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14 February 2017



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

Dear Andrew,

RAIB Report: Runaway of 'ironmen' trolleys and subsequent near miss at Raven level crossing, Garnant, Carmarthenshire, 1 November 2014

I write to provide an update¹ on the action taken in respect of recommendations 1, 2 and 4 addressed to ORR in the above report, published on 17 August 2015. 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 15 February 2017.

Yours sincerely,

A handwritten signature in black ink, appearing to read 'Oliver Stewart', written in a cursive style.

Oliver Stewart

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

Recommendation 1

The intent of this recommendation is for Network Rail to make sure that it takes relevant rules into account and includes appropriate risk mitigations when it plans maintenance work.

Network Rail should review its arrangements for planning work using manually propelled plant. It should implement any changes necessary so that planners are provided with clear and concise information enabling them to assess the risks associated with the use of such plant on the intended gradients. Safe systems of work should include appropriate mitigation for these risks.

ORR decision

1. Network Rail has carried out a project to develop a specific strategy for the improvement of the design, planning, maintenance and operation of Ironman units. The strategy includes a planning tool for using Manually Propelled Rail Handlers (ironman) and has been included in Network Rail's Infrastructure Plant Manual.
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 9 March 2016 Network Rail provided the following initial response:

The Ironman Improvement Project is leading the activity in this area and will meet the intent of this recommendation. The project proposes to develop a specific strategy for the improvement of the design, planning, maintenance and operation of Ironman units. This will complement the delivery of the National Safety Strategy, implementation and embedding of the Life Saving Rules and the introduction of other associated plant and equipment safety initiatives. Together these will contribute to the CP5 commitment to eliminate fatalities and major injuries. The Ironman Improvement Project is well under way with the Terms of Reference and an objectives matrix available separately.

There are 7 objectives for the project; one of these is the delivery of a 'Planning Tool' for Ironman usage.

- *The Planning Tool combines a Work Plan and Decision Tree for operations using Manually Propelled Rail Handlers. These documents are in final draft ready for introduction into Module P514 of the Infrastructure Plant Manual to be published in June 2016 and complied with September 2016.*
- *The Planning Tool is to be incorporated into Task Risk Control Sheet (TRCS) NR/L3/MTC/RCS0216/SP07, 'Use of Iron Men'. The TRCS forms a part of the Risk Manual. The Risk Manual is communicated to all stakeholders whom will be enabled to implement the ironmen planning tool as applicable via the New Electronic Permitting (ePermitting) technology or Permit to Work tool, which will replace safe system of work packs. The new Permit to Work tool will bring multiple improvements to all personnel working on the railway. It will guide users through the planning and risk assessment processes to produce relevant paperwork that fully describes the plan, and attached track schematics will allow us to visualise all activity on our infrastructure in one place. The Planning and Delivering Safe Work (P&DSW) programme will be implementing ePermitting amongst other safety changes.*

Action Plan

- *Add Ironmen planning tool into Module 514 of the Infrastructure Plan Manual (IPM) – May 2016*
- *Amend Task Risk Control Sheet (TRCS) NR/L3/MTC/RCS0216/SP07 – May 2016*
- *Publish IPM version 8 – June 2016*
- *IPM Compliance Date – September 2016*

Attachments

- *Ironman Improvement Project Terms of Reference (ToR)*
- *Ironman Improvement Project – Objectives Matrix*



4. On 23 March 2016 Network Rail provided a copy of its draft final report into the findings from its Ironman Safety Improvement Project, the aim of which was to deliver a specific strategy for the improvement of the design, planning, maintenance and operation of Ironman units. This project sought to assist in the closure of recommendation 1.

