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OFFICE OF RAIL REGULATION

16 October 2013

Ms Carolyn Griffiths
Chief Inspector of Rail Accidents
Rail Accident Investigation Branch
Block A, 2nd Floor
Dukes Court
Dukes Street
Woking GU21 5BH

Dear Carolyn,

Derailment of a freight train at Carrbridge, Badenoch and Strathspey, 4 January 2010

I write to provide an update[1] on the consideration given and action taken in respect of recommendations 2, 3 and 4 addressed to ORR in the above report, published on 24 February 2011.

The annex to this letter provides details of the consideration given/action taken in respect of each recommendation that these recommendations have been implemented.

We do not propose to take any further action in respect of these recommendations unless we become aware that any of the information provided becomes inaccurate, in which case I will write to you again[2].

We expect to publish this response on the ORR website on 30 October 2013.

Yours Sincerely

Chris O'Doherty

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

2 In accordance with Regulation 12(2)(c)

INVESTOR IN PEOPLE

Recommendation 2

The purpose of this recommendation is to ensure that risks to safety on steep gradients during periods of falling or disturbed snow are assessed and that appropriate control measures are considered in advance of adverse weather. It is also intended to extend the current use of line-side snow signs to other sites assessed as requiring such additional risk control measures.

Network Rail, in consultation with train operators, should assess any lines which include steep gradients in order to establish if additional risk control measures (such as bringing trains to a stand prior to descending from summits) may be required during periods when snow is falling or being disturbed by the passage of trains.

Any steep gradients assessed as requiring additional risk control measures in these conditions should be designated in the appropriate sectional appendix and marked by the use of line side snow signs.

Brief Summary on what was previously reported to RAIB on 28 September 2011

1. On 28 September 2011 ORR reported on the action being taken by Network Rail as being in progress.

2. ORR had concluded that Network Rail's initial response did not adequately address the recommendation and therefore wrote to Network Rail on 7 June 2011 asking for details of the outcome of its review, when available and any actions it will be taking to address this recommendation.

Update

3. Network Rail in its response on 17 November 2011 advised:

Proper planning to develop a suitable tool for consistent assessments across all routes has taken more time to develop than was originally anticipated. Routes now require time to populate the tool – the number of gradients to be assessed that are equal or steeper than 1 in 75 runs in to the low hundreds. It has therefore been necessary to extend the target completion date for this recommendation from 30 September 2011 to 13 December 2011.

Rail Freight Operations Group (RFOG) prior to the RAIB report being published produced an approved code of practice – ACOP 001 issue 1, November 2010, Operation of freight services in winter conditions.

Participating organisations included: DB Schenker; Freightliner heavy haul; Freightliner inter modal; DRS; GB Railfreight; Network Rail; and RSSB

This ACoP identifies six falling gradients across the network where it may not be possible to carry out a running brake test every 3 to 5 minutes before reaching the descent, due to the severity of the ascent. They are:

- *Between Perth & Inverness – Drumochter and Slochd*
- *Between Beattock & Carstairs – Beattock*
- *Between Carnforth & Penrith – Shap*
- *Between Newton Abbot West Junction & Totnes – Dainton*
- *Between Craven Arms Junction & Pantyffynnon Jn – Sugar Loaf*

The ACoP states that before descending any of the 6 gradients listed in the ACoP or company specific instructions, drivers must:

- *Bring the train to a stand at, or near to the highest point*
- *Move the train on to the falling gradient*
- *Carry out a succession of running brake tests during the descent until the train is clear of the falling gradient*
- *Carry out any additional company issued instructions*

It could be argued the ACoP referred to above has introduced mitigating actions at the potentially highest risk of a repeat incident location.

The recommendation and agreed actions list what must be done, but not the how. A risk assessment methodology has been developed whereby the [Operations Risk Advisors] ORA team in Western will be assessing gradients and scoring the risks exactly the same as Scotland route. The methodology is in an 'MS Excel' format which simply requires the assessor to enter yes; no or N/A; scoring is calculated automatically. This methodology has been tested with the co-operation of Scotland route to verify its suitability before rolling out across all the other routes. Version 4 has now been rolled out to each ORA team. Work is already well advanced in Scotland who obviously have more work than Anglia will.

4. On 5 January 2012 ORR wrote to Network Rail requesting sight of the outcome of its assessment and any risk control measures, including any associated timescales.

