RISSB

RAIL INDUSTRY SAFETY AND STANDARDS BOARD

AS 4292 Railway Safety Management

Technical Note

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 who participated in the development of this product.

It was endorsed by RISSB's Safety Standing Committee, and approved for publication by the RISSB Board.

I commend this document 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

Notice to Users

The reliance upon or manner of use of this RISSB product is the sole responsibility of the user who is to assess whether it meets their organisation's operational environment and risk profile.

Keeping RISSB products up-to-date

To maintain their currency, products developed by RISSB are periodically reviewed, and new editions published when required. Between editions, amendments can be issued.

It is important that readers assure themselves of that they are using a current RISSB product. Information about RISSB products, including amendments, can be found by visiting www.rissb.com.au.

RISSB welcomes suggestions for improvements and asks readers to notify us immediately of any apparent inaccuracies or ambiguities, please contact us via email at info@rissb.com.au or write to Rail Industry Safety and Standards Board, PO Box 518, Spring Hill, QLD 4004, Australia.

RISSB product can be found at: http://www.rissb.com.au/products/.

Document Control

Identification

Document Title	Version	Date
AS 4292 Railway Safety Management - Technical note		

Document History

Publication Version	Effective date	Page(s) Affected	Reason for and extent of changes

Approval

Name	Date
Rail Industry Safety and Standards Board	

Copyright

Contents

Introduction

The first Parts of the AS 4292 (Railway Safety Management) series of Standards started to become available from 1995 "... to meet a need for a set of railway safety requirements for incorporation into the management systems of railway organisations..." At full complement, the series comprised 7 parts:

- 4292.1 Part 1: General requirements;
- 4292.2 Part 2: Track, civil and electrical infrastructure;
- 4292.3 Part 3: Rolling stock;
- 4292.4 Part 4: Signalling and telecommunications systems and equipment;
- 4292.5 Part 5: Operational systems;
- 4292.6 Part 6: Railway interface with other infrastructure;
- 4292.7 Part 7: Railway safety investigation.

AS 4292 was last revised in 2006, at which point Part 6 was subsumed into Part 1 leading to the withdrawal of Part 6.

Since then there have been significant changes around the railway, not least the formation of RISSB in 2007 (following on from the code Management Company – 2003) and the institution of Australia's Rail Safety National Law (2012). Through the passage of time, and changes such as those, many of the valuable requirements of AS 4292 had largely been transposed into newer documents. By late 2017 Standards Australia had announced that AS 4292 was to be withdrawn (meaning they would no longer be maintaining it).

In 2018 RISSB initiated a project to:

1. determine how much of AS 4292 was covered off elsewhere, and
2. capture any AS 4292 items that weren't covered off.

This document offers a list of current documents which respond to 1. above, as well as the AS 4292 clauses from 2. For those AS 4292 clauses, this document also provides some RISSB commentary on the value to Australia's railway, thus between the documents responding to 1. and the clauses from 2. there should be no need to refer to AS 4292 now that it is withdrawn.

Because this document provides legacy AS 4292 clauses out of context it is, by its nature, a bit discontinuous. This document also provides some suggestions for where legacy AS 4292 clauses might go in the future, and as they are taken up in revisions to existing documents they will be removed from this document (or indeed if it comes to RISSB's attention that a clause is covered somewhere that we were unable to locate). Thus this living document is considered transitionary, and is expected to become redundant one day. Rail companies are free to draw down on useful information from this document now though, there is no reason to wait for this information to migrate into other documents.

The documents that substantially cover off AS 4292

The following document capture the vast bulk of the value of AS 4292.