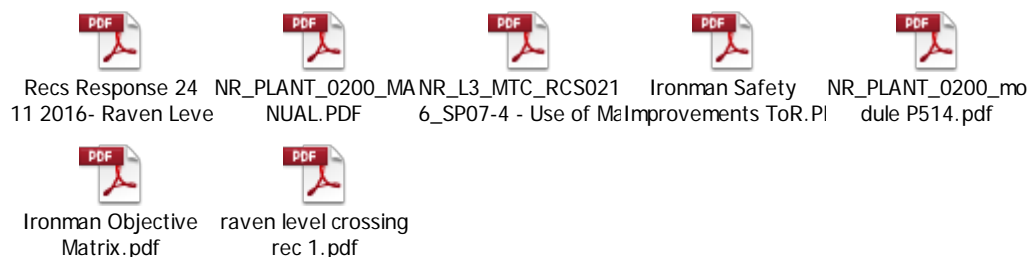


Ironman Project Final
Draft .pdf

5. Network Rail expects this recommendation to be implemented by 3 October 2016.

Update

6. On 29 November 2016 Network Rail provided the following closure statement and supporting evidence:



5. Network Rail state in summary the following:

The Ironman Safety Improvement project was set up following the Ironman runaway incident at Raven Level Crossing on the 1st November 2014. The Project was tasked with developing a specific strategy for improvements in the design, planning, maintenance and operation of Ironman units. There were 7 objectives for the project; one of these is the delivery of a 'Planning Tool' for Ironman usage.

- *The Planning Tool combines a Work Plan and Decision Tree for operations using Manually Propelled Rail Handlers. These documents have been published via Module P514 'Hand Controlled Trolleys' of the Infrastructure Plant Manual.*
- *Task Risk Control Sheet (TRCS) NR/L3/MTC/RCS0216/SP07, 'Use of Manually Propelled Rail Handlers' has been updated. The TRCS forms a part of the Risk Manual. The Risk Manual is communicated to all stakeholders whom will be enabled to implement the ironmen planning tool as applicable. The current updated issue (4) of NR/L3/MTC/RCS0216/SP07 will be published March 2017.*
- *A new Electronic Permitting (ePermitting) technology or Permit to Work tool is being developed as part of the Planning and Delivering Safe Work (P&DSW) programme. This tool will replace safe system of work packs. The new Permit to Work tool will bring multiple improvements to all personnel working on the railway. It will guide users through the planning and risk assessment processes to produce relevant paperwork that fully describes the plan, and attached track schematics will allow us to visualise all activity on our infrastructure in one place. The Planning and Delivering Safe Work (P&DSW) programme will be implementing ePermitting amongst other safety changes.*

Action Plan

- *Publish Task Risk Control Sheet (TRCS) NR/L3/MTC/RCS0216/SP07 'Use of Manually Propelled Rail Handlers' - March 2017.*

Attachments

- *Ironman Improvement Project Terms of Reference (ToR);*
- *Ironman Improvement Project Objectives Matrix;*
- *NR/L2/PLANT/0200 Infrastructure Plan Manual issue 8, Module P514.*
- *Updated Task Risk Control Sheet (TRCS)NR/L3/MTC/RCS0216/SP07 'Use of Manually Propelled Rail Handlers'.*

Recommendation 2

The intent of this recommendation is for Network Rail to clarify the accountability for compliance with the requirements of the Rule Book.

Network Rail should review its arrangements for compliance with the requirements of Handbook 10 of the Rule Book, GE/RT8000, specifically the responsibilities assigned to the person in charge of the trolley (paragraphs 118b, 120a and 120b). It should implement any changes necessary to its procedures and competence management processes so that staff on site are always clearly aware of who is accountable for such compliance.

ORR decision

7. Network Rail has implemented its plan to assess braking systems and revise requirements and guidance for their design, testing and use. They have determined what retrospective action is required.

8. 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

9. On 9 March 2016 Network Rail provided the following initial response:

Network Rail standard NR/PLANT/0200 – 'Infrastructure Plant Manual' (IPM), which details requirements and gives guidance for the use of plant when installing, renewing and maintaining Network Rail's managed infrastructure, is to be amended.

Specifically Module P514 – 'Hand Controlled Trolleys' is to be revised to make it clear for the staff on site who is accountable for the responsibilities assigned to the

person in charge of the trolley as defined in HB10– ‘Duties of the COSS or SWL and person in charge when using a hand trolley’.

The next revision to the IPM is scheduled for release in June 2016, and the subsequent revisions to competence and training material will be made to satisfy this recommendation.

Action Plan

- *Revise Module 514 of the Infrastructure Plan Manual (IPM) – May 2016*
- *Publish IPM version 8 – June 2016*
- *Revised Modules Briefing – September 2016*
- *IPM Compliance Date – September 2016*

Network Rail expects this recommendation to be implemented by 3 October 2016.

