RIS-2712-RST Issue 1.2

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

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Purpose:	Approval to publish		
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Lead industry committee:	Rolling Stock Standards Committee (RST SC)	**Date:**	02 November 2023
Supporting industry committee:	Traffic Operation and Management Standards Committee (TOM SC)	**Date:**	07 November 2023
Supporting industry committee:	Control, Command and Signalling Standards Committee (CCS SC)	**Date:**	16 November 2023

Decision

Rolling Stock Standards Committee (RST SC) is asked to:

APPROVE the proposed revision of RIS-2712-RST for publication.

In approving the standard for publication, the SC has:

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

Traffic Operation and Management Standards Committee (TOM SC) is asked to:

SUPPORT the proposed revision of RIS-2712-RST for publication.

In supporting the standard for publication, the SC has:

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

Control, Command and Signalling Standards Committee (CCS SC) is asked to:

SUPPORT the proposed revision of RIS-2712-RST for publication.

In supporting the standard for publication, the SC has:

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

RIS-2712-RST Issue 1.2

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(s)

Number	Title	Issue
RIS-2712-RST	On-Train Camera Monitoring Systems	1.2

Proposed superseded documents

Number	Title	Issue
RIS-2712-RST	On-Train Camera Monitoring Systems	1.1

Summary

Background and change

RIS-2712-RST issue 1.1 'On-Train Camera Monitoring Systems' sets out requirements for the use of modern camera systems for the purposes of recording, storing, and accessing video data from rolling stock. It also contains guidance on methods to protect the camera systems and data storage from physical or cyber unauthorised access, and what the British Transport Police (BTP) needs when using the recorded data as part of an investigation.

General requirements for camera systems, such as image quality, on-screen information and event triggers are included in the standard, as well as requirements for different camera systems, such as pantograph and forward-facing types.

Rail Accident Investigation Branch (RAIB) report 02/2023 "Train driver struck by a train near West Worthing Middle Siding, West Sussex, 1 February 2022" includes recommendations and learning points from the event that was investigated. Recommendation 2 of the report requires that "the Department for Transport, working in conjunction with Rail Safety and Standards Board, should review standards and guidance, so that all new trains are fitted with effective forward-facing CCTV systems". Furthermore, the Department for Transport (DfT) have also submitted a request for help, 23-REQ-031, asking for support to deliver this recommendation.

RIS-2712-RST issue 1.2 is proposed to set out new requirements for the installation of forward-facing CCTV (FFCCTV) on all new, renewed and upgraded rolling stock, as requested in RAIB report 02/2023, and review existing FFCCTV guidance so that industry can install systems that are as effective as they can be.

Industry impact due to changes

Impact areas	Scale of impact	Estimated value £'s
A. Legal compliance and assurance	Medium	Not proportionate to quantify
B. Health, safety and security	Medium	Not proportionate to quantify
C. Reliability and operational performance	Medium	£100,000
D. Design and maintenance	High	-£520,000
E. People, process and systems	Medium	Not proportionate to quantify
F. Environment and sustainability	N/A	Not applicable
G. Customer experience and industry reputation	N/A	Not applicable
Total value of industry opportunity =		**-£420,000**

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 are the objectives associated with this change?

Objective 1 – Set out new requirements for the installation of forward-facing CCTV

1.1 Rail Accident Investigation Branch (RAIB) report 02/2023 "Train driver struck by a train near West Worthing Middle Siding, West Sussex, 1 February 2022" includes recommendations and learning points from the event that was investigated.

1.2 Recommendation 2 of the report requires that "the Department for Transport, working in conjunction with Rail Safety and Standards Board, should review standards and guidance, so that all new trains are fitted with effective forward-facing CCTV systems".

1.3 The DfT have requested a change to the standard which outlines that they are "seeking to review and amend relevant standards to ensure that forward-facing CCTV becomes mandatory on all new trains [in] the timescales in line with the ORR's expectations for compliance with RAIB recommendations" following the publication of RAIB report 02/2023 recommendation 2.

1.4 Additionally, no requirements or guidance exists for FFCCTV systems in cabs which are not active and in use by the driver, when recording may still be necessary, other than in clause G 3.1.2.12 of RIS-2712-RST issue 1.1 for coupled units. In the case of the West Worthing incident, it is probable that the driver had de-activated the cab before exiting, which may result in the FFCCTV system switching off.

