

Engineering Change Management

EGP-01-04

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1 Introduction

1.1 Purpose

The purpose of this Procedure is to provide guidelines for the preparation, consultation, endorsement and approval of changes to engineering requirements, systems and processes that are owned by the Engineering Services team.

This procedure follows COR-PR-015 Management of Change Procedure but was specifically developed for changes to engineering requirements.

1.2 Scope

This procedure applies to changes to engineering requirements owned and managed by the Engineering Services Team including:

- Engineering Documents
- Route Standards
- Equipment & System Type Approvals

Changes to engineering documents are managed in accordance with COR-GP-003 Controlled Governance Document Procedure.

1.3 Procedure Owner

The General Manager Technical Services and Assurance is the Procedure Owner and is the initial point of contact for all queries relating to this Procedure.

1.4 Responsibilities

Responsibilities for the preparation, review, endorsement and approval of engineering change are outlined in Section 2 and in Appendix A Engineering Change Responsibilities.

2 Responsibilities

Role	Description
Change Initiator	The person representing the entity proposing the engineering change.
Responsible Endorser	The person(s) responsible for managing the engineering change process and for ensuring the soundness of the technical aspects of the proposed change. They are also responsible for ensuring that the change addresses the engineering problem and is fit for purpose.
Stakeholder Endorsers	The persons representing the areas of the business affected by the proposed change and responsible for ensuring that the operating business understands and accepts the risk, benefits and impacts of the engineering change.
Responsible Approver	The person responsible for ensuring that the engineering change process is followed.

2.1 Change Initiator

The Change Initiator is responsible for ensuring that the application for the proposed engineering change is completed accurately and in accordance with this Procedure. The Change Initiator shall ensure that:

- All items are addressed, including determining the impact of change, risk, and affected systems, and that sufficient supporting documentation is provided.
- The Risk Assessment has been completed in accordance with RSK-PR-001 and that SFAIRP justification is provided for each risk identified that has a safety impact. Use EGP0401T-01 Engineering Risk Assessment Template when completing the risk assessment.
- The implementation actions are clearly listed in the form and that the owner/s of the affected documents, processes and systems are notified of the required changes to ensure their completion.

2.2 Responsible Endorser

The Responsible Endorser is a subject matter expert in the discipline of the engineering change and is responsible for evaluating the technical aspects of the proposed change. If the engineering change covers interfaces between multiple subject matters of different disciplines, then more than one Responsible Endorser may be required.

The Responsible Endorser is responsible for managing the engineering change process ensuring:

- That the technical aspects of the engineering change have been fully evaluated and that the proposed change is technically sound.
- That the proposed change correctly addresses the engineering problem that initiated the change and is fit for purpose.
- That the risks arising from the change and corresponding mitigation measures have been correctly identified.

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The Responsible Endorser also determines if the proposed engineering change is Type I or Type II. Type I engineering change is escalated to the Stakeholder Endorser(s) while Type II change is forwarded to the Responsible Approver for approval.

The Responsible Endorser identifies if the proposed engineering change affects the interoperability of the National Network for Interoperability (NNI). Any interoperability matter shall be managed in accordance with COR-GP-005 Interoperability Management Procedure.

Note: If the engineering change is to be included in the Inland Rail baseline, then Inland Rail Pty Ltd (IRPL) will assess and determine appropriate process for acceptance.

2.3 Stakeholder Endorsers

The Stakeholder Endorsers are responsible for ensuring that the operating business understands and accepts the risk, benefits and impacts of the engineering change. The Stakeholder Endorsers represent the areas of the business that will be affected by the proposed change, or anyone who may have useful input into the subject of the proposed change.

All Type I engineering changes are escalated to Stakeholder Endorsers who are responsible for evaluating the impacts of the proposed change and providing recommendation for approval.

The Stakeholder Endorsers' endorsement of the engineering change and supporting documents confirms that:

- The information in the engineering change approval form and supporting documents is correct.
- It fully addresses the technical issues and covers all threats and hazards.
- The change from the standard requirements, including any risk and impacts, is acceptable to the operating business.
- Any assessment of the engineering change has been considered with relevant stakeholders and subject matter experts.
- Risk assessments have been undertaken in accordance with RSK-PR-001.

