Oliver Stewart
RAIB Recommendation Handling Manager

1 August 2024

Mr Andy Lewis
Deputy Chief Inspector of Rail Accidents

Dear Andy,

RAIB Report: Derailment of a freight train at Petteril Bridge Junction, Carlisle on 19 October 2022

I write to report[1] on the consideration given and action taken in respect of the recommendations addressed to ORR in the above report, published on 10 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 recommendation 1 is **'Open'.** The status of recommendations 2 and 3 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

Proposed response to RAIB

Initial consideration by ORR

1. All 3 recommendations were addressed to ORR when the report was published on 10 October 2023.

2. After considering the recommendations ORR passed recommendation 1 to Network Rail, recommendation 2 to RSSB and recommendations 1 & 3 to freight operators 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. This annex identifies the correspondence with end implementers on which ORR's decision has been based. All responses from freight operators in respect of recommendations 1 & 3 can be found at Annex B.

Recommendation 1

The intent of this recommendation is to understand and manage the risks associated with the operation of freight trains in low adhesion conditions.

Network Rail and the freight operating companies should work in collaboration with RSSB to review the risks faced by freight wagons during normal brake applications in foreseeably low adhesion conditions. This work should include a detailed assessment of the risk of individual wheelsets sliding sufficiently so that they generate self-sustaining wheel flats that can ultimately lead to derailment. It should also identify what mitigations may be necessary to ensure that these risks are adequately controlled.

Network Rail, the freight operating companies and RSSB should use the findings from this review to evaluate the processes, standards and guidance documents relating to the management of rail adhesion and the operation of freight trains in low adhesion conditions. Network Rail, the freight operating companies and RSSB should produce a time-bound plan to implement any changes found to be necessary from this process.

ORR decision

4. RSSB, in collaboration with the FOCs and Network Rail has established the Wagon Condition Programme (WCP) with the aim of improving the management of risk involving freight trains in low adhesion conditions. The programme is considering several other RAIB recommendations concerned with low adhesion in addition to Petteril Bridge rec 1.

5. The programme has been organised into 5 work streams:
    - WS 1 – Maintenance and ECM Definition (covers Llangennech Rec 6 & 8)
    - WS 2 - Train Preparation and Planning
    - WS 3 – Network Adhesion (covers Petrill Bridge Rec 1)
    - WS 4 – Risk Assessment of Freight Wagons

- WS 5 – FOC & ECM Segregation of Duties

6. We have attended a WCP seminar and consider the workstreams and the overall plan have the potential to provide an improved understanding and better risk profiling of the underlying risk to wagons and put a strategy together.

7. The responses from Network Rail and the FOCs satisfactorily demonstrate that the recommendation has been taken into consideration. However, we have asked Network Rail to provide greater detail on the review that is underway to evaluate the processes, standards and guidance documents relating to the management of rail adhesion and the operation of freight trains in low adhesion conditions and to provide a timebound action plan.

8. After reviewing the information provided ORR has concluded that, in accordance with the Railways (Accident Investigation and Reporting) Regulations 2005, Network Rail, the FOCs and RSSB have:

- Taken the recommendation into consideration; and
- Are taking action to close it

Status: Open.

Information in support of ORR decision

9. On 17 April 2024 Network Rail provided the following updated action plan and supporting document:

Action Plan
Please provide milestones with dates
1. Identify leads for this recommendation in RSSB and Freight Operating Companies based on current and historical research in this area and to collaborate with the Adhesion Research Group. BH to liaise with RSSB and identify lead and to enquire within the National Freight Team within NR to identify a FOC lead. Dec 23 Complete – RSSB Mark Oakley (in collaboration with FOC representatives at the RWA will draw up a Freight Low Adhesion Strategy – May 2024 and present back to RWA – **Update: New Activity/Action 1**: Following the collaboration meeting between NR and RSSB on 10/04/24 it was agreed that a mapping exercise needed to take place to align all groups managing low adhesion can be mapped directly to all freight groups that reference adhesion management. The Operational mapping as has been submitted and RSSB are completing the mapping of all other freight groups and links. This activity will be completed by the end of April 24. **Update: New Activity/Action 2:** Once Action 1 is complete (above) the outputs of the mapping exercise will be used to map all the relevant Freight Recs to the groups with identified leads. These include Rec 3 (London Gateway), Rec 5 (Salisbury) and Llangennech Rec. It will be supported by Steve Rhymes and Brian Haddock and led by Tim Shakerley. This will determine if a task force is needed or if it can be co-ordinated by RSSB. Action 2 will include the detail below and will begin in May 2024.

