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

Dear Andrew,

Runaway of a maintenance train near Markinch, Fife, 17 October 2017

I write to report¹ on the consideration given and action taken in respect of the two recommendations addressed to ORR in the above report, published on 11 January 2018.

The annex to this letter provides details in respect of each recommendation. The status of recommendation 1 is '**progressing**' and recommendation 2 is '**insufficient response**'.

We will publish this response on the ORR website on 11 January 2019.

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. Both recommendations were addressed to ORR when the report was published on 11 January 2018.
2. After considering the report ORR passed both of the recommendations to Network Rail 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.

Recommendation 1

The intent of this recommendation is to prevent runaway of MPVs following collisions with objects or debris on the track.

Network Rail should identify and implement suitable measures to mitigate the risk of a runaway initiated by multiple unintended operations of the brake distributor release mechanisms on its Windhoff Multi-Purpose Vehicles by objects and debris that might reasonably be encountered on the track during operation. This recommendation may also apply to other infrastructure managers and railway undertakings who own and/or operate similar short formation trains.

ORR decision

4. We asked Network Rail to explain the process they carried out that informed the decision to modify the software on the MPVs. We have also asked for an explanation of what the expected outcome of the software upgrade is and how it will change the functionality of the vehicles. An initial response has been provided to these questions (see para 7), pending a meeting between ORR and Network Rail to discuss the issues identified in more detail.
5. 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 implement it, pending a meeting between ORR and Network Rail to review the actions taken in greater detail

Status: Progressing. ORR will advise RAIB when further information is available regarding actions being taken to address this recommendation.

Information in support of ORR decision

6. On 11 September 2018 provided the following initial response:

Network Rail are designing and implementing modifications to the seasonal MPV brake system to mitigate the risk of a runaway initiated by multiple unintended operations of the brake distributor release mechanisms on its Windhoff Multi-Purpose Vehicles by objects and debris that might reasonably be encountered on the track during operation.

The risk identified during this incident. The first stage of modification to the vehicle software is currently being assessed through the Engineering Change process in Route Services SCO with implementation expected to commence in March 2018 and conclude 31 October 2018.

7. On 8 January 2019, Network Rail provided further supporting information for the actions taken in response to specific questions raised by ORR:

The process you went through to reach the conclusion to modify the software on the MPVs?

Network Rail held a workshop with subject experts from fleet ops, engineering, maintenance etc. Risk logs were produced to identify the failure mechanisms that led to the incident. A number of changes were considered (e.g. changes to how the vehicles are operated could impact upon their operational capability), but changes to software were identified as the most suitable.

How will the new software changed the vehicle functionality?

Changes were made to the PLC that makes brakes apply. Secondary hydraulic brake now operates automatically when air brake fails.

What is the expected outcome of the software upgrade?

If same incident happened again, secondary (hydraulic) braking would prevent runaway.

The response refers to the software modification being at the first stage. What further work is planned in future stages?

No more software changes planned. The physical release system is being changed from a steel rod to a cable, which should make it less vulnerable to the type of impact that caused the brake release at Markinch.

What is planned beyond the 31 October 2018 implementation date?

An internal review of the actions taken concluded that the mitigation measures are sufficient.

Recommendation 2

The intent of this recommendation is to prevent runaway of other short formation trains following collisions with objects or debris on the track.

Network Rail should assess the risk of runaway on other short formation trains that operate on its infrastructure, such as On-Track Machines, as a result of a total loss of the air braking systems due to impact from objects and debris that might reasonably be encountered on the track. It should implement any necessary measures to mitigate the risk of runaway. This recommendation may also apply to other infrastructure managers and railway undertakings who own and/or operate similar short formation trains.

ORR decision

8. We have asked Network Rail to explain in more detail the process that informed the conclusion to exclude vehicles from the requirements of recommendation 2. A meeting to discuss this, along with the issues identified around recommendation 1 will be arranged.

9. We will also discuss with Network Rail how any measures taken in relation to this recommendation will apply to other contractors operating similar MPV-type rolling stock or other similar equipment operating on Network Rail controlled infrastructure.

10. 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 implement it, but have not yet provided a full explanation for the actions being taken and a time-bound plan for the project.

Status: *Insufficient response.* ORR will advise RAIB when further information is available regarding actions being taken to address this recommendation.

Information in support of ORR decision

11. On 11 September 2018 provided the following initial response:

Risk reviews have been undertaken for all Network Rail trains deemed to run in short formations, that being any consist of 6 or less vehicles.

The risk reviews considered if any braking systems on other NR On-track Machines were vulnerable to the same system failure as that experienced at Markinch.

Three exclusion criteria were identified (i.e. reasons which the machine would not present a risk):

a) The distributor release is not in a prone position on the underframe

This is to determine if the distributor release is in a position which could potentially expose it to unintended actuation i.e. translating laterally across the underside of the vehicle.

b) It is locomotive hauled in mainline operation

Therefore the consist would always have one vehicle with a distributor which is not underframe mounted and would not suffer a total loss of braking)

c) It operates on the mainline in a fixed formation with more than six vehicles in the consist

Therefore not a short formation and unlikely for all distributors to be pulled by a single tree strike.

The risk review was led by the Principal Engineering Manager, Principal Engineering Team, Supply Chain Operations.

Information of specific fleets was provided by the responsible Fleet Engineering Managers.

The fleet review commenced in late February and was quickly able to exclude the majority of NR vehicles. A small number of vehicles (specifically Ballast tampers and regulators) required further evidence to fully exclude them. This was centred around physical design, location and protection of the distributor release mechanisms on these vehicles. It is believed by the Principal Engineering Manager the combination of these factors affords sufficient protection for them not to be considered at risk.

The recommendation is therefore closed.