

Category 2 Standard

S2451 Change to Rolling Stock (CRS)

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MAYOR OF LONDON



Contents

1	Purpose	3
2	Scope	3
3	Requirements	3
3.1	Process	3
3.2	Records	5
3.3	Minor Works Arrangements	5
4	Responsibilities	6
4.1	Change Manager	6
4.2	Fleet Manager	6
4.3	CRS Facilitator	6
4.4	Engineering Records Manager	6
4.5	Professional Head of Rolling Stock	6
4.6	Principal Engineer	6
4.7	PHoRS Delegate	6
5	Supporting information	6
5.1	Safety considerations	6
5.2	Environmental considerations	7
5.3	Customer considerations	7
5.4	Other information	7
6	References	10
6.1	References	10
6.2	Abbreviations	11
6.3	Definitions	11
6.4	Technical content manager	12
6.5	Document history	12
7	Appendix	13
7.1	Appendix 1 – CRS Form – Issue 1	13
7.2	Appendix 2 - Qualitative Risk Assessment (QRA) Scheme	15
7.3	Appendix 3 - Minor works Authorisation Form	16
7.4	Appendix 4 - Form A	17
7.5	Appendix 5- Form B	18
7.6	Appendix 6- Form C	20
7.7	Appendix 7 - Design Check List	21
7.8	Appendix 8 - Maintenance Check List	22



1 Purpose

- 1.1 The purpose of this standard is to define the accountabilities, responsibilities and activities of the “Change to Rolling Stock” (change control) process. This is to ensure that all changes falling within the terms of reference of this process are managed, recorded and approved in a consistent and systematic manner.

2 Scope

- 2.1 This Standard applies to all proposed changes to rolling stock falling within the terms of reference for LU cat 1 Standards 1-180 Standard for Rolling Stock and 1-538 Assurance.
- 2.2 Within the terms of this scope a change may include, but is not limited to:
- a) A physical modification to rolling stock.
 - b) A change to a maintenance standard, process, practice, test, schedules or periodicities.
 - c) A change to rolling stock system, equipment standard or setting.
 - d) A change to an equipment overhaul or spare part specification or standard.
 - e) A temporary change to rolling stock to trial or test for a proposed fleet-wide change.
 - f) A change of the supplier of a safety critical part or services associated with a safety critical part i.e.: repair or overhaul
 - g) Provision of a component or part for which the original design details are not available. (a process commonly known as reverse engineering as defined in LU Standard 1-180).
- 2.3 Incorporated within this scope is the provision of engineering support for minor works. Minor works are issues arising from maintenance work in progress which requires technical support from the Principal Engineers to resolve a problem. This may entail a small change to the design arrangements to facilitate completion of maintenance work. This type of issue will be a one off arrangement but may affect more than one car in a unit. If the problem propagates it will require the issue of a CRS.

3 Requirements

3.1 Process

- 3.1.1 The CRS process is designed to provide technical assurance of engineering changes to rolling stock. Where the change may have an effect on either the infrastructure or the operational environment it will require acceptance by other parties i.e. track signals or COO. This will involve consultation and the application of change control processes within the affected disciplines. These requirements are detailed in LU Assurance standard 1-538.
- 3.1.2 Certain changes will require the issue of a Certificate of Technical Conformance as defined in section 3.21 of LU cat 1 standard 1-538 Assurance e.g. replacement bogies, cab air conditioning etc.
- 3.1.3 A change may be initiated from any source if it provides a benefit to LUL. The change requester or change manager shall ensure the change is referred to the Fleet Manager and PHoRS delegate at the earliest opportunity to ensure the correct approval method is employed.



Several templates are provided to facilitate progress through the following process:-:

- (a) A form (Template fo195) - Provides a clear description and scope of the required change to aid the design process and is the reference document for the scope of the change.
- (b) B form (Template fo197) - Identifies the description and scope of the change that has been authorised at the time the CRS is Issued.
- (c) C form (Template fo198) - Provides confirmation that the change has been implemented and all the requirements of the CRS have been completed.

