19-006 - Revision of the Technical Requirements for On-Track Plant and Trolleys

[This page should be deleted at the publication stage of the project]

Version:	V3.0		
Purpose:	Approval to publish		
Authors:	Neil Dinmore – Principal Engineer, Structures and Material Neil Halliday – Professional Head of Plant		
Sponsor:	Tom Lee – Director of Standards		
Lead industry committee:	Plant Standards Committee (PLT SC)	**Date:**	in correspondence
Supporting industry committee:	Infrastructure Standards Committee (INS SC)	**Date:**	in correspondence
Supporting industry committee:	Energy Standards Committee (ENE SC)	**Date:**	in correspondence

Decision

Plant Standards Committee (PLT SC) is asked to:

APPROVE the document (RIS-1530-PLT issue seven) for publication

In approving the document for publication the SC has:

APPROVED with or without modification the proposed responses to comments received during consultation.

APPROVED the new issue of RIS-1530-PLT for publication.

APPROVED the withdrawal of RIS-1530-PLT issue six.

Energy Standards Committee (ENE SC) and Infrastructure Standards Committee (INS SC) are asked to:

SUPPORT the document (RIS-1530-PLT issue seven) for publication

In supporting the document(s) for publication the SCs have:

SUPPORTED with or without modification the proposed responses to comments received during consultation.

SUPPORTED the new issue of RIS-1530-PLT for publication.

SUPPORTED the withdrawal of RIS-1530-PLT issue six.

19-006 - Revision of the Technical Requirements for On-Track Plant and Trolleys

This business case for change has been developed to support standards committees in taking decisions related to changes to standards, it includes an assessment of the predicted impacts arising from the change.

Proposed revised document

Number	Title	Issue
RIS-1530-PLT	On-Track Plant, Trolleys and Associated Equipment	7

Proposed superseded document

Number	Title	Issue
RIS-1530-PLT	On-Track Plant, Trolleys and Associated Equipment	6

Summary

Background and change

The project was to revise RIS-1530-PLT in consultation with the supply chain and infrastructure managers to set out the engineering requirements for on-track plant (OTP), trolleys and associated equipment for railway infrastructure work. Whilst principally applicable to Network Rail (NR) and Transport for London (TfL) managed infrastructure the document could be adopted by other infrastructure managers.

Several of the referenced standards and legislation in RIS-1530-PLT issue six were out of date, and industry (for example, the M&EE Networking Group and Rail Plant Association) has raised a number of other concerns with issue 6.

Industry impact due to changes

Impact areas	Scale of impact	Estimated value
A. Legal compliance and assurance	Medium	£60,000
B. Health, safety and security	Low	£10,000
C. Reliability and operational performance	Neutral	Not proportionate
D. Design and maintenance	Medium	Not proportionate
E. People, process and systems	Neutral	Not proportionate
F. Environment and sustainability	Neutral	Not proportionate
G. Customer experience and industry reputation	Neutral	Not proportionate
Total value of industry opportunity over five years =		**£70,000**

The standards change contribution to the total value of industry opportunity				
☐ None or low	☐ Minor but useful	☑ Moderate	☐ Important / essential	☐ Urgent / critical

Detail

1. What were the objectives associated with this change?

Objective 1 – Address RAIB recommendation 1 in report 08/2019 (Cholmondeston)

1.1 Report 08/2019 'Collision between two road-rail vehicles at Cholmondeston, Cheshire' sets out the findings from the Rail Accident Investigation Branch (RAIB) investigation into an incident on 19th September 2018. A road-rail ballast distributor travelling in reverse on the line between Chester and Crewe collided with a personnel-carrying vehicle. Two track workers in the rear of the personnel carrier were injured, one of them suffering life changing injuries.

1.2 Recommendation 1 of the report states:

"1 The intent of this recommendation is to prevent those operating and controlling road-rail vehicles from adopting unofficial operating methods during travelling.

"RSSB, in consultation with the industry, and involving due industry process, should review the effectiveness and practicality of the engineering and procedural controls permitted by RIS-1530-PLT to manage the travelling of road-rail vehicles safely, taking into account reasonably foreseeable misuse by machine operators and machine controllers, and make changes to the standard, as necessary. This review should include consideration of the following:

- requirements for visibility of the line ahead, taking into account that road-rail vehicles generally spend as much time travelling in reverse as they do forwards (this will be particularly applicable for conversions of unidirectional road vehicles); and

- requirements for managing speed - in particular whether use of a speedometer is an acceptable means of managing speed where the machine's capability is much greater than its permitted maximum."

Objective 2 – Align RIS-1530-PLT with the updated EN 15746 series '*Railway applications – Track - Road rail machines and associated equipment*'

1.3 Parts 1, 2, and 3 of BS EN 15746 '*Railway applications - Track - Road-rail machines and associated equipment*', were published in December 2020. This suite of documents was prepared by the CEN/TC 256/SC 1/WG5 Working Group. This working group includes members of Plant Standards Committee (PLT SC) (including the convenor and experts).

