



Engineering Manual

General

CRN GM 002

ENGINEERING STANDARDS DEVELOPMENT MANUAL

Version 1.4

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Owner: Manager Engineering Services
Approved by: Committee of Principal Engineers
Authorised by: J Zeaiter, Manager Engineering Services

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Document control

Revision	Date of Approval	Summary of change
1.0	December 2011	First Issue
1.1	July, 2013	6.2 – Replacement of reference to Standards Change Request Form with request by phone or email; 8.1 – Revise “Review of engineering standards changes” to include Standards Change Form and Risk Review; 9 – Revise “Approval and authorisation” to detail requirements for submission of changes to the ESCC and reference submission template; Appendix A - Original Appendix deleted – New Appendix – Standards Change Form and Risk Review; New Appendix B – ESCC Change Submission
1.2	October, 2015	Changed title “Asset Management and Engineering Services Manager” to “Manager Engineering Services“ Added “Plant” to Rolling Stock discipline; 2.1 - Added CRC to abbreviations; 3.1 - Changed CRIA to CRC; 4.3.4 - Clarified required attendees for ESCC meetings; 4.3.5 - Reduced required meeting quorum from 4 to 3; clarified requirements for meeting agenda; 10.2 - Clarified requirements for implementation plan; Appendix 1 - Renumbered from Appendix B; Changed form to put implementation review after approval; Appendix 2 - Renumbered from Appendix A; Changed form to clarify risk questions
1.3	December, 2015	Appendix 1 Changed ITSRR to ONRSR, Appendix 2 Included additional change types
1.4	May, 2017	See Summary of changes below

Summary of changes from previous version

Section	Summary of change
Various	Minor formatting corrections
8.1.1	Corrected appendix A to appendix 2.
Appendix 1	Added watermark to sample form(s)
Appendix 2	Added watermark to sample form(s)

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1 Introduction and application

This manual explains the process for development, authorisation and implementation of engineering standards on the John Holland Rail (JHR) Country Regional Network (CRN). The process centres on the role of Principal Engineers as the custodians of the engineering standards and follows a continuous improvement cycle as part of the overall CRN asset management process.

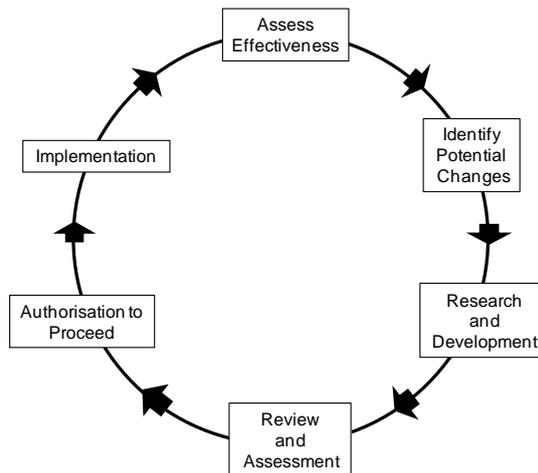


Figure 1: Engineering Standards Development Cycle

Engineering standards change is oversighted by an Engineering Standards Configuration Committee (ESCC) comprising the JHR CRN Manager Engineering Services, Principal Engineers, representatives of key engineering standards users and technical specialists as required.

The general scope, structure, composition and general applicability of the CRN Engineering Standards are described in CRN GM 001 Engineering Standards System Manual. The specific scope of coverage of the CRN engineering standards is described in CRN GM 003 Scope of Coverage of Engineering Standards. Both CRN GM 001 and CRN GM 003 need to be read in conjunction with this manual.

This manual applies to;

- changes to all engineering standards documents, including manuals, specifications and forms; and
- changes to operating conditions, principally incorporated in the Train Operating Conditions (TOC) Manual; and
- type approvals of standard equipment and processes to be utilised on the CRN.

This manual does not apply to granting of engineering waivers and concessions, or publication of special notices or advisory documents by Principal Engineers.

This manual is for use by;

- JHR CRN personnel seeking improvements to the engineering standards;
- members of the Engineering Standards Configuration Committee (ESCC); and
- personnel providing support services to Principal Engineers in the management and development of engineering standards.