The RISSB suite of Standards, Code of Practice and Guidelines, but especially:

- AS 7472, Management of Change;
- AS 7501, Railway Rolling Stock Compliance Certification;
- AS 7507, Rolling Stock Outlines;
- AS 7660, Radio Communication in the Rail Corridor;
- AS 7702, Rail Equipment Type Approval;
- AS 7716, Signalling Testing Process;
- AS 7717, Signal Testing and Commissioning;
- AS 7718, Signal Design Process Management;
- Measuring Safety Performance Guideline;
- Contracting in the Rail Industry – Accreditation and Safety Management Systems Guideline;
- Rail Emergency Management Planning Guideline;
- Safety Critical Communications Guideline;
- Australian Rail Industry Management System Framework Guideline (which supplanted the Code of Practice DIRN Volume 1 'General Requirements and Interface Management');
- Australian Standard Rail Networks Code of Practice Volume 4, Parts 1-3;
  - Track, Civil and Electrical Infrastructure Part 1: Infrastructure Management;
  - Track, Civil and Electrical Infrastructure Part 2: Principles Issue;
  - Track, Civil and Electrical Infrastructure Part 3: Infrastructure Guidelines;
- Australian Rail Network Security Handbook Vol 1 & 2;
- Australian Network Rules and Procedures (ANRP;)
- RISSB Glossary of Terms.

Other (non-RISSB) documents include:

- Rail Safety National Law & Regulations;
- ONRSR's Preparation of a Rail Safety Management System Guideline;
- NTC National Standard for Health Assessment of Rail Safety Workers;
- ISO 55000 – Asset Management;
- The International Rail Industry's Engineering Safety Management Handbook – iESM;
- WHS legislation.

AS 4292 clauses that may still be important

AS 4292.Part 1: General Requirements

Part 1 Section 2 Clause 2.3 – Management and governance

Clause

> **2.3 MANAGEMENT AND GOVERNANCE**
>
> The organization shall nominate a manager who, irrespective of other responsibilities, shall have defined authority and responsibility for ensuring that the requirements of this Standard are implemented and maintained.
>
> The manager shall ensure—
>
> (a) that the organization produces, maintains and reviews railway safety management system documentation covering procedures and instructions in accordance with the requirements of this Standard as set out in Clause 2.1;
>
> (b) that such documentation is effectively implemented;
>
> (c) that railway safety system controls are effective and auditable;
>
> (d) that the control and accuracy of railway safety related documentation within the organization (see Clause 2.7) is properly monitored; and
>
> (e) that systems are in place to provide those responsible for oversight of the organization with appropriate information to enable them to precisely determine and enforce management accountability for safety risks.

RISSB Comment

In the past, some states have legislated the appointment of a 'nominated manager' (i.e. a dedicated single point of responsibility) with the responsibilities as listed above, elsewhere the function was mandated by virtue of enforced compliance with AS 4292. Currently ONRSR's Preparation of a Rail Safety Management System Guideline only identifies the need for "the nomination of a manager who, irrespective of other responsibilities, is responsible for maintaining, reviewing and reporting on the organisation's safety management system".

RTOs may find value in considering the expanded list (a) to (e) over and above the ONRSR's Preparation of a Rail Safety Management System Guideline, and the list may possibly be useful for a future update to that guideline.

Part 1 Section 4 Clause 4.1 – General

Clause (overleaf)

> **4.1 GENERAL**
>
> The organization shall put in place systems to ensure that rail safety workers have—
>
> (b) an adequate sense of responsibility to be entrusted with the work; and

RISSB Comment

This clause doesn't appear to have been captured elsewhere i.e. this is interpreted that it is good practice for rail organisations to recruit the right people for roles, empower them, that those people will know what is required to do the work, and that they undertake the work accordingly.

This may be something for consideration in a future update to The ONRSR's Preparation of a Rail Safety Management System Guideline.

Part 1 Section 4 Clause 4.2(d) – Rail safety worker competence

Clause

> **4.2 RAIL SAFETY WORKER COMPETENCE**
>
> Procedures shall be established and implemented for the development, maintenance and monitoring of rail safety worker competence, and for the provision of training for all work functions affecting railway safety. Establishment of procedures shall include the following:
>
> (d) Workers shall have appropriate verbal and written language skills and the necessary literacy to carry out safety related work.

RISSB Comment

The intent of this clause is implicit in several places (e.g. RISSB's Safety Critical Communications Guideline, and the Australian Industry Standards' Safety Critical Communications Unit of Competence) however there may be value in considering it in a future update to The ONRSR's Preparation of a Rail Safety Management System Guideline.