Objective 3 – Resolve known issues, queries and requests raised by the M&EE Networking Group and other users of RIS-1530-PLT

1.4 The M&EE Networking Group is an established body of professional railway engineers and operators experienced in the operation and use of on-track machines (OTM), on-track plant (OTP) and portable and transportable equipment. The Rail Plant Association represent the owners of OTP.

1.5 As such, these groups have requested several changes to RIS-1530-PLT; see Appendix A.

Objective 4 – Bring RIS-1530-PLT into the latest format for RISs, adding rationale and guidance

1.6 RIS-1530-PLT issue six contained guidance supporting many of its requirements; RSSB standards publications now also provide rationale for each requirement. This is to help the user understand the reason for the requirement.

2. How has the content in the standard changed to achieve the objectives?

Objective 1

2.1 Sections 5.9.1 (Travelling mode) and 5.9.2 (Working mode) of RIS-1530-PLT issue seven set out a clear preference for the machine operator to have full visibility of the line, in the direction of travel. Where this is not possible, alternatives are given in order of preference:

1) to have an assistant, with separate controls who can stop the machine from a position where the assistant can have full visibility of the line in the direction of travel;
2) to have CCTV with sufficient field of view; and
3) to have ground staff able to control the machine movements in conjunction with the operator.

2.2 Section 5.4 (Machine speeds) sets out three options for controlling or indicating speed:

1) Engineering means (such as a speed limiter),
2) a speedometer, or
3) an audible and visual warning.

This is supported by the requirement to have the maximum speed(s) on rail clearly displayed, and by accuracy requirements for the speedometer.

2.3 Appendix N of RIS-1530-PLT issue seven sets out a revised specification for CCTV. Appendix O has been added to provide guidance on collision avoidance systems.

Objective 2

2.4 References to the EN 15746:2020 series have been included in the draft of RIS-1530-PLT issue seven. The opportunity has also been taken to reference prEN 15955:2022 series that will replace EN 15954:2011 and EN 15955.2011. It should be noted that much of the content of the ENs are derived from the RIS (rather than the other way round).

Objective 3

2.5 The changes requested by the M&EE Networking Group and RPA (as set out in Appendix A) have been reviewed and the applicable clauses in draft RIS-1530-PLT issue seven have identified.

Objective 4

2.6 RIS-1530-PLT issue seven is in the current required format for RISs, including rationale and guidance for each requirement. Compared to RIS-1530-PLT issue six this has meant some reordering of the clauses but generally the topic areas have retained similar numbering.

3. How urgently did the change need to happen to achieve the objectives?

3.1 PLT SC has been kept fully informed as to the progress with RIS-1530-PLT issue seven. It was initially expected to publish this in June 2022. However, delays were incurred for several reasons (for example, the Covid-19 pandemic and delays in the publication of associated revised on track plant related ENs). Publication is now on target for September 2023.

4. What are the positive and negative impacts of implementing the change?

Justification of impact, scale and quantification for the seven impact areas

A. Legal compliance and assurance

4.1 The requirements in RIS-1530-PLT issue seven are aligned with those of

- the Supply of Machinery (Safety) Regulations 2008 (as amended), which transposed the Machinery Directive (2006/42/EC) into UK law; and
- the Provision and Use of Work Equipment Regulations 1998.

4.2 Both sets of Regulations are made under the Health and Safety etc. Act 1974.

4.3 The requirements in RIS-1530-PLT issue seven have been updated to address the recommendations of RAIB report 08/2019.

4.4 The costs of not complying with these legislative requirements are potentially very high. In one case, the death of a construction worker resulted in a fine of £200,000[1] , and a contractor was fined £600,000 when a road-rail excavator overturned (with no fatalities)[2]. If it is considered that the changes to the RIS could contribute to the avoidance of an incident occurring over a five-year period, then based on a fine of £60,000 per incident then the benefit would be £60,000 over five years. It should be noted that this figure does not include the costs directly associated with any accident or incident.

[1] See https://www.safetybank.co.uk/blog/consequences-of-non-compliance-in-health-safety-regulations

[2] See https://www.orr.gov.uk/search-news/amey-rail-fined-ps600000-health-and-safety-failings-during-reconstruction-market

B. Health, safety and security

4.5 Updating the RIS with the requirements set out in section 2 (objective 1) can help to reduce the risk of injury if the requirements are complied with. Assuming that the absence of these requirements has a similar risk to injury as a defect on an on-track plant (OTP), then using incidents due to defective OTP involved in collisions, derailments or rollovers as the closest cause precursors from the Safety Risk Model, the risk of injury is 0.01984 FWI per year. If there is a 5% reduction in risk as a result of introducing the changes to the RIS, then this represents 0.000992 FWI per year. Using the Value of Preventing a Fatality (£2,017,000) this represents a benefit of £10,000 over five years.