2 References

The applicable references for this manual are the references contained in CRN GM 001.

2.1 Abbreviations and definitions

In addition to the common abbreviations and definitions described in CRN GM 001, the following are particular to this manual:

ESCC	JHR CRN Engineering Standards Configuration Committee
SMS	JHR CRN Safety Management System
CRC	Country Rail Contracts

3 Engineering standards development

3.1 Approach to engineering standards development

The initial standards for the JHR management of the CRN have been developed from the 2004 RIC Standards applicable to the CRN, as further developed by ARTC and accepted by CRC prior to the JHR CRN management contract.

JHR seeks to apply continuous improvement processes to these standards through the life of the JHR CRN management contract. The improvements shall be based on the experience of JHR in managing the Country Regional Network and wider rail industry developments in rail technology and engineering standards.

3.2 Objectives in engineering standards development

Specific objectives for engineering standards management are set out in Section 4.2 of CRN GM 001. The objective for engineering standards development is to improve the standards to achieve more effective control of safety risk and more effective asset management of the CRN.

3.3 Engineering standards development requirements

The requirements for engineering standards are set out set out in Section 4.3 of CRN GM 001.

3.4 Risk management

Risks associated with the establishment and implementation of engineering standards are managed in accordance with the CRN Risk Management Framework which provides the overarching risk management guideline.

The CRN Risk Management Framework includes the CRN Principal Risk Register (PRR).

The PRR includes those risks and associated controls that are required to be implemented in the establishment and implementation of engineering standards.

4 Management of engineering standards development

4.1 Relevant personnel

Key personnel carrying out activities for engineering standards development include:

- Principal Engineers
- Engineering standards advisors
- Engineering standards reviewers, including independent reviewers
- Stakeholder representatives on the Engineering Standards Configuration Committee

4.2 Responsibility for engineering standards

The Principal Engineers are individually responsible for the engineering standards within their discipline.

The Principal Engineers are collectively responsible for the CRN general engineering standards ("CRN G..." series).

4.3 Engineering Standards Configuration Committee charter

4.3.1 Role

The Engineering Standards Configuration Committee (ESCC) shall overview the management, development, review, authorisation, publication and communication of engineering standards, engineering manuals and other standards documents.

4.3.2 Scope

The committee is responsible to the Manager Engineering Services for:

1. Currency and adequacy of standards (i.e. Do standards reflect current best practice and are they appropriate for CRN operations?)
2. Communication of engineering standards
3. Adequacy of the standards development process
4. Timeliness of standards change
5. Currency and adequacy of competencies and authorities

The committee discharges this responsibility by:

- Over-viewing standards performance within the Asset Management System
- Setting standards strategy
- Reviewing relevance of current standards
- Reviewing relevant reports, including audit, incident reports and regulator / other operator safety notices relevant to standards
- Over-viewing the priorities, resources and program for continuous improvement in standards development
- Reviewing the development program
- Keeping abreast of standards developments, nationally and internationally

- Accessing and reviewing technical literature and participating in technical forums
- Rail and engineering industry engagement
- Facilitating interfaces between John Holland Rail and national standards committees
- Participating in the establishment of and changes to engineering standards, engineering manuals, other standards documents and equipment or process type approvals
- Reviewing recommendations for draft standards changes and making recommendations to the Manager Engineering Services for approval
- Over-viewing the work of independent subject matter specialists or discipline-specific committees
- Facilitating peer review of standards where required
- Configuration signoff / facilitation (as part of CRN's configuration management process)
- Over-viewing the processes for authorities, licenses and competency certification, associated with engineering standards
- Over-viewing and facilitating the effective communication of engineering standards and rail technical developments to users of the standards

4.3.3 Authority

The Committee's authority will come from the authority of the committee's standing members and any authority conferred by the Manager Engineering Services on other members of the committee. The committee has authority to:

- Approve priorities for development
- Endorse standards for authorisation by the Manager Engineering Services.

On discipline-specific matters the committee is to heed the recommendations of the Principal Engineers in exercising this authority. This qualification is on the proviso that such recommendations are based on application of appropriate processes and supported, where necessary, by independent subject matter specialists.

