

**Oliver Stewart**  
**Senior Executive, RAIB Relationship and**  
**Recommendation Handling**

Telephone 020 7282 3864

E-mail [oliver.stewart@orr.gsi.gov.uk](mailto:oliver.stewart@orr.gsi.gov.uk)

16 June 2017



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

Dear Andrew,

**RAIB Report: Derailment at Princes Street Gardens, Edinburgh, 27 July 2011**

I write to provide an update<sup>1</sup> on the action taken in respect of recommendations 2 and 4 addressed to ORR in the above report, published on 30 August 2012. The annex to this letter provides details of the action taken regarding these recommendations, the status of which is now '**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.

We will publish this response on the ORR website on 26 June 2017.

Yours sincerely,

Oliver Stewart

---

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

## Recommendation 2

*The purpose of Recommendation 2 is to gain assurance that the mechanisms of derailment are fully understood, that these are fully addressed by the inspection procedures in the '053 standard and that the inspection procedures are uniformly applied as intended [NR/L2/TRK/0053 Inspection and repair to reduce the risk of derailment at switches].*

Network Rail should carry out a thorough technical review of the '053 standard to satisfy itself that it has a full understanding of how the standard addresses the following:

- The risk of derailment from worn wheels on a switch rail that is compliant with the TGP8 gauge;
- The practicability of achieving a 1:600 gradient when blending-out a grinding repair of switch rail damage, or for removing a derailment hazard 1; and
- The potential risk of a ramp being created by the introduction of a switch rail that is failing gauge 2 in the first metre, between a side-worn stock rail and wheel flange, particularly where the wheel flange is in flange contact with the stock rail.

In the short term, Network Rail should also review the scope for misinterpretation and inconsistent application of the standard's requirements and take any necessary action, for example, through briefing and its competence management system, to ensure that there is a common understanding and application of the standard's procedures for inspection and repair.

## ORR decision

1. Network Rail has reviewed the '053' standard and the associated Track Engineering inspection Form and instigated a programme to improve understanding and ensure it applied consistently. Network Rail has also reissued the standard related to switch and crossing assemblies (NR/L3/TRK/4004) as the original document had expired. The standard relates to tolerances applied during switch machining and should reduce the likelihood of TGP8 failure on new switches.

2. 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
- taken action to implement it.

**Status: Implemented.**

**Previously reported to RAIB**

3. On 22 July 2014 ORR reported that Network Rail had taken the recommendation into consideration and was taking action to implement it. See the full response at Annex B.

### **Update**

4. On 22 March 2017 Network Rail provided a closure statement containing the following information:

*Princes Street Gardens Recommendation 2 / Shrewsbury Rec 2 required a whole-document review and re-issue of TRKJ053 and its associated Track Engineering inspection Form (TEF). TRKJ053 Issue 6 has now been published with a Compliance date of 4/3/17. Issue 6 has simplified the process of switch inspection, and separated the inspection I repair into separate modules to improve clarity. A New TEF has been introduced to assess and record switch risk factors.*

*The revised standard and its TEF have been briefed to the Quarterly Track and Lineside Standards and Governance Briefing, reaching maintenance and project engineers from Network Operations and Investment Project divisions, and briefing down to appropriate front line staff / end users with the 053 competency via the established cascade process. Videos have also been produced to provide further guidance and improved understanding of the 053 principles.*

*The S&C team is now approximately 50% through a national programme of direct briefs to competency holders in addition to the cascade brief process. This aims to maximise exposure to the new process and provide additional mitigation of risk associated with competence updates on this high risk standard. This re-issue and re-brief of 053 mitigates the risks associated with these two recommendations.*

### **Recommendation 4**

*The purpose of Recommendation 4 is to extend the criteria for fitting automatic lubricators to high risk switches which may not qualify for automatic lubrication under current standards.*

Network Rail should consider whether the criteria specified in NR/L3/TRK/3510/A01 for the installation of automatic lubricators on switches should be extended to include the high rails of switches subject to sidewear in areas, such as the approaches to busy stations, where access for maintenance is limited, and where automatic lubrication could slow the development of sidewear and mitigate the risk of derailment.

### **ORR decision**

5. Network Rail has reviewed the standard that specifies the criteria for the fitting of automatic lubricators to switches, taking into account the risks associated with wear and damage being masked by lubrication. Lubrication strategy for switches is

carried out on a route basis, with Network Rail keen to share learning and best practice between routes.

6. 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
- taken action to implement it.

**Status: Implemented.**

### **Previously reported to RAIB**

7. On 22 July 2014 ORR reported that Network Rail had not yet met the intention of the recommendation: *The purpose of Recommendation 4 is to extend the criteria for fitting automatic lubricators to high risk switches which may not qualify for automatic lubrication under current standards.* (See full response at Annex B)

### **Update**

8. Following a timescale extension, Network Rail provided the following closure statement and supporting document on 30 June 2014 and re-submitted this on 12 October 2016:

#### **1. Analysis of friction coefficients**

*Analysis has confirmed that lubrication reduces the risk of a facing switch derailment. However, once the contact angle is below 55° . as in seen at*

*Shrewsbury where the contact angle was 52°, the effect of lubrication is minimal. The new safety limit is imposed (in LOI/284) in light of this incident:*

*Worn or damage switch blade contact angle of below 55° for a distance of 50mm or more, ban all facing traffic until switch repair work has been carried out or the half set of switches is replaced.*

#### **2. Balance of Risk**

*Experience at Shrewsbury has shown that grease on switch, whilst reducing the risk of a flange climb derailment, can mask damage on the switch blade and can make it difficult to assess the level of switch wear and the switch contact angle with a TGP8 gauge.*

*Given this situation it was decided to re-enforce the requirements of the existing standard, and the routes can make a site specific risk based decision on the benefits of fitting automatic lubricators taking into account local conditions.*

### **3. Medium and long term strategy**

*The benefits of automatic lubricators fitted close to switches will continue to be reviewed with the routes.*

*Alternative lubricants will be considered and evaluated. An ideal situation would be an effective lubricant that did not mask the surface profile of the switch. Experience to date has shown that light oil would not obscure the profile, but is quickly ineffective as it is soon washed away.*

*Consideration will be given to lubricating new switches, following a suggestion made by one of the route support engineers. The benefits and risks associated with this are currently being evaluated.*

*Actions taken supporting closure of recommendation*

- *Benefits of switch lubrication have been assessed*
- *Risks associated with wear and damage being masked by lubrication have been assessed*
- *Requirements of the existing '053 standard have been re-briefed in the clarification briefing Ref 003 (February 2014)*
- *LOI/284 mandates the removed of grease before switch inspections are undertaken*