Part 1 Section 6 Clause 6.9 – Decommissioning and disposal

Clause (overleaf)

6.9 DECOMMISSIONING AND DISPOSAL

Standards and procedures shall be established and maintained for decommissioning and if required, disposal of safety related equipment and systems. The standards shall, where appropriate, take into consideration the following factors:

(a) The need to maintain safe railway operations during decommissioning and disposal.

(b) The need to ensure that no ambiguity exists regarding the type of safeworking system in force at any one location or time.

(c) The need to ensure that decommissioned equipment is clearly identified as such.

(d) The need to prevent inappropriate re-use of decommissioned equipment prior to disposal.

(e) The need to eliminate as far as practicable any public hazard associated with decommissioned equipment, giving consideration to both short and long-term conditions.

RISSB Comment

Section 46 of the Rail Safety National Law describes the high-level approach to Risk Management. ISO 55000 and the iESM give related advice however it is considered that the specific list (a) to (e) is an elegant description of the factors for consideration.

The list may be worth considering in a future update to The ONRSR's Preparation of a Rail Safety Management System Guideline.

Part 1 Section 7 Clause 7.2 – Application

Clause

7.2 APPLICATION

Rail safety interface issues which could result in a risk to safety shall be identified and assessed to establish whether specific controls are needed. Typical interface matters to be considered include the following:

(b) Interfaces between railway organizations and other organizations or infrastructure as follows:

(iv) Utilities.

(v) Terminals, yards and stations.

RISSB Comment

(Note – not all of the list has been reproduced, the majority is well covered elsewhere). It is considered that there may be value in highlighting interface issues for these, especially 'Utilities' (it is likely that most/all RTOs capture interface issues relating to 'terminals, yards and stations' in local guidance materials).

This may be something for consideration in a future update to the ONRSR's Preparation of a Rail Safety Management System Guideline.

Part 1 Section 8 Clause 8.12 – Recording and analysis

Clause

> **8.1.2 Recording and analysis**
>
> The organization shall ensure that procedures for collection, indexing, filing, storage and disposal of reports involving all railway safety occurrences, are established and maintained. Procedures shall be established for the recording of occurrences related to railway safety. The recording system shall include the occurrences required by Appendix C and in the categories specified in that Appendix.
>
> Records shall be analysed to show accurately the performance achieved, relative to any performance goals and relative to any trend in performance and to identify any safety issues. Appropriate statistical techniques should be employed.
>
> Occurrences involving contractors and subcontractors shall be included in these records.
>
> All railway safety records shall be legible and identifiable to the organization involved. They shall be stored and maintained in accordance with Clause 2.7.5.

RISSB Comment

The Rail Safety National Law touches on these same issues but only in so far as they relate to 'notifiable occurrences'. There may be value to RTOs in considering these principles for occurrences that are not notifiable too as is suggested by AS 4292.

This may be something for consideration in a future update to the ONRSR's Preparation of a Rail Safety Management System Guideline.

Part 1 Section 8 Clause 8.13 – Investigation

Clause

> **8.1.3 Investigation**
>
> The organization shall establish procedures for investigating railway safety occurrences in accordance with AS 4292.7 and implementing the corrective action needed to prevent recurrence.

RISSB Comment

Section 122 of the Rail Safety National Law comes close to echoing the intent of this clause, however it only relates to investigation of notifiable occurrences, and/or where ONRSR directs the RTO do investigate. The ONRSR's Preparation of a Rail Safety Management System Guideline is much the same. There may be value for RTOs in considering the requirement for ANY rail safety related occurrence.

This may be something for consideration in a future update to The ONRSR's Preparation of a Rail Safety Management System Guideline, and/or RISSB's Australian Rail Industry Management System Framework Guideline.

