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RAIL INDUSTRY SAFETY AND STANDARDS BOARD

STANDARDS

AS 7470

Human Factors Integration and Technical Requirements for Rail Engineering Projects

Australian STANDARD

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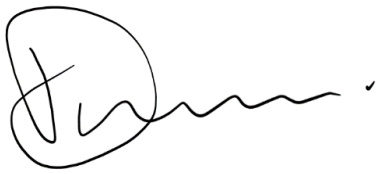
RISSB wishes to acknowledge the positive contribution of subject matter experts in the development of this Standard. Their efforts ranged from membership of the Development Group through to individuals providing comments on a draft of the Standard during the open review.

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
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Publication Version	Effective Date	Reason for and Extent of Change(s)
2024	10 December 2024	This document has been reviewed to ensure it remains relevant and applicable. The latest review assessed the content, confirming that while updates were made to align with current industry practices, technologies, and regulatory requirements, the original authorship and copyright have been acknowledged as required.

Approval

Name	Date
Rail Industry Safety and Standards Board	25 November 2024

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Preface

This Standard was reviewed and prepared by the AS 7470 Human Factors Integration and Technical Requirements for Rail Engineering Projects Development Group, overseen by the RISSB Safety and Operations Standing Committee.

Objective

This Standard has been prepared to support Human Factors Integration (HFI) into the system lifecycle within the Australian Rail Industry. The information presented in this Standard is consistent with the Rail Safety National Law (RSNL) in providing assistance for RTOs to meet their requirements under RSNL Regulations 2012, Schedule 1, Clause 17. Specifically, RTOs are required to have procedures to ensure that human factor (HF) matters are taken into account during the development, operation and maintenance of the safety management system and for the integration of HF principles and knowledge into all relevant aspects of operational and business systems. This Standard describes the requirements for organisations conducting or procuring engineering design activities, services, or products to incorporate HFI into the engineering design process and facilitate a high level of system acceptance amongst end users.

The aim of the HFI process is to identify then mitigate and prevent HF related risk and ensure that human-system interactions are optimized for system performance, safety, and fitness for purpose.

The aim of the requirements specified in this document is to optimize overall system performance through the systematic consideration of human capabilities and limitations as inputs to an iterative design process.

For an operational system to deliver the expected benefits, it is essential that the human interactions with or within the system and system elements are well designed through the application of established HF principles, knowledge, and methods. The process for achieving this is HFI.

A supplier of engineered assets to the Australian rail industry is responsible for ensuring that the assets and systems they provide are safe to operate and maintain, and that all safety risks have either been eliminated or managed so far as is reasonably practicable (SFAIRP). Supporting evidence, demonstrating HFI in safety risk management activities, will provide an important contribution to an overall safety and operational assurance argument for most assets.

The benefits of considering HF in the design process are not limited to safety. Equally valuable benefits can be gained regarding the operation and maintenance of the system. These include but are not limited to: improving effectiveness; and improved user comfort; and increased system acceptance; and minimising errors. To achieve these benefits, it is important to take HF into account early, starting with feasibility, solution optioneering, conceptualising, and throughout the full design process. In addition, information can be found in the supporting RISSB Guidelines for the Integration of Human Factors Across the Project Lifecycle and the Integration of Human Factors in Engineering Design.

Compliance

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

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 organisations where the risk may be shared.

RISSB Standards address known hazards within the railway industry. Hazards, and clauses within this Standard that address those hazards, are listed in Appendix A.

Appendices in RISSB Standards may be designated either "normative" or "informative." A "normative" appendix is an integral part of a Standard and compliance with it is a requirement, whereas an "informative" appendix is only for information and guidance.

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Section 1 Scope and general

1.1 Scope

This Standard provides the requirements for HFI within the following activities:

(a) Design or procurement of new or altered systems and assets to the rail industry. This includes any design changes to an asset throughout its lifecycle.

(b) Assurance of the suitability of Commercial Off the Shelf (COTS) and like-for-like (see Section 2.2 *Process requirements*) replacement of systems or assets within the rail industry.

(c) Construction staging including temporary works over or alongside an operational environment.

Procurement of new or altered assets can involve design and manufacture, use of existing products or replacing like-for-like items. The requirements in this Standard are focused around enabling effective HFI in the system-engineering life cycle. However, the HFI is scalable to enable support to other procurement strategies.

This Standard includes the requirement for HFI primarily for the following stages of the asset life cycle:

(a) Nomination and Feasibility

(b) Development and Planning

(c) Preliminary and Detailed Design

(d) Build and Implementation

(e) Testing and Commissioning

(f) Transition and Monitoring

(g) End of Service/Recycle

RISSB intends this Standard to be used by HF specialists, systems engineering and safety assurance practitioners, design professionals including engineers and project and change managers within a Rail Transport Operator (RTO) or within an organisation that is contracted, including downstream contractors, to provide engineering services and/or assets to an RTO.

The aim of this Standard applies to the project life cycle, the HFI principles, when applied, will support the organisation of the day-to-day operations or maintenance of assets following hand over to the operating and maintenance organisation.

It should be noted that different terms may be used other than those referred to in this Standard within different organization when referring to some of these activities.

1.2 Out of scope

There are benefits for organisations to conduct an HFI process and apply HF knowledge in their day-to-day business. However, this Standard is not intended for (although they are not prevented from using it): miniature railways and amusement railways; and sugar cane, tourist, and heritage operations.