4.3.4 Membership

The committee shall consist of the following permanent members:

1. Manager Engineering Services
2. Principal Engineers covering the engineering disciplines of the CRN engineering standards

The following personnel shall be invited to attend as required:

3. CRN Safety and Environment Manager or delegate
4. CRN Infrastructure Manager or delegate
5. CRN Operations Manager or delegate (where operational interfaces are discussed)

The Asset Management and Engineering Services Manager may appoint other personnel to the committee as required to support the committee's activities.

4.3.5 Protocols

The committee shall meet at least 4 times per calendar year at intervals not exceeding 4 months. Additional meetings shall be held where justified by the volume or urgency of matters to be considered. The Manager Engineering Services shall call any such additional meetings on the advice of committee members.

A quorum will consist of 3 members, with the relevant Principal Engineer or delegate required to attend where discipline specific matters are considered. Attendance may be in person or by video / phone hook-up.

The permanent chair of the committee will be the Manager Engineering Services. The Manager Engineering Services may delegate this role to a member of the committee.

The standing agenda of the committee will comprise:

- i. Confirmation and review of minutes from the previous meeting;
- ii. Consideration of reports from the Principal Engineers (covering amendments to standards, waivers and type approvals);
- iii. Consideration of other relevant reports;
- iv. Consideration of specific matters listed in the agenda of each meeting; and
- v. General Business.

Formal records of the meeting, including recommendations of the committee are to be prepared and maintained.

Decisions are to be reached by agreement. Voting will NOT be used to reach decisions.

4.4 Competencies and Authorities

Members of the committee will be deemed competent to do so by virtue of one of the following:

1. By holding the competencies required to occupy a management position nominated as a permanent member of the committee, as defined in the Engineering Standards Configuration Committee Charter;
or
2. Being a delegate of a permanent member of the committee, where permitted by the Engineering Standards Configuration Committee Charter;
or
3. Meeting the competency requirements of a Standards Advisor, defined in Table 1.

Technical specialists undertaking reviews of standards shall meet the competencies defined in Table 2 for a Standards Reviewer.

Engineering Authority is required for work associated with standards development, including provision of technical advice, and standards review. Engineering Authority must be approved by the Manager Engineering Services or, where work is contained within an engineering discipline, by the relevant Principal Engineer.

Competency \ Task	Standards Advisor		
	1. Assess standards performance*	2. Identify, analyse, develop and assess solutions to standards issues*	3. Controlled development of standards and changes*
1. Specific qualifications and current industry leading experience in the discipline	M	M	M
2. Current experience in development or application of standards within relevant area	M	M	M
3. Current experience in analysing and managing complex technical issues	M	M	N/A
4. Proficient in articulating and documenting complex technical issues	N/A	M	M
5. Understanding and current experience in risk management	M	M	M
6. Experience in working within a safety management system	D	M	M
7. Current broad experience across standards, design, fabrication & construction, maintenance and operations	D	D	D
8. Understanding of OHS requirements	D	D	D
9. Understanding of Rail Safety Requirements		M	M
10. Understanding of Environmental Management Requirements		D	D
11. Understanding of Asset Management Process	D	D	D

* "M" = must have competency, "D" = desirable competency

Table 1: Competencies Required for an Engineering Standards Advisor

Competency \ Task	Review Draft Engineering Standards		
	1. General review across disciplines	2. General review within discipline	3. Subject Matter Specialist
1. Specific qualifications and current industry leading experience in specific task area or discipline	M	M	M
2. Current experience in development or application of standards within relevant area	D	D	D
3. Current experience in analysing and managing complex technical issues	D	M	M
4. Proficient in articulating and documenting complex technical issues	D	D	D
5. Understanding and experience in risk management	M	D	D
6. Current cross-discipline management experience	M	D	N/A
7. Experience in working within a safety management system	D	D	D
8. Current broad experience across standards, design, fabrication & construction, maintenance and operations	M	D	N/A
9. Understanding of OHS requirements	D	D	D
10. Understanding of Rail Safety Requirements	M	M	D
11. Understanding of Environmental Management Requirements	D	D	D
12. Understanding of Asset Management Process	D	D	D