C. Reliability and operation performance

4.6 The updated requirements in RIS-1530-PLT assist manufacturers in achieving 'state of the art' with respect to machine reliability. However, it is not proportionate to quantify the benefits.

4.7 Zero net benefit is therefore claimed.

D. Design and maintenance

4.8 The updated requirements in RIS-1530-PLT assist manufacturers in achieving 'state of the art' with respect to machine design and maintenance.

4.9 Ensuring consistent requirements between the ENs and the RIS ensures that suppliers can design machines for multiple applications across GB and the EU.

4.10 It is not proportionate to quantify the benefits; suffice to say that the potential costs of redesign or modifications to meet different requirements in different countries could be significant.

E. People, process and systems

4.11 Users of the revised standard benefit from improved guidance and the updated legal context of the process. This will assist with maintaining tacit knowledge.

4.12 Conversely, there is a risk that changing the standard could import risk by requiring users to act differently; however, the intention is to align the standard with existing industry good practice.

F. Environment and sustainability

4.13 In the absence of available detail, it is not considered proportionate to quantify a benefit.

G. Customer experience and industry reputation

4.14 Indirectly, it is anticipated there may be some benefit derived from updated standards for on-track plant; for example, in reducing the risk of possession overruns, and thereby improving customer perception.

4.15 There is little data in relation to the number of delays that this could prevent; therefore, it is not considered appropriate to apportion a value for this benefit.

5. What is the contribution of this standards change in realising the value to industry opportunity?

5.1 The project was expected to have a positive benefit on cost and performance for the GB rail industry as a whole. Not updating the requirements will mean that identified issues set out in the objectives will not be addressed.

6. What was the effort required by RSSB to make the change?

6.1 RIS-1530-PLT issue six has been reviewed against the requirements set out in the updated ENs. Duplicate requirements have been removed, and guidance retained where appropriate.

7. Has RSSB delivered against industry's expected timescales?

7.1 It was initially expected to publish this in June 2022; however, delays were incurred for several reasons (for example, the Covid-19 pandemic and delays in the publication of associated revised on track plant related ENs). Publication is now on target for September 2023.

8. How will the industry implement the change?

8.1 The development of BS EN 15746 '*Railway applications. Track. Road-rail machines and associated equipment*', and prEN 15955 '*Railway applications. Infrastructure. Demountable machines, trailers and associated equipment*' was undertaken by CEN/TC 256/SC 1/WG5; this working group includes members of PLT SC.

8.2 Requests for changes to RIS-1530-PLT have been received from the M&EE Networking Group and RPA, which represents owners and users of machines covered by this standard.

8.3 Industry is already aware of the content of RIS-1530-PLT issue seven as it is generally based on the content of RIS-1530-PLT issue six. The industry is therefore well-prepared to implement the changes when it comes into force.

9. How will RSSB assess whether the change is achieving the objectives?

9.1 Twelve months after publication RSSB will review, via PLT SC, whether the requirements and guidance are still fit for purpose. This will take into account enquiries, requests for change, amendments and clarifications, and comments from industry stakeholders.

Appendix A Appendix A RIS-1530-PLT - Topics for issue 7 (Alphabetical order)

Brakes general

- Need to fit slack adjusters – NIR 3485 Genie Z60 runaway *New clause G 5.7.1.22.*
- Promote torque testing of brake instead of dynamic testing. *Modified clause 5.7.1.7 and new clause G 5.7.1.20*
- Incorporate LUL gradient requirements. *New clause G 5.7.1.27*

Brake testing (acceptance)

- Acceptance testing – consider transferring brake test from Plant Manual P700 to avoid calling up COP0025

Cab clutter – display ergonomics

- Issue with positioning of displays for additional systems after the host machine has been modified. Can they be integrated to reduce the clutter and use of targeted alerts to draw attention when necessary? *New clause G5.1.7 referring to GEGN8613 for HF.*

Coupler requirements

- Issue with coupling trailers with Josh couplers at different heights. Currently specify bars with 40mm diameter holes and the Josh coupler has 38mm pins. Suggestion that the eyes be permitted to up to 50mm diameter. *New clause G.K.5.7*

Data logger requirements

- Simplified requirements for cranes with one duty cycle – HIAB cranes on lorries *New clause G.5.12.15*

Dig mode

- Link dig mode to data recorders – time stamped evidence *New clause G.5.12.13*
- Alert to company's central location when dig mode selected – live video feed via tracker system *New clause G.5.12.14*
- Consider only permit dig mode if knows a bucket is fitted – leave it to manufacturer to come up with solution (RFID tag on bucket : camera recognition)

Earth bonding – OLE protection

- Impedance reduced to 0.05Ω *Modified clause 5.16.6.1*
- Bond sizes – NR preparing guidance on bond sizes – still being drafted
- Staff protection to align with RIS-1702-PLT *New clauses G.5.18.1.14, G 5.18.3.12 and modified clause G 5.18.3.11*

