RISSB

RAIL INDUSTRY SAFETY AND STANDARDS BOARD

Integration of Human Factors Across the Project Lifecycle

Guideline

This Rail Industry Safety and Standards Board (RISSB) product has been developed using input from rail experts from across the Rail Industry. RISSB wishes to acknowledge the positive contribution of all subject matter experts and DG representatives who participated in the development of this product.

The RISSB Development Group for this Guideline consisted of representatives from the following organisations:

PTV	Asset Standards Association	Metro Trains Melbourne
Transport for NSW	GES Consulting	V/Line
Queensland Rail	Ergonomie	ARTC
Sydney Trains	Human Systems – Tactix	Aurecon
Consultarc	Viva Health Group	Acmena

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.

Paul Daly
Chief Executive Officer
Rail Industry Safety and Standards Board

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Document control

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Contents

1 Introduction

1.1 Purpose

Human factors (HF) integration is essential at all stages of a project lifecycle and experience has shown it is ineffective to address human factors issues as an afterthought. HF integration involves applying a systematic and scientific approach to the identification, tracking, and resolution of issues related to human-system interactions. Effective HF Integration ensures the balanced development of both the technological and human aspects of a system and delivers the desired safety and operational capability.

This purpose of this guideline is to assist organisations to improve the implementation and effectiveness of HF Integration into projects by providing guidance on scaling and managing HF activities across a project lifecycle. Organisations may vary or modify some aspects of the guidance provided in this document to suit their particular context. However, this guidance is intended to provide a rational baseline for HF integration from which an organisation may derive its own specific approach.

1.2 Scope

The project lifecycle includes the following phases:

- Concept.
- Design.
- Development.
- Validation.
- In-service and decommissioning.

This guideline outlines the HF integration process, HF inputs, activities and outputs (deliverables) across all stages of the project lifecycle.

This guideline is a companion document to the Standard AS 7470 Human Factors Integration in Engineering Design - General Requirements. It is intended to provide guidance on meeting the requirements of this standard. Specific HF Integration information relating to engineering design can be found in the RISSB Guideline Integration of Human Factors in engineering design (2018).

Applying a HF integration process across all phases of a project lifecycle delivers measurable benefits to organisations and customers. The guideline will also help ensure organisations satisfy their legal obligations under the Rail Safety National Law (RSNL) and Regulations.

1.3 Application

This guideline can be applied to all projects related to railway operations, assets or systems, including but not limited to:

- rolling stock/vehicles;
- track infrastructure and maintenance equipment;
- depot and maintenance facilities;
- signalling equipment;
- ticketing systems;
- control systems and control centres;

- communications;
- IT systems;
- operating and maintenance procedures;
- stations and precincts;
- level crossings (pedestrian/road);
- major organisational change[1].

This guide is intended to be used by rail transport operators (RTO) and those undertaking work for the Australian and New Zealand rail industry. This guide applies to managers, designers, and engineers engaged in projects across the industry. The guide will be useful to those scoping projects, those responsible for project planning and resourcing and those accountable for the implementation and assurance of HF Integration activities within a project.

1.4 Terms and Definitions

The following terms and definitions apply in this document:

Asset: any good, product, equipment, facility or other tangible resource (excluding people) which comprises part of a rail system and which is under the control of a rail transport operator.

End user: people who will interact with, or are affected by, an asset during the operational phase.

Ergonomics: see human factors.

Graphic user interface (GUI): a form of user interface that allows interaction with electronic devices through graphical icons and visual indicators instead of text-based user interfaces, typed command labels or text navigation.

Human factors (HF): the scientific discipline concerned with understanding the interactions among humans and other elements of a system, and the profession that applies theory, principles, data, and methods to design in order to optimise human well-being and system performance. Synonymous with ergonomics.

HF integration: the formal process to integrate human factors into the system-engineering life cycle. It involves applying a systematic and scientific approach to the identification, tracking, and resolution of issues related to human-system interactions. Effective HF integration ensures the balanced development of both the technological and human aspects of the system and delivers the desired safety and operational capability.

Operational concept document (OCD)[2]: a verbal and graphic statement of an organisation's assumptions or intent in regard to an operation or series of operations of a system or a related set of systems. (ANSI/AIAA G-043-1992). An element of systems engineering.

Post implementation review: a review of the project to identify the human factor lessons learned and to identify any remaining issues and how they can be resolved.

[1] Organisational changes may involve a change in staff numbers or technology, outsourcing work to contractors and revising roles and responsibilities, for example. These changes may have impacts on areas such as workload, allocation of tasks and activities, competence and management of hazards, and for this reason the HF Integration processes, activities and deliverables outlined within this Guideline are applicable.

[2] The operational concept is designed to give an overall picture of the operations using one or more specific systems, or set of related systems, in the organisation's operational environment from the users' and operators' perspective. See also concept of operations (ISO/IEC/IEEE 29148).