* "M" = must have competency, "D" = desirable competency

Table 2: Competencies Required for an Engineering Standards Reviewer

5 Assessment of the effectiveness of engineering standards

5.1 Assessment criteria

The effectiveness of engineering standards shall be assessed against the following criteria:

Criteria	Guideline Considerations
1. Safety	a. Effectiveness of engineering standards controls called up by the JHR CRN Principal Risk Register
2. Reliability	a. Assurance of reliability of assets and the operational reliability of the JHR CRN network
3. CRN Configuration	a. Relevance of the engineering standards to the current or proposed CRN asset and rolling stock configurations
4. Interfaces	a. Compatibility of JHR CRN engineering standards in interfacing with the engineering standards of other organisations and rail industry frameworks b. Compatibility of JHR CRN engineering standards with the requirements imposed by physical interfaces with other rail networks and external parties
5. Cost	a. Life cycle benefits and costs of compliance, particularly against alternative standards provisions or other control measures
6. Compliance	a. Compliance with JHR CRN Safety Management System (SMS), incorporating requirements of relevant rail safety and occupational health and safety legislation. b. Compliance with JHR Environmental Management Plan and relevant environmental legislation c. Compliance with JHR CRN management policies and procedures

Assessment of the effectiveness shall consider control of risk associated with the above criteria.

5.2 Assessment activities

Principal Engineers shall undertake activities for the assessment of the effectiveness of Engineering Standards applied to the CRN. These activities shall include:

- Sample inspection of assets and engineering activities for compliance
- Review of asset performance, represented by data in the Asset Management System
- Review of CRN reliability and operational performance
- Review of, or change to, the JHR CRN Principal Risk Register
- Consultation with standards users
- Asset design review
- Review of rolling stock information submitted for approval to operate on the CRN
- Review of incident data
- Keeping abreast of rail industry developments in standards
- Review of waivers and design concessions

- Review of performance of type approved equipment
- Consultations with suppliers and manufacturers
- Periodic review of standards documents in relation to improvement logs and need for updates.
- Audit reports

All engineering standards documents shall be reviewed for effectiveness and requirements for update within 5 years of the previous review.

6 Identification of potential changes to engineering standards

6.1 Sources of standards change proposals

The factors which may instigate a need for changes to engineering standards are outlined in Section 8.1 of CRN GM 001. Users of the JH CRN Engineering Standards have an obligation to identify and report on issues which may arise in the application of standards and to make suggestions for improvements to the engineering standards.

Potential sources of proposals for engineering standards change include:

1. The assessment activities of the Principal Engineers outlined in Section 5.
2. Changes to the JHR CRN Principal Risk Register
3. Requests for change from standards users
4. Changes to the operation and / or configuration of the CRN
5. Wider rail industry standards development
6. Changes in technology

6.2 Registering and assessing engineering standards development proposals

Users of engineering standards documents may report issues which arise in the application of engineering standards or request changes to standards by phone or email. Records of the requests shall be maintained by the Principal Engineers.

The relevant Principal Engineers shall carry out an initial assessment of the requests. The assessment shall be based on both the criteria outlined in Section 5.1 and consideration of the benefits and costs of the change in relation to the existing configuration of standards. The outcome of this assessment may result in a decision to;

- i. (in the case of safety critical matters), issue an interim technical instruction and proceed with a high priority change to the engineering standards; or
- ii. list in an improvement log for further investigation and development; or
- iii. list in an improvement log for minor changes, deferred to when the standard is routinely updated; or
- iv. not change engineering standards, potentially with a recommendation back to the initiator of the request to undertake alternative measures

The initiator of the request shall be advised of the outcome of this assessment by the relevant Principal Engineer who shall maintain a record of all responses.

Principal Engineers shall routinely report such requests and outcomes of assessment to the Engineering Standards Configuration Committee.

All requests shall be registered in an engineering standards improvement log.

