GDF), but the cost benefit analysis for retrospective application of TI 022 used a GDF of 6, (which is the highest GDF scale applied to level crossings) and was still red, due to only a small change in FWI.

38. To support this conclusion, we have further challenged Network Rail to demonstrate: the calculated benefit from fitting extra TPWS; the cost of fitting the equipment as a special exercise; and the cost of fitting it as part of a wider scheme. Network Rail are currently engaged in further discussions with us to demonstrate the

adequacy of their risk assessment and the conclusion that fitting TPWS is not reasonably practicable.

39. 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 close it

Status: Open.

Information in support of ORR decision

40. On 11 June 2024 Network Rail provided the following closure statement:



[N227-13] Salisbury
Rec 7 Closure Statement

Recommendation 8

The intent of this recommendation is that South Western Railway drivers are able to identify areas of low adhesion and report them, if appropriate.

South Western Railway should review its arrangements for training and briefing drivers to ensure that they are able to effectively identify areas of low adhesion and that they report them if appropriate. This review should specifically understand the effectiveness of the relevant provisions of the railway Rule Book in informing drivers as to the requirements for reporting low adhesion, as well as other methods. South Western Railway should evaluate its processes for monitoring and reviewing the reporting of low adhesion by drivers to ensure that these arrangements remain effective.

ORR decision

41. South Western Railway (SWR) has provided a summary of actions taken following the collision at Salisbury tunnel junction, which were informed by the findings from the Joint Industry Investigation (JII), internal discussions and workshops with Network Rail and H&S reps. The actions taken cover arrangements for training and briefing drivers for driving in low adhesion conditions and processes for monitoring and reviewing the reporting of low adhesion by drivers.

42. After reviewing the information provided ORR has concluded that, in accordance with the Railways (Accident Investigation and Reporting) Regulations 2005, South Western Railway has:

- taken the recommendation into consideration; and
- has taken action to close it

Status: Closed.

Information in support of ORR decision

43. On 25 January 2024 South Western Railway provided the following initial response:

Following the incident, and as a result of its own joint industry investigation, SWR introduced additional measures. They were detailed by RAIB in paragraphs 347 and 348 of the Report. They address the requirements of Recommendation 8. We have not repeated those paragraphs here, save to highlight that:

1. In relation to arrangements for training and briefing drivers

- SWR has enhanced both its guidance for driving in conditions of low adhesion, for example information describing the location of high risk, low adhesion (“HRLA”) sites now refers to visual cues rather than mileages and its train driver briefing process;*
- Face-to-face briefings on autumn arrangements have been reintroduced;*
- SWR drivers are now required to complete a running brake test on the approach to known areas of HRLA (as identified in the drivers’ Autumn brief). This change was briefed out to drivers in a traction notice issued in November 2022;*
- SWR’s driver training simulator now alerts the train driver to ‘reportable’ adhesion conditions, adopting the language used in the Rule Book instruction;*
- SWR has updated its Wessex route risk assessment and posted it (alongside all information associated with route knowledge) on the SWR intranet so that it is easily accessible; and*
- Whilst not related to drivers, SWR has rolled out training to all its guards on the use of GSM-R (including use of GSM-R in emergency situations).*

2. In relation to processes for monitoring and reviewing the reporting of low adhesion by drivers

The SWR Professional Driving Policy and Driving Instructions describes the relevant control measures for dealing with low adhesion and drivers are assessed and monitored on compliance with this within the application of the SWR competence management system. The Report does not reference any concerns with the content or application of SWR’s competence management system.

Notwithstanding this, SWR has evaluated its internal processes for monitoring and reviewing the reporting of low adhesion by drivers and taken

the following action:

a. If a SWR driver enters any low adhesion information on the flip chart located at the depot booking-on point, the driver is now required to follow this up with a formal report to the signaller. This is monitored by local Management following a reportable event.

b. SWR now publishes – on a weekly basis – a list of sites where low adhesion incidents have occurred in the previous week, and identifies low adhesion ‘hot spots’ where there have been two or more incidents of low adhesion within 24 hours; and

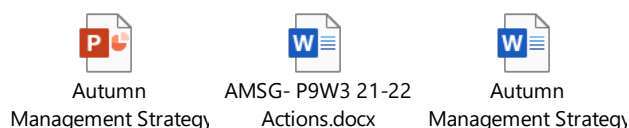
c. SWR has introduced the ‘Notus’ system to assist in advising its controllers and drivers of Wheel Slip Protection (WSP) activity on the Wessex route. This system highlights HRLA sites and areas where there have been low adhesion reports. The information from Notus is also used to evaluate the locations of HRLA on an annual basis with Network Rail.