5. Network Rail in its response on 7 March 2012 advised:

Network Rail identified a further 668 falling gradients of 1 in 75 or steeper and greater than 440 yards in length. All these assessments have been completed, being assessed against criteria including:

- *Long climb before falling gradient where running brake test may not be possible without bringing train top a stand*
- *Approach to buffer stops or trap points*
- *Entrance to single line on or at end of falling gradient*
- *Freight trains use route*
- *Forced brake application before falling gradient e.g. station stop, token exchange or PSR*
- *Falling gradient followed by rising gradient*
- *Freight train likely to be stopped on falling gradient (loop, siding, junction)*
- *Gradient prone to drifting snow?*
- *Previous history of runaways (snow related) at this location*

The results of the assessments are being shared with operating companies at OPSRAM meetings. No further mitigation measure has been identified over and above the four identified by RFOG by any OPSRAM group during this assessment process.

ORR Decision

6. After reviewing all the information received from Network Rail, ORR concluded that, in accordance with the Railways (Accident Investigation and Reporting) Regulations 2005, Network Rail has:

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

ORR will write to RAIB again if it becomes aware that the information above is inaccurate.

Status: *Implemented*

Recommendation 3

The purpose of this recommendation is to ensure that the potential risks involved in the prolonged use of stock equipped with miniature snow ploughs to clear snow from lines are understood and that Network Rail staff involved in the management of extreme weather are made aware of any risk control measures identified.

Network Rail, in consultation with train operators, should assess the risks of an accumulation of snow being left on or close to the line as a result of the prolonged use of miniature snow ploughs to clear lines of snow.

Any appropriate risk control measures (such as additional instructions within route winter working arrangements) that are identified should be implemented.

Brief Summary on what was previously reported to RAIB on 28 September 2011

7. On 28 September 2011 ORR reported that Network Rail's initial response did not adequately address the recommendation and had wrote to Network Rail on 7 June 2011 asking for details of the outcome of its review, when available, and of any actions it will be taking to address this recommendation.

Update

8. Following extensive correspondence with Network Rail about the risk assessment and implementation of risk control measures, Network Rail in a response on 24 October 2012 provided ORR with a copy of its report titled 'Risk Workshop into the prolonged use of miniature snow ploughs on Network Rail controlled infrastructure; 25 June *2012'.*

9. The 'Report' acknowledged that the accident was to some extent caused by a combination of the presence of deep lying snow close to the railway line and the train ploughing into (and / or) turbulence disturbing lying snow which resulted in snow and ice ingress into the brake rigging and the gap between the brake blocks and the wheel treads reducing the effectiveness of the train's brakes.

10. The 'Report' concluded that:

The replacement Rule Book Module makes a rather ambiguous statement that a driver must stop their train specially and report to the signaller the presence of any build-up of snow that might affect the passage of trains.

It was the universal consensus of opinion within the workshop that this instruction relating to snow heights above the rail head in Module M4 at the time of the incident led to prolonged use of the miniature snow plough based on the need to comply with snow heights relating only to the part of the infrastructure that was being ploughed.

If the incident at Carrbridge had not occurred; the workshop also had the opinion that the instruction now reflected in Module M3 would have led the Route Control in Scotland to deploy the miniature snow plough in the same manner.

The workshop concluded that there is no prompt for frontline operators to consider snow build up, either caused naturally or by ploughing operations, and therefore it was felt that the snow depth instruction should apply to the full gauge [width of the track formation, including ballast shoulders] of the track.

11. The 'Report' recommended that:

- *A national review to identify the succession arrangements for providing miniature snow ploughing capabilities following the withdrawal from service of the present fleet type capable of carrying out this activity.*
- *Consider a number of rulebook changes or provision of national instructions to provide the following:*
- *Clarity to be reflected in the rulebook instruction on snow depths as to the extent to which they apply to the infrastructure profile [M3]*
- *Definition of falling snow [TW1]*
- *Train speed reduction during falling snow should be risk based and relevant to modern rolling stock operating on the infrastructure*
- *Consider whether freight train speed reductions need to be introduced due to snowfall.*
- *Establish where the guidance previously shown in M4 has been disposed or arrange for its reinstatement so it can be readily accessed by frontline staff so they can make sound operational decisions in relation to train running from site.*
- *Freight operators to identify and publish minimum operating temperatures for their freight vehicles.*

12. On 22 November 2012 ORR wrote to Network Rail as it did not consider that response fully addressed the recommendation, as Network Rail had not advised ORR if it had implemented all of the recommendations made in its Risk Workshop report:

13. Network Rail in its response on 19 December 2012 advised:

Network Rail Recommendation C1.2a:

Clarity to be reflected in the rulebook instruction on snow depths as to the extent to which they apply to the infrastructure profile [M3]

C1.2 a) is considered to be clear in the rule book and no further action is proposed. Rule book module M3 is also clear that drivers should report anything that poses a threat to the safety of the line.