6.3 Setting of priorities and resourcing of engineering standards development

Principal Engineers shall maintain improvement logs of proposals for investigation or changes of engineering standards. Items in the improvement log will be categorised by priorities based on:

- i. Assurance of safety; and
- ii. Benefits and costs of the change, including consideration of the availability of key technical personnel

The Principal Engineers shall establish and update a program for engineering standards review and development, including addressing matters in the improvement log. The program shall be reviewed for endorsement by the Engineering Standards Configuration Committee at least once per year.

Where significant expenditure is required for standards development and implementation, budget submissions and approvals for expenditure and monitoring of progress and cost will be managed through the Engineering Standards Configuration Committee.

7 Research and development for engineering standards change

7.1 Investigating and researching engineering standards issues

The basic requirements for the development of a new or changed standard include:

- **Engineering Standards Controls** called up by the Principal Risk Register
- **Design Inputs** - The inputs include
 - ~ key client requirements
 - ~ Legislative and Regulatory requirements that must be taken into account
 - ~ CRN standards, Australian and other standards applying to the change
 - ~ Other references (including old standards, internal background documents, workshop outcomes, incident investigations, failure data etc.)
- **Interfaces** – assess potential changes for impact on interfaces with
 - ~ Other discipline activities/infrastructure
 - ~ Rollingstock or operations
 - ~ Transit space
- **Research requirements**

Depending on the requirements of the brief, research the requirements of Australian and international standards, other railway standards and practices and reference material.

When researching design, maintenance and construction standards, reference should be made to available failure and performance data.

Reference should also be made to records of previous versions of standards as a means of establishing reasons for current limits. Conversation with experienced design, construction and maintenance personnel will also assist.

- **Investigation**

Determine whether sufficient information is available or whether a more detailed investigation is required to establish appropriate limits for inclusion in a standard

If further investigation is required seek advice. Additional information may be available from field staff or it may be necessary to undertake a specialist investigation.
- **Hazard & Risk Analysis**

Identify and assess hazards that may be introduced by the proposed change in standards, including:

 - ~ Limits proposed are technically unachievable
 - ~ Limits proposed increase probability of derailment/collision
 - ~ Limits proposed increase maintenance costs
 - ~ Design Limits can be interpreted to give inappropriate design solution
 - ~ Insufficient information provided to give design solution
 - ~ Inspection/maintenance regime etc. - will it need to change?
 - ~ Inspection method inappropriate for detection of failure mode
 - ~ Inspection period inappropriate for timely detection of failure mode
 - ~ Construction/Repair method inappropriate to achieve requirements
 - ~ For changes to the TOC Manual and Rolling Stock Standards, consideration of interface risks between rolling stock and the CRN infrastructure and operations
- **Integrated Support Analysis**

If Integrated Support Analysis has been identified as a requirement, then it should be undertaken at this time. Some issues to be considered include:

 - ~ Have maintenance support requirements been considered?
 - ~ Is new maintenance equipment required?
 - ~ Have other publications that need to be altered been identified?
 - ~ Is staff training required for new/changed publication?

7.2 Drafting engineering standards change proposals

Engineering Standards shall be drafted in accordance with the CRN Engineering Manual CRN GM 004 Writing Requirements and Guidelines for Engineering Standards.

8 Review and assessment of changes

8.1 Review of engineering standards changes

8.1.1 Purpose of review

The purpose to the review is to provide a particular review of technical content changes in the standards and their associated risks.

The output of the review shall be documented in a CRN Standards Change Proposal Form (See Appendix 2) and, where necessary, on relevant design files for the change.

8.1.2 Inputs to review

1. Reasons for the Standards Change
2. Identification of the Standards Change
3. Scope of Standards Coverage
4. Identification and Assessment of the Impacts of the Change
5. Risk identified to the Development of the Standards
 - ~ Risks related to content
 - ~ Risks related to implementation
6. Interfaces
 - ~ affected by a change to a standard
 - ~ a change to interface will affect a standard
7. Technical Content Change as Identified in Tracking Document
8. Summary Details of Stakeholder Consultation
9. Implementation Strategy

8.1.3 Output of review

The following are considerations for review:

- Adequacy and completeness of inputs
- Whether technically appropriate
- Right for CRN configuration
- Robust integrity of asset
- Are identified risks adequately controlled by the standards docs?