Part 1 Section 8 Clause 8.1.4 – Review and rectification procedures

Clause

> **8.1.4 Review and rectification procedures**
>
> The organization shall establish, document and maintain procedures for—
>
> (a) reviewing and analysing occurrence data;
>
> (b) reviewing occurrence reports at a senior level to consider any recommendations for the prevention of similar occurrences and to initiate preventative action;
>
> (c) applying controls to ensure that corrective actions are taken and that they are effective; and
>
> (d) implementing and recording changes in procedures resulting from corrective action.

Part 1 Appendix B (human factors and safety culture) B2 – Error tolerance

Clause

> **B2 ERROR TOLERANCE**
>
> Interfaces between people and tasks need to exhibit tolerance to human error. Operators should be able to monitor the results of their actions and recover from their own errors. While humans are generally good at detecting and correcting their own errors, timely feedback and appropriate controls must be provided through the system interface. An error-tolerant interface ensures that user mistakes are observable, user actions are reversible and that the adverse effects arising from operator error are minimized.

RISSB Comment

The term 'error tolerance' does not appear in the main references. It is considered that this may be worthy of consideration for retention perhaps in ONRSR's Preparation of a Rail Safety Management System Guideline.

AS 4292 Part 2: Track, civil and electrical infrastructure

Part 2 Section 3 Clause 3.3 – Infrastructure items

Clause (overleaf)

3.3 INFRASTRUCTURE ITEMS

Standards and procedures shall be established and maintained for the selection and design of infrastructure items, including where relevant, those listed as follows:

(a) Sight distance provision.

(b) Operational signage.

(c) Structure and electrical infrastructure clearances.

(d) Track geometry.

(e) Structures.

(f) Flooding and storm damage management.

(g) Earthworks.

(h) Rail support systems.

(i) Rail.

(j) Guardrails.

(k) Points and crossings.

(l) Track lateral stability.

(m) Access control and protection.

(n) Fire prevention and control.

(o) Operation and control of the electrical system.

(p) Electric traction system capacity and integrity.

(q) Separation distances from electrical equipment.

(r) Working on live equipment.

(s) Electrical switching and isolating procedures.

(t) Earthing potential and bonding.

(u) Spatial location of conductors.

(v) Electrical fault protection.

(w) Electrolysis mitigation.

(x) Electric traction system interference management.

NOTES:

1 These standards and procedures should be based on consideration of the recommendations and factors to be considered for each of the above items set out in Appendix D and should include maintenance issues.

2 Items listed for detailed consideration in Appendix D are, in many instances, of particular relevance to steel wheel on steel rail systems using open ballasted track. Users of this Standard preparing standards and procedures for other systems will need to add or delete items to or from the list to accord with their type of operation.

RISSB Comment

While the list (a) to (x) is covered off in lots of places (Schedule 1, Clause 19 of the Regulations comes close), however it is considered that the specific list is an elegant description of infrastructure items.

This may be something for consideration in a future update to The ONRSR's Preparation of a Rail Safety Management System Guideline.

Part 2 Section 8 – Decommissioning and disposal

Clause

> SECTION 8 DECOMMISSIONING AND DISPOSAL
>
> Standards and procedures shall be established and maintained for the decommissioning of track, civil and electrical infrastructure prior to disposal. The standards should, where appropriate, take into consideration the following factors:
>
> (a) The need to maintain safe operations during decommissioning and demolition.
>
> (b) The need to ensure that no decommissioned infrastructure is used inappropriately.
>
> (c) The need to ensure that the condition of decommissioned material and equipment is clearly identified.
>
> (d) The need to prevent inappropriate re-use of decommissioned material.
>
> (e) The need to eliminate as far as practicable, any public hazard associated with decommissioned infrastructure, giving consideration to both short- and long-term conditions.
>
> The need for each of the items listed in this Section to be included in an organization's safety management system should be determined in accordance with Clauses 1.2, 1.7 and 1.8.

[Clause 1.2 is about the application of AS 4292, Clause 1.7 is about adoption of existing practices, and Clause 1.8 is about hazard identification and risk analysis].

RISSB Comment

Although the legislation does not have the lengthy list of items to be considered (i.e. from Part 2 Section 3 Clause 3.3 above), there is much information clearly describing what needs to be done with respect to decommissioning and disposal etc - particularly when coupled with the 'Risk Management' requirements (Rail Safety National Law s46).

