

Oliver Stewart
RAIB Recommendation Handling Manager
T: 020 7282 3864
M: 07710069402
E-mail oliver.stewart@orr.gov.uk

1 February 2021

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

Dear Andrew,

RAIB Report: Loss of brake control on a sleeper train approaching Edinburgh on 1 August 2019

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 28 May 2020.

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 '**Implementation on-going**'. The status of recommendation 2 is '**Implemented**'.

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 on 2 February 2021.

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 28 May 2020.
2. After considering the recommendations ORR passed recommendation 1 to RSSB and recommendation 2 to Serco Caledonian Sleepers Limited 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 2 to the attention of brought to the attention of TOCs, FOCs and charter operators 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 to ensure the integrity of the mandated brake continuity test when coupling a locomotive to a train.

RSSB, in consultation with its members, should amend the wording of section 4.2 of Rule Book module TW1 (GERT8000-TW1 – 'Preparation and movement of trains') to make it clear that the brake continuity test should be carried out after all coupling-related activities have been completed

ORR decision

5. RSSB are planning to update the relevant section of the Rule Book to make clear the need for a brake continuity test when coupling activities have been carried out. Consideration is also being given to the need for a brake continuity test after any jumper cables have been disconnected and reconnected in the course of a journey without any attachment or detachment of vehicles
6. After reviewing the information provided ORR has concluded that, in accordance with the Railways (Accident Investigation and Reporting) Regulations 2005, RSSB has:
 - taken the recommendation into consideration; and
 - is taking action to implement it by 30 September 2021.

Status: Implementation ongoing. ORR will advise RAIB when actions to address this recommendation have been completed.

Information in support of ORR decision

7. On 5 August 2020 RSSB provided the following initial response:

I am pleased to report that, having accepted the recommendation, RSSB tabled the amendment at the meeting of the Traffic Operation and Management Standards Committee (TOM SC) held on 28 July 2020. TOM SC supported the proposed rules

change, which will be progressed as part of a range of changes included in a single project for publication in September 2021. TOM SC suggested that consideration too be given to the need for a brake continuity test after any jumper cables have been disconnected and reconnected in the course of a journey without any attachment or detachment of vehicles. This will be considered as part of the same project.

The review will also be an opportunity to agree whether there is value in amending this section of the Rule Book in the light of the more recent incident at Crofton West Junction.

We will keep ORR informed of progress in the usual manner.

8. On 29 January 2021 RSSB provided the following update:

RSSB Project 21-901 includes publication of the Carmont-related amendments to the Rule Book, delivery of which will supersede the related point releases published on 5 December 2020. The project also incorporates a change to TW1 to address the RAIB 'Edinburgh sleeper' recommendation. The publication date for the outputs of this project will be March 2021, with an in-force date of June 2021. The changes to the Rule Book in 21-901 were approved for authorisation to publish by TOM SC at its meeting on 1 December 2020. The closing date for any final comments by industry is 15 January 2021.

Recommendation 2

The intent of this recommendation is to reduce the probability of the driver losing control of the coach brakes on the Caledonian Sleeper trains.

Serco Caledonian Sleepers Limited, in conjunction with its design authority, should review the design of the brake pipe isolating cock on its Mark 5 sleeper coaching stock, particularly in relation to its vulnerability to undetected, inadvertent operation by people during shunting or train preparation, or by objects (such as fallen trees, flying ballast, or other debris). If applicable, it should implement mitigation measures to reduce the risk

ORR decision

9. Having reviewed the design of the brake pipe isolating cock (BPIC), Serco Caledonian Sleepers Ltd have modified it to reduce the risk of accidental operation. In addition to the engineering change, Serco Caledonian Sleeper Ltd has changed its coupling process and training packages to mitigate the risk of the BPIC being undetected in the closed position.

10. After reviewing the information provided ORR has concluded that, in accordance with the Railways (Accident Investigation and Reporting) Regulations 2005, Serco Caledonian Sleepers Ltd has:

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

Status: Implemented.

Information in support of ORR decision

11. On 14 August 2020 Serco Caledonian Sleeper provided the following initial response:

Serco Caledonian Sleeper (SCS) engaged a 3rd party to undertake an independent technical risk review of proposed options for changes to the Brake Pipe Isolation Cock (BPIC) on the ends of the Mk5 sleeper coaches. The actions implemented to date as per the advice offered in the letter were discussed with our Lead Inspector David Gould.

The hazard analysis considered the following as per the RAIB recommendation:

- *The BPIC cannot accidentally close under forces experienced during the train's operation (vibrations, ballast strikes, etc.)*
- *The BPIC cannot be accidentally/inadvertently closed by persons in the area of the isolating cock during the act of coupling or uncoupling*

As a starting point, a table of options was generated to mitigate the risk of the BPIC being or becoming closed through accidental operation or being struck by an object e.g ballast, falling ice and operated to a closed position, those options were divide into 4 specific categories

1. *Modify BPIC*
 - a. *Option 1a – BPIC handle rotation direction*
 - b. *Option 1b – BPIC venting*
 - c. *Option 1c – BPIC latch arrangement*
2. *Move Protect BPIC*
 - a. *Option 2a – BPIC protection*
 - b. *Option 2b – Move BPIC elsewhere on underframe*
 - c. *Option 2c – Move BPIC inside coach*
3. *Monitor BPIC*
 - a. *Option 3 – Handle position monitoring*
4. *Monitor Brake Pipe Pressure/Continuity*
 - a. *Option 4a – Brake continuity test monitoring (or initial running brake test monitoring)*
 - b. *Option 4b BP pressure difference monitoring*
 - c. *Option 4c - Loco-Coach Continuity monitoring*
 - d. *Option 4d - Loco-Coach Continuity test*

Each of the options was subject to a risk assessment by and independent 3rd party which included linking each of the options to an event tree analysis and included discussions with the design authority on the practicalities of some of the options e.g. moving the BPIC. The final analysis report concluded that the change of orientation of the BPIC handle provided the required benefits in the management of risk associated with the potential unintended operation of the BPIC or its ability to move under forces and vibrations generated by vehicle movements.

SCS reviewed the outputs of the optioneering assessment with the design authority and it was agreed that the change in orientation as concluded in the report (Option 1) was the best engineering solution to mitigate the risk. This option was then subject to a more robust hazard analysis which looked at latching, rotation, being accidentally activated in the new position and controlling the change .

It was additionally noted as a key finding in the risk assessment that the changed orientation of the handle is more aligned with the arrangement that is typical on hose-coupled rolling stock. In this respect, changing the orientation has the added advantage from a human factors perspective of being more typical of other arrangements and was therefore an additional positive factor.

The Design Authority initiated engineering change process required to progress the change in orientation of the BPIC handle through to completion. That change in orientation has now been achieved on the full MK5 fleet, and has already been acknowledged by the RAIB in Paragraph 123 of the report into the incident.

In addition to the engineering change, Caledonian Sleeper also made changes to their coupling process and training packages to mitigate the risk of the BPIC being undetected in the closed position. The Train Manager now checks the orientation of the BPIC prior to departure and provides positive affirmation recorded in the Train Manager's nightly report that the check has been undertaken, it has also been written into procedures that if for any reason an operative has to go back between the locomotive or coach after a brake continuity has been completed then the brake continuity test must be repeated, all methods of work have been reviewed to ensure that the brake continuity is the last task prior to authorising the train move.