RISSB

RAIL INDUSTRY SAFETY AND STANDARDS BOARD

Configuration Management for Railway Contractors

Guideline

This guideline was prepared by a Rail Industry Safety and Standards Board (RISSB) development group consisting of representatives from the following organisations:

ARTC	BHP	Downer Group
INDEC	Marling and Associates	Public Transport Victoria
Sydney Trains	Transport for NSW	

Development of this guideline was undertaken in accordance with RISSB's accredited processes. It was approved by the Development Group, endorsed by the Standing Committee, and approved for publication by the RISSB Board.

I commend this guideline to the Australasian rail industry as part of the suite of RISSB products assisting the rail industry to manage rail safety, improve efficiency and achieve safety outcomes through interoperability and harmonisation.

Deb Spring
Exec. Chair / CEO
Rail Industry Safety and Standards Board

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Contents

1 Introduction

1.1 Introduction

When a contractor undertakes work for a customer (e.g. an RTO, RIM, OEM or RSO) modifying or upgrading products or introducing new products it is critical that the configurations (the physical and functional characteristics that define a product) are managed. Configuration management (CM) is the process for establishing and maintaining consistency of these characteristics.

Physical specifications may include items such as dimensions, weight, shape, or materials used. Functional specifications generally relate to ability for the product to achieve a certain outcome such as meeting emissions standards or acceleration criteria. For the purposes of this guideline, the term "product" incorporates systems and assets as well as facilities, locations, hardware, software, firmware, tools, materials, processes, services and documents.

This guideline is focused on the application of configuration management to the safe and functional integration of work undertaken by a contractor on their customer's existing network, operations and/or rollingstock. The CM process outlined offers flexibility and industry best practice for the contractor and their customer to manage and control rail product configuration throughout the product lifecycle.

1.2 Aim and purpose

This guideline aims to contribute to a harmonised, uniform and consistent approach for managing the safety of existing and future Australian and New Zealand railway network assets and systems.

The primary purpose of this guideline is to provide an easy reference for contractors in the rail industry on configuration management during execution of a contract. The guideline aims to assist the contractor in developing their configuration management plans and processes to satisfy the high-level configuration management requirements of the customer across the product lifecycle.

The guideline can also be used by a customer to assist them in determining the necessary level of configuration management required based on the complexity and environment of their system and how the guidance applies to their contractor through the generation and implementation of configuration management plans.

1.3 Scope

The guideline outlines the essential functions applied in configuration management and highlights how these relate to various contractors who are undertaking project work for a customer, including both new construction or the maintenance or upgrade of the existing rolling stock or part or all of a network.

The configuration management functions discussed are:

- configuration management planning;
- configuration identification;
- configuration control;
- configuration status accounting;
- configuration audit.

1.4 Who this guideline applies to

This guide is primarily aimed at existing or prospective contractors to the rail industry for new or altered rail assets and links to the configuration management practices of the contractor to the customer. It also provides useful information on configuration management for customers.

1.5 How to use this guidance

Configuration management is not a one-size fits all process and should be tailored according to the nature and complexity of the work. Contractors should ensure CM processes and requirements are discussed with the customer and ensure their configuration management plan, if one is required, aligns with recognised standards or the customers configuration management plan.

1.6 Definitions and abbreviations

For purposes of this guide, the following definitions and abbreviations apply.

Approval authority: The organisation or person authorized to approve: (1) A configuration change to a product, (2) Changes to product definition information and other related documents, (3) Release (or cancellation) of documents for use anywhere or in a specific program and (4) Commitment of resources.

Artefact: (1) A contained piece of information that is used or produced by a software or hardware development process, or by deployment and operation of a system. Examples of artefacts include: representational views, model files, source files, scripts, and binary executable files, a table in a database system, a development deliverable, a word-processing document, or a mail message,(2) Physical entities and their elements such as patterns, parts, components, and assemblies. New artefacts can be created by grouping existing artefacts.

Allocated baseline: The approved allocated configuration performance-oriented documentation for a work product or configuration item to be developed. It describes the functional and interface characteristics that are allocated from those of the higher-level CI and the verification required to demonstrate achievement of those specified characteristics.

Change request: Information, by which a change is proposed, described, justified, and submitted to the approval authority.

CM: Configuration management a system engineering process for establishing and maintaining consistency of a product's performance, functional, and physical attributes with its requirements, design, and operational information throughout its life.

CMP: Configuration Management Plan

Configuration: (1) The product attributes of an existing or planned product, or a combination of products, i.e., product requirements, the product, and associated product configuration information; (2) one of a series of sequentially created variations of a product.

Configuration audit (CA): Review of processes, product definition information, documented verification of compliance with requirements, and an inspection of products, to confirm that products have achieved their required attributes and conform to released product configuration definition information.

Configuration baseline: Configuration of a product, at a specific point in time, which serves as a basis for defining change, for conducting verifications, and for other management activities. For a software product, the build baseline includes the actual product.

Configuration control board (CCB): A group comprised of technical and administrative representatives who review and recommend approval or disapproval to the approval authority, of changes and variances to a configuration managed product and its supporting documentation.

Configuration control (CC): The systematic proposal, justification, evaluation, coordination, disposition of proposed changes or requested variances and the implementation of all approved changes or variances in the configuration after the establishment of a configuration baseline.

Configuration identification: The configuration management function which (1) assigns unique identifiers to each product and product configuration information; (2) establishes a structure for products and product configuration information; (3) selects, defines, documents, and baselines product attributes.

Configuration item: A product, allocated components of a product, or both, that satisfies an end use function, has distinct requirements, functionality and/or product relationships, and is designated for distinct control.

Configuration management planning: The application of the five configuration management functions to the product and process environment.

Configuration status accounting (CSA): Configuration status accounting tracks the current status of a configuration, providing traceability of configuration items throughout their development and operation.

COTS: Commercial Off The Shelf

Customer: An individual or enterprise that (1) commissions the engineering or design of a product; (2) is a prospective purchaser of the end products of a system or a portion thereof; (3) is a procurer of a product; (4) is a user or consumer of the product; or (5) obtains an output.

FCA: Functional Configuration Audit

Functional baseline: The approved configuration documentation describing a system's or top-level configuration item's performance (functional, interoperability, and interface characteristics) and the verification required to demonstrate the achievement of those specified characteristics.

Interface information: The documents and agreed functional and physical attributes (characteristics) required to exist at a common boundary between two or more products

Material system: Means the operational system(s) combined with the support system(s).

OEM: Original Equipment Manufacturer

Operational system: Is the element of the material system that directly performs the operational function to fulfil the contract performance requirements derived from the Concept of Operations (ConOps).

PCA: Physical Configuration Audit

Product: Anything used in or resulting from the execution of a process including the process itself (assembly, component, Computer Software Configuration Item (CSCI), configuration item, end item, facility, hardware, item, material, part, service, set, software, system, unit, asset, artefact, commodity)

Product configuration information: Technical Information about the product consisting of product design information, configuration control information and product operational information.

Product baseline: The approved technical documentation that describes the configuration of a configuration item during the production, fielding/deployment and operational support phases of its life cycle.

Product design Information: Information that defines the product's requirements, documents the product attributes including the process information, and is the authoritative source for configuration management of the product.