Note: Two check lists have been included: FO196 to aid design consultation and FO194 a maintenance checklist

- 3.1.4 All CRSs must contain a prioritisation code to determine its urgency with an agreed timescale for completion before being issued. The prioritisation allocation shall be based on the risk prior to the proposed change and where the CRS is supporting a CCSO it shall be referenced on the CRS form.

The prioritisation levels are as follows:

a) A1 High safety risk:

Potential to cause top ten event, CRS is providing either mitigation or a final solution to a serious safety risk.

b) A2 Medium Safety risk:

A low safety risk but the consequences of failure may have associated operational safety risks either due to the affect of the failure mode on operation of the train or the current level of occurrences may impose an unacceptable risk to the operational railway.

c) A3 Low Safety Risk:

Supporting an engineering improvement

- 3.1.5 In all cases where the change includes the installation of new equipment, software or alterations to existing arrangements the installation and testing instructions shall be included in the reference documentation. This also applies to any additional maintenance requirements or changes to existing maintenance documentation.

- 3.1.6 Where the CRS is supporting a trial or test it shall clearly identify the reasons for the test/trial, the assessment criteria to be used and the success criteria. Reference documentation shall include:

- a) Installation and removal instructions for test equipment or software (including any test requirements to confirm integrity of the installation).
- b) A test plan detailing how the test will be conducted, measurements to be taken and how these will be recorded.
- c) A final report and conclusions from the test.

- 3.1.7 In cases where the CRS identifies procurement or logistical requirements the following shall be included:

- a) Part description, specification and where appropriate drawing details including a safety critical parts rating where appropriate, to provide an unambiguous engineering description in support of an application for a part number.
- b) Supplier details if there is a preferred sole supplier including justification for choice.



- c) Where parts or equipment are specifically manufactured for a change consideration shall be given to any requirements for technical, engineering or inspection verification as part of the supplier approval process.
- d) Identification of any parts made redundant by the change including any specific disposal arrangements.

3.2 Records

A CRS register shall be maintained for each Stock to provide a unique number for each CRS and will record:

- a) Allocated number
- b) Date CRS Number Allocated
- c) CRS Title
- d) Date CRS Approved
- e) Date CRS change was completed
- f) Date C Form received
- g) Change Manager

- 3.2.1 The approved CRS document and all referenced documentation including approved drawings, A, B and C forms shall be forwarded to the CRS Facilitator and filed electronically in the Document Management Facility provided for this purpose.
- 3.2.2 Where documents were not available at the time of issue, such as updated maintenance documents or a final report for a trial or test, they will be recorded on the B form and a copy which shall be retained for reference by the Change Manager.
- 3.2.3 On completion of the change a signed C form and all outstanding documentation recorded on the B form shall be forwarded to the CRS Facilitator and filed electronically with the original CRS
- 3.2.4 All drawings associated with the CRS will be forwarded by the CRS Facilitator to the Engineering Records Manager for filing and electronic storage.
- 3.2.5 The progress of CRS's shall be monitored to ensure that they are issued in a timely manner and implementation meets the agreed timescale. Responsibility for monitoring progress rests with the Change Manager who shall carry out regular reviews to ensure implementation timescales are achieved.
- 3.2.6 To maintain the integrity of the CRS register any CRS number allocated and not approved in a 6 month period shall be subject to a review to confirm it is still active otherwise it shall be cancelled as not required
- 3.2.7 The following records are produced and retained under this process.

Type	Responsible	Retention Period
CRS Documents including A,B & C Form	CRS Facilitator	Life of the stock + 5 years
CRS Register	CRS Facilitator	Permanent
Engineering Drawings	Engineering Records Manager	Permanent

3.3 Minor Works Arrangements

- 3.3.1 All requests for minor works support shall be made to the APD Engineers



- 3.3.2 The relevant Principal Engineer will decide if the issue is covered by minor works arrangements or requires a CRS.
- 3.3.3 When the scope of the work is agreed a MWA form (attachment 3) will be issued to approve the work.
- 3.3.4 Once the work has been completed the maintainer must record the work on the maintenance management system and reference the MWA form filing the hard copy for future reference.
- 3.3.5 The APD Engineers will maintain a register of all issued MWA forms and retain a copy of the forms for future reference.
- 3.3.6 The MWA form can only be approved by the relevant Principal Engineer or accredited deputy.