Tim Shakerley supported by NR and RSSB will draw up a plan that will focus on 'Risks face by freight wagons during normal brake applications in foreseeably low adhesion conditions'. The outcome of the plan will provide:

- Assimilate all the actions within the 'Locked Wheels Task Force' and combine them into the overarching Freight Low Adhesion Strategy.
- Assessment of individual wheel sets sliding to a point that generates self-sustaining wheel flats.
- Assessment/measurement of point of a flat wheel that can lead to a derailment.
- Assessment of the variation between the two types of TF25 bogies and analysis of why the bogie mounted TF25 type is more vulnerable to flats than the body mounted type. To be assessed by the TF25 working group.

2. Once these assessments and measurements have been identified the task force will collaborate with SMEs from independent braking specialist engineering organisations and freight operators to determine possible mitigations.
3. Once these mitigations have been reviewed and agreed by freight operators and engineering specialists a suite of control measures will be drafted. These will be developed into future SCSG GB Rail Approach Documents as part of the seasonal assurance work.
4. RSSB will produce guidance notes to support learning and changes made to support the controls developed

Evidence required to support closure of recommendation

- Commitment from RSSB, FOCs NR National Freight team with SPOCs for the task force
- Commitment from RSSB on dedicated support to work and develop a time bound plan at Industry level
- A draft paper of the plan – with clearly defined outcomes of how and who will be developing the metrics for the measurements and assessments as set out in the recommendation
- A paper presented to RSSB, SCSG and National Freight Forums that:
  1: illustrates the conclusions in an easy-to-use format for practitioners and industry experts
  2: defines the suite of possible mitigations
  3: an operating procedure developed by and used by front line practitioners across all freight operators and duty holders in managing low adhesion
- An RSSB guidance note for the rail industry
- The agreed control measures from the research findings as well as new and emerging practices to be incorporated into future SCSG GB Rail Approach documents into managing low adhesion

Groups_Mapping-V0.3.pptx

10. On 26 July 2024 Network Rail and RSSB provided the following additional information on workstreams regarding adhesion involving freight trains:

- T1350: Understanding root causes and preventing freight wagon wheel flats.
- T1351: Explore modelling approaches for low adhesion in freight.

11. More detail on each workstream is in the attached document:


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Recommendation 2

The intent of this recommendation is to ensure that the rules relating to sequential axle counter failures are clear.

RSSB, working in consultation with Network Rail, should review the sections of GERT8000 (the Rule Book) relevant to sequential axle counter failures. This review should consider the type of operating incidents that such failures may indicate and identify what mitigations may be necessary to ensure that these risks are adequately controlled. RSSB should update the Rule Book as required following this review. Network Rail should ensure that relevant staff working for them are appropriately briefed and trained on any new or amended rules which result from this update

ORR decision

10. RSSB has considered the recommendation and concluded that the existing rules relating to sequential axle counter failures are clear. Network Rail have updated the National Operating Instructions (NOIs) to signallers to make this clear with a reference to Reg 19. We have reviewed the information provided by RSSB and consider the instructions to signallers in Reg 19 of the NOI module TS1 to be fit for purpose.

11. After reviewing the information provided ORR has concluded that, in
12. accordance with the Railways (Accident Investigation and Reporting) Regulations 2005, RSSB has:

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

Status: Closed.

Information in support of ORR decision

13. On 14 February 2024 RSSB provided the following initial response:

Network Rail's single duty holder National Operating Instructions (NOIs) have been in place since the new approach to the Rule Book and contain several modules. For a signaller, the NOI carries the same weight as the Rule Book. NOI Module 39 covers axle counters and contains all the relevant information for signallers to manage the equipment and the different failure modes. Clause 3.6 below links sequential failure to Reg 19 in TS1.

