

Australian Standard™

Railway safety management

Part 1: General requirements



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Australasian Railway Association
Australian Chamber of Commerce and Industry
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Railway safety management

Part 1: General requirements

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PREFACE

This Standard was prepared by the Standards Australia Committee ME-079, Railway Safety and supersedes AS 4292.1—1995, *Railway safety management*, Part 1: *General and interstate requirements*.

It is one of a series of Standards as follows:

AS

4292	Railway safety management
4292.1	Part 1: General requirements (this Standard)
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
4292.7	Part 7: Railway safety investigation

The previous edition of this Standard was prepared to meet a need for a set of railway safety requirements for incorporation into the management systems of railway organizations primarily involved with what was previously known as the defined Interstate Railway Network. In that role it served successfully for a number of years as a foundation for the co-regulation of the railway industry. It has been now brought up to date to reflect the changed structure and composition of the industry and to emphasize that it now applies to the entire industry subject to regulation under rail safety legislation.

As far as practicable the general shape and framework of the previous edition have been retained to obviate the need for extensive changes to regulatory and other documents which either reference the Standard or are otherwise closely aligned with it. The following important changes and upgrades have however been incorporated:

- (a) There is a greater emphasis on the development of safety management systems appropriate to the size and nature of the railway or related activity, including the involvement of workers.
- (b) Risk management is to be more closely based on AS/NZS 4360, *Risk management*.
- (c) Requirements have been introduced for change management and more closely defined for contract management.
- (d) Direct reference to the ISO 9000 quality system has been removed but the underlying principles have been retained.
- (e) The following additional matters have been either freshly introduced or have been significantly upgraded:
 - (i) Personnel issues such as competency, health and fitness.
 - (ii) Human factors and fatigue management.
 - (iii) OHS issues that significantly impact on railway safety.
- (f) Security is now included as a railway safety issue to be dealt with in this Standard.
- (g) The text has been edited to ensure a clearer distinction between normative requirements and guidance material, to facilitate its use for regulatory purposes.

It is further noted that AS 4292.6, *Railway interface with other infrastructure*, has been withdrawn and relevant material incorporated into this Standard.

The terms 'normative' and 'informative' have been used in this Standard to define the application of the appendix to which they apply. A 'normative' appendix is an integral part of a Standard, whereas an 'informative' appendix is only for information and guidance.

CONTENTS

	<i>Page</i>
FOREWORD.....	5
 SECTION 1 SCOPE AND GENERAL	
1.1 SCOPE	6
1.2 OBJECTIVE	6
1.3 APPLICATION	6
1.4 REFERENCED DOCUMENTS	6
1.5 DEFINITIONS	7
1.6 SAFETY PRINCIPLES	9
1.7 ADOPTION OF EXISTING PRACTICES	11
 SECTION 2 SAFETY MANAGEMENT SYSTEM	
2.1 GENERAL REQUIREMENTS	12
2.2 SAFETY MANAGEMENT POLICY	12
2.3 MANAGEMENT AND GOVERNANCE.....	13
2.4 RESPONSIBILITIES AND AUTHORITIES	13
2.5 RESOURCE MANAGEMENT	13
2.6 REGULATORY COMPLIANCE	14
2.7 DOCUMENT AND DATA CONTROL	14
2.8 KEY SAFETY PERFORMANCE INDICATORS AND PERFORMANCE MONITORING.....	15
2.9 SAFETY MANAGEMENT SYSTEM REVIEW.....	15
2.10 RAILWAY SAFETY AUDIT.....	16
2.11 CHANGE MANAGEMENT	16
2.12 HUMAN FACTORS	17
2.13 SECURITY MANAGEMENT.....	18
2.14 SAFETY CULTURE.....	18
 SECTION 3 RISK MANAGEMENT	
3.1 IDENTIFICATION AND ASSESSMENT OF RAILWAY SAFETY RISKS	19
3.2 RISK CONTROL MEASURES.....	20
 SECTION 4 PERSONNEL MANAGEMENT	
4.1 GENERAL	21
4.2 RAIL SAFETY WORKER COMPETENCE	21
4.3 HEALTH AND FITNESS	21
4.4 DRUG AND ALCOHOL CONTROL	22
4.5 FATIGUE MANAGEMENT	22
 SECTION 5 GOODS AND SERVICES PROCUREMENT	
5.1 PROCUREMENT PROCESS.....	23
5.2 CONTRACT MANAGEMENT.....	23
5.3 PURCHASING.....	24
5.4 MONITORING.....	24
5.5 AUDIT PROCESS.....	25
5.6 REVIEW PROCESS.....	25

