RISSB
RAIL INDUSTRY SAFETY AND STANDARDS BOARD

CODE OF PRACTICE

Vigilance Systems and Timing Cycles

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HF Integration, Inland Rail, KiwiRail, MS Rail Services, Metro Trains, PTA, Queensland Rail, Rail Safety Consulting Australia, Rail, Tram & Bus Union, TasRail, TfNSW, and Wabtec.

The Safety and Operations Standing Committee verified that RISSB's accredited process was followed in developing the product, before the RISSB Board approved the document for publication.

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 Code of Practice to the Australasian rail industry as it represents industry good practice and has been developed through a rigorous process.

Damien White
Chief Executive Officer
Rail Industry Safety and Standards Board

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2025	4 April 2025	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
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Objective

The purpose of this document is to provide RTOs and system designers with a process for determining the appropriate vigilance system and timing cycles for specific operational context.

Background

Vigilance systems have been integral to rail safety since the 1960s, but they face significant challenges that can compromise their ability to maintain continuous Rail Traffic Crew (RTC) alertness. Originally developed to improve RTC alertness and stop rail traffic in the event of RTC incapacitation, these systems have design limitations that impact their overall effectiveness, including:

a) Subconscious response to alerts: An RTC respond to prompts out of habit, not fully aware of their actions. This automatic behaviour can make it seem like the RTC is alert, but in reality, their situational awareness might be compromised.

b) Limited monitoring and hazard awareness during timing cycles: Vigilance systems operate on timing cycles, requiring RTC responses at intervals (e.g., every 30 to 60 seconds). However, during these cycles, an RTC may not be alert resulting in rail traffic covering significant distances without oversight.

c) Poor workload design: Workload design and the understanding of the cognitive load for a given task demand is critical for optimising RTC engagement. Poor workload design can result in cognitive overload and distraction for the core task of managing rail traffic or low cognitive engagement leading to disengagement and fatigue.

These limitations indicate that while effective in stopping rail traffic, vigilance systems do not ensure constant RTC alertness, further, poorly designed vigilance systems timing cycles can have a detrimental effect on RTC performance.

Investigation and Commission reports into the Beresfield (1997) and Waterfall (2003) incidents and the Independent Transport Safety and Reliability Regulator (ITSSR) in 2006 and the Australian Transport Safety Bureau (ATSB) in 2024 highlight these issues, emphasizing the need for rail transport operators (RTOs) to understand the limitations of vigilance systems and manage the risks.

RISSB products address known hazards within the railway industry and further information relating to vigilance system limitations are presented in Appendix A.

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Section 1 Scope and general

1.1 Scope

This Code of Practice (CoP) applies to vigilance system and timing cycles for rolling stock operating within Australian and New Zealand rail networks. It covers various types of rail services, including:

a) locomotive-hauled freight and passenger services;

a) diesel multiple units (DMU);

b) electric multiple units (EMU);

c) metro services (excluding unmanned operations);

d) light rail services; and

e) infrastructure maintenance vehicles.

This CoP should be read in conjunction with AS 7511 and AS 7501 to determine additional requirements for new or existing rolling stock or rolling stock that is being upgraded or modified.

1.2 Out of scope

This CoP does not specifically cover:

a) rolling stock used on sugar cane railways, monorail networks, and heritage rail traffic, although relevant items may be applied at the discretion of the relevant RTO;

b) the operation of rolling stock, the design and operation of wayside elements that interface with onboard train protection systems, or the design and operation of other rolling stock systems that interface with onboard train protection systems in detail; and/or

c) onboard train protection systems on rolling stock with a grade of automation GoA 2 or above as defined in EN62290-1, although items from this CoP may be applied to such systems as deemed appropriate by the relevant RTO.

1.3 Referenced documents

The following documents are referred to in the text in such a way that some or all of their content is considered in this CoP:

- AS 7510.6:2014, *Braking Systems Part 6 – Train*
- AS 7511, *Onboard train protection systems*
- AS 7540, Human Factors Integration in Rail Engineering Projects
- ITSRR Information Paper, *RTC Safety Systems and Automatic Train Protection*
- *ATSB Report, Collision between freight trains 7MP5 and 2K66 - Jumperkine, Western Australia, on 24 December 2019*

NOTE:

Documents for informative purposes are listed in a Bibliography at the back of the document.