



TS 04978:0.1
T MU HF 00001 ST
Standard

Human Factors Integration – General Requirements

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Document history

Revision	Effective date	Summary of changes
1.0		First issued 22 August 2014.
2.0		Second issue, 7 June 2017. Template updated.
3.0		Adoption of AS/RISB 7470:2016 <i>Human Factors Integration in Engineering Design – General Requirements</i>
4.0		Adoption of AS/RISB 7470:2024 Human Factors Integration and Technical Requirements for Rail Engineering Projects
0.1	05/08/2025	Renumbered as TS 04978:0.1. Version number recommenced in line with new designation. Re-templated and minor revision.

Preface

This standard is the first issue as TS 04978. It supersedes T MU HF 00001 *ST Human Factors Integration – General Requirements – Version 3.0*.

This document details the requirements for the demonstration of a systematic process for scaled HFI and for the application of recognised HF principles, within the engineering design process.

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

The aim of the HFI process is to ensure the human-system interactions optimise system performance, and to identify and mitigate risk.

This document supports organisations undertaking work for TfNSW, including TAOs, in the development and application of HFI. This document describes the need for the following:

- an HFI process
- generic HF requirements.

Meeting these needs will optimise overall system performance through the systematic consideration of human capabilities and limitations within the design process.

Organisations that provide assets to TfNSW need to ensure that they are safe to operate and maintain, and that all safety risks have been minimised so far as is reasonably practicable (SFAIRP) during the engineering design process, in addition to their professional duty of care.

Supporting evidence demonstrating HFI in safety risk management activities will provide an important contribution to the overall safety assurance argument in most cases.

The benefits of considering HF in the engineering design process are not limited to safety. Equally valuable are benefits regarding the overall operability and maintainability of the system. These include but are not limited to the following:

- minimising errors
- improving effectiveness
- improving user comfort
- increasing system acceptance.

To achieve these benefits, it is important to take HF into account early in the asset life cycle, starting with feasibility, optioneering, conceptualising, and continuing through the full design process.

Guidance material to assist with implementing this document is provided in TS 04976.

Adequate integration of HF complements the systems engineering approach to all phases of an asset's life cycle, ensuring the asset is fit for purpose.

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1 Scope

This standard details the requirements for the demonstration of a systematic process for scaled HFI and for the application of recognised HF principles, within the engineering design process.

It provides the requirements for HFI within the following activities:

- provision of engineering design services including the management of the process
- provision of new or altered assets to TfNSW
- provision of like-for-like replacement of assets.

2 Application

This document is applicable to all transport modes except metro.

TfNSW intends for organisations, including TAOs, undertaking work on any new or altered TfNSW transport asset to apply this document. This document is intended for use by HF specialists, design professionals including engineers, and managers acting on behalf of an organisation that is contracted to provide applicable services and assets to TfNSW.

This document should be read in conjunction with other applicable transport standards including but not limited to the following:

- TS 04976 (this document provides guidance on how this document could be implemented)
- TS 04981
- TS 01471.

This document should also be read in conjunction with AS/RISSB 7470:2024.

While AS/RISSB 7470:2024 refers specifically to the Australian rail industry, the requirements of this standard should be implemented for all transport modes except metro. This ensures that human factors are incorporated into the engineering design processes for all modes of transport and across the entire life cycle of the asset.

Appendix A in AS/RISSB 7470:2024 references rail specific hazards, many of which can be easily adapted to other modes of transport.

3 Referenced documents

The following documents are cited in the text. For dated references, only the cited edition applies. For undated references, the latest edition of the referenced document applies.

Australian standards

AS/RISSB 7470:2024 *Human Factors Integration and Technical Requirements for Rail Engineering Projects*

Transport for NSW standards

TS 01471 (T MU AM 06006 ST) *Systems Engineering*

TS 04976 (T MU HF 00001 GU) *Guide to Human Factors Integration*

TS 04981 *System Safety Standard for New or Altered Assets*

4 Terms, definitions and abbreviations

The following terms, definitions and abbreviations apply in this document.

asset as defined in AS/RISSB 7470:2024

HF human factors

HFI human factors integration

RIM rail infrastructure manager

RSO rolling stock operator

RTO rail transport operator; as defined in AS/RISSB 7470:2024

system as defined in AS/RISSB 7470:2024

TAO technically assured organisation

TfNSW Transport for NSW

5 Human factors integration – process requirements

HFI processes shall comply with section 2 to section 8 of AS/RISSB 7470:2024.

All references to 'rail' in AS/RISSB 7470:2024 shall be read as being applicable to all relevant modes of transport. References to the RIM, RSOs and RTOs shall be read as applicable to the transport asset operator and the transport asset maintainer, regardless of the mode.

6 Generic human factors requirements

HF activities shall comply with section 9 of AS/RISSEB 7470:2024.

All references to 'rail' in AS/RISSEB 7470:2024 shall be read as being applicable to all relevant modes of transport. References to the RIM, RSOs and RTOs shall be read as applicable to the transport asset operator and the transport asset maintainer, regardless of the mode.