Emergency recovery under live OLE

- Location of access points needs to consider safe working. *See 5.13.2 and 10.1.1.1 k)*

EMC

– EN 13309:2000 has been withdrawn *replaced by BS EN ISO 13766-1 /-2:2018*

Exclusion zones

– Illuminated boundary – Pod trak Blue LEDs

– Encroachment alerts – Stobart Rail system

– NR conducting installation trials – evaluation still on going

First aid kit

– Consider provision of kit to support Health and Safety (First Aid) Regulations. *New clause G 5.11.29*

Forward visibility

– Look at wording to remove needing to see signal. OTP operators do not use lineside signals. *Reference to signals removed from 5.9.1.1.*

Identification numbers

– Displaying 12 digit numbers starting ZZ instead of 99 *Modified Appendix C*

'Iron men' braking

- Awaiting NR / TfL trials – still ongoing

Inadvertent movement

- Touch controls / sensitive joy sticks – for new machines *New clause G 5.9.5.3*

- Loss of hydraulic pressure indicator *New clause G 9.9.10*

Labelling Floating and Fixed ends

– For consistency with COP008 – Float End (Zero ^{o}) : Fixed End (180 ^{o}). *New clause G 9.1.3.5*

Lifting Charts following upgrade

– Following any RCI upgrade work need to ensure that the central RCI (Prolec, GKD, etc) databases (used to the lift planners) are kept up to date with the appropriate lifting chart details. Add a note the responsibility lies with the machine owners/operators. *New clause G 9.7.1.15*

– PABs to check both the paper and electronic duty charts – for RIS-1710-PLT

Limitations on certificates

– Review wording on templates – clear statements needed that are not open to misinterpretation. e.g. High performance MLD is fitted / Low performance MLD is fitted / No MLD is fitted. *New Certificate Example in Appendix H*

– Clarity on twisted track capabilities – declare actual machine limits

– On and off tracking capabilities. *New Certificate Example added to Appendix H*

– See also comment about other networks

London Emissions – NRMM LEZ

- Rail not directly covered by NRMM LEZ – Potentially could be applied via planning conditions

Machines used in Enclosed locations

- Fire assessment when only 'Predominantly' used in enclosed area – consider deleting the word predominantly. *Modified title see 5.31*

Maintenance Manuals

– More clarity on the compilation of maintenance manual information - concern about having to cherry pick from several documents – risk error in doing wrong activity *New clause G 10.2.1.5*

MEWPs overload alarms

- EN280 suggested update -- Value decreases after each overload e.g. 100% - 95% - 90% and after 3 overloads machine goes into safe mode
- Record the overload value *New clause G 5.12.12*

On-off tracking

– Testing on 150mm cant. *Modified clause G 5.19.1.12*

Operation on other networks - *Covered by clause G 5.3.4*

– Gradients steeper than 1 in 25

– Curve radii tighter than 80m

– Test to machine capability (declared by manufacturer)
Minimum being NR limits but encourage recording actual *Modified clause G 5.19.1.14*

Pantograph used for earthing

– Consider adding this as an option – in line with EN 15746:2020 *New clause G 5.16.5.15*

Quick hitch duty charts

– Duty charts for machines with removeable quick hitches. *New clause G 9.4.3.11*
- duty chart without quick hitch
- duty chart with quick hitch if this is the usual working condition

Recovery of machines

– Better guidance on recovery of machines – need to consider access by staff and them carrying out the recovery actions safely – consider position of controls, valves, use of remote controls, etc. *Modified clause G 5.13.6*

Reversing Cameras

- Difficulty sourcing cameras to 1530 issue 6 *Appendix N revised to align with prEN15955*

Reversing in travelling mode

- Emphasis on engineering solutions vs operational controls. *Clause G 5.9.1.7 states options are set out in order of preference.*
- Not permitted to go faster than 5km/h unless direct line of sight or camera system fitted. *Clause 5.9.1.4 requires 5 km/h limited by engineering means; G 5.9.1.8 suggests 16 km/h for CCTV.*
- Speedometer to display rail speed not just road speed *Clause 5.4.7 gives this requirement.*
- Wide angle CCTV may give a false indication of distance – consider adding warning 'Caution objects on the screen are closer than they appear'. *New clause G 5.9.1.14*
- Inclusion of guidance on collision avoidance systems. New *Appendix P derived from prEN15955*

Safety critical components

- Include need to identify safety critical components (see COP0038 for list)
- Handbook to include actions to deal with failure of SCC *Covered by 10.2.1.2*

Safety critical control systems

- Align critical control system selection chart from prEN 15955 *Covered by Table 3*
- Need to consider foreseeable mis-use – blocks of wood in deadman's / overload switches *Modified clause G 5.11.26*

Slew speeds when excavator used as a crane

- Consider different speeds selected when in crane mode : dig mode *Modified clause G 5.8.3.13*