SECTION 6 ENGINEERING AND OPERATIONAL SYSTEMS SAFETY

6.1	GENERAL	26
6.2	PROCESS CONTROL	26
6.3	ENGINEERING DESIGN	27
6.4	CONSTRUCTION AND INSTALLATION	27
6.5	IMPLEMENTATION AND COMMISSIONING	27
6.6	MONITORING AND MAINTENANCE.....	28
6.7	SYSTEM OPERATION	28
6.8	MODIFICATION	29
6.9	DECOMMISSIONING AND DISPOSAL.....	29

SECTION 7 INTERFACE MANAGEMENT

7.1	GENERAL	30
7.2	APPLICATION	30
7.3	INTERFACE CO-ORDINATION	30
7.4	SAFETY MANAGEMENT OF THE INTERFACES	31

SECTION 8 OCCURRENCE MANAGEMENT

8.1	OCCURRENCE NOTIFICATION AND MANAGEMENT.....	33
8.2	EMERGENCY RESPONSE	33
8.3	PRESERVATION OF EVIDENCE	34

APPENDICES

A	GUIDANCE ON PREPARATION OF SAFETY POLICY STATEMENTS	35
B	HUMAN FACTORS AND SAFETY CULTURE.....	36
C	OCCURRENCE NOTIFICATION REQUIREMENTS	38
D	INTERFACES BETWEEN RAILWAY AND OTHER INFRASTRUCTURE.....	42

FOREWORD

This Standard has been prepared primarily with a view to achieving uniformity in the management of railway safety both as a general principle and with specific reference to the accreditation of railway industry participants.

Railway safety management requires a risk management system, which aims to ensure that railways develop and maintain appropriate standards, procedures and rules to provide safe operational and engineering processes and systems. This objective, in common with all responsible industry, is to manage to a level as low as is reasonably practicable, the risk of injury to people or damage to property.

This approach recognizes that, while there is an ideal level of safety, the practical costs of attaining this ideal might far outweigh the benefits, and limit the viability of railway operations. It is also well understood that an operator protects its commercial and community interests by running a safe railway.

Railway safety has a relationship with workplace health and safety. Occupational health and safety (OHS) is governed by specific legislation and is therefore not the primary objective of this Standard. However, as it would be a consequence of preparing, implementing and maintaining a railway safety management system in accordance with this Standard, its importance is recognized within the safety principles of the Standard.

This Standard also includes common interface requirements for track managers and operators. The philosophy adopted in identifying these requirements has been that whenever this interface occurs, observance of all of the generally applicable requirements of this Standard by each party will ensure safe interfacing for the greater part. It is only in those relatively few areas where, despite the above, a mismatch of critical practices or dimensioned requirements could still occur, that common essential requirements have been identified and specified.

STANDARDS AUSTRALIA

Australian Standard

Railway safety management

Part 1: General requirements

SECTION 1 SCOPE AND GENERAL

1.1 SCOPE

This Standard specifies railway safety requirements including accountabilities to be included in a railway safety management system by any organization or other railway industry participant demonstrating its ability to work safely and which is committed to achieving continuous improvement to the organization's safety performance. It is applicable where achievement of the safety requirements is to be by either adherence to established designs, specifications or operating and maintenance procedures in particular subject areas, or by demonstration of adequate capabilities in those areas by other means.

The Standard applies to railways as defined in Clause 1.5.13 and includes mainline systems, isolated systems, heritage systems, in each case either government, commercial, private or not-for-profit.

Occupational health and safety issues are not the prime objective of this Standard, but are acknowledged in that the primary aspects common to both railway safety and OHS are dealt with.