8.2 Verifying and validating engineering standards changes

8.2.1 Verifying standards changes

Design verification is the process of reviewing and attesting that the output of the standards development conforms to the design input requirements.

Verification shall, as a minimum, cover the following aspects:

- Key assumptions and standards are appropriate for specification requirement and intended use
- Independent reviews have been completed and documented (*if required*)
- Hazard and risk analysis has been completed and documented
- Interface requirements have been verified
- Documentation is completed and ready for release.
- Validation requirements have been defined
- Maintenance, training and spares requirements have been reviewed and updated
- Operating and maintenance manuals have been reviewed and updated

8.2.2 Validating standards changes

Design validation is the process of ensuring that the final documented change conforms to user requirements. It represents the final stage in the process of ensuring that new or changed standards are fit for the intended purpose, before release for use.

Depending on the nature and complexity of the proposed changes to the standard, validation may include:

- Use of sample field data to test the outcome of calculations or processes
- Sampling of representative users to test that the document meets the requirements for presentation and useability
- For complex changes it may include introduction of the changes on a trial basis (either geographically or to a defined group in JHR CRN) to test that the change meets its intended purpose.

9 Approval and authorisation

Changes to engineering standards shall be both approved and authorised.

The Principal Engineers are responsible for approving the engineering standards within their discipline.

The Principal Engineers are collectively responsible for approving the general engineering standards.

The Engineering Standards Configuration Committee endorses engineering standards for authorisation by the Manager Engineering Services.

All submissions for new standards and changes to existing standards shall be formally presented to the Engineering Standards Configuration Committee. Documentation presented shall include

1. ESCC Change Submission (See Appendix 1)
2. CRN Standards Change Proposal Form (See Appendix 2)
3. Documents referenced in the ESCC Change Submission

All submissions shall be appropriately recorded in the minutes of the Engineering Standards Configuration Committee, and, when endorsed by the ESCC, authorised by the Manager Engineering Services.

Engineering Standards changes come into effect when they are published as approved and authorised standards on the JHR CRN website.

10 Implementation

10.1 Implementation plan

For every change to the engineering standards, the requirements for implementation shall be considered and a plan developed for implementation of the change.

The plan shall consider:

- pre-conditions for the change to become effective
- SMS requirements for assessing and managing change, including requirements for notification to ITSR
- personnel briefing and consultation
- changes to training, competencies, licensing, or granting of engineering authority
- risk controls required by the risk assessment of changes to technical content of standards
- communications to interfacing stakeholders, including contractors, suppliers and rolling stock operators
- requirements for addressing potential non-compliance resulting from the change, including the existing CRN configuration, operator rolling stock, supply contracts and works in progress.
- verification and / or validation activities
- a program for implementation, including the date on which the change becomes effective
- monitoring and review of the implementation plan.

10.2 Communications

The implementation plan shall include actions for communications of engineering standards changes: These communications may include;

- Advice to relevant users of the standards of the changes;
- Briefing of users whose work practices and procedures may be directly affected by the change;
- Advice to interfacing parties that may be affected by the change; and
- Notification on the JHR CRN website of the change

10.3 Finalisation of Engineering standards change

A change to engineering standards shall be considered as complete when;

- the required actions of the implementation plan are complete;
- the controls required by the risk assessment of the engineering standards change have been effected;
- residual risk of the engineering standards change has been transferred to an appropriate owner of the residual risk; and
- an implementation completion report has been submitted to, and reviewed by, the Manager Engineering Services.

