AS 7703:2020

Australian STANDARD®

Railway signalling – Power supply systems

RISSB
RAIL INDUSTRY SAFETY AND STANDARDS BOARD

Train Control Systems Standard

This Australian Standard® AS 7703 Railway signalling – Power supply systems was prepared by a Rail Industry Safety and Standards Board (RISSB) Development Group consisting of representatives from the following organisations:

Rio Tinto	PTA WA	Transport for NSW / ASA
Queensland Rail	Transport Victoria	Powercom Group
V/Line	Hitachi	JMD Railtech

The Standard was approved by the Development Group and the Train Control Systems Standing Committee in December, 2020. On December 16, 2020 the RISSB Board approved the Standard for release.

This standard was issued for public consultation and was independently validated before being approved.

Development of the Standard was undertaken in accordance with RISSB's accredited process. As part of the approval process, the Standing Committee verified that proper process was followed in developing the Standard

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 comment 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.

Deb Spring
Exec. Chair / CEO
Rail Industry Safety and Standards Board

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Notice to users

This RISSB product has been developed using input from rail experts from across the rail industry and represents good practice for the industry. 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.

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Approval

Name	Date
Rail Industry Safety and Standards Board	16/12/2020

Copyright

This Standard was prepared by the Rail Industry Safety and Standards Board (RISSB) Development Group AS 7703 Railway signalling – Power supply systems. Membership of this Development Group consisted of representatives from the organisations listed on the inside cover of this document

Objective

The objective of this Standard is to provide an approach to the use of the electrical equipment throughout the system life cycle in achieving the functional signalling safety inherent with the hazards associated with the use of electricity. This standard specifically covers the signalling power supply and the manner in which it supports the other signalling equipment.

Compliance

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

1. Requirements.
2. Recommendations.
3. Permissions.
4. Constraints.

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 recognise 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

Commentary

This Standard includes a commentary on some of the clauses. The commentary directly follows the relevant clause, is designated by 'C' preceding the clause number and is printed in italics in a box. The commentary is for information and guidance and does not form part of the Standard.

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Appendix Contents

1 Scope and general

1.1 Scope

This Standard covers the use of the electrical equipment as part of a signalling system to achieve vital and non-vital functions. The signal power supply is a critical aspect for safe operation of signalling systems. This Standards scope includes the functional requirements of electrical equipment performing signals safety applications. The scope of this Standard covers the range of environmental conditions signals are likely to be exposed to when operating in Australian and New Zealand rail networks. The scope also details standard requirements for electrical equipment that is used in signalling systems to aid standardisation of supply and interoperability of equipment across railway networks.

This Standard also covers the use and safety throughout the system life cycle. This includes:

(a) design;

(b) construction;

(c) testing and commissioning;

(d) operation;

(e) maintenance;

(f) modification;

(g) decommission and disposal.

Because of the inherent hazards with electricity there are legislative requirements for its application. Appendix G provides further information.

The hazards associated with the electrical equipment and the railway signalling functions have been considered and controls identified. The rail infrastructure manager (RIM) should consider if the controls are safe SFAIRP for the application on their rail network.

1.2 Exclusions

High voltage and railway traction power supplies are excluded from this standard. Where the signalling power supply is derived from these sources the standard only covers the transformer secondary and protection circuits and all downstream equipment.

Railway traction return current circuits and associated equipment are excluded from this standard. This also includes the associated equipment for electrolysis protection.

On board signalling system power supplies are excluded from this standard.

1.3 Demarcation between application of AS/NZS 3000 and AS 7703 requirements

For clarity in applying the correct requirements, a hard line of demarcation is defined between supply authority system or similar power systems and the signalling power system. The line of demarcation is at the low-voltage output terminals of the isolating / transformer supplying the signalling power system.