However it may be advantageous to relate the list (a) to (e) to the list from Part 2 Section 3 Clause 3.3 above. This may be something for consideration in a future update to RISSB's Australian Rail Industry Management System Framework Guideline.

AS 4292 Part 3: Rolling stock

Part 3 Section 3 Clause 3.3 – Rolling stock items

Clause

3.3 ROLLING STOCK ITEMS

Standards and procedures shall be established and maintained for the selection and design of rolling stock including, where relevant, those listed as follows:

(a) Vehicle structure.

(b) Vehicle suspension.

(c) Coupling and draw gear.

(d) Electrical couplings and equipment.

(e) Braking systems.

(f) Motive power systems.

(g) Wheel sets.

(h) Operation of rolling stock, safety elements.

(i) Rolling stock recovery equipment.

NOTES:

1 These standards and procedures should be based on consideration of the detailed selection and design recommendations and factors to be considered for each of the above items as set out in Appendix D and should include maintenance issues.

2 The recommended lists of safety items given in Appendix E may also need to be considered at the design stage.

RISSB Comment

While the list (a) to (i) is probably covered off (Schedule 1, Clause 19 of the Regulations comes close), it is considered that the specific list is an elegant description of rolling stock items. This may be something for consideration in a future update to RISSB's Australian Rail Industry Management System Framework Guideline.

Part 3 Section 6 Clause 6,2,3 – In-service inspections

Clause (overleaf)

6.2.3 In-service inspections

For in-service inspections, the following may be included:

(a) Rolling stock inspections:

(i) Braking systems.

(ii) Load security.

(iii) Structural integrity.

(iv) Suspension equipment integrity.

(v) Loading configuration.

(vi) Wheels and bearings.

(vii) Couplings and draw gear.

RISSB Comment

The items listed in AS 4292 do not seem to appear in current documents, however a competent RTO will have such knowledge. There is also the broad requirement to have procedures for conducting risk assessment in the Rail Safety National Law as well as in the AS 7500 series.

However the list (i) to (viii) is considered elegant and may be something for consideration in a future update to The ONRSR's Preparation of a Rail Safety Management System Guideline

AS 4292 Part 4: Signalling and telecommunications systems and equipment

Part 4 Section 3 Clause 3.3.1.2 – Specification

Clause (overleaf)

3.3.1.2 *Specification*

Standards and procedures shall be established and maintained for the selection, use and maintenance of signalling and telecommunications systems and equipment and to ensure that such systems and equipment meet requirements for a particular application in accordance with Clause 3.2.

Standards and procedures shall include the following:

(a) Fail-safe design of all safety critical systems or components.

(b) Measures to ensure the availability and reliability of equipment and systems to a defined level.

(c) Provision of clear and unambiguous information to train control.

(d) Where active protection is provided at vehicle and pedestrian level crossings, provision of clear and unambiguous warning of the approach of trains.

RISSB Comment

While AS 7718 and AS 7660 both give information and description of the requirements for signalling and communication systems, these probably do not adequately cover off 'design' of telecommunications.

Part 4 Section 4 Clause 4.2(b) – Factors to be considered

Clause

4.2 FACTORS TO BE CONSIDERED

These standards and procedures should take into consideration, where appropriate, the following:

(b) The need to ensure that no ambiguity exists regarding the type of safeworking system or signalling and telecommunications system in force at any one location or time.

RISSB Comment

The avoidance of ambiguity does not seem to be captured elsewhere. This may be valuable around issues of workforce mobility, or transitions between project phases (e.g. construction to operations). This may be something for consideration in a future update to RISSB's Australian Rail Industry Management System Framework Guideline.

Part 4 Section 5 – Commissioning

Clause (overleaf)

5.1 GENERAL

Standards and procedures shall be established and maintained for the commissioning of new or modified signalling and telecommunications systems and equipment to ensure that the new system is integrated into the operational environment and is verified as meeting the appropriate requirements and standards.