Objective 2 – Review the existing requirements and guidance related to forward-facing CCTV for accuracy

1.5 Figure 1 in RIS-2712-RST sets out a requirement for the field-of-view of a FFCCTV system, which is identical to the view of the driver as set out in GMRT2161. There is however more than one reference standard for the driver's field-of-view, such as is contained within the BS EN 16186 series of standards.

1.6 Technology related to cameras has improved since the first publication of the standard in 2020, and therefore guidance on FFCCTV systems may now be outdated.

Objective 3 – Update references

1.7 References, such as BS IEC 62443-3-3:2013 and BS EN 50467, have been withdrawn and require updating as they are no longer applicable.

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

Objective 1 – Set out new requirements for the installation of forward facing CCTV

2.1 New requirements for FFCCTV systems are set out in the draft RIS-2712-RST issue 1.2 for FFCCTV to be fitted to all rolling stock and when the system is required to be active/recording considering cab activation.

Objective 2 – Review the existing requirements and guidance related to forward facing CCTV for accuracy

2.2 Figure 1 of RIS-2712-RST issue 1.1 was reviewed for accuracy but has now been withdrawn and is no longer suitable for use.

2.3 The guidance within part 3.1 of RIS-2712-RST issue 1.1 was reviewed for accuracy, with a view to adding guidance on modern technology if appropriate. However, no changes have been made and no additional guidance is provided.

Objective 3 – Update references

2.4 All references made within RIS-2712-RST were reviewed and have been updated as necessary.

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

3.1 The revised RIS is proposed for publication in March 2024, based on standards committee approval in December 2023. It is anticipated that there will be a negligible impact to industry following these changes in the next 12 months considering current published tenders for rolling stock upgrades.

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 changes to the RIS will help rolling stock operators, suppliers, manufacturers, and maintainers meet their general and ongoing obligations to comply with health and safety legislation. However, these benefits are disproportionate to quantify.

B. Health, safety and security

4.2 Setting out requirements for the fitment of FFCCTV to rolling stock will support safety investigations by the BTP such as trespass on the railway, level crossing incidents and near misses or staff incidents and accidents, such as the accident reported on in RAIB report 02/2023, and security investigations such as cable theft or vandalism. Lessons can be learned from these investigations, which can ultimately improve health, safety and security. However, these benefits are disproportionate to quantify.

C. Reliability and operation performance

4.3 Between August 2018 and August 2019, there were 732 reported incidents of cable crime on the GB rail network, as indicated in the Control Centre Incident Log (CCIL). This resulted in 119,384 delay minutes being accrued at an estimated cost to industry of approximately six million pounds based on £50 per delay minute, which excludes the value of the cables that were either stolen or damaged, the time taken for remedial works and other knock-on impacts. The fitment of FFCCTV systems to rolling stock can act as a deterrent to those performing cable crimes, for which the cost is significant but not a quantifiable benefit as an outcome of an adaption to the standard.

4.4 Trespass is a significant problem on the GB rail network and it can take some time for such incidents to be accurately investigated and the cause and effect of such incidents to be understood. The fitment of FFCCTV will support BTP investigations into trespass incidents where trains are in the area at the time that they occur. Although this benefit is significant, it is not proportionate to quantify.

4.5 A near miss is an unsafe event or act specifically involving a train, on-track machinery or on-track plant. A significant number of near miss events are recorded in CCIL each year, with the delay minutes from February to August 2023 alone totalling around 21,000 at a cost to industry of approximately one million pounds, based on £50 per delay minute. If the change to the standard, and resulting change to vehicles being fitted with FFCCTV, resulted in a 1% reduction in investigation time spent which can involve the railway line being closed causing delays, this would provide a benefit to industry of around £20,000 per year, or £100,000 over five years.

D. Design and maintenance

4.6 It is not possible to quantify the benefits of any requirements that may be set out that are associated with the design and installation of FFCCTV systems on rolling stock. Design costs are typically considered per train carriage which would include a marginal cost for FFCCTV.