Extract from rule book GE/RT8000/M3

> *5.1 Reporting procedure*
>
> *You must report to the signaller, stopping your train specially to do so if necessary, if you see any build-up of snow that might affect the passage of trains. You must tell the signaller if you believe the snow is deeper than 200 mm (8 inches) above the top of the rail head.*

Network Rail Recommendation C1.2b:

Definition of falling snow [TW1]

C1.2 b) is considered to be clear in the rule book and no further action is proposed.

No definition was found in the following:

- Rule Book Index and Glossary
- M3 – Managing incidents, floods and snow
- TS1 - General signalling regulations
- TW1 - Preparation and movement of trains General
- TW2 - Preparation and movement of multiple-unit passenger trains -

Network Rail Recommendation C1.2c:

Train speed reduction during falling snow should be risk based and relevant to modern rolling stock operating on the infrastructure

Network Rail Recommendation C1.2d:

Consider whether freight train speed reductions need to be introduced due to snowfall.

- *C1.2 c) and d) are being addressed through a review of the Control Manual and amendments to the EWAT process which are currently in progress. It is anticipated that this review will be complete prior to 31 January 2013 and dates for actions agreed at the workshop.*

Network Rail Recommendation C1.2e:

Establish where the guidance previously shown in M4 has been disposed or arrange for its reinstatement so it can be readily accessed by frontline staff so they can make sound operational decisions in relation to train running from site.

- *C1.2 e) is covered by RSSB document 'M4 Disposition Sheet' that is available on the RGS website.*
- *Extract from M4 Disposition Sheet:*
- *Existing section / clause number*
- *Reporting procedure*
- *You must report any build-up of snow to the signaller, you must stop your train specially to do so if necessary (Driver).*
- *If special working arrangements need to be introduced, you must tell operations Control (Signaller).*
- *Train running*
- *If you are told that snow is deeper than 200 mm above rail level you must suspend running of trains (Operations Control Signaller)*
- *However, you can allow trains which have miniature snow ploughs to continue to run normally if the snow is not deeper than 300 mm above rail level.*

14. ORR considered that the responses had not shown that Network Rail had taken appropriate action to implement the recommendation made in its report titled 'Risk Workshop into the prolonged use of miniature snow ploughs on Network Rail controlled infrastructure; 25 June 2012'. As no measures had been introduced to manage the risks of an accumulation of snow being left on or close to the line as a result of the prolonged use of miniature snow ploughs to clear lines of snow.

15. ORR met with Network Rail on 8 March 2013 to discuss the adequacy of Network Rail's responses. Network Rail agreed to provide a 'complete response' by 31 May 2013.

16. Network Rail provided its 'Closure Statement' and Letter of Instruction NR/BS/LI/290 (issue 1) on 2 August 2013 which advised:

Network Rail's Operations Principle and Standards team along with Network Rail's route safety team in Scotland (as lead route) and the National Weather Specialist reviewed the two existing National Control Instructions for Weather and Seasonal Management with the aim of learning lessons from previous severe winters and several incident investigations. The following issues were addressed:

- *The ability for the routes to use a Structured Expert Judgement. For making decisions during poor weather.*
- *The option for the routes to utilise live information as part of the Structured Expert Judgement and remove the over reliance on forecasted weather data. This means that rather than imposing blanket speed restrictions, the routes have flexibility to carry out a Structured Expert Judgement and impose restrictions in the area concerned.*
- *A new requirement for routes to liaise with TOCs and FOCs regarding rolling stock operating restrictions during snow events i.e. gauge of stock and profiles of snow*
- *A new requirement for routes to use Structured Expert Judgement relating to risk of accumulation of snow due to the prolonged use of snow ploughs.*
- *Update on Autumn Weather Arrangements with regards special working arrangements for track circuits during leaf fall season.*
- *New Appendix A (Failure to Operate Track Circuits – Standard Operating Report Form) and Appendix B (Simplified Report Form for Subsequent Incidents) incorporated into this document (previously held in Route Produced Weather Mitigation Plans).*
- *Two National Control Instructions were combined into one document which was sent out for consultation within Network Rail and following a review of the comments received, the new National Control Instruction for Weather & Seasonal Management was issued as a Letter of Instruction to all routes in April 2013.*

Network Rail also provided ORR with the following supporting evidence:

- *NR/BS/LI/290 – Weather & Seasonal Management Letter of Instruction*
- *National Control Instruction 7.1 & 7.2 review objectives*
- *NCI 7.1 Stakeholder comments and actions taken*

17. Network Rail Letter of Instruction NR/BS/LI/290 (Standard Affected: NR/L3/OCS/43 – National Control Instruction – Procedure 7-1 (Issue 6), Weather & Seasonal Management) was issued on 25 April 2013. This includes: '*a new requirement for routes to consider (Structured Expert Judgement) risk of accumulation of snow due to the prolonged use of snow ploughs*.'