If the change is to be applied in a state with Professional Engineering requirements, the stakeholder endorsement must be undertaken by a registered Professional Engineer for that state and discipline.

2.4 Responsible Approver

The Responsible Approver for engineering change is responsible for:

- Determining if the proposed change is in line with Corporate Strategy and/or Policy.
- Final decision on whether the change requires Regulator Notification in accordance with the ARTC SMS (Manage Accreditation – Variation & Change) and for nominating the person responsible for preparing the notification.
- Ensuring the process described in this Procedure is followed with no outstanding issues.
- Confirming that all interoperability matters have been correctly identified and an Interoperability Management Plan has been prepared where required.

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3 Types of Engineering Change

3.1 Type I

A change is classified as Type I if the change creates significant changes to current requirements to the extent that adjustment will be required by the end user. A change will typically be classified as Type I if it creates a significant change for any of the following:

- Risk profile
- Life cycle cost including service life
- Reliability and maintainability
- Delivery of operations or maintenance
- Skills, resources, training or human engineering design
- Interoperability of the National Network for Interoperability

These typically involve significant change to people, planning and processes, require detailed consultation and risk assessment and may require implementation planning to ensure they are properly embedded (e.g. overhauling the scope inspection process with new tasks, responses, training).

3.2 Type II

Type II changes are classified as:

- Changes involving negligible impact on ARTC or stakeholder costs, risk profiles, or resource requirements.
- Changes that would be considered Type I but have already been accepted by an alternate process (e.g. audit actions, business decision papers etc.).

These typically involve adjusting existing processes or requirements, negligible change in risk profile and can be embedded through existing process they are already structured within (e.g. updating an existing inspection task with minor changes within its existing scope, able to be undertaken with the same training and knowledge as prior).

3.3 Editorial Update

Editorial updates include:

- Editorial changes to engineering documents (restructuring of documents or re-wording of requirements to improve clarity)
- Engineering changes that have already been approved by an alternate process

An example of an editorial update is updating the Route Access Standards following a Network Alteration Notice or Route Access Condition Notice or incorporating registered rolling stock additions.

These changes involve editing or updating of documents without changing requirements of end users. For these changes the Engineering Change Management process is not required. These changes shall be managed through the Controlled Document Governance process.

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4 Step by Step Procedure

The following procedure provides an informative explanation of the process for the management of engineering changes. The actual steps taken for the proposed change may require deviation from below depending on the nature and complexity of the change. Ultimate discretion as to if the process has been correctly applied sits with the Responsible Approver.

4.1 Defining the Change

1. After the need for an engineering change has been identified, the Change Initiator will:
 - Clearly define the proposed change, ensuring that it is fit for purpose for the problem that is being solved
 - Review the issues register and existing related documents to determine any possible duplications, conflicts, or deficiencies that can be improved upon
 - Review other available external documents (e.g. Australian Standards)

If the change to the engineering document is an editorial update, follow the Controlled Document Governance Procedure.

2. The Change Initiator will then work with end users to identify the following:
 - Risk

What are the new risks associated with the engineering change? What is the risk rating for each risk? How will the risks be controlled?

Conduct a risk assessment if necessary. Where a formal risk assessment is conducted, it should include all impacted parties and relevant subject matter experts and be conducted in line with RSK-PR-001. **Use EGP0401T-01 Engineering Risk Assessment Template.**
 - Impact of change

Are there any impacts to systems, processes, documents, people, assets, budgets, etc?

Examples of impacts are changes to the EAMS (Enterprise Asset Management System, otherwise known as Ellipse) such as changes to MSTs (maintenance schedule tasks) and inspections scripts. Other changes include updates to documents, changes to SWMS (safe work method statements), competencies, etc.
3. Any engineering change will result to changes in engineering document(s). The Change Initiator will request a word document copy of the affected engineering document from the Integrated System Document Controller to mark up with the proposed changes. The marked-up document will be circulated for consultation.
4. Complete EGP0104F-01 Engineering Change Approval (ECA) Form.

4.2 Consultation

5. The Change Initiator consults the Responsible Endorser who will evaluate the scope of the change and advise if consultation is required and to what extent.