4.7 The installation of FFCCTV would require increased maintenance. If it is assumed that labour for maintenance costs of £800 per day, and that maintenance of a FFCCTV system takes around two hours per year per train, the cost of maintenance for one train per year is estimated to be £200 or £1000 over five years.

4.8 In a 2019 report by the Department for Transport, it is indicated that 4,500 new carriages were set to be in use for passengers by 2022, which extrapolates to 1,500 carriages per year or 7,500 over a five-year period. Using this value to estimate carriage introduction for the next five years, with a third of these trains being four carriages and the other two thirds being twelve carriages, with two cabs per train, this is approximately 520 cabs introduced over a five-year period. This results in a maintenance cost for new fleets of £520,000 over five years.

E. People, process and systems

4.9 Incident and accident investigation can be time consuming due to the limited number of data sources available to the RAIB and BTP. A mixture of perishable and non-perishable evidence is typically used, and although FFCCTV can be considered as a perishable form of evidence due to files typically being recorded on a ‘first-in-first-out’ (FIFO) principle, they are usually acquired before being overwritten and provide key information in the incident or accident that took place.

4.10 FFCCTV systems have the capability to significantly improve incident and accident investigation time, although the time and duration of such investigations can vary significantly and therefore it is not possible to quantify the benefit of improvements that may be made.

F. Environment and sustainability

4.11 Not applicable.

G. Customer experience and industry reputation

4.12 Not applicable.

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

5.1 The addition of requirements for FFCCTV to be fitted to rolling stock, and how it should operate, will ensure that future vehicle builds and modifications for GB rolling stock align with operational requirements and provide greater support to RAIB and BTP investigations.

5.2 FFCCTV requirements and guidance is expected to improve incident and accident investigation on the GB rail network. This will have a direct impact on passenger services from a safety and performance perspective through a reduction in time spent investigating as well as provide a greater insight into the incidents and accidents that have occurred.

5.3 The changes to RIS-2712-RST are expected to result in a net cost to industry of approximately £420,000 over the next five years due to an increase in maintenance required on such systems. However, there are unquantified benefits, such as those relating to investigation time spent and achieving complete incident and accident investigation outcomes without assumptions being made, that could offset this cost across the whole of the industry.

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

6.1 No project was necessary for the implementation of this change. A technical specialist from the rolling stock standards team led the change supported by risk and safety intelligence and policy specialists for their review and comment.

7. Can RSSB deliver against industry's expected timescales?

7.1 Resources are available to meet a target publication date of March 2024. If the change is not made in the expected timescale there will be limited impact to industry.

8. How will the industry implement the change?

8.1 The change will be implemented by the fitment of FFCCTV to all new, renewed and upgraded rolling stock operating on the GB mainline railway.

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

9.1 Feedback on the application of the standard from industry groups will be sought from industry at the 12-month review.

Appendix A Disposition Table

Table A1: RIS-2712-RST issue 1.1 and new content to RIS-2712-RST issue 1.2

From RIS-2712-RST issue 1.1	To RIS-2712-RST issue 1.2	Way forward	Comments	Objective
G 2.1.1	G 2.1.1	Revised	Year of standard publication added – BS EN 62676-4:2015	3
G 2.2.3.8	G 2.2.3.8	Revised	Year of standard publication added – BS EN 61373:2010	3
G 2.2.3.9	G 2.2.3.9	Redrafted	BS EN 50467 reference updated to standard which superseded it, BS EN IEC 62847:2023.	3
G 2.3.1.1	G 2.3.1.1	Revised	Year of standard publication added – BS EN 62676-4:2015	3
G 2.3.1.2	G 2.3.1.2	Revised	Year of standard publication added – BS EN 62676-4:2015	3
G 2.4.4	G 2.4.4	Revised	Year of standard publication added – BS EN 62676-4:2015	3
G 2.4.5	G 2.4.5	Revised	Year of standard publication added – BS EN 62676-4:2015	3
G 2.4.13	G 2.4.13	Revised	Guidance restructured to include G 2.4.14, for clarity only	2
G 2.4.14		Withdrawn	Combined with G 2.4.13	2
G 2.11.1.5	G 2.11.1.5	Revised	Year of standard publication added – BS EN 62676-4:2015	3
	3.1.1	New	Part title	1
	3.1.1.1	New	Requirement added to support RAIB report 02/2023 recommendation two so that all new, renewed and upgraded rolling stock is now fitted with a forward-facing camera system	1
	3.1.1.2	New	Requirement added to support RAIB report 02/2023 where the accident identified that the driver left the cab. If camera systems do not continue to record on cab deactivation, event information can be missed	1
	G 3.1.1.3	New	Rationale to support requirement 3.1.1.1 on why forward-facing camera systems generally beneficial	1

