AS 7739.1:2022

Australian STANDARD®

Digital engineering for fixed rail infrastructure Part 1: Concepts and principles

RISSB
RAIL INDUSTRY SAFETY AND STANDARDS BOARD

Infrastructure Standard

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This Australian Standard® AS 7739 Digital Engineering for Rail – Part 1: Concepts and Principles was prepared by a Rail Industry Safety and Standards Board (RISSB) Development Group consisting of representatives from the following organizations:

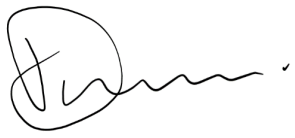
Unity Alliance	TfNSW	Cross River Rail
WSP	Lynnwood Consulting	Keolis Downer
Western Sydney University	KiwiRail	Cirrus Digital
Queensland Rail	PCSG Australia	BG&E
EIC Activities	UGL	KBR
Rail Projects Victoria	Aurecon	John Holland
HitachiRail	University of Technology Sydney	Metro Trains
CPB Contractors Pty Ltd	PTA WA	Laing O'Rourke
BuildingSMART		

The Standard was approved by the Development Group and the Infrastructure Standing Committee in November 2022. On 30 January 2023 the RISSB Board approved the Standard for release.

This standard was issued for public consultation and was independently validated before being approved. Development of the Standard was undertaken in accordance with RISSB's accredited process. As part of the approval process, the Standing Committee verified that proper process was followed in developing the Standard.

RISSB wishes to acknowledge the positive contribution of subject matter experts in the development of this Standard. Their efforts ranged from membership of the Development Group through to individuals providing comments on a draft of the Standard during the open review.

I commend this Standard to the Australasian rail industry as it represents industry good practice and has been developed through a rigorous process.



Damien White
Chief Executive Officer
Rail Industry Safety and Standards Board

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This Standard was prepared by the Rail Industry Safety and Standards Board (RISSB) Development Group AS 7739 Digital engineering for rail – Part 1: Concepts and principles. Membership of this Development Group consisted of representatives from the organizations listed on the inside cover of this document.

Objective

The objective of this Standard is to:

- build on current developments and progress with digital engineering (DE);
- combine globally leading practice;
- define contemporary best practice;
- specify building blocks for national consistency;
- reduce complexity for both asset owners and rail industry suppliers;
- provide a method for creating and classifying information relating to rail assets in a consistent manner; and
- simplify the mapping of asset information by providing a consistent and repeatable information delivery method.

This Standard is Part 1 of the AS 7739 Digital engineering for fixed rail infrastructure series.

- Part 1: Concepts and Principles

  AS 7739 Part 1 provides DE guidance that introduces and defines key concepts and principles for the ANZ rail industry. This guide provides detailed information on how to build data management capability and the overarching digital framework required for successful DE project implementation.

  It is not intended to be directly referenced in project procurement contracts, as it does not provide the appropriate level of detail necessary to adequately specify DE project deliverables.

- Part 2: Technical Requirements

  AS 7739 Part 2 provides detailed technical requirements (including specifications and procedures) for the procurement and management of DE project deliverables.

Compliance

There are four types of provisions contained within Australian Standards developed by RISSB:

1. Requirements.
2. Recommendations.
3. Permissions.
4. Constraints.

Requirements – it is mandatory to follow all requirements to claim full compliance with the Standard. Requirements are identified within the text by the term ‘shall’.

Recommendations – do not mention or exclude other possibilities but do offer the one that is preferred. Recommendations are identified within the text by the term ‘should’.

Recommendations recognize that there could be limitations to the universal application of the control, i.e. the identified control is not able to be applied or other controls are more appropriate or better.

Permissions – conveys consent by providing an allowable option. Permissions are identified within the text by the term ‘may’.

Constraints - provided by an external source such as legislation. Constraints are identified within the text by the term ‘must’.

For compliance purposes, where a recommended control is not applied as written in the standard it could be incumbent on the adopter of the standard to demonstrate their actual method of controlling the risk as part of their WHS or Rail Safety National Law obligations. Similarly, it could also be incumbent on an adopter of the standard to demonstrate their method of controlling the risk to contracting entities, or interfacing organizations where the risk may be shared.

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Appendix Contents

1 Scope and general

1.1 Introduction

1.1.1 Preface

Digital engineering (DE) is a term that is used globally and has been adopted by both asset owners and delivery partners alike. Given it is a relatively new term used to describe business processes that are relatively advanced yet also conceptual, there currently exists a wide range of interpretations and expectations about DE.

Like all technological change, DE will continue to grow and evolve rapidly as more organizations adopt digital processes and develop new innovations with DE. This Standard aims to provide guidance and instruction on best-practice DE, based on leading global initiatives.

Given the current diversity in thinking around DE, it is important to clarify a few key points regarding this Standard:

(a) DE is an entirely new way of working that represents a convergence of master data management, business process optimization and emerging technologies,

(b) DE represents a completely new approach to data management in the rail sector,

(c) DE should not be considered as an incremental change, or basic optimization to existing ways of working, and

(d) DE should not be used interchangeably to describe BIM and general information management.

This Standard aims to increase general awareness and technical understanding of DE, however the target audience is intentionally asset owner organizations due to their central role in the overall rail industry (see figure 1.1).

Figure 1.1: Asset owners and the supply chain