Strapping down on lorries

- To transport OTP safely, suitable and sufficient tie down points or securing system to anchor the OTP to be provided. Guidance to ensure that tie down straps/chains do not foul the rail gear and associated equipment. *New clauses G 5.29.4 and G 6.4.9*

Tandem Lift with linked RCIs

- Consider additional guidance on use of linked RCIs *New clause G 9.7.1.16*
- How to link – using Bluetooth / WiFi (NR have given PA to GKD system)

Tip testing

- Use of load cells under each wheel *Covered by G 9.5.6.16*
- Repeatability for worst case conditions *Covered by G 9.5.6.14*
- Any recommendations from the tip testing survey – still to be undertaken

Track twist

- Consider increasing track twist criteria to align with NR limits set in NR-L2-TRK-001 module 11 Table 2. *Rejected by PLT SC: retained as 1 in 150 in Appendix A*

- Clarity that twist is Appendix A over wheelbase plus a rail dip of 20mm. *Clarified in Appendix A*

Trailer braking

– Tell tail on the service brake – non-visible brakes *New clause G 7.3.3.3*

– Venting of parking brake lines and dirt protection *New clause G 7.3.2.5*

Wheel specifications

– Consider incorporating TfL wheel specs

Working at height

– Harness attachments *New clause G 5.22.11*

– Temporary fences *New clause G 5.22.11*

– Visual marking of the boundary on access platforms / trailers *New clause G 5.22.12*

Working lights vs travelling lights

- Avoid confusion on direction of movement *Covered by G 5.15.1.16*

Working under OLE

- Consider OLE mode like ALO where the speed of slew and lift is reduced on approach to OLE proximity. This will help reduce risk of OLE strikes and increase time to deal with situation *New clause G 5.8.7.8*
- Consider need for OLE duty charts when boom heights / geometry has to be restricted to avoid the OLE. *Modified clause G 9.7.1.9*

360 Cameras

- Consider fitment and appropriate requirements – Potential new NR specifications

Good practice – *included in definitions section*

A process or method that has been shown to work well; succeeds in achieving its objective(s); is widely accepted; and therefore can be recommended as an approach.

Avoid using the term “best practice” – we cannot claim that an approach we are recommending is the best.

Appendix B Disposition Table

Table B1: RIS-1530-PLT issue six to RIS-1530-PLT issue seven

From RIS-1530-PLT iss 6	To RIS-1530-PLT iss 7	Way forward	Comments	Objective
Title	**Title**	**Redrafted**	Was **'*Rail Industry Standard for Technical Requirements for On-Track Plant and their Associated Equipment and Trolleys*'** Changed to **'*On-Track Plant, Trolleys and Associated Equipment*'** so that the title doesn't contain the document type, nor 'requirements'	**4**
1.1 Purpose of this document	1.1 Purpose	Redrafted	Minor amendments to wording for clarity	N/A
1.2 Application of this document	1.2 Application of this document	Revised	To current template text	4
1.3 Health and safety responsibilities	1.3 Health and safety responsibilities	Revised	To current template text	4
1.4 Structure of this document	1.4 Structure of this document	Revised	To current template text	4
1.5 Copyright	Copyright statement on front cover	Revised	To current template text	4
1.6 Approval and authorisation of this document	1.5 Approval and authorisation of this document	Revised	To current template text	4
2.1 Scope of this document	2.1 Scope of this document	No change	N/A	N/A
2.2 Relevant legislation	2.2 Relevant legislation	Redrafted	To reflect current relevant legislation	4

From RIS-1530-PLT iss 6	To RIS-1530-PLT iss 7	Way forward	Comments	Objective
2.3 Definitions	Definitions	Revised	Moved to the end of the document in accordance with the current template. Added master glossary definition of “good practice” (M&EE request).	3, 4
3 Engineering Assessment				
3.1.2	3.1.2	Redrafted	The Plant Assessment Body (PAB) shall assess the machine for compliance with this document (see Appendix F) and, when satisfied that the machine is compliant, shall issue an Engineering Conformance Certificate (ECC). **Changed to:** ‘The machine shall be assessed for compliance with this document (see Appendix F) and, when satisfied that the machine is compliant, an Engineering Conformance Certificate (ECC) shall be issued.’	4
3.1.2	3.1.4 – 3.1.6	Redrafted	Guidance: G 3.1.4 Railborne plant is accepted onto the railway using a three-point process of conformity with statutory requirements, engineering conformance and product acceptance. G 3.1.5 Engineering conformance is assessed by Plant Acceptance Bodies, accredited by the United Kingdom Accreditation Service (UKAS). G 3.1.6 The item of railborne plant is then assessed for suitability for the intended application each time it is used. G 3.1.7 RIS-1710-PLT gives further guidance.	4
Part 4 Classification of Machines				
4.1 Machines in scope of this document	4.1 Machines in scope of this document	Revised	Converted to Guidance; this is a statement rather than a requirement.	2, 4
4.2 Demountable machine	4.2 Demountable machine	Revised	Converted to Guidance; this is a statement rather than a requirement.	4
4.3 RRV – Type 9 machines	4.3 RRV – Type 9 machines	Redrafted	To current template: added Rationale and Guidance.	2, 4