Appendix 1 ESCC Change Submission

Engineering Standards Configuration Committee			
Submission on Change or Addition to Engineering Standards			
			Page 1
1. Submission details			
Submission Ref No.			
Submission date:	<i>Date</i>		
Submitted by:	<i>Name</i>		
Position / role:	<i>Position</i>		
Purpose of submission:	<input type="checkbox"/> Inform / update the committee on proposed changes <input type="checkbox"/> Seek endorsement on the approach to change <input type="checkbox"/> Seek endorsement for approval of the change <input type="checkbox"/> Report implementation completion		
2. Reasons for the change			Attachment: Yes <input type="checkbox"/> No <input type="checkbox"/>
3. Change identification, including technical content change			Attachment: Yes <input type="checkbox"/> No <input type="checkbox"/>
The following documents are attached			
Document	Identifier	Attachment	
4. Identification and assessment of the impacts of the change			Attachment: Yes <input type="checkbox"/> No <input type="checkbox"/>
5. Risk assessment of the change (See CRN CM 002 Appendix 2)			Attachment: Yes <input type="checkbox"/> No <input type="checkbox"/>
Independent Subject Matter Specialist Review Required?: Yes <input type="checkbox"/> No <input type="checkbox"/>			
6. Significant change requiring ONRSR Notification? (as per SMS CRN-FRA-RLS-011)		Yes <input type="checkbox"/> , No <input type="checkbox"/>	Attachment: Yes <input type="checkbox"/> No <input type="checkbox"/>
7. Stakeholder consultation			Attachment: Yes <input type="checkbox"/> No <input type="checkbox"/>
Stakeholder	Required?	Complete?	Outcome
1. CRN Infrastructure	<input type="checkbox"/>	<input type="checkbox"/>	
2. CRN Operations	<input type="checkbox"/>	<input type="checkbox"/>	
3. CRN Safety and Environment	<input type="checkbox"/>	<input type="checkbox"/>	
4. CRN Human Resources	<input type="checkbox"/>	<input type="checkbox"/>	
5. CRN Business	<input type="checkbox"/>	<input type="checkbox"/>	
6. External train operators	<input type="checkbox"/>	<input type="checkbox"/>	
7. Network interfacing AROs	<input type="checkbox"/>	<input type="checkbox"/>	
8. CRC	<input type="checkbox"/>	<input type="checkbox"/>	
Others?	<input type="checkbox"/>	<input type="checkbox"/>	

Submission on Change or Addition to Engineering Standards

Page 2

8. Review outcomes		Attachment: Yes <input type="checkbox"/> No <input type="checkbox"/>	
9. Implementation requirements		Attachment: Yes <input type="checkbox"/> No <input type="checkbox"/>	
Submission			
Signed		Date	
Committee outcome			
Meeting Ref.		Date	
Noted:	Yes <input type="checkbox"/> No <input type="checkbox"/>	Endorsed	Yes <input type="checkbox"/> No <input type="checkbox"/>
Notes / conditions			
Authorisation (ESCC Chairman)			
Signed		Date	
10. Implementation completion		Attachment: Yes <input type="checkbox"/> No <input type="checkbox"/>	
Changes complete?	Yes <input type="checkbox"/> , No <input type="checkbox"/>		
Risk controls implemented?	Yes <input type="checkbox"/> , No <input type="checkbox"/>		
Residual stakeholder issues?	Yes <input type="checkbox"/> , No <input type="checkbox"/>		
Comments on issues / lessons learned / recommendations for future			
Signed		Date	
Reviewed by ESCC Chairman			
Signed		Date	