3.6 Actions in the event of sequential axle counter failures

3.6.1
If you become aware that sequential axle counter sections are failing or have failed during the passage of a train, you must stop the train involved (or arrange for this to be done if the train is no longer in your area of control) in accordance with TS1 Regulation 19.

Regulation 19 in TS1 supplies the information for the signaller to arrange for the train to be stopped and examined, this includes sequential track circuit failures.

19 Stop and examine train

19.1 When this general signalling regulation must be used

You must carry out this regulation if you become aware of anything unusual or wrong such as:

- signals of alarm
- an insecure load
- a vehicle on fire
- a hot axle box
- a door open or on the catch
- a person has fallen from a train
- unusual noise coming from a train
- other mishaps.

You must also look for damage to the infrastructure which might have been caused by the train including:

- multiple or sequential track circuit failures, or
- multiple or sequential loss of detection of points.

To support the above the glossary of terms confirms that the rules relating to track circuits also include axle counters unless there is an exception. There are no exceptions for sequential axle counter failures so the above regulations should be followed.

Track circuit	A method of detecting the presence of a train or vehicle on a line. An electrical device, using the rails as an electrical circuit, detects the absence of a train or vehicle. If these rules refer to track circuits, this also includes detection by axle counters unless specially excluded.

We believe that the relevant instructions are already in place to manage the issue on which the recommendation focuses, and that following the recommendation would result in the addition of unnecessary complexity and duplication to these instructions. With all this in mind, we are rejecting the recommendation.

Recommendation 3

The intent of this recommendation is to understand and review the effectiveness and safety of the Rule Book requirement for freight train drivers to regularly look back along their train.

Freight operating companies, represented through the Rail Freight Operations Group, working in conjunction with RSSB, should work to understand the purpose and effectiveness of the Rule Book and other operating requirements for drivers to look back along a freight train while it is moving. This work should consider the risks that looking back is seeking to mitigate, the effectiveness of this measure as a mitigation, and the additional risks that are introduced as a result of the activity. It should also consider what alternative mitigations could be used to appropriately address these risks, and implement any changes to standards, processes and rules identified as necessary

ORR decision

14. The Rail Freight Operators Group (RFOG) has reviewed the effectiveness of the Rule Book requirement for a freight train driver to look back along a train to identify possible faults, such as a non-rotating wheelset. The RFOG has concluded that the practice remains worthwhile, as a technological solution that would allow the same level of monitoring has not yet been developed, although a number of projects (such as the intelligent wagon programme) may mean this decision is revisited in future.

15. After reviewing the information provided ORR has concluded that, in accordance with the Railways (Accident Investigation and Reporting) Regulations 2005, Freight Operating Companies (cooperating through RFOG) have:

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

Status: Closed.

Information in support of ORR decision

16. On 8 May 2024 the Rail Freight Operators Group provided the following initial response:

RFOG discussed the contents of the recommendation at length during the December meeting and it was decided that Gerald Riley (RSSB Principal Operations Specialist) would create a paper summarising the freight industry's viewpoints. The paper was presented during the March 2024 RFOG meeting (see appendix at end of response).

The recommendation requested that the freight industry operators assessed the effectiveness and safety of the Rule Book requirement for freight train drivers to regularly look back along their train. During the meeting the main discussion points were raised:

- *It was discussed that there is more risk than value in looking out of the window. Mitigating one risk by replacing it with another risk such as distraction.*
- *It was asked if this is still comprehensively covered in driver training?*
- *If it is removed from the rule book what are the control measures that will need to be put in place?*
- *If it is removed what will replace it? Is there risk that it will disappear from the consciousness all together?*
- *Empower people with a skill and manage their own risk under a set of guidance to make an effective decision. A more integrated approach from all staff on the railway to keep an eye out would be beneficial.*
- *Is there an option to soften the language of the rule? E.g., safe, and reasonable. Creating the awareness for the driver to determine what is safe, training on what driver needs to consider.*
- *Aim to assess it as a non-technical skill. Incorporate it into the competence management system. Be more descriptive on when it is used and include it in the professional driving rules.*

In summary the Rail Freight Operators Group believes there is some value in the rule as there are no current technological options to replace the visual observation method. We are also of the view that the rule needs to be addressed in competence management as a non-technical skill and professional driving policies. Including emphasis on Rule Book Module G1 in terms of greater involvement of other rail industry personnel such as station staff to observe passing trains and report any problems in line with the general requirement to do so in section 2.