From RIS-1530-PLT iss 6	To RIS-1530-PLT iss 7	Way forward	Comments	Objective
4.4 Trailers and wheeled attachments – Type 0 machines	4.4 Trailers and wheeled attachments – Type 0 machines	Redrafted	To current template: added Rationale and Guidance.	4
4.5 Trolleys	4.5 Trolleys	Revised	Converted to Guidance; this is a statement rather than a requirement.	4
4.6 Miscellaneous machines and attachments	4.6 Miscellaneous machines and attachments	Redrafted	To current template: added Rationale and Guidance.	2, 4
Part 5 Common Design Requirements				
5.1 Design assessment	5.1 Design assessment	Redrafted	To current template: Single requirement per clause; added rationale; 'should' reworded as 'it is good practice'. Updated references. New guidance for Human Factors in response to M&EE.	**2, 3, 4**
5.2 Gauge	5.2 Gauge	Redrafted	To current template: Single requirement per clause (more use of lists to clarify long sentences); added rationale; 'should' reworded as 'it is good practice'. Updated references.	**2, 4**
5.3 Track condition	5.3 Track condition	Redrafted	To current template: Single requirement per clause; added rationale. Updated references. Amended guidance in response to M&EE.	**2, 3, 4**
5.4 Machine speeds	5.4 Machine speeds	Redrafted	To current template: Single requirement per clause; added rationale; 'should' reworded as 'it is good practice'. Updated references. Added clarity regarding speed control, speedometers, and alternative options in response to RAIB Recommendation.	**1, 3, 4**
5.5 Wheel loadings	5.5 Wheel loadings	Redrafted	To current template: Single requirement per clause (more use of lists to clarify long sentences; added rationale; 'should' reworded as 'it is good practice'. Updated references.	**2, 4**
5.6 Dynamic stability	5.6 Dynamic stability	Redrafted	To current template: Single requirement per clause; added rationale; 'should' reworded as 'it is good practice'. Updated references.	**2, 4**
5.7 OTP rail mode brakes	5.7 OTP rail mode brakes	Redrafted	To current template: Single requirement per clause; added rationale; 'should' reworded as 'it is good practice'. Updated references. New clauses in response to M&EE.	**2, 3, 4**

From RIS-1530-PLT iss 6	To RIS-1530-PLT iss 7	Way forward	Comments	Objective
5.8 Movement limiting devices	5.8 Movement limiting devices	Redrafted	To current template: Single requirement per clause; added rationale; 'should' reworded as 'it is good practice'. Updated references.	**2, 3, 4**
5.9 Personnel areas (where fitted)	5.9 Personnel areas (where fitted)	Redrafted	To current template: Single requirement per clause; added rationale; 'should' reworded as 'it is good practice'. Updated references. Added clarity regarding preference for direct line of sight in direction of travel, with prioritised alternatives (assistant, CCTV or ground staff). Amended clauses as requested by M&EE and in response to RAIB recommendation.	**1, 2, 3, 4**
5.10 Setting up and packing away	5.10 Setting up and packing away	Redrafted	To current template: Single requirement per clause; added rationale. Updated references.	**2, 4**
5.11 Other safety features	5.11 Other safety features	Redrafted	To current template: Single requirement per clause; added rationale; 'should' reworded as 'it is good practice'. Updated references.	**2, 3, 4**
5.12 Data logging	5.12 Data logging	Redrafted	To current template: Single requirement per clause; added rationale. Updated references.	**2, 3, 4**
5.13 Failure recovery conditions	5.13 Failure recovery conditions	Redrafted	To current template: Single requirement per clause; added rationale; 'should' reworded as 'it is good practice'. Updated references.	**2, 4**
5.14 Retention of components	5.14 Retention of components	Redrafted	To current template: Single requirement per clause; added rationale; 'should' reworded as 'it is good practice'. Updated references.	**2, 4**
5.15 Visibility and Audibility	5.15 Visibility and Audibility	Redrafted	To current template: Single requirement per clause; added rationale; 'should' reworded as 'it is good practice'. Updated references.	**2, 3, 4**
5.16 Electrical equipment and electrical safety bonding	5.16 Electrical equipment and electrical safety bonding	Redrafted	To current template: Single requirement per clause; added rationale; 'should' reworded as 'it is good practice'. Updated references.	**2, 3, 4**
5.17 Electromagnetic compatibility	5.17 Electromagnetic compatibility	Redrafted	To current template: Single requirement per clause; added rationale; 'should' reworded as 'it is good practice'. Updated references.	**2, 4**