Appendix 2 CRN Standards Change Proposal Form

CRN STANDARDS CHANGE PROPOSAL			
Standard	Number	Title	Version
	CRN XX NNN	Title	n.n
Type of change	New standard <input type="checkbox"/> Typos, grammar etc. <input type="checkbox"/> Changed presentation <input type="checkbox"/> Changed /new/ deleted limits /requirements <input type="checkbox"/> Changed /new/ deleted method <input type="checkbox"/> New component <input type="checkbox"/> Withdrawn standard <input type="checkbox"/> Product Approval. <input type="checkbox"/>		
Change detail	Include reference to Needs Log Items Waivers and Technical Notes included (and deleted)		
Interfaces	RISK - Change to standard does not account for interfaces affected by change CONTROL - Establish the interfaces below and determine level of involvement required in development and/or review		
Are there interfaces with other disciplines? What interfaces?		YES <input type="checkbox"/> NO <input type="checkbox"/>	
Affected by change	Rolling stock <input type="checkbox"/> Signalling <input type="checkbox"/> Operations <input type="checkbox"/> Civil infrastructure <input type="checkbox"/> External Infrastructure <input type="checkbox"/> Designers, maintainers, constructors competencies <input type="checkbox"/> Training Material <input type="checkbox"/> Maximo <input type="checkbox"/> Other Systems <input type="checkbox"/> (Nominate systems affected)		
Will affect the change	Rolling stock <input type="checkbox"/> Signalling <input type="checkbox"/> Operations <input type="checkbox"/> Civil infrastructure <input type="checkbox"/> Designers, maintainers, constructors willingness to comply <input type="checkbox"/> Designers, maintainers, constructors ability to comply <input type="checkbox"/> Designers, maintainers, constructors competence to comply <input type="checkbox"/> Maximo ability to reflect change <input type="checkbox"/> Other Systems ability to reflect change <input type="checkbox"/> (Nominate systems affected)		
Peer Review Requirements	RISK - New, changed or deleted requirements /limits are technically unachievable.; RISK - Change to construction/repair method is inappropriate to achieve requirements; RISK - Insufficient information provided to give design solution CONTROL - Establish the review needs below and determine level of involvement required in development and/or review		
Are changes major? Are implications major?		Are the changes of interest to many?	
YES <input type="checkbox"/> NO <input type="checkbox"/>		YES <input type="checkbox"/> NO <input type="checkbox"/>	
Are the changes technically complex		YES <input type="checkbox"/> NO <input type="checkbox"/>	
Peer Review method	Use the answers to the questions above to determine the review method Client Review <input type="checkbox"/> Stakeholder Review <input type="checkbox"/> Limited Review <input type="checkbox"/> Internal Review <input type="checkbox"/>		
Peer Reviewers	ES reps <input type="checkbox"/>	Designers <input type="checkbox"/>	Maintenance Reps <input type="checkbox"/> Renewals Reps <input type="checkbox"/> Interface Reps <input type="checkbox"/>
Add entries on a file if necessary			
Hazards	RISK - Changes may lead to increased risk of infrastructure/operational failure or degraded performance CONTROL - Establish the hazards and undertake a risk review of the proposed changes		
New, changed or deleted requirements /limits MAY increase risk.	YES <input type="checkbox"/> NO <input type="checkbox"/>		If YES complete a Detailed Risk Review See attached Risk Review)
Design Limits MAY BE interpreted to give inappropriate design solution	YES <input type="checkbox"/> NO <input type="checkbox"/>		
Change to inspection method MAY BE inappropriate for detection of failure mode	YES <input type="checkbox"/> NO <input type="checkbox"/>		
Change to inspection period MAY BE inappropriate for timely detection of failure mode	YES <input type="checkbox"/> NO <input type="checkbox"/>		
Are there other hazards?	YES <input type="checkbox"/> NO <input type="checkbox"/>		
Is a Risk Workshop required?	YES <input type="checkbox"/> NO <input type="checkbox"/>		
Lifecycle costs	RISK - New, changed or deleted requirements /limits increase asset life cycle costs CONTROL - Estimate the impact for assessment prior to implementation		
Does the change increase asset lifecycle cost	YES <input type="checkbox"/> NO <input type="checkbox"/>		If YES document in file
Integrated Support Requirements	RISK - Change to standard impacts inspection/maintenance regime CONTROL - Assess impact of change		
Inspection/maintenance regime etc. - will it need to change?	YES <input type="checkbox"/> NO <input type="checkbox"/>		If YES document requirements
Is new maintenance equipment required?	YES <input type="checkbox"/> NO <input type="checkbox"/>		
Do other publications require alteration?	YES <input type="checkbox"/> NO <input type="checkbox"/>		
Communication	RISK - Insufficient communication to users of critical change to standard CONTROL - Establish method of communication		
Is staff training required for new/changed publication?	Notification <input type="checkbox"/> Local updating <input type="checkbox"/> Workshop <input type="checkbox"/> Formal Training <input type="checkbox"/>		
- Will Asset Managers/Designers/ Maintainer, Constructor understand documents and be able to find critical information - Will Asset suppliers understand documents			
Risk Review			
Completed	Date	Reviewers	Names