Update

10. On 14 October 2016 Network Rail provided the following closure statement and supporting evidence.



Raven LC 011114 - NR_PLANT_0200_mo
Rec 2 - closure signec



odule P514.pdf



PTMP 07.01 Module
Information.pdf

11. Network Rail state in summary the following:

Network Rail standard NR/PLANT/0200 - 'Infrastructure Plant Manual' (IPM), which details requirements and gives guidance for the use of plant when installing, renewing and maintaining Network Rail's managed infrastructure has been amended.

Specifically Module P514- 'Hand Controlled Trolleys' has been revised to make it clear for the staff on site who is accountable for the responsibilities assigned to the person in charge of the trolley as defined in HB10- 'Duties of the COSS or SWL and person in charge when using a hand trolley'.

As a result of this module update, NR/PLANT/0200/MANUAL Infrastructure Plant Manual issue 8 was published 4th June 2016 with a compliance date of 4th September 2016. Briefings on the changes have been completed.

Subsequent revisions have been made to the relevant competence and training materials - PTMP 07.01 Manually Propelled Rail Handler Course Pack issue 2.1 01/09/2016.

Recommendation 4

The intent of this recommendation is to ensure that the design and testing of the brakes of trolleys and ironmen is appropriate for their intended use.

Network Rail, in conjunction with RSSB and the M&E Engineers Networking Group, should define the required functionality of the braking systems fitted to manually propelled plant used on its infrastructure. They should then carry out a generic risk assessment of such braking systems, taking account of all foreseeable failure modes and possible misuse. Based on the findings of this assessment, they should revise the requirements and guidance for design, testing and use of the braking systems, and determine what retrospective action is required with respect to existing equipment.

ORR decision

12. Network Rail has put together a plan to improve the design, planning, maintenance and operation of Ironman units. The risks from using existing ironmen is understood and Network Rail have operational restrictions in place in the form of a limiting gradient. The report will also inform Network Rail's procurement of new ironmen in CP5.

13. 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

14. On 9 March 2016 Network Rail provided the following initial response:

Required functionality of the braking systems

Network Rail Plant team under instruction from the Professional Head of Plant and T&RS have commenced with brake performance testing of all trolley braking arrangements under controlled conditions to review performance in adverse weather conditions and environments. This work has established the limitations of all types of trolleys in use. Further to this a requirements specification for new trolleys has been generated based upon the inputs of end users and the manner in which trolleys are to be used within the industry aligned to the Network Rail Plant strategy, supported with an analytical approach to defining brake performance requirements for given speeds, conditions and gradients. This work is complete and also informs the revisions to the RSSB standards for this equipment.

Risk assessment of braking systems

In parallel to the practical testing undertaken a series of design risk assessment workshops have been undertaken to conduct a critical review of each braking system in use on the trolleys used on the infrastructure. The activity considered the presence on any single point failures, the use and foreseeable misuse and the effects of maintenance intervention. This work has now concluded and informs the revisions to the RSSB standards and new trolley specifications.

Revise the requirements and guidance for design, testing and use

The output of the brake performance testing, design risk analysis and consideration of end user requirements has informed the revisions to the RSSB Railway Industry Standards for Trolleys (RIS-1530-PLT and RIS-1701-PLT) as an asset and the specifications for new Trolleys and Ironmen. Additionally this work has informed and underpinned the mitigations put in place to control the risk of runaway as a medium term containment measure such as the gradient restriction of 1:150.

Retrospective action required with respect to existing equipment.

There is no retrospective action to drive existing equipment out of the business. This is because the risk imposed from existing equipment is understood and operational restrictions remain in place in the form of a limiting gradient. With the design analysis complete and the standard changes in place it is Network Rail's intent to procure any new Trolleys and Ironmen against the new specifications which once available will be exempt from any gradient restrictions.

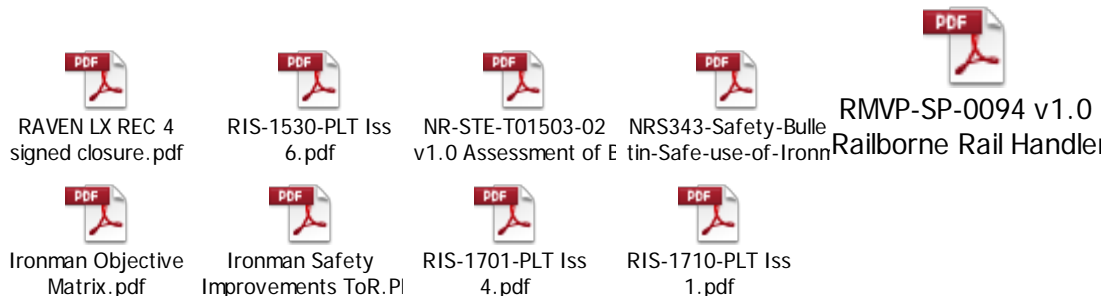
The increased operational scope of this new equipment is expected to drive the demand, and at the point of replacement the older equipment will be removed from use pending a supporting business case to either upgrade or scrap. Network Rail will be procuring new fleets of manually propelled rail handlers and trolleys during CP5. The requirements specification to support this activity has been informed by the lessons learnt from this incident.