From RIS-1530-PLT iss 6	To RIS-1530-PLT iss 7	Way forward	Comments	Objective
5.18 Protection from overhead line equipment and conductor rails	5.18 Protection from overhead line equipment and conductor rails	Redrafted	To current template: Single requirement per clause; added rationale; 'should' reworded as 'it is good practice'. Updated references.	**2, 4**
5.19 On and off tracking system	5.19 On and off tracking system	Redrafted	To current template: Single requirement per clause; added rationale; 'should' reworded as 'it is good practice'. Updated references. Clauses amended in response to M&EE request.	**2, 3, 4**
5.20 Towing requirements	5.20 Towing requirements	Redrafted	To current template: Single requirement per clause; added rationale; 'should' reworded as 'it is good practice'. Updated references.	**2, 4**
5.21 Rail wheels	5.21 Rail wheels	Redrafted	To current template: Single requirement per clause; added rationale; 'should' reworded as 'it is good practice'. Updated references.	**2, 4**
5.22 Doors, door handles, steps, handrails and railings	5.22 Doors, door handles, steps, handrails and railings	Redrafted	To current template: Single requirement per clause; added rationale; 'should' reworded as 'it is good practice'. Updated references.	**2, 3, 4**
5.23 Audible warning devices	5.23 Audible warning devices	Redrafted	To current template: Single requirement per clause; added rationale. Updated references.	**4**
5.24 Demountable modules	5.24 Demountable modules	Redrafted	To current template: Single requirement per clause; added rationale; 'should' reworded as 'it is good practice'. Updated references.	**2, 4**
5.25 Windscreens and windows	5.25 Windscreens and windows	Redrafted	To current template: Single requirement per clause; added rationale; 'should' reworded as 'it is good practice'. Updated references.	**2, 4**
5.26 Remote control systems	5.26 Remote control systems	Redrafted	To current template: Single requirement per clause; added rationale. Updated references.	**2, 4**
5.27 Noise emissions	5.27 Noise emissions	Redrafted	To current template: Single requirement per clause; added rationale. Updated references.	**2, 4**
5.28 Vibration emissions	5.28 Vibration emissions	Redrafted	To current template: Single requirement per clause; added rationale; 'should' reworded as 'it is good practice'. Updated references.	**2, 4**

From RIS-1530-PLT iss 6	To RIS-1530-PLT iss 7	Way forward	Comments	Objective
5.29 Structural integrity	5.29 Structural integrity	Redrafted	To current template: Single requirement per clause; added rationale; 'should' reworded as 'it is good practice'. Updated references, including to GMRT2100.	**2, 3, 4**
5.30 Fire prevention	5.30 Fire prevention	Redrafted	To current template: Single requirement per clause; added rationale; 'should' reworded as 'it is good practice'. Updated references, including to RIS-2730-RST.	**2, 4**
5.31 Design requirements for machines intended for use in enclosed locations	5.31 Design requirements for machines intended for use in enclosed locations	Redrafted	To current template: Single requirement per clause; added rationale; 'should' reworded as 'it is good practice'. Updated references.	**2, 3,4**
5.32 Owner identification	5.32 Owner identification	Redrafted	To current template: Single requirement per clause; added rationale. Updated references.	**2, 4**
Part 6 Road-Rail Vehicle Requirements				
6.1 On and off tracking	6.1 On and off tracking	Redrafted	To current template: Single requirement per clause; added rationale; 'should' reworded as 'it is good practice'.	**4**
6.2 Rail wheel systems	6.2 Rail wheel systems	Redrafted	To current template: Single requirement per clause; added rationale; 'should' reworded as 'it is good practice'. Updated references.	**2, 4**
6.3 Steering	6.3 Steering	Redrafted	To current template: Single requirement per clause; added rationale.	**4**
6.4 Road vehicle conversion	6.4 Road vehicle conversion	Redrafted	To current template: Single requirement per clause; added rationale; 'should' reworded as 'it is good practice'. Updated references.	**2, 3, 4**
Part 7 Trailers				
7.1 Trailer design	7.1 Trailer design	Redrafted	To current template: Single requirement per clause; added rationale. Updated references.	**4**
7.2 Trailer design general requirements	7.2 Trailer design general requirements	Redrafted	To current template: Single requirement per clause; added rationale; 'should' reworded as 'it is good practice'. Updated references.	**2, 4**