With the above in mind RFOG will help guide freight operators to disseminate the rule and its meaning to staff in the most effective manner. We therefore consider this recommendation to be closed.

RFOG - RAIB Response - Petteril Br

Freight Operators responses to recommendations 1 & 3

Recommendation 1

The intent of this recommendation is to understand and manage the risks associated with the operation of freight trains in low adhesion conditions.

Network Rail and the freight operating companies should work in collaboration with RSSB to review the risks faced by freight wagons during normal brake applications in foreseeably low adhesion conditions. This work should include a detailed assessment of the risk of individual wheelsets sliding sufficiently so that they generate self-sustaining wheel flats that can ultimately lead to derailment. It should also identify what mitigations may be necessary to ensure that these risks are adequately controlled.

Network Rail, the freight operating companies and RSSB should use the findings from this review to evaluate the processes, standards and guidance documents relating to the management of rail adhesion and the operation of freight trains in low adhesion conditions. Network Rail, the freight operating companies and RSSB should produce a time-bound plan to implement any changes found to be necessary from this process.

1. On 13 March 2024 Colas Rail provided the following initial response:

Colas Rail are a member of the Rail Wagon Association (RWA) and have regular representation at the monthly meetings. Colas Rail are actively involved in the RWA's "Locked Wheel Task Force" who are investigating this issue and giving feedback to the RSSB Freight Technical Committee.

Colas Rail is working with VTG in facilitating a trial of "Wheel Flat Prevention" and "Wheel Flat Detection" equipment on three cement wagons operating on a Colas Rail freight service from Dunbar. These cement wagons are the same wagon type as those at Petteril Bridge and the data gathered from the trials will be valuable for the Locked Wheel Task Force to work out the physics of what is taking place during normal braking applications in low adhesion areas.

A more comprehensive roll out of such wheel flat prevention/detection technology would require further consideration and study as to whether retrofitting this technology to the industry's 15,000 wagons represented the best value solution to address this problem. Additionally, there remains challenges with the technology's application on wagons used for dangerous goods traffic, for example in sensitive environments such as oil refineries where everyday items such as electronic car keys and mobile phones are prohibited from site due to the risk imposed by their electromagnetic emissions.

2. On 19 February 2024 DB Cargo provided the following initial response:

As this recommendation is on the freight industry, DB Cargo will fully collaborate with Network Rail, RSSB and other FOC's to address this recommendation. DBC have asked for this to be added to the agenda for the next National Freight Safety Group (NSFG) at which all the parties are represented so that the views of all

represented parties can be developed, and a response prepared which includes a plan on the proposed next steps and timeframes, which DBC do not believe can be achieved without wider industry support. We have also raised this recommendation with Network Rail separately.

3. On 3 May 2024 DC Rail provided the following initial response:

DC Rail is participative and integrated with the work of the NFSG, RFOG, FTC and the subgroup CFVN and will continue to work towards the resulting collaborative best practice to minimise impact risk of poor adhesion in this particular scenario and thereafter agree the implementation of any changes deemed necessary at the conclusion of the review.

4. On 4 March 2024 DRS Ltd provided the following initial response:

Direct Rail Services confirms its commitment to working in collaboration with Network Rail and RSSB to jointly review the risks faced by freight wagons during normal brake applications in foreseeably low adhesion conditions and to support any jointly agreed actions determined as a result of this review. We understand that no formal meetings have as yet taken place on this subject but we will follow this up with both Network Rail and RSSB this month to understand timescales and next steps.

5. On 28 February 2024 Freightliner provided the following initial response:

I can confirm that Freightliner are represented at both RFOG and NFSG and will collaborate with other stakeholders through these groups in association with actions arising from recommendations 1 and 3.

6. On 20 March 2024 GB Railfreight provided the following initial response:

GBRf are part of this process.
GBRf are member of the CFVN Group.
The lead for the CFVN is working with NR and the RSSB and we await an update on when the RSSB will have a plan available.