15. On 23 March 2016 Network Rail provided a copy of its draft final report (see paragraph 10) into the findings from its Ironman Safety Improvement Project, the aim of which was to deliver a specific strategy for the improvement of the design, planning, maintenance and operation of Ironman units. This project sought to close recommendation 4.

16. Network Rail provided a further update on 18 May 2016 extending the timescale for completion to 31 January 2017 to realign the closure date with changing contracts and procurement tender timelines which were changed to ensure conformance with recent changes in the Utility Regulations governing the tender process. Network Rail has advised that the Manually Propelled Rail Handler Tender Framework Go Live date is now estimated to be October 2016 given suitable responses are received.

Update

17. On 22 December 2016 Network Rail provided the following closure statement and supporting evidence.



18. Network Rail state in summary the following:

Required functionality of the braking systems.

Network Rail Plant team under instruction from the Professional Head of Plant and T&RS have completed brake performance testing of all trolley braking arrangements under controlled conditions to review performance in adverse weather conditions and environments. This work has established the limitations of all types of trolleys in use.

Further to this, under the umbrella of the Iron men Improvement Programme, a requirements specification for new trolleys has been generated based upon the inputs of end users and the manner in which trolleys are to be used within the industry aligned to a Network Rail Plant strategy. This was supported with an analytical approach to defining brake performance requirements for given speeds, conditions and gradients. This work is complete and also informs the revisions to the RSSB standards for this equipment.

Risk assessment of braking systems.

In parallel to the practical testing undertaken a series of design risk assessment workshops have been undertaken to conduct a critical review of each braking system in use on the trolleys used on the infrastructure. The activity considered the presence any single point failures, the use and foreseeable misuse and the effects of maintenance intervention. This work has now concluded and informs the revisions to the RSSB standards and new trolley specifications.

Revise the requirements and guidance for design, testing and use.

The output of the brake performance testing, design risk analysis and consideration of end user requirements has informed the revisions to the RSSB Railway Industry Standards for Trolleys (RIS-1530-PLT and RIS-1701-PLT) as an asset and the specifications for new Trolleys and ironmen.

Additionally this work has informed and underpinned the mitigations put in place to control the risk of runaway as a medium term containment measure such as the gradient restriction of 1:150. RIS-1701-PLT no longer houses the requirements for manually propelled rail borne portable and transportable plant, these requirements have been moved to IS-1530-PLT issue 6 and reside within section 8. The requirements have since been tightened with the introduction of new clauses under Section 8. Brake System (8.3.2, 8.3.4 & 8.3.5) and Section 8.5 Dynamic Stability. Trolleys are now under the remit of a Plant Assessment Body (RIS-1710-PLT issue 1); this was not the case formerly. Network Rail attended and provided technical input during review meetings hosted by the RSSB during the development of RIS-1530-PL issue 6. In addition, Network Rail made direct contributions to the content of IS-1530-PLT issue 6 and RIS-1710- PLT Issue 1 feeding back lessons learnt from plant incident investigations and the role of product acceptance.

Retrospective action required with respect to existing equipment.

There is no retrospective action to drive existing equipment out of the business. This is because the risk imposed from existing equipment is understood and operational restrictions remain in place in the form of a limiting gradient. With the design analysis complete and the standard changes in place it is Network Rail's intent to procure any new Trolleys and Ironmen against the new specifications which once available will be exempt from any gradient restrictions

The increased operational scope of this new equipment is expected to drive the demand, and at the point of replacement the older equipment will be removed from use pending a supporting business case to either upgrade or scrap. Network Rail will be procuring new fleets of manually propelled rail handlers and trolleys during CP5. The requirements specification to support this activity has been informed by the lessons learnt from this incident.