All measures referenced in the Report (including those summarised above) were implemented on or before the autumn season of 2022 – some 12 months before publication of the Report. This was also raised with RAIB during the consultation process as further reasoning why Recommendation 8 did not need to feature in the Report.

44. On 1 October 2024 South Western Railway provided the following update:

The clauses you identified are all associated with the driver reporting the conditions. The thought process behind this was that a driver may experience low adhesion but was able to stop in the correct position they should think about the next train behind them and what they would experience if they were going faster than they were. I raised this at the Operations Standards Forum where RSSB are in attendance and following discussions it was deemed not necessary to change the rules so it wasn’t progressed any further.

In regards professional discussions I have attached our joint Autumn strategy plan from 2022, the associated actions tracker and a powerpoint dashboard example that we used during joint monthly meetings.



Other discussions with Traincrew during depot visits were not recorded but were used in our review of the professional driving policy and the Autumn booklet.

There were further discussion with RAIB during interviews and report consultation that also steered us to make changes.

Recommendation 9

The intent of this recommendation is for industry to realise the potential benefits of future technologies to enable trains to better cope with low wheel/rail adhesion when braking.

The Rail Delivery Group working with the train operating companies and Rail Safety and Standards Board should create a framework and mechanism for the assessment of future technologies to enable trains to better cope with low adhesion when braking. The framework should set out criteria and establish the process for cost benefit analysis to apply to the assessment of future technologies as they arise.

ORR decision

45. RDG is coordinating industry action to address this recommendation through a working group which will report to the Salisbury Recommendations Steering Group (SRSG). Currently the SRSG includes Network Rail, RSSB, RDG and representatives of the TOC and ROSCO sectors. RSSB and RDG plan to create a framework for the assessment of technologies and business plans including cost to benefit ratio. RDG are considering if and how to involve the freight sector. We have requested a project plan from the SRSG for both recommendations 9 and 10.

46. After reviewing the information provided ORR has concluded that, in accordance with the Railways (Accident Investigation and Reporting) Regulations 2005, The Rail Delivery Group has:

- taken the recommendation into consideration; and
- is taking action to close it.

Status: Open.

Information in support of ORR decision

47. On 2 February 2024 the Rail Delivery Group provided the following initial response on recommendations 9 & 10:

Thank you for your letter of 7 December 2023, requesting a response regarding Recommendation 9 in RAIB's report on the Collision between passenger trains at Salisbury Tunnel Junction. As you will be aware from ORR colleagues, RDG is playing a wider role in delivering progress against the requirements of RAIB's recommendations.

Following a meeting on 22 January 2024, it was agreed that the two recommendations relating to rolling stock (i.e. 9 and 10) would be rolled into the Salisbury Recommendations Steering Group (SRSG). This group will consider the recommendations that are most applicable to multiple owners/operators. The SRSG which will deliver the industry response will be chaired by RDG, supported by industry.

SRSG will include one representative (and one alternate) from each relevant organisation, and ORR as an observer. It will provide the overarching

leadership of the response, and ultimately provide the industry responses to the recommendations.

Each of the recommendations will be managed by a working group, where required, noting that some items (such as RSSB project work) will not require a direct working group, but may request representatives to be part of the project stakeholder group. Each working group will have a lead individual and consist of relevant stakeholders. The working groups will be tasked with collating, analysing, and delivering a response. This may require external support, and this will be managed by the working group as required.

Each working group will develop a plan or route map, which will be agreed on by the SRSG. Reporting will be via a scorecard supplied to each SRSG meeting.

Although the structure of the various recommendations varies, the approach to each recommendation, is expected to consist of three main stages:

- Stage 1. A knowledge search or collation of available information
- Stage 2. A cost benefit or ALARP analysis/development of a solution
- Stage 3. A response to the recommendation

Ultimately it will be for the SRSG to decide the required approach.

Following the first meeting of the SRSG, members are currently being invited to nominate individuals to chair and form the two working groups.

48. On 1 October 2024 the Rail Delivery Group provided the following update:

A working group was established for this recommendation. The group includes representatives of TOCs, ROSCOs, RSSB, and Network Rail and is chaired by Andrew Skinner (GWR) and Dean Fry (TfW).

RDG raised a Request for Help (RfH) with RSSB and has been working with RSSB to develop a full research specification, T1341 “Framework for assessment of technologies to deliver reliable braking in low adhesion conditions”. This has received support from both the Adhesion Research Group (ARG) and recommendation 9 working group. This project will primarily focus on technical performance while considering economic viability, retrofitting, and overall feasibility.