From RIS-2712-RST issue 1.1	To RIS-2712-RST issue 1.2	Way forward	Comments	Objective
	G 3.1.1.4	New	Rationale to support requirement 3.1.1.2 on why continuing to record images following cab deactivation is beneficial	1
	G 3.1.1.5	New	Rationale to support requirement 3.1.1.2 on the reason why the time duration is set out	1
	G 3.1.1.6	New	Guidance added to support the recording of images in a non-active cab for events that may occur at the rear of the train	1
	G 3.1.1.7	New	Guidance added to support requirement 3.1.1.2 on how recording images for a greater period of time can provide constant monitoring of the railway environment	1
	G 3.1.1.8	New	Guidance added to support the application of requirement 3.1.1.1	1
3.1.1	3.1.2	No change	No comments	
3.1.1.1	3.1.2.1	Revised	Requirement changed to reference GMRT2161 issue 2.1, clause 2.1.1, instead of providing reference to previous Figure 1. The intent of the requirement remains the same but it will additionally remain correct if forward viewing angle requirements in GMRT2161 change in the future	2
Figure 1	-	Withdrawn	Requirement 3.1.2.1 now references GMRT2161 issue 2.1, clause 2.1.1, instead of providing this figure which was taken from GMGN2606 for GMRT2161 issue one. Additionally, the figure appeared to be adapted from one provided in BS EN 16186-1:2014 without permission and additional details were added that may mislead the reader due to the format	2
3.1.1.2	3.1.2.2	No change	No comments	
3.1.1.3	3.1.2.3	No change	No comments	
3.1.1.4	3.1.2.4	No change	No comments	
3.1.1.5	3.1.2.5	No change	No comments	
3.1.1.6	3.1.2.6	No change	No comments	

From RIS-2712-RST issue 1.1	To RIS-2712-RST issue 1.2	Way forward	Comments	Objective
	G 3.1.2.8	New	Guidance added on references made to case a and case b in the requirements	2
G 3.1.1.7	G 3.1.2.7	No change	No comments	
G 3.1.1.8		Withdrawn	Guidance withdrawn as figure 1 has been withdrawn	2
G 3.1.1.9	G 3.1.2.9	No change	No comments	
3.1.2	3.1.3	No change	No comments	
3.1.2.1	3.1.3.1	No change	No comments	
3.1.2.2	3.1.3.2	No change	No comments	
3.1.2.3	3.1.3.3	No change	No comments	
3.1.2.4	3.1.3.4	No change	No comments	
3.1.2.5	3.1.3.5	No change	No comments	
G 3.1.2.6	G 3.1.3.6	No change	No comments	
G 3.1.2.7	G 3.1.3.7	No change	No comments	
G 3.1.2.8	G 3.1.3.8	No change	No comments	
G 3.1.2.9	G 3.1.3.9	No change	No comments	
G 3.1.2.10	G 3.1.3.10	No change	No comments	
G 3.1.2.11	G 3.1.3.11	No change	No comments	
G 3.1.2.12	G 3.1.3.12	No change	No comments	
G 4.6.6	G 4.6.6	Redrafted	New references added to BS IEC 62443 series standards and PD CLC/TS 50701:2021	3

From RIS-2712-RST issue 1.1	To RIS-2712-RST issue 1.2	Way forward	Comments	Objective
	References	Revised	BS IEC 62443-3:2013 revised to BS IEC 62443 series standards, so that all parts of the standard are included as guidance BS EN IEC 62847:2023 replaces BS EN 50467, which it supersedes Numerous references updated with years of publication	3
	References	New	PD CLC/TS 50701:2021 added for railway cybersecurity BS EN 16186-1:2014+A1:2018 added for driving cabs	3