7. We wrote to Rail Operations Group on 19 December 2023 but have received no response.

8. On 14 February 2024 Victa Railfreight provided the following initial response:

As an introduction to our response to your letter dated 19th December 2023 we feel it relevant to confirm that Victa Railfreight Ltd (VRL) does not own or maintain any locomotives or wagons, and that it is not an Entity in Charge of Maintenance (ECM) for any rail vehicle. Other parties, therefore, undertake these roles for wagons operated by VRL under its safety certification (SMS). This SMS requires suppliers of these assets to be approved and monitored.

We note that both recommendations 1 and 3 in the RAIB Petteril Bridge Junction report refer to a collaborative industry response. In view of the nature of the investigations and consideration required, VRL agrees this approach to be appropriate and appreciates the importance of progressing the work involved in a timely and effective way. We have, therefore, been actively encouraging a collaborative approach through our membership of National Freight Safety Group

(NFSG) and Rail Freight Operations Group (RFOG) and will continue to do so. Also, we intend to actively engage in, and support, any resulting initiatives through appropriate senior members of our team. We will keep developments and progress under close review.

Recommendation 3

The intent of this recommendation is to understand and review the effectiveness and safety of the Rule Book requirement for freight train drivers to regularly look back along their train.

Freight operating companies, represented through the Rail Freight Operations Group, working in conjunction with RSSB, should work to understand the purpose and effectiveness of the Rule Book and other operating requirements for drivers to look back along a freight train while it is moving. This work should consider the risks that looking back is seeking to mitigate, the effectiveness of this measure as a mitigation, and the additional risks that are introduced as a result of the activity. It should also consider what alternative mitigations could be used to appropriately address these risks, and implement any changes to standards, processes and rules identified as necessary

9. On 13 March 2024 Colas Rail provided the following initial response:

Colas Rail Services are committed to working with industry groups such as the Rail Wagon Association, Rail Freight Operations Group and RSSB to understand the purpose and effectiveness of the Rule Book and other operating requirements for drivers to look back along a freight train while it is moving.

Colas Rail are represented at the Rail Freight Operations Group and whilst this topic has not yet formed part of the agenda, it has been added for the next meeting scheduled for 14/03/2024.

10. On 19 February 2024 DB Cargo provided the following initial response:

As per the recommendation, DBC are already collaborating with the wider industry and were part of recent discussion at the Rail Freight Operations Group (RFOG) where it was agreed that a joint response would be offered on behalf of the freight industry (supported by RSSB) to this recommendation. This was first discussed and minuted at the December 2023 meeting and will be endorsed at the next meeting (14.03.2024) The response will be from the chair of RFOG (who is Nick Edwards – DB Cargo).

11. On 4 March 2024 DRS Ltd provided the following initial response:

Direct Rail Services took part in a meeting of the Rail Freight Operations Group which included several personnel from RSSB on 7th December 2023 where a review took place detailing the purpose and effectiveness of the Rule Book and other operating requirements for drivers to look back along a freight train while it is moving. The review also considered the risks that looking back is seeking to mitigate, the effectiveness of the measure as a mitigation, and the additional risks

that are introduced as a result of the activity. We also considered what alternative mitigations could be used to appropriately address these risks.

We fully support the conclusions of the discussions on 7th December which detailed;

1.1 There is some value in a driver looking back along the train at intervals if cab design allows this.

1.2 It is possible to identify and manage the circumstances in which it is safe to do so.

1.3 There are no technical means of replacing this visual observation that are immediately available.

Direct Rail Services operates Class 68 and Class 88 locomotives with central driving positions within the cab environment which prevents drivers being able to safely look back along their train once a journey has commenced and the train is on the move. However where cab design does enable rear visibility (our Class 57 and Class 66 fleet), traincrew route knowledge can identify safe and appropriate places for such checks to take place. These locations will be added to our Route Risk Assessments as these are reviewed going forward. We also continue to focus our traincrew on the importance of conducting roll by checks where possible both on departure and at traincrew relief points enroute and will use the RAIB 10/23 report in Safety Briefs to highlight the importance and potential consequences of defective equipment on the safety of train running.