Tenders for this project are due to be evaluated in October. Work is planned to begin in November and completion of the project is expected for April 2026 (See Figure 1).



Figure 1: RSSB project T1341 timeline

Following the completion of T1341, RSSB has proposed a follow-on project, T1340, which focuses on the economics of managing low adhesion and the associated business case challenges.

At the September RAIB Salisbury Rolling Stock Recommendation Steering Group T1341 and T1340 were endorsed as appropriate responses to addressing recommendation 9. It was agreed to stand down the working group, with members distributed between the RSSB project group and the RDG-led RAIB Salisbury Rolling Stock Recommendation Steering Group. Figure 2. Shows the structure of the steering group and the associated working groups.

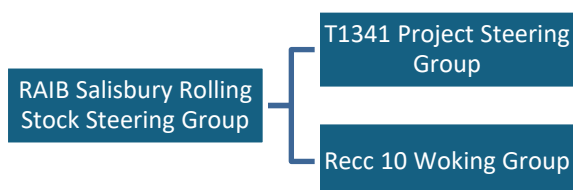


Figure 2. Structure of the steering group and working groups.

A working group was established for this recommendation. The group includes representatives of TOCs, ROSCOs, RSSB, and Network Rail and is chaired by Andrew Skinner (GWR) and Dean Fry (TfW).

RDG raised a Request for Help (RfH) with RSSB and has been working with RSSB to develop a full research specification, T1341 “Framework for assessment of technologies to deliver reliable braking in low adhesion conditions”. This has received support from both the Adhesion Research Group (ARG) and recommendation 9 working group. This project will primarily focus on technical performance while considering economic viability, retrofitting, and overall feasibility.

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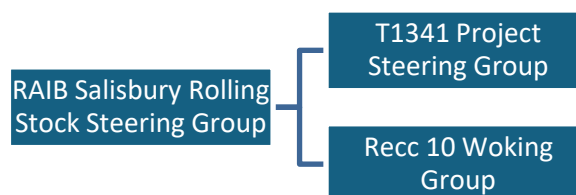


Figure 2. Structure of the steering group and working groups.

Recommendation 10

The intent of this recommendation is to minimise the risk that passengers are unable to evacuate from class 158 and 159 carriages.

Porterbrook, Angel Trains and Eversholt Rail, working in conjunction with the operators of class 158 and class 159 trains, should review the design of the internal sliding doors on these carriages and determine if there is a practicable means to prevent these doors becoming jammed in the event of a collision.

They should develop a time-bound plan to implement measures identified by this review

ORR decision

49. The recommendation was addressed to Porterbrook, Angel Trains and Eversholt Rail, but work is being coordinated by the RDG led Salisbury Recommendations Steering Group (SRSR), along with recommendation 9.

50. Porterbrook commissioned DB ESG, jointly funded by Angel Trains, Eversholt Rail and Porterbrook to consider the failure mode and possible changes to the design of vestibule doors on Class 158 and 159. The different options are undergoing Cost Benefit Analysis, with an outcome expected in November 2024.

51. After reviewing the information provided ORR has concluded that, in accordance with the Railways (Accident Investigation and Reporting) Regulations 2005, The Rail Delivery Group has:

- taken the recommendation into consideration; and
- is taking action to close it.

Status: Open.

Information in support of ORR decision

52. See recommendation 9 above for the Rail Delivery Group response to recommendation 9 & 10 on 2 February 2024:

53. On 1 October 2024 the Rail Delivery Group provided the following update:

A dedicated working group, chaired by Stephen Powney (Porterbrook), has been established to review the design of the internal sliding doors on these carriages and identify practicable solutions to prevent the doors from becoming jammed.

The joint project with ROSCOs Porterbrook, Eversholt Rail, and Angel Trains has significantly progressed. The project has been broken into phases with initial investigative work which includes developing a fault tree analysis of the potential causes of the doors' failure, under contract with DB-ESG.

Visits to The Long Marston and Etches Park sites took place where participants observed and replicated viable fault conditions. Additional research has strengthened the evidence base and understanding of the failure modes.

A workshop with the working group and additional stakeholders is scheduled for October 1st to further discuss and review the analysis as well as the proposed next steps.

54. On 1 October 2024 the Rail Delivery Group provided the following further update:

As per your request for an update from the output from the RAIB Salisbury accident report recommendation 10 workshop held 1st October.