1.2 OBJECTIVE

The objective of this Standard is to provide the railway industry with a set of railway safety management system requirements which may be integrated into a management system and which adequately control risk by adherence to the safety principles set out in Clause 1.6.

1.3 APPLICATION

This Standard is intended to stand alone as a set of requirements for a railway safety management system. Other parts of the AS 4292 series may be used as a means of demonstrating compliance with particular requirements, but they may not necessarily be the only means, see Clause 1.7.

The application in an appropriate manner of relevant clauses in this Standard, can lead to the development of a robust safety management system tailored to the scope and complexity of the particular activity of the railway regardless of its size, and to the risks to be controlled.

1.4 REFERENCED DOCUMENTS

The following documents are referred to in this Standard:

AS	
1742	Manual of uniform traffic control devices
1742.7	Part 7: Railway crossings
4292	Railway safety management
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
4292.7	Part 7: Railway safety investigation
AS/NZS	
4360	Risk management
AS/NZS ISO	
19011	Guideline for quality and/or environmental management systems auditing

1.5 DEFINITIONS

For the purposes of this Standard, the definitions below apply.

1.5.1 Civil infrastructure

Track formation and drainage (but excluding track, see Clause 1.5.24), fixed structures beside, over or under the track or otherwise associated with the railway, including supports for overhead electric traction equipment, supports for signalling and telecommunications equipment but excluding those equipments.

1.5.2 Competence

The possession of defined skills and knowledge, and the application of them to the standards required to safely and efficiently perform work.

1.5.3 Contractor

Contracting companies, sub-contractors and rail safety workers working for either of these.

1.5.4 Electric traction infrastructure

Equipment and systems associated with the supply and reticulation of electricity for traction purposes, but excluding elements of civil infrastructure supporting or otherwise associated with the equipment or systems.

1.5.5 Ensure

To take all reasonable action insofar as controllable factors will allow.

1.5.6 Human factors

The scientific discipline that is concerned with the application of information about human characteristics, capacities, and limitations to the design of human tasks, machines, machine systems, and environments.

1.5.7 Interface coordination plan

An agreement between parties managing an interface which sets out the responsibilities of each party.

NOTE: May also be referred to as a safety interface agreement.

1.5.8 Just culture

An occurrence investigation environment which acknowledges human error and encourages honest reporting of errors while establishing clear accountability for actions.

NOTE: A more extensive explanation of just culture is given at Appendix B.

1.5.9 Occurrence

A general term for accidents and incidents which lead to injury or loss, or which are considered by the responsible authority to have the potential to compromise safety.

1.5.10 Operator

The person or body who has ultimate management accountability for safe operation of rolling stock on a railway.

1.5.11 Organization

A track manager or an operator, or a person or a body which is both track manager and operator.

1.5.12 Rail safety worker (worker)

A person performing or responsible for safety-related work, be that person a paid member of the staff of the railway, a contractor, subcontractor or an employee of either, or a volunteer.

1.5.13 Railway

A guided system designed for the movement of rolling stock, which has the capability of transporting passengers, freight or both on a track together with its infrastructure and associated sidings, and includes a heavy railway, a light railway, an inclined railway or a tramway including a street tramway, having a nominal gauge in each case not less than 600 mm, but excludes crane type runways and slipways.

1.5.14 Railway infrastructure

Facilities other than rolling stock necessary for a railway to operate safely including railway track, associated track structures, over- or under-track structures, supports (including supports for railway equipment or items associated with the use of a railway), tunnels, bridges, stations, platforms, train control systems, signalling systems, communication systems, electric traction infrastructure, buildings, workshops and associated equipment.

NOTE: More detailed definitions of specific types of infrastructure are given under 'civil infrastructure', 'electric traction infrastructure', 'signalling and telecommunications infrastructure', 'track'.

1.5.15 Rolling stock

Any vehicle which operates on or uses a railway track, excluding a vehicle designed for both on- and off-track use when not operating on the track.

1.5.16 Safety culture

The product of individual and group values, attitudes, perceptions, competencies and patterns of behaviour that determine the commitment to, and the style and proficiency of, an organization's health and safety management.