12. On DC Rail provided the following initial response:

The basis of the recommendation is centred upon the observation made within paragraph 180 of the RAIB report, in that the Driver did not observe that the affected wheelset was failing to rotate as expected.

Whilst DC Rail understand the basis upon which this recommendation is made, we highlight the fact that the failure to observe the locked wheelset was not resultant of the 'looking back' procedure somehow being proven defective. The premise of looking back is based upon the need to monitor the behaviour of the wagons and to look for any potentially indicative signs of defect or incident affecting the train. Indeed what is difficult to quantify is just how many potential incidents have been prevented from escalating into significant incidents by the application of this rule?

The incident took place in darkness and in adverse weather.

It is our opinion that the value of the looking back procedure has not been diluted to the extent whereby it needs removing. Given the time of day and weather at the time of the incident, the chances of a Driver observing evidence of an issue or defect would be minimal, but that is a judgement applicable to the particular date, time and conditions at the time of incident, and not to the overall value of the procedure.

It is DC Rail's opinion that looking back, when safe to do so, still provides operational value, as doing so can provide the Driver with advanced warning signs of an emerging issue, such as dragging brakes, fires, shifting loads and even derailments etc.

The rulebook instruction (TW1, Section 18) applying already gives qualification to the physical act of looking back, in that Drivers are instructed to look back "When it is safe and possible to do so".

Therefore, any risk arising from carrying out this instruction is addressed by the qualification given in the wording. Drivers are examined on route knowledge and are trained in situational awareness. This is, in my view, sufficient, when applied in conjunction with the qualified instruction contained within TW1, to allow Drivers to exercise their professional competency and awareness of the infrastructure risks when carrying it out.

The design of modern locomotives that may preclude looking back are also covered by the existing wording, in that, if the design of the locomotive cab or seating position does not allow a safe look back, the Driver cannot do it, and will still be working in accordance with TW1 as it currently applies.

We also must consider the effect any withdrawal of the instruction may have on passenger and heritage operations, as this instruction also applies to Guards.

Any removal of this requirement would massively increase the PTI risk at stations, and whilst most modern rolling stock negates the need for look-back via the provision of power operated doors, heritage and charter stock would be negatively affected by any such move.

DC Rail believe the rulebook instruction should be retained to empower Drivers to continue to look back as they have been doing to date. As an additional mitigation, I propose to add additional questions to the route knowledge tests to ask Drivers to identify locations where it would be unsafe to look back along the train, so they can identify those infrastructure hazards and exhibit their situational awareness.

13. On 28 February 2024 Freightliner provided the following initial response:

I can confirm that Freightliner are represented at both RFOG and NFSG and will collaborate with other stakeholders through these groups in association with actions arising from recommendations 1 and 3.

14. On 20 March 2024 GB Railfreight provided the following initial response:

This requirement was reviewed as part of the process review our Train Driving RA and our Professional Head and other subject matter experts were involved. This has been published and can be shared by GBRf @GB Document Controller upon request.

Looking back, when safe to do so has been retained and remains part of the train driver competence.

15. We wrote to Rail Operations Group on 19 December 2023 but have received no response.

16. On 14 February 2024 Victa Railfreight provided the following initial response:

As an introduction to our response to your letter dated 19th December 2023 we feel it relevant to confirm that Victa Railfreight Ltd (VRL) does not own or maintain any locomotives or wagons, and that it is not an Entity in Charge of Maintenance (ECM) for any rail vehicle. Other parties, therefore, undertake these roles for wagons operated by VRL under its safety certification (SMS). This SMS requires suppliers of these assets to be approved and monitored.

We note that both recommendations 1 and 3 in the RAIB Petteril Bridge Junction report refer to a collaborative industry response. In view of the nature of the investigations and consideration required, VRL agrees this approach to be appropriate and appreciates the importance of progressing the work involved in a timely and effective way. We have, therefore, been actively encouraging a collaborative approach through our membership of National Freight Safety Group (NFSG) and Rail Freight Operations Group (RFOG) and will continue to do so. Also, we intend to actively engage in, and support, any resulting initiatives through appropriate senior members of our team. We will keep developments and progress under close review.