The need for each of the items listed under each heading in this Section to be included in an organization's safety management system, should be determined in accordance with Clauses 1.2, 1.7 and 1.8.

NOTE: The inspection and testing for the commissioning of safety-related signalling and telecommunications systems are essential elements in ensuring their safety integrity. They should complement and in no way substitute for, quality control of the design, production and installation of these systems.

5.2 INSPECTION AND TEST PLAN

These standards and procedures should include an inspection and test plan covering the following items:

(a) The independence of workers performing inspection and testing.

(b) The compatibility between new works and other functional areas.

(c) Verification that the system conforms to the design and operating requirements of the client and the operating parameters of the railway.

(d) Validation that the installed system conforms to the required safety standards and client requirements.

(e) The need to ensure safe transition during any system change.

(f) The handover process.

(g) The timely provision of as-constructed documentation, plans and drawings as relevant.

(h) Specific inspection and testing as follows: .....

RISSB Comment

Section 5 is broadly covered by the RSNL, ONRSR's Preparation of a Rail Safety Management System Guideline and AS 7501; signalling is covered in more detail within AS 7716 and AS 7717 however these may not adequately cover off telecommunications.

AS 4292 Part 5: Operational systems

Part 5 Section 4 Clause 4.2(c) – Factors to be considered

As per "Part 4 Section 4 Clause 4.2(b) – Factors to be considered" above.

AS 4292 Part 7: Railway safety investigation

Recommend this transition to RISSB and be renewed as a compliment to RISSB's investigations code of practice.

Other useful items in AS 4292

This document identifies those clauses in AS 4292 which are not believed to have been covered off in other, more contemporary documents. The following is a list of items which, while probably covered off, are still seen to have value:

- AS 4292.2, Track, civil and electrical infrastructure;
  - Appendix B
    This appendix contains 'Descriptions of the phases in the asset life cycle and the process requirements associated with each phase including verification and validation tasks';
  - Appendix D
    'This Appendix lists detailed recommendations and factors to be considered in respect of each of the track, civil and electrical infrastructure items listed in Clause 3.3 [reproduced in this document above] and referenced in other clauses';
  - Appendix E
    Provides informative guidance for the 'management of worksites';
  - Appendix F
    Relates to the 'frequency of inspection and assessment';
- AS 4292.3, Rolling stock
  - Appendix B
    This appendix contains descriptions of the phases in the asset life cycle and the process requirements associated with each phase, including verification and validation tasks.
- AS 4292.4, Signalling and telecommunications systems and equipment
  - Clause 3.2.3
    This clause relates to 'factors to be considered' when selecting a safeworking system.
- AS 4292.4, Signalling and telecommunications systems and equipment
  - Section 8
    This section relates to decommissioning and disposal
- AS 4292.4, Signalling and telecommunications systems and equipment
  - Appendix A
    This appendix contains descriptions of the phases in the asset life cycle and the process requirements associated with each phase, including verification and validation tasks.

- Appendix B
  This appendix contains ‘matters to be considered in the interface coordination plan’.

- AS 4292.5, Operational systems
  - 3.2.3
    As with 3.2.3. from AS 4292.4 above, this clause relates to ‘factors to be considered’ selecting a safeworking system
  - 3.4
    This clause defines ‘construction sites’ and discusses safe traffic management through them.
  - 5.2
    This clause discusses items to be covered in a commissioning plan.
  - Appendix A
    This appendix contains descriptions of the phases in the asset life cycle and the process requirements associated with each phase, including verification and validation tasks.
  - Appendix B
    This appendix discusses interfaces between engineering and operational functions.

RISSB

RAIL INDUSTRY SAFETY AND STANDARDS BOARD

ABN 58 105 001 465

For information regarding s product developed by RISSB contact:
Rail Industry Safety and Standards Board

Brisbane Office
Level 4, 15 Astor Terrace
Brisbane, QLD, 4000

Melbourne Office
Level 4, 580 Collins Street,
Melbourne, Vic, 3000

PO Box 518
Spring Hill, QLD, 4004

T +61 7 3724 0000
E Info@rissb.com.au