From RIS-1530-PLT iss 6	To RIS-1530-PLT iss 7	Way forward	Comments	Objective
7.3 Brakes	7.3 Brakes	Redrafted	To current template: Single requirement per clause; added rationale; 'should' reworded as 'it is good practice'. Updated references.	**3, 4**
7.4 Jacking points for recovery	7.4 Jacking points for recovery	Redrafted	To current template: Single requirement per clause; added rationale. Updated references.	**2, 4**
Part 8 Trolleys				
8.1 General	8.1 General	Redrafted	To current template: Single requirement per clause; added rationale; 'should' reworded as 'it is good practice'. Updated references.	**4**
8.2 Rail wheels	8.2 Rail wheels	Redrafted	To current template: Single requirement per clause; added rationale. Updated references.	**4**
8.3 Brake system	8.3 Brake system	Redrafted	To current template: Single requirement per clause; added rationale; 'should' reworded as 'it is good practice'. Updated references.	**4**
8.4 Manual propulsion	8.4 Manual propulsion	Redrafted	To current template: Single requirement per clause; added rationale; 'should' reworded as 'it is good practice'. Updated references.	**4**
8.5 Dynamic stability	8.5 Dynamic stability	Redrafted	To current template: Single requirement per clause; added rationale; 'should' reworded as 'it is good practice'. Updated references.	**4**
Part 9 Machines with Moveable Parts Affecting Stability				
9.1 General	9.1 General	Redrafted	To current template: Single requirement per clause; added rationale; 'should' reworded as 'it is good practice'.	**3, 4**
9.2 Cranes	9.2 Cranes	Redrafted	To current template: Single requirement per clause; added rationale. Updated references.	**4**
9.3 Mobile elevating work platforms	9.3 Mobile elevating work platforms	Redrafted	To current template: Single requirement per clause; added rationale; 'should' reworded as 'it is good practice'. Updated references.	**2, 4**
9.4 Attachments	9.4 Attachments	Redrafted	To current template: Single requirement per clause; added rationale; 'should' reworded as 'it is good practice'. Updated references. New guidance clause in response to M&EE request.	**3, 4**

From RIS-1530-PLT iss 6	To RIS-1530-PLT iss 7	Way forward	Comments	Objective
9.5 Static stability	9.5 Static stability	Redrafted	To current template: Single requirement per clause; added rationale; 'should' reworded as 'it is good practice'. Updated references.	**2, 3, 4**
9.6 Dynamic stability	9.6 Dynamic stability	Redrafted	To current template: Single requirement per clause; added rationale; 'should' reworded as 'it is good practice'. Updated references.	**2, 4**
9.7 Rated capacity indicator	9.7 Rated capacity indicator	Redrafted	To current template: Single requirement per clause; added rationale; 'should' reworded as 'it is good practice'. Updated references.	**2, 3, 4**
9.8 Condition of variables during calculation and testing	9.8 Condition of variables during calculation and testing	Redrafted	To current template: Single requirement per clause; added rationale; 'should' reworded as 'it is good practice'.	**4**
9.9 Burst protection	9.9 Burst protection	Redrafted	To current template: Single requirement per clause; added rationale; 'should' reworded as 'it is good practice'. Updated references.	**2, 3, 4**
9.10 Load lifting points	9.10 Load lifting points	Redrafted	To current template: Single requirement per clause; added rationale; 'should' reworded as 'it is good practice'.	**4**
Part 10 Information for Users				
10.1 Instruction handbook	10.1 Instruction handbook	Redrafted	To current template: Single requirement per clause; added rationale. Updated references.	**2, 4**
10.2 Maintenance	10.2 Maintenance	Redrafted	To current template: Single requirement per clause; added rationale; 'should' reworded as 'it is good practice'. Updated references.	**2, 3, 4**
N/A	10.3 Documentation	New		**2, 3, 4**
Appendixes				
Appendix A	Appendix A	Revised	Formatted as guidance. Amended in response to M&EE.	**3, 4**
Appendix B	Appendix B	Revised	Updated to give ZZ machine number.	**4**

From RIS-1530-PLT iss 6	To RIS-1530-PLT iss 7	Way forward	Comments	Objective
Appendix C	Appendix C	Revised	Updated to give ZZ machine number.	**3, 4**
Appendix D	Appendix D	No change	N/A	**N/A**
Appendix E	Appendix E	Revised	Formatted as guidance.	**4**
Appendix F	Appendix F	Revised	Formatted as guidance.	**2, 4**
Appendix G	Appendix H	Revised	New example certificate **(Note: Appendix G not used).**	**3, 4**
Appendix H	Appendix J	Redrafted	To current template: Single requirement per clause; added rationale. Updated references.	**3, 4**
Appendix J	Appendix K	Redrafted	To current template: Single requirement per clause; added rationale; 'should' reworded as 'it is good practice'. Updated references.	**2, 3, 4**
Appendix K	Appendix L	Redrafted	To current template: Single requirement per clause; added rationale; 'should' reworded as 'it is good practice'. Updated references.	**2, 3, 4**
Appendix K	Appendix M	Redrafted	To current template: Single requirement per clause; added rationale. Updated references.	**2, 3, 4**
Appendix L	Appendix N	Redrafted	To current template: Single requirement per clause; added rationale; 'should' reworded as 'it is good practice'. Updated references to align with prEN15955.	**2, 3, 4**
N/A	Appendix P	New	New guidance on obstacle detection systems derived from prEN15595	**3**