1.5.17 Safety-related work

Safety activity in one or more of the following:

- (a) Driving and operation of trains.
- (b) Control of the movement of trains.
- (c) The design, construction, repair, maintenance, upgrading, inspection or testing of track, rolling stock, civil and electric traction infrastructure, and signalling and telecommunications equipment.
- (d) Development, design, implementation and management of safety related processes.
- (e) Any other duties prescribed by an organization as safety-related work.

1.5.18 Safety validation

A systematic and structured process to ensure that all risks associated with a change are identified and are reduced to as low as reasonably practicable (ALARP) (see Clause 3.1) before the change is implemented.

1.5.19 Security

Protection of persons, property and railway operation by means of arrangements to reduce the risk of harm from criminal acts of other parties such as theft, assault, sabotage and terrorism.

1.5.20 Shall

Indicates that a statement is mandatory.

1.5.21 Should

Indicates a recommendation.

1.5.22 May

Indicates the existence of an option.

1.5.23 Signalling and telecommunications infrastructure

Signalling equipment and telecommunication equipment provided and used as part of the safeworking and operating systems of the railway, but excluding supports for such equipment.

1.5.24 Track

The guidance system (rails) on which the rolling stock travels and its immediate support which may include rail connectors, sleepers, ballast, points and crossings, and substitute devices where used.

1.5.25 Track manager

The person or body who has ultimate management accountability for—

- (a) the safe construction or maintenance, or both, of railway infrastructure; or
- (b) the safe operation of railway infrastructure including train control, signalling and telecommunication systems.

1.5.26 Train

A single unit of rolling stock or two or more units coupled together, at least one of which is a locomotive or other self-propelled unit.

1.6 SAFETY PRINCIPLES

1.6.1 General management principles

The underlying safety management principles on which the objective of this Standard is based are listed as follows:

- (a) Establishing effective risk management.
- (b) Ensuring that emergencies and other occurrences can be properly managed.
- (c) Ensuring that interfaces between different organizations and organizational elements are properly defined and managed.
- (d) Protection of passengers, rail safety workers and maintaining public health, safety and security.
- (e) Protection of property from damage.

1.6.2 Implementation

Implementation of these principles entails compliance with the following aspects:

- (a) *Operational aspects* These include the following:
 - (i) Ensuring train integrity before and during its journey.
 - (ii) Maintaining safe train separation.
 - (iii) Protecting rail safety workers moving on or about the track.
 - (iv) Ensuring that trains can operate safely over the route.
 - (v) Protecting against over-speed operation.
 - (vi) Managing human error in formulation, transmission and execution of authorities or instructions, both written and verbal.
- (b) *Infrastructure aspects* These include the following:
 - (i) Ensuring the integrity of the track and other infrastructure.
 - (ii) Ensuring that both railway traffic, and the track and other infrastructure have compatible operating parameters.
 - (iii) Ensuring the safety of persons and property on or adjacent to the railway.
 - (iv) Communicating operating parameters, requirements and restrictions by adequate and effective means.
- (c) *Rolling stock aspects* These include the following:
 - (i) Ensuring the integrity of rolling stock.
 - (ii) Ensuring compatibility with track and other infrastructure parameters.
 - (iii) Ensuring safe retention of loads.
 - (iv) Provision of adequate passenger and worker protection in the event of a derailment, collision or other unscheduled events.
 - (v) Provision of reliable vehicle couplings, brake systems, and brake and other connections between vehicles.
- (d) *Interfaces with other transport modes* Recognition of the responsibilities of the interfacing parties in respect of matters such as the following:
 - (i) Managing risk at level crossings by implementing appropriate safety control systems and warning measures for road users including pedestrians.
 - (ii) Ensuring the integrity of rail-over or rail-under structures, including overheight protection from non-rail traffic for rail-over structures.
 - (iii) Where practicable, managing the risk of track obstruction arising from accidents on nearby roads or other transport routes, or involving services.
 - (iv) Managing the risks associated with the construction and maintenance of non-railway services and utilities on railway property.
 - (v) Managing the risks associated with the interface between rail and non-rail traffic on roadways, at terminals, yards and stations, and at joint/alternate use facilities such as dual use roadways and bridges.
- (e) *Interfaces with other rail networks.* Recognition of the responsibilities of the interfacing rail organizations in respect of matters such as the following:

- (i) Connection of one network to another including the definition of the interface points and the management of the infrastructure and train operations through the connection.
 - (ii) Crossings (at grade or separated) of the networks including the management of infrastructure and train operations at the crossing points.
 - (iii) Management of infrastructure and train operations on shared corridors.
 - (iv) Safeworking procedures.
- (f) Human factors management.