Consultation may be undertaken differently based on several factors, including:

- Type of change
- Scope of change
- Number of affected stakeholders
- Number of SMEs who can reasonably contribute

The Responsible Endorser nominates the level of consultation required for the proposed engineering change. This may include one or more of the methods below:

- Open consultation via the SharePoint page
- Consultation via direct provision of documents and feedback sheets
- Workshops
- Working group and steering committee meetings
- Email consultation

The stakeholders involved in completing the implementation actions should also be included in the consultation.

The Responsible Endorser also determines if the proposed change results in interoperability matters for the NNI. Any interoperability matter shall be managed in accordance with COR-GP-005 Interoperability Management Procedure.

6. The Change Initiator will review the consultation feedback and respond accordingly, making appropriate changes to the affected engineering document. Depending on the number and nature of changes, the document may require additional consultation after being updated. This is at the discretion of the Responsible Endorser.
7. If the change will be included in the Inland Rail baseline, then IRPL will assess and determine the appropriate process for acceptance.
8. The Responsible Endorser will evaluate if the change is Type I or Type II.

4.3 Endorsement and Approval

For a Type I change, the proposed changes are sent to the appropriate Stakeholder Endorsers for endorsement. Endorsement is only required by representatives from the affected business units.

Stakeholder endorsement is not required for a Type II change; however, it may be included as required.

Note: These Endorsers/Approvers vary based on document discipline and are covered in Appendix A.

If the change is rejected it is to be returned to the Responsible Endorser to determine how to proceed.

9. The Responsible Approver reviews the change to determine:
 - If the change has been correctly classified as Type I or Type II
 - If the change has been acceptably managed, consulted and the risk assessed

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- If the change requires committee approval
- If the change has been accepted by the appropriate business unit endorsers, where required
- If all interoperability matters have been identified and an Interoperability Management Plan has been prepared where required

Notes: Approval through additional committees is required for some changes based on significance of change and business impact. This decision is made by the Responsible Approver.

Changes not endorsed by the business unit may either be rejected or escalated to a higher level for decision. This may be direct or via a committee.

If the change is rejected it is to be returned to the Responsible Endorser to determine how to proceed.

10. The Responsible Approver reviews the changes for endorsement and determines if the change is notifiable to Office of the National Rail Safety Regulator.

Changes that require ONRSR notification or result in a risk rating of High require additional endorsement by GM Technical Services and Assurance.

Notes: Professional Engineering requirements may apply to some changes depending on the nature of change and applicability.

11. Notifiable changes must await submission and expiration of the prescribed notification period before proceeding. The Change Initiator ensures that all agreed implementation period, communications and other process are followed as per the agreed implementation requirements.

Note: In some cases, a new document may be published before the implementation date.