4 Responsibilities

4.1 Change Manager

Responsible for ensuring a particular CRS application is followed through to successful completion and to act as primary contact for all issues arising.

4.2 Fleet Manager

To act as agent on behalf of the Head of Fleet & Trains for the acceptance of changes to Rolling Stock and accountably for the impact on the maintenance of these assets. As authorised signatory on behalf of the Head of Fleet & Trains will monitor implementation of the change against planned completion dates.

4.3 CRS Facilitator

responsible to the fleet manager to provide oversight of CRS register and integrity of the electronic documentation facility.

4.4 Engineering Records Manager

To ensure all engineering drawings associated with CRSs are registered and stored electronically in accordance with Asset Performance Directors engineering procedures.

4.5 Professional Head of Rolling Stock

To ensure all changes are assessed in accordance with LU Assurance Standard 1-538 and comply with LU standards and any appropriate legislation.

4.6 Principal Engineer

under delegated authority from the PHoRS will carry out engineering and design reviews and provide technical approval for engineering changes. Additionally will manage and approve minor works.

4.7 PHoRS Delegate

Provide assurance approval for all CRSs ensuring due diligence is applied throughout the process.

5 Supporting information

5.1 Safety considerations

- 5.1.1 All CRSs shall provide a safety statement which outlines any safety risk being mitigated by the change and confirms why it is safe to make the proposed change. Where the change is mitigating a safety risk the safety statement must be supported by a QRA. In some cases the change may not completely eliminate all the risks, in such cases, the remaining risks must be in the tolerable category





or following further review and quantitative assessment is classified as ALARP. Any change with a mitigated safety risk value greater than 8 must be validated by the change manager and the PHoRS.

- 5.1.2 All QRAs shall meet the requirements of Cat 5 standard 5-044 Asset Risk Standard clause 4.3 using the risk scoring scheme in Attachment 2 section 13. Copies of all QRAs shall be forwarded to the Maintenance Assurance Engineer for inclusion in the local Risk Register.
- 5.1.3 In some cases where there is a complex change i.e. significant software revisions, refurbishment, and introduction of new systems it may be appropriate to hold a safety review with a peer group. Such assessments shall also consider if the change will materially affect the safety of the railway, as defined under the ROGS Regulations in which case the appropriate approval will be sought.
- 5.1.4 In all such cases any safety review will be implemented in consultation with the PHoRS. The final conclusions reached as a result of a safety review will be documented, referenced and filed with the CRS.
- 5.1.5 The Safety Certificate and Authorisation requires railway operators to give confidence that they have the ability, commitment and resources to control health and safety risks. The ROGS Regulations require new and altered works materially affecting safety to be approved before being brought into use. These mean that there must be a clear framework for the control of change.
- 5.1.6 For Rolling Stock assets, these requirements are described in LU Standards 1-538 and 1-180 which details the various types of change and the associated change management processes to be followed. One or a combination of these processes may comprise the safety arrangements for the proposed change.

5.2 Environmental considerations

- 5.2.1 In the development of any change consideration must be given to any impact on the environment in areas affected by the change in particular noise levels.
- 5.2.2 Particular attention shall be given to the disposal of any waste generated by a change or use of material / processes that adversely impact on the environment (e.g. paint solvents /lubricants /de icing fluid)

5.3 Customer considerations

- 5.3.1 Due consideration must be given to any impact that may affect customers either to their environment i.e. notices, DVA messages or the ability to use any facilities provided.
- 5.3.2 Any proposed change shall not adversely impact on the reliability of the train service or expose customers to any additional risks.

5.4 Other information

- 5.4.1 The flowchart below outlines the process to be followed to progress any requested change

Flowchart symbols

Activity:



Responsible for ensuring that the outcome of an activity is achieved, and that an audit trail is maintained for mandatory consultations.



Consultation: Mandatory consultation with the indicated person(s), as a minimum, to complete the activity.