1.7 ADOPTION OF EXISTING PRACTICES

It is acknowledged that in existing railway operations there are practices considered by organizations as safe. Continued use of these practices or their use by a new railway that can be shown to be sufficiently similar to an existing railway, shall be supported by a comprehensive assessment to ensure that all risks including latent risks are identified and any appropriate additional controls implemented. This option may have particular relevance to the operation and maintenance of tourist, heritage and special purpose systems.

SECTION 2 SAFETY MANAGEMENT SYSTEM

2.1 GENERAL REQUIREMENTS

The organization shall establish, document, implement and maintain a safety management system as a means of conforming to this Standard. The safety management system may be integrated with the organization's other management systems.

The safety management system documentation shall comprise the following elements:

- (a) The safety management policy, see Clause 2.2.
- (b) The allocation of responsibility and accountabilities for safety management within the organization, see Clauses 2.3 and 2.4.
- (c) The risk management system for—
 - (i) risk identification, evaluation, analysis and control;
 - (ii) maintaining a risk register linking risks to controls; and
 - (iii) risk mitigation through an action plan that includes resources, see Section 3.
- (d) Policy and procedures for safety documentation, information and data control, see Clause 2.7.
- (e) Procedures for personnel management, see Section 4.
- (f) Procedures for goods and services procurement, see Section 5.
- (g) Procedures for all life cycle stages of asset management (design, construction, operation, maintenance, modification and eventual removal), see Section 6.
- (h) Procedures for interface management, see Section 7.
- (i) Change management methods and procedures, see Clause 2.11.
- (j) Procedures for disseminating information within the organization and between organizations.
- (k) Emergency management, see Clause 8.2.
- (l) Occurrence notification, investigation, analysis, developing safety actions, see Clause 8.1, and reporting in a 'just culture' environment, see Clause 1.5.8.
- (m) Key safety performance indicators and performance monitoring, see Clause 2.8.
- (n) Management review and auditing, see Clauses 2.9 and 2.10.
- (o) Security management, see Clause 2.13.
- (p) Safety culture development and maintenance, see Clause 2.14.

2.2 SAFETY MANAGEMENT POLICY

Policies and objectives for, and commitment to, railway safety shall be defined and documented by the organization or included in its general safety policy documents.

NOTE: Guidance on the preparation of policy statements is given in Appendix A.

The organization shall ensure that this policy is understood, implemented and maintained at all levels in the organization.

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.

2.4 RESPONSIBILITIES AND AUTHORITIES

The responsibility, authority and the interrelation of all rail safety workers who manage, perform and verify safety-related work shall be defined. Such definition shall ensure that these workers are given the necessary organizational freedom and authority to—

- (a) initiate action to prevent unsafe occurrences;
- (b) identify and record any railway safety issues;
- (c) initiate, recommend or provide solutions to railway safety issues through designated channels;
- (d) initiate action to learn from railway safety occurrences and to prevent any recurrence;
- (e) verify the implementation of solutions;
- (f) control further design, construction, commissioning, operation or maintenance activities so that any observable deficiency or unsatisfactory railway safety condition is corrected; and
- (g) identify internal verification requirements, provide adequate resources and assign trained and qualified personnel for verification activities.

Internal verification activities shall include inspection, testing and monitoring of design, production, installation and servicing of processes and products. Audits of the safety system, processes and products by personnel independent of those having direct responsibility for the activities being performed shall be provided for as specified in Clause 2.10.

2.5 RESOURCE MANAGEMENT

2.5.1 Financial capacity

The organization shall have the capacity to financially sustain safe railway operations. This requirement shall include:

- (a) Ability to comply with the safety management system.
- (b) Ability to meet public liability claims.
- (c) Provision for dealing with foreseeable emergencies and catastrophic events.