4.4 Implementation

12. For Type I changes, implementation should be considered as part of the change. The assessment should cover:

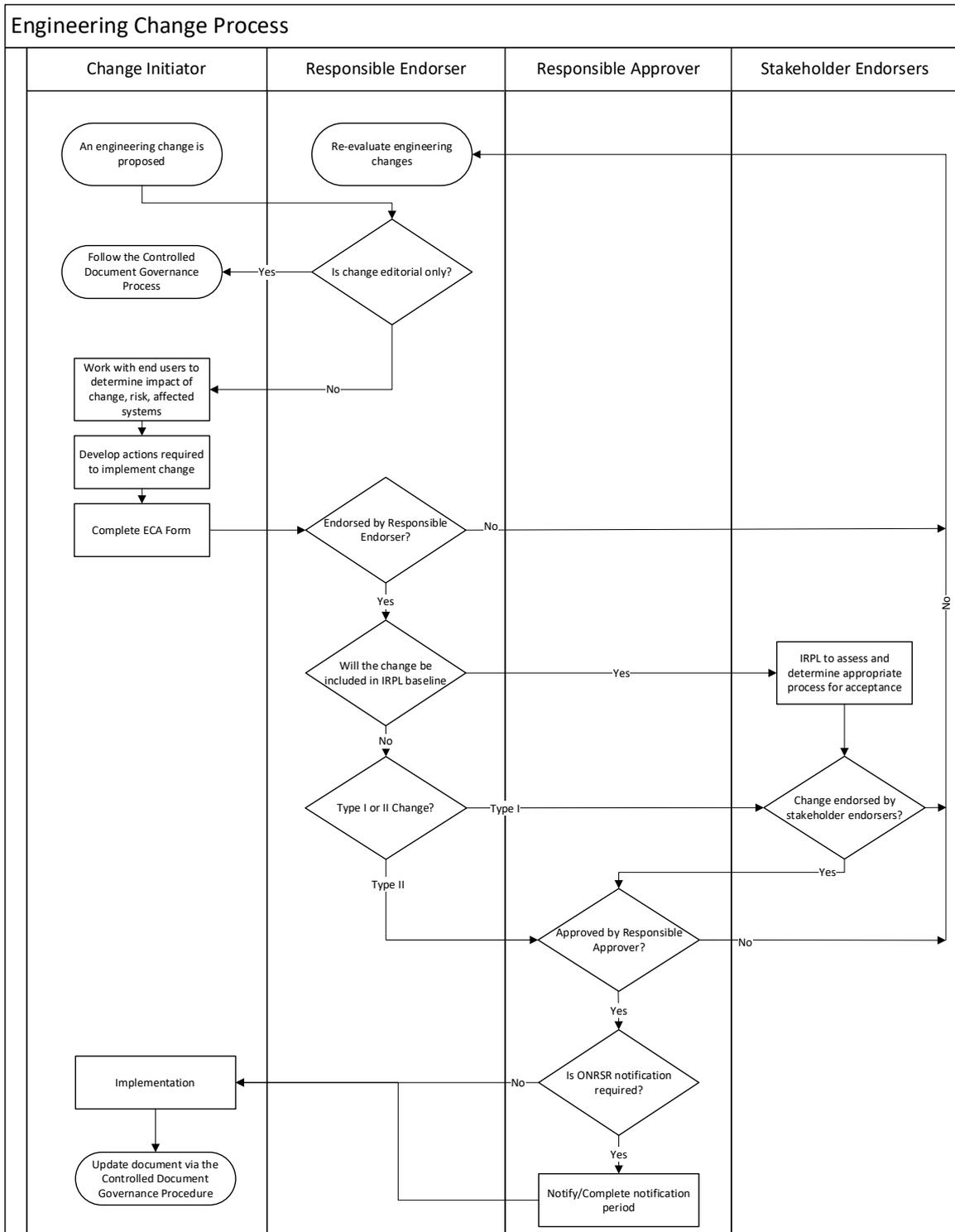
- The risk posed if end users are unaware of the change
- If an implementation period is required and how long it should be
- What communications are necessary to ensure the change is received
- If new training, briefing, or equipment is required as part of the change

A formal implemented plan may be adopted where deemed appropriate by the Responsible Endorser.

13. The Change Initiator will update all affected documents via the Controlled Document Governance Procedure. The completed and approved Engineering Change Approval form will be an attachment to the electronic Controlled Document Approval form (eCDA).

5 Engineering Change Approval Process Flow Chart

The following flowchart summarises the engineering document change process. Refer to Section 4 Step by Step Procedure for a more detailed description of the process.



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6 Engineering Change Approval Form Details Breakdown

Change Initiator

Enter the name and contact details of the person proposing the change. If the Change Initiator is not an ARTC employee, also add the name of the relevant ARTC contact person.

Proposed Type of Change

The type of proposed change, whether Type I or Type II, as defined in Section 3.

Description of Engineering Requirements Change

Specify the clause of the Engineering document in which a change is proposed and provide a clear and detailed explanation of what the proposed change is.

Reason for Change

Provide details as to why the change is proposed, including

- The trigger for the change (e.g. regulator action)
- The benefits of the proposed change
- The problems that the change will solve

Risk

The Change Initiator is to ensure that an assessment is undertaken to determine the impact of the change in relation to the risks and/or hazards that the exact clause/section(s) of the standard addresses.