18. Extract from Letter of Instruction:

"***13.5 Mini Snow Ploughs*** *…Consideration shall be given to the risk of an accumulation of snow being left on or close to the line as a result of prolonged use of miniature snow ploughs to clear lines of snow, particularly with regards accumulated*

snow where it could directly contact components on the bogies of rolling stock. A [Structured Expert Judgement] SEJ may be used for this consideration."

ORR Decision

19. After reviewing all the information received from Network Rail, ORR concluded that, in accordance with the Railways (Accident Investigation and Reporting) Regulations 2005, Network Rail has:

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

ORR will write to RAIB again if it becomes aware that the information above is inaccurate.

Status: *Implemented*

Recommendation 4

The purpose of this recommendation is to ensure that the risk of an overrun of signal AC336 is reviewed in line with existing industry requirements to ensure that it is acceptably low. It is also intended to ensure that the secondary risk introduced by trap points at other similar locations is considered.

Network Rail should consider if there are additional measures which could reduce the overrun risk at signal AC336 and implement those measures found to be reasonably practicable to introduce.

This consideration should include the undertaking of a detailed assessment as required by Network Rail standard NR/L2/SIG/14201.

Network Rail should have regard to the guidance and requirements regarding trap points within Railway Group Guidance Note GI/GN 7606 and Railway Group Standard GK/RT 0064 and should specifically consider the risks to the public of an overrun at this signal.

Network Rail should also review where trap points have been used to control overrun risk at similar locations in order to establish that any secondary risks introduced by their use have been adequately assessed and mitigated.

Brief Summary on what was previously reported to RAIB on 28 September 2011

20. On 28 September 2011 ORR reported that Network Rail's initial response did not adequately address the recommendation and had wrote to Network Rail on 7 June 2011 asking if it considered action to reduce the risk to the public from any rolling stock that enters the run out at Carrbridge, after passing signal AC336, and to provide clarification and details of why it believes that modifications to the run out are not required.

21. Network Rail provided a further responded on 4 July 2011 which showed some consideration of the difficulty in arresting a fully loaded freight train that enters the run-out. But it did not provide any clarification on the extent to which the risk from any other train or section of a train, that either passes AC336 at danger or breaks/runs away from a northbound train has been assessed and controlled by engineering means in the design of the run out.

22. Network Rail did not confirm that the design of the run-out meets current best practice, so far as is reasonably practicable. Therefore ORR was unable to conclude that the recommendation has been adequately addressed in-so-far as Network Rail is yet to show that it has considered whether there are additional measures which could reduce the **overrun risk** associated with signal AC336, or from trains entering the run-out, for whatever reason, as opposed to the risk of overrun occurring.

23. ORR is continuing to engage with Network Rail to establish whether further engineering controls in the design of the run out are reasonably practicable and if so secure their implementation.

Update

24. Network Rail in its response of 15 November 2011 advised ORR that:

25. *Network Rail can confirm that the self-restoring feature for the catch points at Tomatin and Carrbridge have been removed, this means that the route will not automatically call to the catch point once a train travelling north has departed north.*

26. *The Route Asset Manager (Signalling & Telecoms) (Network Operations) will confirm full route setting arrangements so Network Rail can establish whether there are any circumstances for acceptance purposes that the points still need to be called to the run off. As soon as Network Rail gets this detail it will advise ORR.*

ORR Decision

27. Network Rail has confirmed that the self-restoring feature on 116 trap points at Carrbridge was removed on the 13 November 2011.

28. As a result the points will now routinely be in the 'reverse' position (train not directed into run out). The catch points will now only set 'normal' (towards the run out) with an active intervention by the signaller.

29. Network Rail confirmed on 25 November 2011 that it does not consider there to be any circumstances where such an intervention is necessary and they will now plan recovery of the catch points. Its evaluation has taken into account the presence of TPWS at signal AC336 and that new rules are likely to be introduced as an outcome of the gradient assessment (Recommendation 2) that will identify a brake failure like that experienced by 4N47 on 4 January 2010 prior to beginning the descent towards the signal.

30. The changed arrangements have been confirmed by ORR in discussions with the signaller at Aviemore on 29 November 2011.

31. After reviewing all the information received from Network Rail, ORR concluded that, in accordance with the Railways (Accident Investigation and Reporting) Regulations 2005, Network Rail has:

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

ORR will write to RAIB again if it becomes aware that the information above is inaccurate.

Status: *Implemented*