- *Presentation of Findings: DB ESG presented their findings to the relevant stakeholders of their investigation of the vestibule door failure.*
- *Review of Failures: DB ESG gave fault mode analysis of failures attributed by Electrical, Mechanical, and Human Factors.*
- *Initial Options Overview: Preliminary options of potential solutions presented for Cost-Benefit Analysis (CBA).*
- *CBA Timeline: Results of the CBA expected in six weeks from the workshop.*
- *Fleet special Check: One-off inspection to be issued for the class 158 and class 159s from the RoSCos to inspect the vestibule doors' micro switch relay and wiring initiated based on the findings from the investigation.*

55. On 9 February 2024 Angel Trains provided the following initial response:

I can advise that Angel Trains has met with representatives from Porterbrook and Eversholt Rail to discuss and agree a collaborative response to Recommendation 10 and its application to the entire Class 158 / 159 fleet.

We have agreed a methodology using Failure Mode and Effects Analysis (FMEA) techniques to assess the current design of the bi-parting doors fitted to Class 158 / 159 multiple units to identify failure modes that could result in the doors failing to open or becoming seized and hindering evacuation. It is envisaged that the FMEA will be undertaken as a combined desk top and practical assessment with the support from the door system OEM and Class 158/159 operators. It was agreed that the work would be undertaken by an independent engineering consultancy with oversight from a working group comprising engineers from each rolling stock leasing company.

Once the first stage of the FMEA work has been completed, the output will be circulated among affected train operating companies to ensure that, as duty holders, they have the opportunity to input and comment on the work.

It is expected that the conclusion of the FMEA will identify potential improvement opportunities which can be developed into concept designs for costing purposes. Concept designs arising from this work would be subject to a review by cost benefit analysis in line with RSSB's Taking Safe Decisions methodology.

Currently, the working group is putting the detailed scope of work together to put out to the consultancy market and we expect this to have been completed by the end of February 2024. Once we have received proposals we will be able to more accurately predict timescales for the stages of the work.

I can also advise that a steering group has been established by the Rail Delivery Group (RDG) to provide oversight and governance of all rolling stock recommendations set out in RAIB report 12/2023. The ROSCO working group for Recommendation 10 will be represented by Porterbrook to feedback on progress.

56. On 8 February 2024 Porterbrook provided the following initial response:

With regard to the three specific actions raised in the letter, the following update is provided:

(a) Full details of any measures taken to implement the recommendation

With regard to Recommendation 10 of the report, Porterbrook is currently in the process of reaching a position of clear understanding of the failure mode(s), or most probable failure mode(s), the vestibule doors experienced during the Salsbury Tunnel incident, which resulted in passengers being unable to open the doors. To this end Porterbrook have already undertaken an internal workshop to identify credible potential failure modes which now require further engineering assessment as to their probability of occurrence. This will be achieved through the use of tools such as FMECA supported by activities such as vehicle inspections and desktop reviews.

While this analysis work is taking place, Porterbrook will share information directly with both Angel Trains and Eversholt Rail in support of timely progress as well as via the Rail Delivery Group (RDG) Salsbury Recommendations Steering Group

(SRSG). It is expected that this analysis phase will conclude during late Summer 2024.

(b) Full details of any measures that you propose to take to implement the recommendation and the proposed timetable for securing that implementation

Following the completion of the analysis phase Porterbrook will move forward to evaluate potential options to reduce the risk to a level As Low As reasonably Practicable (ALARP) – as appropriate.

It is the intention to undertake this exercise utilising industry standard tools – including the Rail Safety and Standards Board (RSSB) Taking Safe Decisions – Cost-Benefit Analysis framework. The results of the analysis phase will inform the development and implementation of a time-bound delivery plan accordingly.

(c) A full explanation as to why you do not think that any measures to implement the recommendation is necessary

The outputs from the workstreams described above in the responses to points (a) and (b) will enable the measure(s) required to implement the recommendation to be defined.

Furthermore, Porterbrook fully supports the RDG SRSG & associated working groups, and will be providing periodic updates into these forums according to the established meeting/ communications schedule. Porterbrook understand that this forum will also be providing periodic updates into the ORR as well as having ORR attending as an observer.

In addition to the status updates provided by the RDG SRSG, Porterbrook will provide specific updates to ORR as required by ORR accordingly.

57. On 1 October 2024, RDG provided the following update:

As per your request for an update from the output from the RAIB Salisbury accident report recommendation 10 workshop held 1st October.

- *Presentation of Findings: DB ESG presented their findings to the relevant stakeholders of their investigation of the vestibule door failure.*
- *Review of Failures: DB ESG gave fault mode analysis of failures attributed by Electrical, Mechanical, and Human Factors.*
- *Initial Options Overview: Preliminary options of potential solutions presented for Cost-Benefit Analysis (CBA).*
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