- Provide a list of all risks being controlled by the Engineering Standard affected by the change and indicate the consequence, likelihood and overall risk rating for each risk after the change is implemented.
- Any new risks associated with the application of the change and variation to the Engineering Standard are to be identified, assessed and documented in accordance with RSK-PR-001 Risk Management Procedure and EGP0401T-01 Engineering Risk Assessment Template.
- These assessments shall include input from and/or review by identified stakeholders affected by the engineering change. If the issue affects design, then a person with design competency for the respective discipline shall be a stakeholder.
- Where multiple changes are intended to be applied, this assessment shall consider the cumulative impact of these changes.
- If a risk assessment was not undertaken, the Change Initiator shall provide a justification why a risk assessment was deemed unnecessary.

Impact of Change

List all the impacts of the engineering change to documents, people, processes, assets, budgets, etc. in this section. Provide a brief explanation of what the impact will be for each.

Examples of impacts are changes to engineering documents, changes to Ellipse (inspections scripts, MSTs), SWMSs and training matrices. The owner/s of any affected documents, processes and systems are to be notified so that they are aware of the required change or impacts.

Inland Rail

Indicate in this section if Inland Rail will adopt the change. If yes, it is up to Inland Rail to determine the processes for the acceptance and implementation of the change.

Interoperability

Assess if the proposed change has any impact on the National Network for Interoperability. List and describe all interoperability matters.

Stakeholders

The Stakeholders are the persons representing the areas of the business affected by the change who were consulted prior to the approval and implementation of the change. List all the details of the stakeholders and how they were consulted (e.g. via workshop, email feedback, etc.)

Implementation

List all the actions required for implementing the change including updates to Ellipse, changes to other documents, training, SWMS, etc. This section should include details of changes to impacted systems and processes listed under Impact of Change.

Notify affected stakeholders of the proposed change.

7 Reference Documents

- COR-PR-015 Management of Change Procedure
- RSK-PR-001 Risk Management Procedure
- EGP0104F-01 Engineering Change Approval (ECA) Form
- EGP0104T-01 Engineering Risk Assessment Template
- COR-GP-003 Controlled Governance Document Procedure
- COR-GP-005 Interoperability Management

7.1 Engineering Documents

The following are examples of documents that are subject to engineering changes:

Document	Description
Codes of Practice	A consolidation of Standards, Procedures, and Guidelines
Engineering Documents	<p>A suite of controlled documents prepared by competent professional engineers that establish uniform engineering or technical criteria, methods, processes and practices to ensure the safety, consistency, and reliability of an asset over its lifecycle. They include Standards, Procedures, Engineering/Work Instructions, Technical Notes, Guidelines, Specifications and Forms/Templates.</p> <p>Typically, these documents will have document numbers starting with 'E'.</p>
New Equipment & System Approvals	New equipment and systems to be introduced into the ARTC network are managed in accordance with the new equipment & system approvals procedure. They are also known as type approvals.
Route Standards	Route Standards contain interface requirements for access to the ARTC Network and have been published for use by current and potential Operators for the development of their operating plans. These standards contain important infrastructure and operational information about our network.

Appendix A: Engineering Change Responsibilities

Document Type	Responsible Endorser ^[1]	Stakeholder Endorser ^[2]	Responsible Approver ^[3]
Track & Civil	Principal Track Engineer	Manager Engineering / Manager Asset Engineering Planning & Coordination Inland Rail Head of Engineering, Assurance and Technical Services	Manager Engineering Services
Signalling	Principal Signalling Engineer	Head of Engineering, Assurance and Technical Services	
Structures	Principal Structural Engineer	Manager Structures Inland Rail Head of Engineering, Assurance and Technical Services	
Rolling Stock	Principal Rolling Stock Interface Engineer	Manager National Services	
Route Access Standards		Change Dependant	
RAS Section Pages			
Engineering Governance	Manager Engineering Services	N/A	GM Technical Services and Assurance

Notes:

1. *Endorsers may vary from above based on individual nature of engineering changes. The Responsible Approver has discretion to alter as required.*
2. *Stakeholder Endorsement is only required for Type I changes.
Where role title changes this approval should come from a position that reports to General Manager or equivalent.*
3. *Changes that require ONRSR notification require additional endorsement by GM Technical Services and Assurance.*