RISSB

RAIL INDUSTRY SAFETY AND STANDARDS BOARD

GUIDELINE

# Derailment Investigation and Analysis

## Notice to users

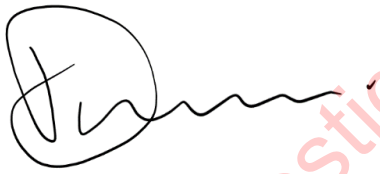
This RISSB product has been developed using input from rail experts from across the rail industry and represents good practice for the industry. The reliance upon or manner of use of this RISSB product is the sole responsibility of the user who is to assess whether it meets their organisation's operational environment and risk profile.

CERT Rail Training, Rail Safety Consulting Australia, Viva Health Group, Pacific National, RTBU, Kiwi Rail, Jacobs, Bradken, WSP, Yarra Trams, Transport for New South Wales, Monash University, PTA, Roy Hill, and Rail Train.

The Safety & 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 Guideline. Their efforts ranged from membership of the Development Group through to individuals providing comments on a draft of the product during the open review.

I commend this Guideline 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

## Keeping RISSB products up-to-date

Products developed by RISSB are living documents that reflect progress in science, technology and systems. To maintain their currency, RISSB products are periodically reviewed, and new editions published when required. Between editions, amendments may be issued. Products developed by RISSB could also be withdrawn.

It is important that readers assure themselves that the RISSB product they are using is current, including any amendments that have been issued since the product was published. 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. Members are encouraged to use the change request feature of the RISSB website at: http://www.rissb.com.au/products/. Otherwise, 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.

## Document details

First published: 4 April 2014

## Document history

| Publication Version | Effective Date | Reason for and Extent of Change(s) |
|---|---|---|
| 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 |
|---|---|
| Rail Industry Safety and Standards Board | 4 April 2025 |

## Copyright



Published by the Rail Industry Safety and Standards Board, PO Box 518 Spring Hill Qld 4004, Australia.

## Objective

The objective of this Guideline is to provide the technical information in determining the contributing factors of a derailment for anyone undertaking a rail safety investigation into a derailment.

It also guides the reader on what evidence to collect and how to interpret it in determining the contributing factors of a derailment.

The derailment occurrence site can present those involved in the response, including an investigator, with safety hazards which must be identified and managed. This Guideline also provides information on likely hazards that are exceptional to derailments.

It also guides the reader on what evidence to collect and how to interpret it in determining the contributing factors of a derailment.

## Table of Contents

## Figures

## Equations



## Tables

# Section 1 Scope and general

## 1.1 Scope

The *Derailment Investigation and Analysis Guideline* has been written to provide a technical resource to identify and analyse different modes of derailment to supplement an investigation undertaken in accordance with the RISSB *Rail Safety Investigations Code of Practice*.

This document provides guidance for the investigation of the track and rolling stock aspects of derailments to assist investigators in establishing the causes of derailments on the rail network. Investigators are encouraged to involve other disciplines within the investigation process investigation for technical advice such as subject matter experts and refer to appropriate railway safety standards and codes where applicable.

The document does not provide repair instructions for track or rolling stock following derailments.

The document also serves as a guide for derailment site analysis and evidence collection for a worker undertaking a rail safety investigation into a derailment.

This document describes aspects of rail operations, rolling stock, infrastructure, environments and human factors that could cause or contribute to a derailment.

References to rolling stock within this document are generally referred to as trains and include locomotives, electrical multiple units, rail freight vehicles, passenger carriages, light rail vehicles, track machines and road rail vehicles.

This Guideline has been developed for heavy rail; however it could be applicable in other wheel-on-rail networks.

## 1.2 Referenced document

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

- AS 7509, *Rolling Stock – Dynamic Behaviour*
- AS 7635, *Track Geometry*
- AS 7639, *Track Structures and Supports*
- AS 7640, *Rail Management*
- AS 7642, *Turnouts and Other Special Trackwork*
- TLIF5023, *Undertake a Derailment Investigation*
- RISSB, *Rail Safety Investigation Code of Practice*
- RISSB, *Wheel Rail Profile Development Guideline*
- *Wheel and Rail Profile Development Guideline*
- *Handbook of Railway Vehicle Dynamics – Chapter 11: Railway Vehicle Derailment and Prevention – Wu, Wilson, Klopp, Keylin*